

Montague Water Conservation District
**Site Plan Agreement between Montague Water Conservation 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*)**

A. Introduction

This Site Plan for the Template Safe Harbor Agreement (Agreement) is between ***Montague Water Conservation District***, National Marine Fisheries Service (NMFS), 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 Permittee 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 of the Enrolled Property and the management authority of the Permittee, the Enrolled Property 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 Participant on the enrolled property that are expected to benefit coho salmon.

B. Enrolled Property - Montague Water Conservation District.

B.1. General narrative and map describing property

Montague Water Conservation District (MWCD) is a public irrigation district that owns and operates Dwinnell Reservoir located in the southern portion of Shasta Valley and provides irrigation water to users within the district boundary, located in the northern portion of Shasta Valley. MWCD owns Dwinnell Reservoir, the property under the high water mark of Dwinnell Reservoir and the property along the Shasta River immediately below Dwinnell Reservoir where much of the water operations for the irrigation district occurs. This proposal incorporates and extends MWCD's Conservation Habitat Enhancement and Restoration Project (CHERP) as well as additional measures proposed in this Safe Harbor Agreement. CHERP is a package of restoration projects MWCD has committed to and is currently implementing that are described in section E.2 of this Site Plan. Additional conservation measures providing net conservation benefit are also committed to by MWCD and described in Section E.3.

Montague Water Conservation District - List of Appendices

- Appendix A - Property Deed
- Appendix B - Water Use Reports
- Appendix C - MWCD Operations Plan

B.2. Legal Description of Property Boundary

The Enrolled Property consists of the following APNs:

APNs and Field Names/Descriptions:

020-270-030-000 Shasta River	9.00 acres
020-280-100-000 Shasta River and Spill Tower	2.00 acres
020-280-110-000 Dwinnell Dam/Canal/Reservoir	<u>117.10 acres</u>
	228.10 acres

MWCD's site plan includes work on existing easements that are provided in Appendix A with MWCD's deeds to enrolled property.

Figure 1. Ownership - MWCD Boundary Map for Safe Harbor Agreement on Shasta River



Figure 1b. Easement MWCD Boundary Map for Safe Harbor Agreement on Parks Creek



B.3. Description of Water Rights

MWCD has two permits to deliver water to storage in Dwinnell Reservoir. Permit #2452 is for diversion to storage on the Shasta River while Permit #2453 is for water delivered to storage from Parks Creek (see Appendix B). MWCD is including both its Parks Creek and Shasta River rights in this Site Plan Agreement.

SWRCB Permit No. 2452; Decree No. 287 (Shasta River at Dwinnell Dam)

Point of Diversion: N. 52°, 43' E., approximately 2601 feet from SW corner of Section 25, T43N, R5W, MDB&M, being within the NE¼ of SW¼ of said Section 25
Place of Use: 19,500 acres within District, as shown on map on file with SWRCB
Purpose of Use: Irrigation
Season of
Diversion: October 1 to June 15, collected to storage in Dwinnell Reservoir
Season of Use: April 1 to October 1
Quantity: 35,000 acre-feet per annum
Priority date: July 23, 1923

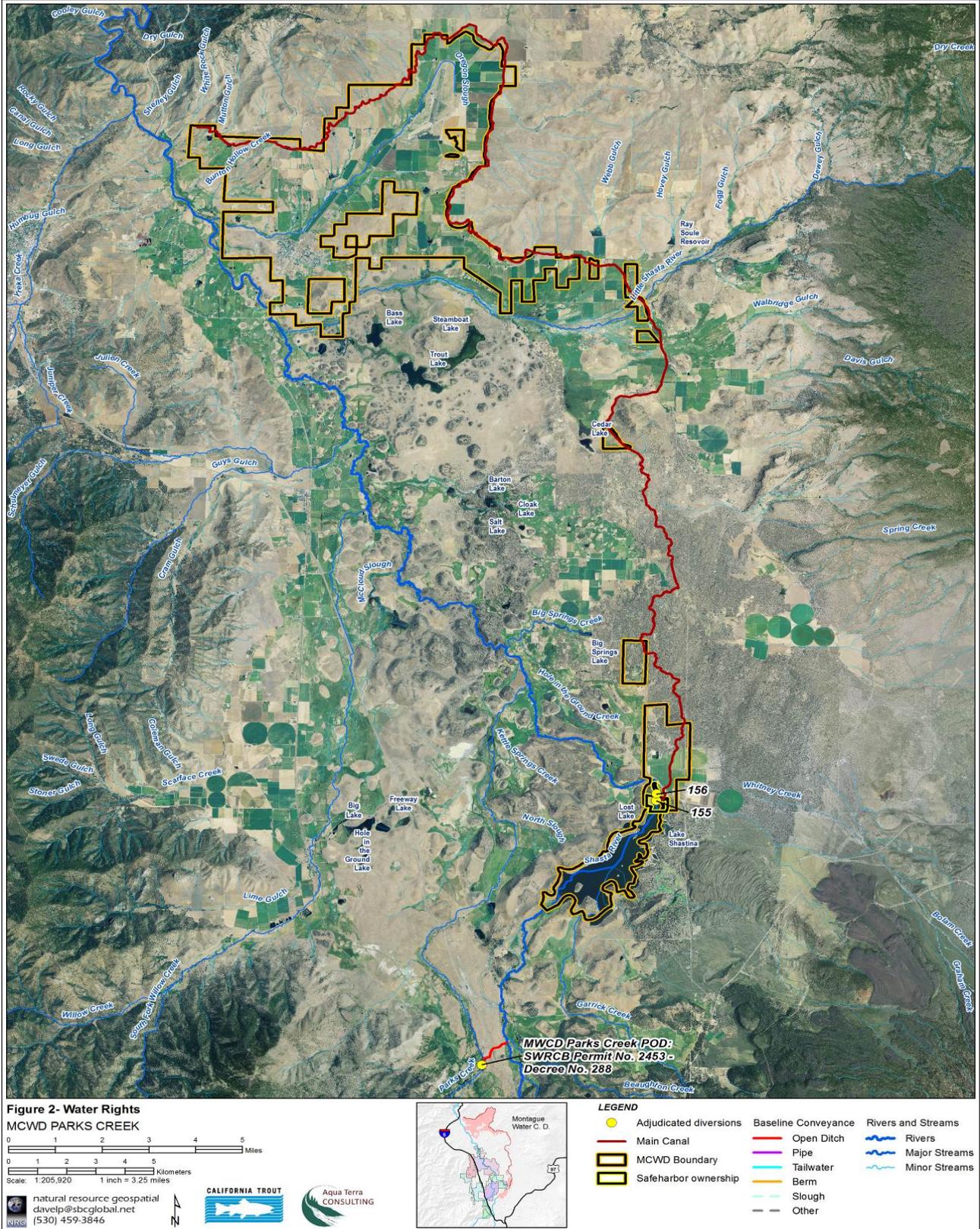
SWRCB Permit No. 2453; Decree No. 288 (Parks Creek diversion to Dwinnell Reservoir)

Point of Diversion: N. 70°, 30' E., approximately 2511.8 feet from SE corner of Section 29, T42N, R5W, MDB&M, being within the SW¼ of SE¼ of said Section 29
Place of Use: 19,500 acres within District, as shown on map on file with SWRCB
Purpose of Use: Irrigation
Season of
Diversion: October 1 to June 15, collected to storage in Dwinnell Reservoir
Season of Use: April 1 to October 1
Quantity: 14,000 acre-feet per annum
Maximum 150 cfs
Diversion:
Priority date: July 30, 1923

Volume of Diversions used by MWCD

Diversion #/Water	Description	Water Rights Values	Acres Irrigated with diversion	Average days/season of diversion
#2452	Shasta River Storage	Up to 35,000 afy	Maximum 14,255 acres	257
#2453	Parks Creek Diversion to storage	Up to 14,000 afy	Maximum 14,255 acres	257

Figure 2. MWCD Map -Place of Use



C. Routine Land Use

C.1. Present Routine Land Use

MWCD delivers water to approximately 14,255 currently irrigated acres within the 19,772 acres included within the district boundary. District acreage is irrigated either by flood irrigation or sprinkler irrigation for pasture production or irrigated for hay crops amongst district users. MWCD owns the property to the high water mark of Dwinnell Reservoir (elevation 2809), Dwinnell dam and property below the dam including approximately 1,600' of the Shasta River below Dwinnell Dam.

Real property owned by MWCD near Dwinnell Reservoir is used to manage the reservoir, and water releases for irrigation or instream purposes. These parcels comprise the Enrolled Property and are where much of MWCD's enhancement projects are located. The storage efficiency of Dwinnell Reservoir is unknown but considerable storage loss occurs as the reservoir exceeds 70% capacity. Significant storage loss is thought to occur to deep percolation, supply groundwater and potentially reemerge at critical spring sources for coho salmon.

MWCD also holds easements that are important to its operation and objectives of the Site Plan and are included as part of the Enrolled Property. One easement is the Permittee's point of diversion (POD) from Parks Creek, within current ownership of Parks Creek Ranch, a separate Permittee within the SWGC. MWCD uses this site to divert water to storage in Dwinnell Reservoir from Parks Creek.

Irrigation Management:

MWCD can irrigate up to 14,255 acres, on the northeast side of the Shasta Valley near the community of Montague. MWCD has a 19.4 miles long Main Canal from Dwinnell Reservoir to the location where the ditch splits within the MWCD district. MWCD has numerous lateral and secondary ditches it manages and maintains within the district where delivery loss occurs. There are also numerous other ditches within MWCD that are privately operated where delivery inefficiency also occurs.

MWCD Irrigation: Average volume of property irrigated annually is 12,376 acres within the recent past. Irrigation season is from 4/1-9/30 for MWCD while diversion to storage is allowed from 10/1 to 6/15 for the two permitted rights. The average volume of water released from Dwinnell Dam to MWCD, is 22,000-24,000 afy. Over the past 8 years, an average of approximately 1.9 acre feet of water was released from Dwinnell per irrigated acre. A significant amount of the irrigated acreage in the District is irrigated for grain hay production requiring only 1 or 2 irrigation rotations or approximately 1.0 acre foot per acre, depending on spring precipitation. Other crops grown within the District include alfalfa and pasture production requiring irrigation into September, if water is available. Average acre foot of water released from storage for pasture and alfalfa is approximately 2.0-3.5 acre feet/acre per year.

The most significant irrigation inefficiency related to MWCD is delivery loss in MWCD's 19.4 mile long main canal. Investigations show that approximately 28% of the water released for delivery to MWCD District is lost in transmission losses in the main canal. 90% of the loss in the main canal occurs in the most inefficient reaches which consist of approximately 8.4 miles of

MWCD's main canal. Significant losses also occurs within the MWCD district through transmission losses on secondary ditches. There are approximately 44 miles of secondary and small delivery ditches within MWCD.

Improvements to infrastructure and resulting operation of MWCD's facilities, is a key objective of MWCD that will provide significant enhancement to Coho Salmon and other salmonids. Critical components of MWCD's infrastructure are further described below:

Cross Canal: MWCD storage facility, Dwinnell Reservoir, delivers water to the Shasta River via the Cross Canal, located at the base of Dwinnell Dam. Water is released from the control facility at Dwinnell Dam to the Shasta River via the cross canal is either for the purpose of providing water for instream benefit or delivering water to water rights impacted by the establishment of MWCD, commonly referred to as prior rights. During establishment, MWCD agreed to provide water via MWCD's infrastructure to previously established water right holders affected by the construction of MWCD's infrastructure. Specifically, five water rights totaling up to 3,382 af of water are provided annually via MWCD's storage, cross canal or main canal. Three water rights totaling 1,984 acre feet are provided through MWCD's Cross Canal to the Shasta River.

Dwinnell Dam's Emergency Spill Tower: A second method to release water from Dwinnell Reservoir is via the emergency Spill Tower. As the reservoir reaches full capacity of 49,000 acre feet, water drains into the spill tower base when full storage elevation is attained. Up 1,800 CFS can be released through the spill tower in the event of flood conditions. Water can also be released via the Emergency Spill Tower, by a lower elevation adjustable slide gate when storage volume reaches approximately 32,000 af. Operation of this gate is problematic due to debris getting jammed in the gate upon closure.

MWCD Flow Gauging Operations: MWCD operates numerous flow gages to improve operations and accounting. The following gages are operated by MWCD:

<u>Gage Name:</u>	<u>Purpose:</u>
CDEC MPD	MWCD Parks Creek Diversion- cfs/acre feet
CDEC PME	MWCD Parks Creek- Stage
CDEC DRE	MWCD Dwinnell Reservoir Storage -acre feet
CDEC DSW	MWCD Seeps below Dwinnell Reservoir- cfs
CDEC DFB	MWCD Environmental Water to Shasta River- cfs
CDEC SRX	MWCD Shasta River Prior rights - cfs
Main Canal	Releases to MWCD and Main Canal Prior Rights

Flying L Pumps: MWCD operates several pumps near Dwinnell Reservoir that have mainly delivered up to 5.4 cfs groundwater to MWCD's main canal for irrigation purposes. In 2014, an emergency project installed a pipeline to allow the water produced by the pumps to be delivered to the City of Montague via the Shasta River for emergency municipal purposes as well as to aid development and protection of cold water habitat within the Shasta River.

Parks Creek Point of Diversion: MWCD diverts from Parks Creek to storage in Dwinnell Reservoir from 10/1-6/15. The diversion is operated by a concrete and flashboard structure that is utilized to build water surface elevation in Parks Creek to divert water. Operation is manual and access is difficult in high flows. While a fish screen and improved diversion facility has been designed for the site, it has not been funded or installed.

MWCD CHERP: Over the past several years, MWCD has worked with agencies and partners to develop a long term conservation and enhancement project titled MWCD's CHERP (Conservation Habitat Enhancement and Restoration Plan). MWCD's CHERP is a coordinated group of projects that will improve MWCD's infrastructure and commitment to manage those improvements to enhance conditions for Coho Salmon, salmonids and other cold water dependent species. The projects proposed by MWCD in CHERP are complementary and inclusive of the projects identified in this site plan. Current Section 7 coverage provided by CHERP focuses on implementation of projects identified in Section E.2 and operations to manage delivery or by-pass of water for instream purposes. Larger components of CHERP are described below:

- I. Parks Creek Fish Screen: MWCD operates a diversion on Parks Creek. MWCD may divert up to 14,000 afy at this diversion point for storage in Lake Shastina. MWCD has completed engineering design for fish passage and a fish screen for the Parks Creek diversion. The facility has been designed to meet both CDFW and NMFS fish passage and fish screening criteria.
- II. Main Canal Lining: MWCD proposes to line up to 8.4 miles of its main irrigation canal in order to limit delivery loss and conserve water from leakage and loss. The conserved water would be provided for instream enhancement to benefit water quality and cold water dependent species, including coho salmon. MWCD has worked with CDFW and NMFS to determine the best approach(es) to enhance cold water fisheries downstream of MWCD's diversions points. MWCD has submitted a Change Petition SWRCB to add Fish and Wildlife as a secondary beneficial use including Water Code 1707.
- III. Modify MWCD Facilities and Other Habitat Enhancements below Dwinnell Reservoir: In coordination *with NMFS and CDFW* MWCD *proposes to improve and modify its diversion and storage facilities* below Dwinnell Reservoir to enhance and restore salmonid habitat as follows:
 - By-Pass and/or release of conserved water to enhance fishery life stages (e.g., for sediment transport or temperature improvements); and/or
 - Development of habitat enhancement in the Cross canal and Shasta River below Dwinnell Dam to improve water quality. Increase the capacity of the Cross Canal below Dwinnell Reservoir that releases flow back to the Shasta River to provide

for increased flow releases made available by lining the main canal (see Figures 1 and 2); and/or

- Incorporation of groundwater sources in system operations to improve temperature and enhance water quality below Dwinnell Dam; and/or
- Develop enhanced side-channel habitat in and adjacent to the Cross Canal and Shasta River at the base of Dwinnell Reservoir to improve SONCC habitat and water quality prior to entering the Shasta River.
- Connect the Flying L Pumps to the Cross Canal and side channel habitat to provide an assured cold water source to the Shasta River, especially during the summer rearing period.

IV. MWCD Flow Gauging Operations: MWCD will improve and continue to operate flow gages to verify operations for multiple beneficial uses. The following gages are operated by MWCD:

Gage Name:	Purpose:
CDEC MPD	MWCD Parks Creek Diversion- cfs/acre feet
CDEC PME	MWCD Parks Creek- Stage
CDEC DRE	MWCD Dwinnell Reservoir Storage -acre feet
CDEC DSW	MWCD Seeps below Dwinnell Reservoir- cfs
CDEC DFB	MWCD Environmental Water to Shasta River- cfs
CDEC SRX	MWCD Shasta River Prior rights - cfs
Main Canal	Releases to MWCD and Main Canal Prior Rights

Irrigation Maintenance

Ditch cleaning:

The approximately 44 miles of open irrigation ditches MWCD maintains are prone to moss growth, which slows the conveyance of water and clogs the buried mainlines and sprinkler heads. The ditches should be cleaned annually yearly to remove moss and repair breaches. Cleaning ditches on both the Main Canal and laterals managed by MWCD consists of mechanical cleaning with a excavator at least every several years. Maintenance typically occurs during the non-irrigation season between 11/15 and 4/1. MWCD is proposing to line 8.4 miles of its Main Canal to reduce delivery loss while also reducing maintenance costs.

Diversion operation and cleaning:

Parks Creek: The Parks Creek diversion intake is maintained by a concrete and flash board intake structure that builds water surface elevation in order to divert to an open canal from Parks Creek. A fish screen is not present and the concrete flashboard structure is used to divert water and provide by-pass. Operation and maintenance can entail the use of heavy equipment at the point of diversion to remove spoils and deposited sediment to maintain channel design elevations and a berm that ties into the concrete structure. Repair work including rebuilding the

berm (constructed from bedload materials) and excavating deposited sediment typically occurs after a significant storm event (such as a five year flow event). Maintenance including removing sediment to maintain channel and diversion elevations occurs during the summer months between 8/15-9/30 when base flow exist. Expected maintenance would include sediment and spoils removal near POD as well as woody debris. MWCD proposes to reconstruct the diversion infrastructure and construct a compliant fish screen in the canal with a by-pass pipe. Operations will be guided by the Upper Parks Creek Flow Strategy and by-pass objectives based on life stage needs.

Shasta River: Dwinnell Reservoir is an on-channel reservoir. Diversion of stored water is operated by four adjustable head gate intake structures. Water is released from the reservoir to the main canal where it can be delivered to the MWCD, Prior Rights on the main canal, or to the cross canal which releases flow to the Shasta River. Prior Rights are water rights that existed prior to establishment of MWCD. Therefore, MWCD releases up to 3,382 acre feet of irrigation water to Prior Right holders via the Shasta River or the Main Canal. The Cross Canal is used to deliver water to the Shasta River either for delivery of Prior Rights, water for instream purposes or to prevent uncontrolled spills when storage is at or risking exceeding capacity. Operation and maintenance can entail the use of heavy equipment at the point of diversion (POD) to remove spoils and deposited sediment to maintain channel design elevations of the intake structure as well as the Main Canal and Cross Canal.

Pasture Grazing Management:

MWCD does not graze livestock on the Enrolled Property.

Vehicle Crossings Maintenance:

MWCD does not have vehicle or livestock stream crossings on the Enrolled Property.

Riparian Fencing Maintenance & Management:

MWCD does not propose to graze the Enrolled Property. However neighboring livestock has entered the Enrolled Property in the past and a boundary fence is necessary along the Shasta River below Dwinnell.

Road Maintenance: Road systems within the Enrolled Property are maintained by MWCD. Road systems are surfaced with base. Runoff during heavy precipitation is delivered to the main canal, not the Shasta River.

Herbicide/Fertilizer/Pesticide Use

MWCD does apply spot spray of over-the-counter herbicides outside of riparian corridor per label applications. MWCD will not apply herbicides within 35' of a natural water body.

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 considered standard practices for production of livestock, pasture and hay. For the purposes of the Agreement, standard practices for production of livestock, pasture and hay production 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 non-farming/ranching routine activities include installation, repair, maintenance and operation of: diversions, fish screens, instream habitat structures, fences, roads, riparian area cultivation and maintenance, stream crossings, monitoring infrastructure activities, erosion control, flood and emergency protection and invasive plant removal and control. 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 that are 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.

1. Monitoring Protocols for Implementation

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

- Log of the in-water work that 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.

1. 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.

C. 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.

C1. 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.

C2. 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.

1. 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.

D. 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.

D1. 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 4th 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>.

D2. 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 tackified 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.

D3. 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.

D.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

1. 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.

E. 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.

E1. Ensure that any pesticide or herbicide is handled and applied by a licensed applicator (when required) in accordance with 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.

E2. Use care to minimize fertilizer use in applications that could result in nutrient loading to natural waterways.

E3. Review label information and avoid the use of any material known to be detrimental to fish where it could impact Covered Species.

E4. 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.

E5. 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.

1. 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.

F. 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 further defined in California Code of Regulations section 15359.

F1: 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.

F2: NMFS and CDFW will be notified within 14 days of beginning emergency work per Fish and Game Code 1610.

1. 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 that will result in improved habitat conditions for the Covered Species. The types of actions to be implemented will vary with each Site Plan. 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 BMAs, 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 its intended benefits.

Table 1. Beneficial Management Activities and Associated Monitoring Techniques.

Beneficial Management Activity	Monitoring Techniques
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.

1. 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.

1. 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 salmonid fish passage 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 fish 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 juvenile and adult fish passage. 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 fish passage projects at stream crossings, small dams and water diversion structures and should be referenced when developing fish 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 salmonids, additional site-specific criteria may be appropriate and recommended by agencies.

1. Monitoring Protocols

All fish 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.
http://www.habitat.noaa.gov/toolkits/restoration_center_toolkits/forms_and_guidance_documents/ori_monitoring_sheet_w_guidance.pdf

D. Bioengineering and Riparian Habitat Restoration

These projects are intended to improve salmonid 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 fish habitat and fish survival by increasing fish embryo and alevin survival in spawning gravels, reducing injury to juvenile salmonids 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 whenever possible.

1. 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.)

E. Removal of Small Dams (permanent and flashboard)

The CDFG Manual does not cover the removal of small dams, however guidelines and minimization measures have been developed here. Types of small dams covered are permanent, flash board, and seasonal dams with the characteristics listed below. Implementing these types of projects may require the use of heavy equipment (*e.g.*, mechanical excavators, backhoes, etc.). Dams removed in part or in whole, by the use of explosives are not included as a BMA. Dams included here are less than 25 feet in height from the natural bed of the stream or watercourse at the downstream toe of the barrier, or from the lowest elevation of the outside limit of the barrier to the maximum possible water storage elevation. In addition, BMAs will only include dam removal that will result in the formation of a channel at natural grade and shape upstream of the dam, naturally or with excavation, in order to minimize negative effects on downstream habitat. Candidate dam removal projects will (1) have a relatively small volume of sediment available for

release that when released by storm flows, will have minimal effects on downstream habitat, or (2) are designed to remove sediment trapped by the dam down to the elevation of the target thalweg (the deepest and fastest moving part of the stream) including design channel and floodplain dimensions. This can be accomplished by estimating the natural thalweg using an adequate longitudinal profile (CDFG Manual Part XII *Fish Passage Design and Implementation*) and designing a natural shaped channel that provides the same hydraulic conditions and habitat for the Covered Species that is provided by the natural channel and has the capacity to accommodate flows up to a 2-year flood.

Data Requirements and Analysis

- A longitudinal profile of the stream channel thalweg for at least a distance equal to 20 channel widths upstream and downstream of the structure and long enough to establish the natural channel grade, whichever is farther, shall be used to determine the potential for channel degradation (as described in the CDFW Manual).
- A minimum of five cross-sections: one downstream of the structure, three roughly evenly spaced through the reservoir area upstream of the structure, and one upstream of the reservoir area outside of the influence of the structure to characterize the channel morphology and quantify the stored sediment.
- Sediment characterization within the reservoir and within a reference reach of a similar channel to determine the proportion of coarse sediment (>2mm) in the reservoir area and target sediment composition.
- Prior to project initiation, further consultations with CDFW and NMFS will be required prior to removing a small dam to determine if: (1) sediments stored behind dam have a reasonable potential to contain environmental contaminants [dioxins, chlorinated pesticides, polychlorinated biphenyls (PCB's), or mercury] beyond the freshwater probable effect levels (PELs) summarized in the NMFS Screening Quick Reference Table guidelines or (2) the risk of significant loss or degradation of downstream spawning or rearing areas by sediment deposition is high. Sites shall be considered to have a reasonable potential to contain contaminants of concern if they are downstream of historical contamination sources such as lumber or paper mills, industrial sites, or intensive agricultural production going back several decades (*i.e.*, since chlorinated pesticides were legal to purchase and use). In these cases, preliminary sediment sampling is advisable.

1. 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.)
- The NOAA Restoration Center's Fish Passage Barrier Removal Performance Measures and Monitoring Worksheet which includes longitudinal profiles, cross sections and socio/economic information.
http://www.habitat.noaa.gov/toolkits/restoration_center_toolkits/forms_and_guidance_documents/ori_monitoring_sheet_w_guidance.pdf

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 fish 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).

1. 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.

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.

1. 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, fish surveys, habitat improvement, and food availability.

1. 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.

J. Water Storage and Tailwater Capture Systems

This BMA addresses water storage that results from storage of water diverted from surface or groundwater sources and tailwater capture (off channel). A water storage facility enables a landowner to use stored water at a later date or when desired. Water storage facilities can have many benefits that go beyond agricultural use including groundwater recharge, and allowing diversion during winter and early spring when instream discharge is ample. Water storage, when paired with reduction of water use later in the season, can be a benefit to the Covered Species.

Tailwater is created in flood irrigation operations as unabsorbed, untranspired, and unevaporated irrigation water that may flow back into the stream. Restoration projects to address tailwater input will include construction of tailwater capture systems (pond, berms or pick up ditches) to intercept tailwater before it enters streams as surface flow. Water held in capture systems, such as a pond, can be reused for future irrigation purposes, therefore reducing the need for additional stream diversions. Tailwater ponds are used primarily during the irrigation season (dry summer months).

A tailwater pond allows a landowner the ability to irrigate between set irrigation cycles (if in an irrigation district). The State Water Board allows for captured water to be put to beneficial use, but it cannot be used to irrigate ground that may not have been in production in the past or otherwise harm other legal users of water. Tailwater ponds will be located at a distance from the edge of the active channel to avoid causing stranding of juvenile salmonids or channel avulsion during flood events. Tailwater ponds must be combined with a reduction in diversion amounts or be utilized at an existing point of diversion to ensure water allocation is consistent with adjudication. Tailwater berms allow for intercepting tailwater before it enters the stream, but is not able to be reused. Berms allow tailwater to be kept on the fields and percolate into soils and back to the river. These shall be placed in areas where they will not pose any channel pressure in the event of a flood and in areas where soils have high permeability (well-draining) and not be an excessive amount. Tailwater pick up ditches allow the landowner to intercept tailwater and convey it to another place of use to utilize for irrigation, thereby reducing demand for surface water diversion.

1. Monitoring Protocols:

- Report of amount of water stored or captured and reused where possible.

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.

1. 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).

1. 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.

1. 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.

N. Optimizing cold water spring inputs

Cold water springs are an important habitat feature on the Shasta River and can provide both local and reach scale benefits to the Covered Species.. Projects to optimize cold water spring inputs may include developing alcoves (described in the off channel section above), installing spring boxes or piping springs to the river to improve habitat conditions at a specific location. All spring optimization projects will be designed to maintain fish passage, minimize erosion, comply with water laws, and improve, or not impair, water quality conditions. All spring optimization projects will be reviewed and approved by a NMFS/CDFW engineer to ensure that these conditions have been met.

Monitoring Protocols:

- If any infrastructure is constructed to convey spring water to the river the 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.)
 - Temperature Monitoring Protocol (TBD) as specified in the Individual site plan or in the Flow Management Plan.
 - Real time water diversion monitoring protocol (TBD) as specified in the Individual site plan or in the Flow Management Plan.

O. Combining or moving points diversions

Combining or moving current points of diversion can be employed as a BMA in order to enhance flows in certain reaches, maintain cold water springs or provide fish passage so long as operations are undertaken in compliance with law. Each permittee shall affirm its operations complies with law if it undertakes operations under this section.

1. Monitoring Protocols:

- To document the construction of new infrastructure that will facilitate moving a point of diversion or combining diversions the 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.)
 - Temperature Monitoring Protocol (TBD) as specified in the Individual site plan or in the Flow Management Plan.
 - Real time water diversion monitoring protocol (TBD) as specified in the Individual site plan or in the Flow Management 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.

1. 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 and fish and wildlife.

1. 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. These measures would occur on MWCD's property and infrastructure on the Shasta River, at the Parks Creek POD and Parks Creek canal and at the Point of re-diversion on the lower Shasta River where the existing POD is located.

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 salmonids.
- If the thalweg of the stream has been altered due to construction activities, efforts shall be undertaken to reestablish it to its original configuration¹.

B. Requirements for Fish Relocation and Dewatering Activities

1. Guidelines for dewatering. Project activities funded or permitted under the Template SHA may require fish 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

¹ Projects that may include activities that may alter the thalweg, such the use of willow baffles, are allowed.

habitat, and the stranding, or displacement of fish and amphibian 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 fish 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 fish will be removed. Block net mesh shall be sized to ensure salmonids 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 fish and other aquatic vertebrates (as described more fully below under ***General conditions for all fish capture and relocation activities***).
- Coordinate project site dewatering with a qualified biologist in coordination with NMFS and CDFW to perform fish relocation activities. The qualified biologist(s) must be familiar with the life history and identification of listed salmonids 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 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 cofferdams 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 fish or amphibians that failed to be removed. Check intake periodically for impingement of fish or amphibians.

- 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 fish stranding as the area upstream becomes dewatered.

2. General conditions for all fish capture and relocation activities:

- Fish 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 listed salmonids 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 salmonids:
 1. Determine the most efficient means for capturing fish (*i.e.*, seining, dip netting, trapping, electrofishing). Complex stream habitat generally requires the use of electrofishing equipment, whereas in outlet pools, fish may be concentrated by pumping-down the pool and then seining or dipnetting fish.
 2. Notify NMFS and CDFW one week prior to capture and relocation of salmonids to provide NMFS and CDFW an opportunity to monitor.
 3. Initial fish 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 fish 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 fish, 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 fish.

- 3. Low likelihood of fish reentering work site or becoming impinged on exclusion net or screen.
- 4. Fish 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 fish 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 fish 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 fish:

Voltage setting on the electrofisher shall not exceed 300 volts.

A) Voltage:	100	300 Volts
B) Duration:	500 μs (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 salmonids within the area proposed for dewatering.
- No electrofishing shall occur if water conductivity is greater than 350 microSiemens per centimeter (μS/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 fish are removed with seines.

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

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

- Salmonids shall not be overcrowded into buckets; allowing approximately six cubic inches per young-of-the-year (0+) individual and more for larger fish.
- 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+ fish from larger age-classes. Place larger amphibians, in containers with larger fish.

- Salmonid 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 relocation sites. To minimize predation on salmonids, these species shall be distributed throughout the wetted portion of the stream so as not to concentrate them in one area.
- All captured salmonids shall be relocated, preferably upstream, of the proposed construction project and placed in suitable habitat. Captured fish shall be placed into a pool, preferably with a depth of greater than two feet with available instream cover.
- All captured salmonids will be processed and released prior to conducting a subsequent electrofishing or seining pass.
- All native captured fish will be allowed to recover from electrofishing before being returned to the stream.
- Minimize handling of salmonids. When handling is necessary, always wet hands or nets prior to touching fish. Handlers will not wear DEET based insect repellents.
- Temporarily hold fish in cool, shaded, aerated water in a container with a lid. Provide aeration with a battery-powered external bubbler. Protect fish from jostling and noise and do not remove fish 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., fish 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 fish captured. Avoid anesthetizing or measuring fish.
- If more than three percent of the salmonids 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 salmonids 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 listed salmonids. 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.

3. 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 delivery sediment into streams supporting, or historically supporting salmonids. 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

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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 Middle 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.

Table 2 Summarizes the Beneficial Management Activities required to maintain Baseline Conditions and achieve Elevated Baseline Conditions on the Enrolled Property for the term of the Site Plan Agreement. Section E (Description of Beneficial Management Activities) describes the activities in more detail. The Beneficial Management Activities implement habitat enhancement actions recommended in the Template Safe Harbor Agreement (Appendix 2) for the Mid-Shasta reach of the Shasta River.

This Site Plan is specific to Montague Water Conservation District's Enrolled Property. The present baseline and elevated baseline for the Enrolled Property may, pursuant to the mutual agreement of the Parties as described in the Agreement, be adjusted if, during the term of the Agreement and Site Plan and for reasons beyond the control of the Permit Holder, the present baseline or elevated baseline condition is reduced.

MWCD's Shasta River storage facility and diversion is located within the Upper-Shasta Reach along the Shasta River. MWCD's Parks Creek diversion to storage is located in the upper Parks Creek Reach of Parks Creek. MWCD is in the process of obtaining approvals and implementing numerous habitat and operational improvement projects identified as MWCD's Conservation Habitat Enhancement and Restoration Project (CHERP) as described in Section C. CHERP is an independently required consultation separate from but complementary to the SHA. MWCD's CHERP Projects are located on its point of diversion from Parks Creek, within MWCD's Main Canal and Shasta River infrastructure at Dwinnell Reservoir. MWCD's CHERP projects and commitments are complementary components to MWCD's Site Plan (Section E.2). MWCD has obtained a 404 permit and Biological Opinion from NOAA (attached as Appendix B) for the Proposed CHERP project components. The current 404 permit has a 5 year duration, ending in 2022. MWCD has also submitted a Change Petition to the SWRCB including adding Fish and Wildlife as an additional beneficial use and utilization of Water Code 1707. MWCD has a 401 permit and Streambed Alteration Agreement for work proposed below Dwinnell Dam. In addition to CHERP, MWCD proposes Other Beneficial Management Activities that provide additional net conservation benefit within this site plan (Section E.3).

MWCD is considering work proposed under CHERP as a long term commitment that is currently being implemented concurrent and complementary to its Safe Harbor Agreement. Therefore, the CHERP commitments are part of the current baseline. Because the components of CHERP are a separate but concurrent and complementary commitment dependent on public funding, they are difficult to define under this template.

It has been mutually concluded that while CHERP actions are included and incorporated as described in Section E.2, they are baseline conditions (i.e. not Elevated Baseline Conditions) for purposes of the Section 7 permit. MWCD's additional commitments to Beneficial Management Activities reach net conservation benefit in addition to CHERP are described in Section E.3.

Table 2- Summary of Baseline and Net Conservation Benefits

Habitat Parameter	Net Conservation Benefits		
	<p>Present Baseline (Maintain) Current E1</p>	<p>CHERP Activities (Restore; Measures to Avoid and Minimize Impacts) CHERP E2</p>	<p>Other Beneficial Management Activities (Restore; Measures to Avoid and Minimize Impacts) SHA E3</p>

Habitat Parameter	Net Conservation Benefits		
<p>Hydrology/Water Quality(A)</p>	<ul style="list-style-type: none"> - Maintain existing bypass flow requirements at Parks Creek diversion as described in E.1.a1 -Continue release of flows for environmental purposes Per CHERP 404 permit and corresponding BO from NOAA . E.1.a2 -Continue Flow gage operations at Parks Creek diversion, Parks Creek below POD, Dwinnell Reservoir, environmental releases to Shasta River, Prior Rights to Cross Canal and Seeps below Dwinnell. E.1.a3 -Continue to seek funds for canal lining. E.1.a4 -Operate and maintain existing Flying L pipeline E.1.a5 -Operate and maintain alternative City of Montague POD E.1.a6 -Continue to 	<ul style="list-style-type: none"> -CHERP: Main Canal Lining: Line and maintain up to 8.4 miles of MWCD’s Main Canal where delivery loss is highest. Provide 515 (value determined through loss investigations) af per mile of canal lined for instream benefit for life of Agreement. As interim measure, continue Interim Settlement Model averaging to determine instream flow contribution to Shasta River until Main Canal Lining is complete, then implement MWCD increased flow commitments based on water year type for the life of this agreement (Appendix F) E.2.a CHERP: Dwinnell Enhancement Projects. The following projects allow improved management of flow to aid instream conditions and habitat on the Shasta River within the Upper Shasta Reach. E.2.a1 a.) CHERP: Complete,operate, 	<ul style="list-style-type: none"> -Upper Parks Creek Flow Strategy: Participate in and play leading role in implementing a reach-wide flow strategy. E.3.a1 -Upper Shasta River Flow Strategy: Participate in and play a leading role in a reach wide flow strategy. E.3.a2 -Implement additional summer instream flow releases of 2 cfs over proposed CHERP commitments during Very Dry Water Years when prior rights are not being released during summer period. E.3.a3 -Add new Point of Diversion: Assess and if feasible, construct, operate, and maintain new Point of Diversion (POD) in lower Shasta River to allow 9.4 cfs to remain instream to seasonally enhance flows in Upper Shasta River. E.3.a4 -Add new Point of Diversion: Assess and if feasible, construct, operate, and maintain new Point of Diversion

Habitat Parameter	Net Conservation Benefits		
<p>advance Change Petition for municipal water and Environmental water. E.1.a7</p> <p>-Continue permitting, design and seek funding to implement CHERP components, including operations and maintenance that enhance flow and water quality objectives. E.1.a8</p>	<p>and maintain “Flying L” groundwater contributions for prior rights and/or instream flow releases, providing up to 5.5 cfs of water with temperatures under 13.2 C when water released from Dwinnell exceed 18 C during the summer months as described in E2.a2</p> <p>b.) CHERP: Construct, operate, and maintain cold water habitat near base of Dwinnell Reservoir parallel to Shasta River where seeps and Flying L releases of cold water can be provided to ensure over-summering, spawning and over wintering habitat. E2.a3</p> <p>c.) CHERP: Expand Cross Canal capacity to allow for an increased volume of water released to provide increased sustained or pulsed flows up to 110 cfs E2.a4.</p> <p>d.) Maintain and Operate flow and temperature gauges to measure and verify</p>	<p>(POD) in lower Shasta River to allow up to 10 cfs to remain instream to seasonally enhance flows in Upper Parks Creek. E.3.a5</p> <p>-Investigate and if feasible, implement, operate, and maintain retrofit of trash racks and gate adjustment on spill gate of emergency tower to allow for larger releases of flow to Shasta River on wet and very wet years. E.3.a6</p> <p>-Work with agency and NGO partners and to gain approvals to implement water exchanges to provide 3.0 cfs of cold water with downstream SHA Participants during the summer as described in E.3.a7</p>	

Habitat Parameter	Net Conservation Benefits		
		<p>prior rights, environmental water, Flying L pumps and seeps. E2.a5</p> <p>e.) Continue to work with SWRCB to obtain approval of submitted Change Petition to add Fish and Wildlife and Municipal uses as additional beneficial uses of water and protect water released for fish and wildlife purposes through Water Code 1707. Petition also proposes to add a point of re-diversion for irrigation purposes (9.4 cfs) near the City of Montague that will also aid water quality and quantity objectives. E2.a6</p>	
<p>Passage/Migration/Screening (B)</p>	<p>-Continue to use existing infrastructure to provide fish passage on Parks Creek. E.1.b1</p> <p>-Continue to seek funding for Parks Creek screening and passage project. E.1.b2</p>	<p>- Seek funding, implement, operate, and maintain fish passage and fish screening facility at the Parks Creek diversion. Provide by-pass flows to PCE as MWCD agreed upon in Upper Parks Creek Flow Plan when constructed. E.2.b</p>	<p>-Continue to evaluate alternatives and constraints for future fish passage above Dwinnell Reservoir, as described in E.3.b1</p> <p>-Coordinate permitting and installation with Seldom Seen POD fish passage project</p>

Habitat Parameter	Net Conservation Benefits		
	<p>-Provide access and continue to work with partners to ensure funding and completion of Seldom Seen legacy diversion structure to provide fish passage on Shasta River on MWCD property. E.1.b3</p>		<p>on MWCD property. E.3.b2</p>
<p>Instream Habitat Complexity(C)</p>	<p>-Continue to work with partners to design, permit, fund and install LWD and spawning gravel enhancement projects on MWCD property. E.1.c</p>		<p>- Provide access and participate in implementation of LWD enhancement as deemed applicable by the Agencies as described in E.3.c1</p> <p>- Cooperate in hydrologic/geomorphic assessment of sediment transport and channel maintenance flow needs (“Assessments/Studies” below) and implement channel periodic maintenance flows as coordinated with NMFS, SHA CDFW for Wet and Very Wet flow release schedules. E.3.c2</p>

Habitat Parameter	Net Conservation Benefits		
Riparian Condition (D)	-Work with neighbors to exclude livestock on Shasta River ownership below Dwinnell Reservoir. E.1.d	-Plant and maintain riparian habitat enhancement associated with cold water habitat on the MWCD owned reach of Shasta River E.2.d	<p>-Develop a Riparian cutting and seed source for over story riparian species on MWCD property below Dwinnell Reservoir. Maintain and enhance riparian habitat along Cross Canal, cold water habitat and Shasta River within MWCD ownership. E.3.d1</p> <p>-Protect riparian area along Shasta River under MWCD ownership by constructing a riparian fence on the east side of the Shasta River.</p>
Substrate Quality (E)			<p>-Operate and maintain periodic flow releases (using "Block water") from Wet and Very Wet Water years year determinations to release increased spring flows to Upper Shasta River as coordinated with NMFS and CDFW with intention of enhancement spawning substrate. If results are not determined sufficient, MWCD will deliver up to 100 cubic yards of spawning gravel</p>

Habitat Parameter	Net Conservation Benefits		
			substrate to at least 3 sites in the Upper Shasta River reach every 5 years. E.3.e1
Pasture Management (F)	Not applicable.	Not applicable.	Not applicable.
Assessments/Studies (G)	<ul style="list-style-type: none"> - Participate in flow experiments like 2015 (Upper Shasta River) and 2016 (Parks Creek). E.1.g1 - Continue monitoring of diversion volumes and release or by-pass volumes at Parks Creek and Below Dwinnell Reservoir (including Flying L) - 6 gage sites .E.1.g2 -Continue temperature monitoring of cross canal. E.1.g3 	-Continue monitoring of current MWCD gages sites.	-Based on results of Upper Shasta River hydrologic/geomorphic assessment (E.3.e1) of sediment transport and channel maintenance flow needs (“Assessments/Studies” below), implement channel periodic maintenance flows as coordinated with SHA, NMFS and CDFW under MWCD's Wet and Very Wet flow release schedules, as described in E.3.e1.
Supplementation (H)	Not applicable.	Not applicable.	- Allow access and support supplementation efforts.E.3.h1

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.

Figure 3a. MWCD Baseline Conditions - Shasta River

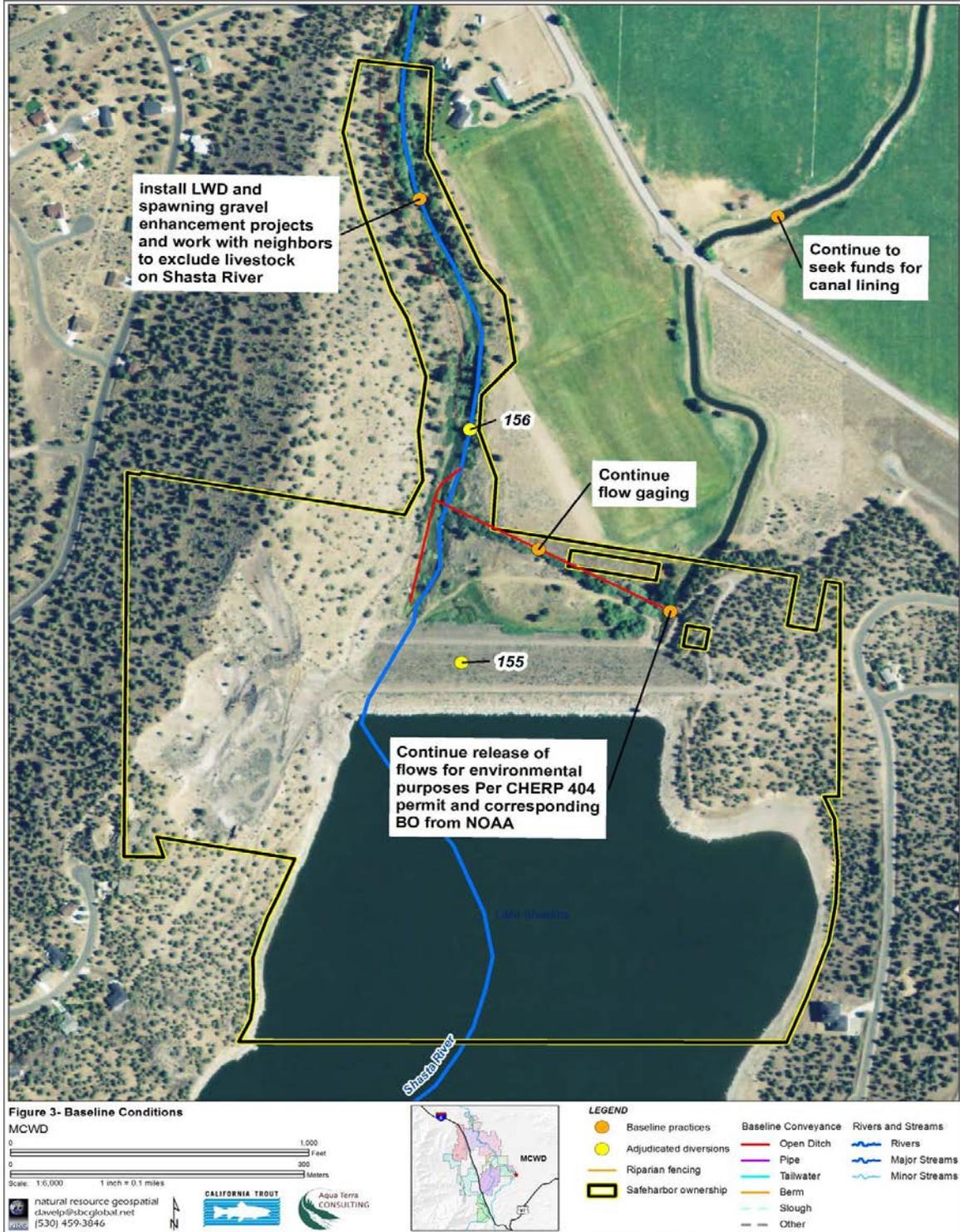
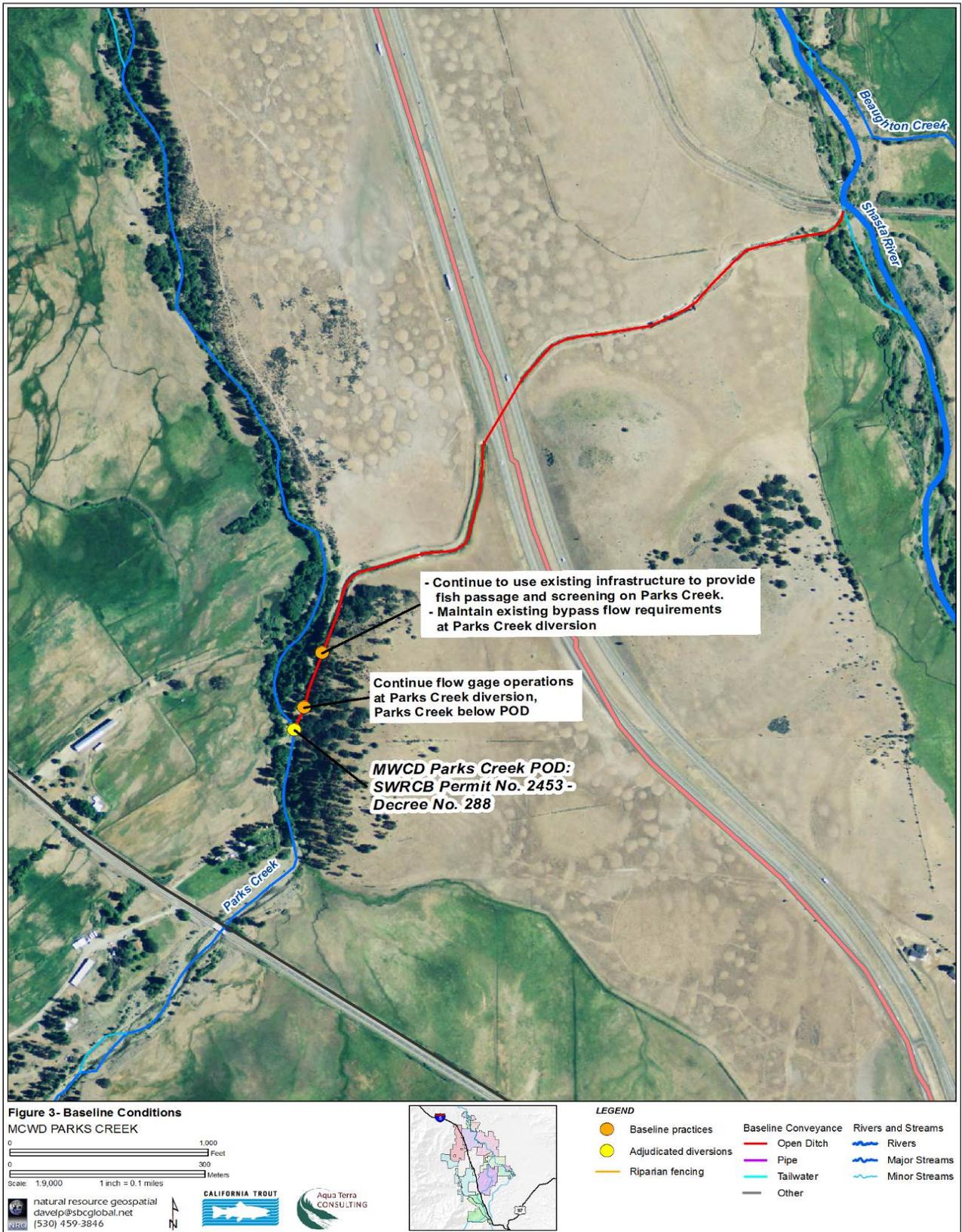


Figure 3b. MWCD Baseline Conditions - Parks Creek



E.1. Present Baseline Activities

MWCD agrees to continue and expand efforts and commitments to maintain, operate, implement, expand and abide by the ongoing measures described below. MWCD agrees to actively participate through actions including assistance in funding, seeking funding, design, implementation, maintenance, repair and operation as further described below.

E.1.a Hydrology/Water Quality

E.1.a1: MWCD will maintain existing instream by-pass conditions below the Parks Creek diversion point per following schedule:

<u>Time period:</u>	<u>Minimum By-pass volume:</u>
10/1-2/28	6.0 cfs
3/1 -9/31	16.00 cfs

By-pass value below Parks Creek diversion is determined by maintaining flow curve for stage recording at CDEC site PME, located just below MWCD Parks Creek diversion.

E.1.a2: MWCD will continue release of flows for environmental purposes from Dwinnell Dam as identified in MWCD's Permit with ACOE and corresponding Biological Opinion (Permit and BO attached as Appendix B), largely based on storage volumes in Dwinnell Reservoir as an interim step until the Main Canal lining is completed.

E.1.a3 MWCD will continue to operate, maintain and keep the following gage locations:

<u>Gage Name:</u>	<u>Purpose:</u>
CDEC MPD	MWCD Parks Creek Diversion- CFS/AF
CDEC PME	MWCD Parks Creek- Stage
CDEC DRE	MWCD Dwinnell Reservoir Storage -AF
CDEC DSW	MWCD Seeps- CFS
CDEC DFB	MWCD Environmental Water to Shasta River- CFS
CDEC SRX	MWCD Shasta River Prior rights - CFS
Main Canal	Releases to MWCD and Main Canal Prior Rights

E.1.a4 Provide access and continue to work with partners to ensure funding and completion of legacy diversion structure to provide fish passage on Shasta River located on MWCD property.

E.1.a5 Maintain and Operate existing Flying L pipeline and pumps as designed to provide cold water to Shasta River when water released from Dwinnell Reservoir exceeds 18C.

E.1.a6 Maintain alternative City of Montague Point of diversion located near the City of Montague. Releases will only be from sources to Shasta River when release temperatures are less than 18C.

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

E.1.b1 MWCD will continue to use existing infrastructure to provide fish passage on Parks Creek using the existing concrete and flashboard infrastructure.

E.1.b2 MWCD will continue to seek permitting and seek funding for Parks Creek Screening and Passage Project Implementation

E.1.b3 Provide access and continue to work with partners to ensure permitting, funding and implementation of Seldom Seen legacy diversion structure to provide fish passage on Shasta River to MWCDs proposed cold water refugia.

E.1.c Instream Habitat Complexity

MWCD will continue to work with partners to design, permit, fund and install LWD and spawning gravel projects on MWCD property on the Shasta River below Dwinnell Reservoir in the upper Shasta Stream reach

E.1.d. Riparian Condition/Function

Riparian Fencing

MWCD has no riparian fencing at this time.

Crossings

MWCD has no vehicle or livestock stream crossings on the Enrolled Property

Off-Channel Stock watering

MWCD does not intend to graze livestock on the Enrolled Property

E.1.e Substrate Quality

Described in E.1c

E.1.f Pasture Management

The Enrolled Property is not used for livestock grazing. no activity

E.1.g Assessments/Studies

MWCD will allow CDFW and NOAA staff involved with the Agreement access for monitoring and assessment as long as a the scope and duration link to Agreement objectives is provided to the MWCD Board for review and consideration.

E.1.g1 MWCD will continue to participate in flow experiments similar to the experiments conducted in 2015 (Upper Shasta River) and 2016 (Parks Creek).

E.1.g2 MWCD will cooperate with the Parties to the Agreement to implement the gage strategy developed by the Parties. MWCD will continue monitoring of the following gauges or similar gauges measuring flow at the same sites:

<u>Gage Name:</u>	<u>Purpose:</u>
CDEC MPD	MWCD Parks Creek Diversion- CFS/AF
CDEC PME	MWCD Parks Creek- Stage
CDEC DRE	MWCD Dwinnell Reservoir Storage -AF
CDEC DSW	MWCD Seeps- CFS
CDEC DFB	MWCD Environmental Water to Shasta River- CFS
CDEC SRX	MWCD Shasta River Prior rights - CFS
Main Canal	Releases to MWCD and Main Canal Prior Rights

E.1.g3 MWCD will continue temperature monitoring of MWCD cross canal.

E.1.h Supplementation

No activity

E.2 CHERP Activities Identified in CHERP :

This section provides a detailed description of Conservation and Habitat Enhancement Activities to be implemented on the Enrolled Property by the Permittee for the benefit of the Covered Species. MWCD agrees to continue and expand efforts and commitments to maintain, operate, implement, and abide with

proposed activities voluntarily committed to in CHERP. MWCD agrees to actively participate through actions including assistance in funding, seeking funding, participation in design, implementation and lead in maintenance, repair and operation as further described below in section E.2 -B CHERP Activities.

MWCD Project Summary List -CHERP Projects

Canal Lining: Line up to 8.4 miles of Main Canal with highest delivery loss values. MWCD will provide 515 acre feet per mile lined for instream benefit for an average water year type (4,400 acre feet per year). MWCDs Water Year Determination Process, identifies 5 water year types and associated release schedules, including agency determined "Block Water" for Wet and Very Wet Water years. Water year types and associated instream annual contributions for the Shasta River are further described in Appendix B - MWCD Operations Plan.

In the interim, MWCD will coordinate with NOAA and CDFW providing releases based on averaging Interim Settlement Models as identified in MWCD's Biological Opinion from NOAA, until the Main Canal Lining objective is met.

Infrastructure Improvements Below Dwinnell Dam: The following suite of projects are proposed below within the infrastructure at Dwinnell Dam infrastructure through MWCD's CHERP.

- a.) Finish Flying L Pipeline and service redundancy project to provide cold water during over-summering conditions to cold water habitat and upper Shasta River. E.2.a3
- b.) Construct side channel cold water habitat near confluence of Cross Canal and Shasta River fed by either Dwinnell Releases, seeps and/or Flying L pumps, depending on temperature of sources to ensure over-summering refugia similar to Clear Springs Kettle Springs . E.2.a.2
- c.) Expand Cross Canal capacity from a maximum 45 cfs of 110 cfs to increase volume of water released to Shasta River from Dwinnell Reservoir via Cross Canal to aid in habitat enhancement resulting from increased flow volumes and pulse flows.
- d.) Continue gauging, operations infrastructure and data presentation for monitoring/verification.

Parks Creek: Seek funding and construct Parks Creek Fish Passage and Fish Screening Facility including continued gauging of flow below POD and of diverted volume at Parks Creek POD.

E.2.a. Hydrology/Water Quality:

MWCD-CHERP: In exchange for water conservation and water quality projects proposed under MWCD's CHERP, MWCD will proportionally increase releases for instream benefit or projects that aid water quality based on Coho Salmon life stage needs and water quality enhancements. The primary project that will increase instream is lining reaches of MWCD's Main Canal. MWCD will use the average of Interim Settlement models with CDFW and NOAA to determine the annual volume of water provided for instream benefit until the Main Canal lining project is completed. MWCD will release conserved water per MWCD's Operations Plan including water year determination and corresponding flow schedule for instream objectives. This includes larger flow volume releases identified as "block water" during wet and very wet years where up to 110 cfs can be released through MWCD's expanded cross canal (E2a2c). Water quality can be maintained during the summer months through incorporation of the Flying L pumps to deliver up to 5.5 cfs of cold water(13.2 C) to the Shasta River. Cold water from MWCDs Seeps and Flying L Pumps can be routed to a proposed off-channel or side habitat to ensure suitable over-summer and winter habitat exists. The MWCD Main Canal Lining projects and projects at Dwinnell Dam are further described below in E.2.a1 and E.2ae.

Increase delivery and irrigation efficiency for instream benefit:

E.2.a1: MWCD Main Canal Lining: Line/Shotcrete/Pipe up to 8.4 miles of Main Canal where transmission loss is highest. In exchange for lining/piping MWCD, will provide 515 af per mile of lined canal for instream dedication based upon MWCD's Developed Water Year Determination and corresponding flow schedules. The design is for the main canal is funded and the proposed reaches are not within ACOE jurisdiction. MWCD has partial CHERP funding secured and seeks to actively pursue funding for full project implementation five years after issuance of permit. Upon completion, conserved water will be released based upon water year determination and corresponding volume provided for instream benefit per water year calendar.

MWCD Water Year Determination

Water Year Type	March 1st Storage Estimate for Dwinnell Reservoir	Instream Volume
Very Dry	Less than 17,000 Acre Feet	2,263 af
Dry	Equal to 17,000 to less than 24,000 Acre Feet	3,541 af
Normal	Equal to 24,000 to less than 36,000 Acre Feet	4,437 af

Water Year Type	March 1st Storage Estimate for Dwinnell Reservoir	Instream Volume
Wet	Equal to 36,000 to less than 43,000 Acre Feet	6,236 af
Very Wet	Greater than or equal to 43,000 Acre Feet	8,152 af

E.2.a2: Flying L Pumps Cold Water Contribution: MWCD will complete installation of Flying L pipeline that will connect the Flying L pumps to the Cross Canal and Cold Water Habitat to provide up to 5.5 cfs of cold water to the Shasta River. Task includes adding backup generator for redundancy protection. MWCD will operate “Flying L” pipeline to provide cold water contributions to prior rights, and/or instream flow releases when water temperatures in Shasta River on MWCD property exceeds 18.0 C. MWCD has secured funding and committed in-kind contribution of operating the Flying L pumps. MWCD commits to have this project completed two years after issuance of permit.

E.2.a3: Development of Cold Water Habitat: MWCD will construct a lateral cold water habitat near the base of Dwinnell Reservoir at the confluence of MWCDs Cross Canal and the Shasta River to ensure cold water refugia. Flow from the Seeps, Flying L pumps, and/or releases from Dwinnell Reservoir can be delivered to the off Channel habitat, dependent on temperature. MWCD has secured funding and committed to in-kind contribution for this project. MWCD will have the project completed two years after issuance of permit.

E.2.a4 Expand MWCD Cross Canal Capacity: MWCD will expand Cross Canal capacity to increase volume of water released to Shasta River from Dwinnell Reservoir via Cross Canal. Increased capacity will aid in increased flow volumes that can be released to Shasta River improving conditions in the Shasta River. Funding and participant cost share has been secured to conduct this work and MWCD commits to have work completed 2 years after issuance of permit.

E.2.a5 Continue Flow Gauging: MWCD will continue to operate and maintain gages at the following locations with gage data collected and logged at least hourly:

<u>Current CEDC Gage Name:</u>	<u>Purpose:</u>
CDEC MPD	MWCD Parks Creek Diversion- CFS/AF
CDEC PME	MWCD Parks Creek- Stage
CDEC DRE	MWCD Dwinnell Reservoir Storage -AF
CDEC DSW	MWCD Seeps- CFS, temperature
CDEC DFB	MWCD Environmental Water to Shasta River-

CDEC SRX

CFS, temperature
MWCD Shasta River Prior rights - CFS

E.2.a6. Continue to work with SWRCB to obtain approval of submitted Change Petition to add Fish and Wildlife and Municipal uses as additional beneficial uses of water and protect water released for fish and wildlife purposes through Water Code 1707. Petition also proposes to add a point of re-diversion for irrigation purposes (9.4 cfs) near the City of Montague, allowing additional flow to remain in Shasta River for 23+ miles. SWRCB Change Petition.

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

E.2.b1: MWCD will seek funding, implement and maintain fish passage and fish screening facility at Parks Creek diversion. The project is designed and under the progress of obtaining permitting. MWCD will actively seek funding through the first three years of the permit. If not funded by 5 years after issuance of permit, MWCD will meet with CDFW and NOAA to re-evaluate project.

10/01-2/28 - MWCD will assure 6.0 cfs is by-passed at MWCD's Park Creek diversion prior to diverting to aid adult migration and Spawning. Under MWCD's SHA site plan, in section E.3.a1, MWCD will provide increased by-pass volumes to enhance flows and better mimic the natural hydrograph.

3/1-9/30 - MWCD will by-pass 16.00 CFS at its diversion prior to diverting to ensure spring out-migration and redistribution. Under MWCD's SHA site plan, in section E.3.a1, MWCD will provide increased by-pass volumes to enhance flows and better mimic the natural hydrograph.

E.2.c. Instream Habitat Complexity:

No activity

E.2.d. Riparian Condition/Function:

MWCD will plant, maintain and protect riparian species within the Cross Canal, the cold water habitat and along the Shasta River within its ownership. Partial funding and in-kind match is secured and MWCD will seek additional funds. MWCD intends to have riparian planting completed by fall of 2021 or three years after issuance of permit

E.2.e. Substrate Quality:

No activity

E.2.f Pasture Management:

Not applicable

E.2.g Assessments/Studies

MWCD will continue current flow and temperature data collection at the following locations.

Continue Flow Gauging: MWCD will continue to operate and maintain gages at the following locations with gage data collected and logged at least hourly:

<u>Current CEDC Gage Name:</u>	<u>Purpose:</u>
CDEC MPD	MWCD Parks Creek Diversion- CFS/AF
CDEC PME	MWCD Parks Creek- Stage
CDEC DRE	MWCD Dwinnell Reservoir Storage -AF
CDEC DSW	MWCD Seeps- CFS, temperature
CDEC DFB	MWCD Environmental Water to Shasta River- CFS, temperature
CDEC SRX	MWCD Shasta River Prior rights - CFS

E.2.h Supplementation

No activity

E.3. Proposed under this Site Plan

This section provides a detailed description of Conservation and Habitat Enhancement Activities to be implemented on the Enrolled Property by the Permittee for the benefit of the Covered Species.

MWCD agrees to continue and expand efforts and commitments to maintain, operate, implement, expand and abide with proposed Beneficial Management Activities that are in addition to those activities committed to in MWCD's CHERP (defined in Section E.2). MWCD agrees to actively participate through actions including assistance in funding, seeking funding, participation in design, implementation and lead in maintenance, repair and operation as further described below in Section E.3:

Figure 4a. MWCD -Proposed Conditions - Shasta River

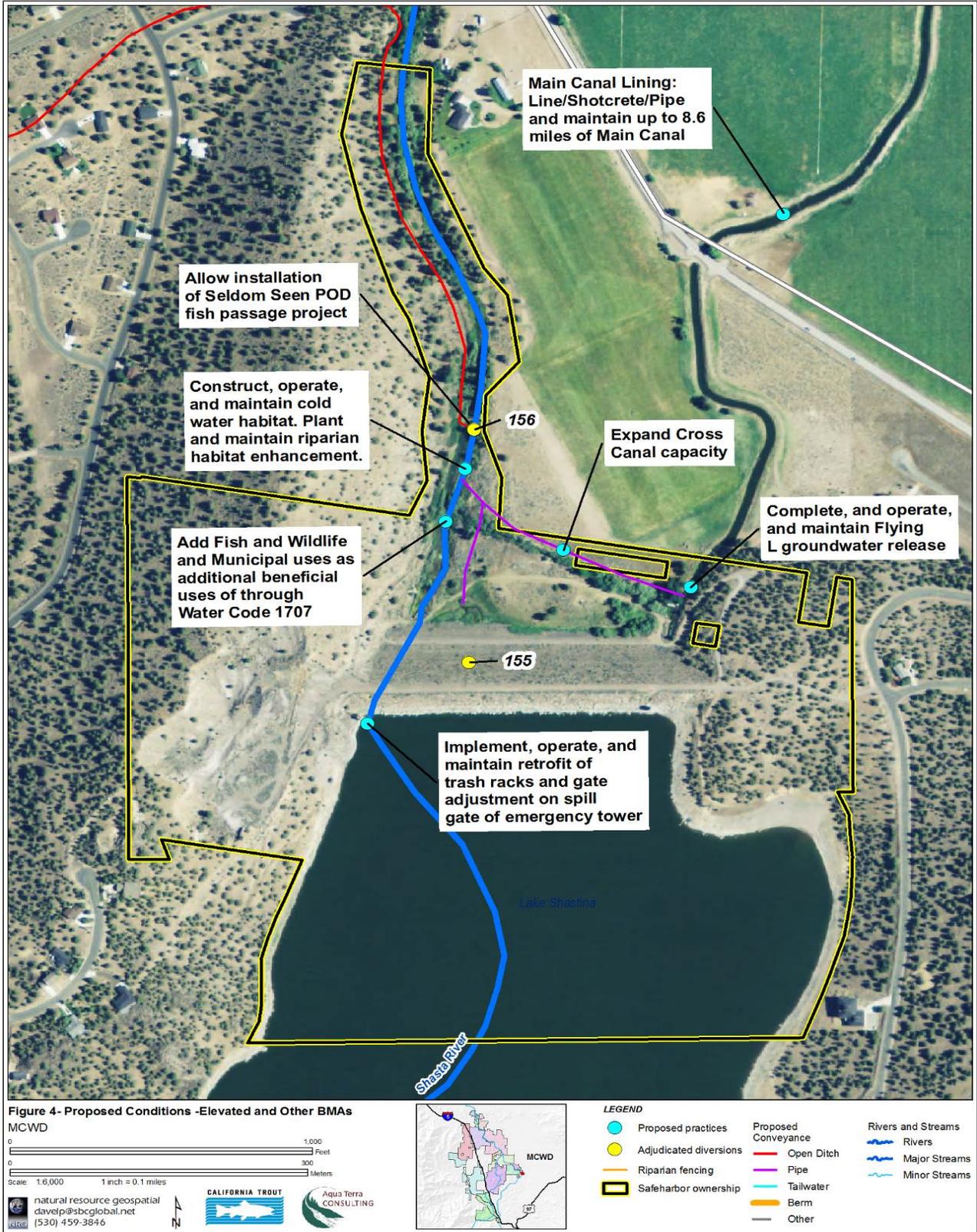


Figure 4b. MWCD -Proposed Conditions - Parks Creek

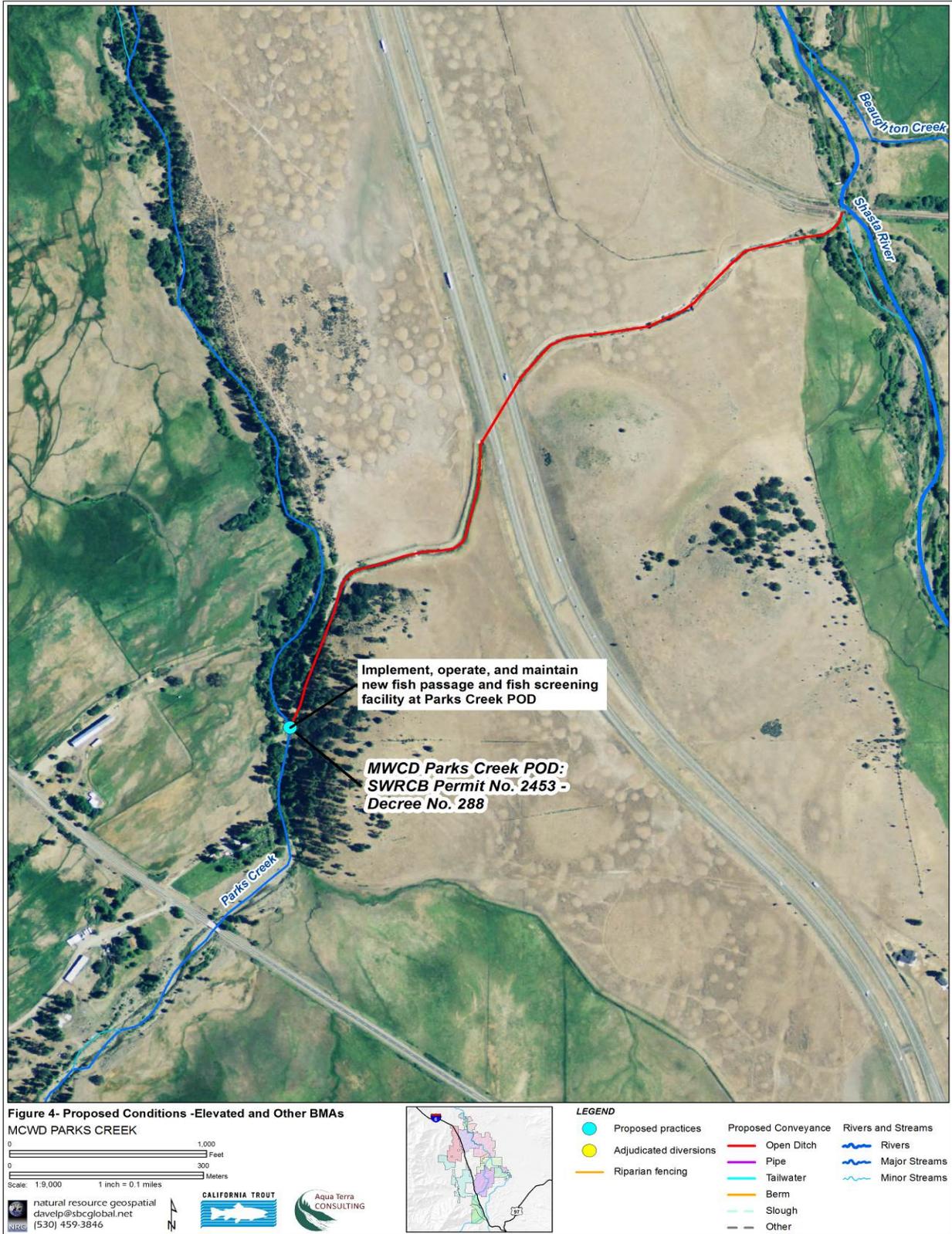
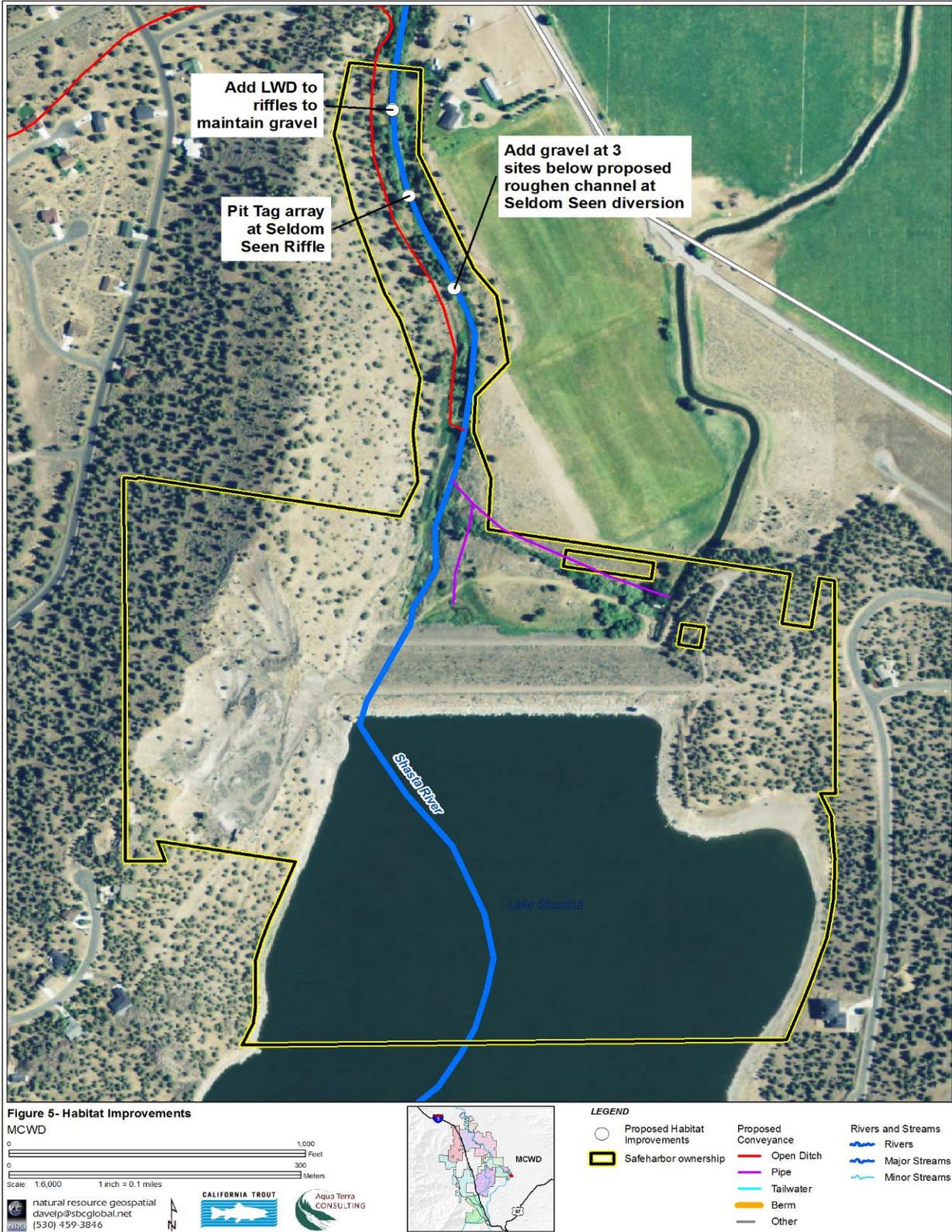


Figure 5a. MWCD -Shasta River -Proposed Habitat Improvements



E.3.a. Hydrology/Water Quality

Increase delivery and irrigation efficiency: MWCD will use Interim Settlement models with CDFW and NOAA to determine the volume of water provided between issuance of permit and full implementation of the main Canal Lining Project (See CHERP and associated BIOP) as described in E.2a1. Upon completion of the Main Canal Project lining project (estimated to be completed in spring of 2023), MWCD will use CHERP flow schedule to release conserved water based on Water Year Determination and corresponding flow instream release volume schedule identified under CHERPs Biological Opinion. In addition to continuing CHERP flows provided by water conserved through the Main Canal Lining Project, MWCD will expand its instream bypass commitment at Park Creek and on the Shasta River as described below in Section E.3. All instream commitments will be measured by an approved flow gage and flow data will be recorded on at least an hourly frequency:

E.3.a1 Upper Parks Creek Flow Strategy: MWCD will participate and play leading role in implementing a reach-wide flow strategy on upper Parks Creek including seeking funding for water conservation projects, and serving on advisory panel to confirm implementation plans and monitoring. MWCD will participate throughout term of this agreement. Upon completion of MWCD's infrastructure improvements at Parks Creek Diversion (described in E.2c), MWCD will expand the by-pass terms committed to in CHERP to include the terms MWCD has committed to in the Upper Parks Creek Flow Plan, which include:

-Assure 21.0 cfs is at PCE by-passed prior to diverting to aid adult migration and spawning from 10/1-12/31. 21 cfs includes conserved water made available when water conservation measures are implemented by Upper Parks Creek stream reach participants.

-Assure 6.0 cfs is at PCE from 1/1-2/28 prior to diverting. MWCD will work with agencies and other participants in the Upper Parks Creek stream reach to evaluate if redds are sufficiently protected with 6.0 cfs of by-pass by the close of the 5th year of the agreement. If redds are not sufficiently protected, up to 10.0 cfs may be by-passed at PCE to meet the biological objective. MWCD will assure 10.0 cfs is at PCE after MWCD diverts more than 20 cfs from 1/1-2/28

- Bypass 21.0 cfs at PCE prior to diverting from 3/1-6/15. The 21 cfs bypass includes water conserved through conservation projects conducted by Parks Creek Ranch and Edson-Foulke Ditch when proposed water conservation projects are completed. Bypass of conserved water by other participants is contingent on operating gages at PCE and participating diversions. MWCD agrees to increase by-pass values proportionality with diverted volume, verified downstream by CDEC stream flow gage PCE. Proportionate by-pass to diversion values include:

- 1.) Stream flow in Parks Creek at PCE must equal 21.0 cfs or more before MWCD can begin diversion and divert up to 20 cfs.
- 2.) Streamflow in Parks Creek at PCE must equal 30 cfs or more before MWCD can divert more than 20 cfs but less than 90 cfs. 30 cfs will be measured at PCE.
- 3.) Streamflow in Parks Creek at PCE must equal 40 cfs or more before MWCD can divert more than 90 cfs but less than 150 cfs. 40 cfs will be measured at PCE.

E.3.a2 MWCD-Upper Shasta River Operations Plan: MWCD will participate and play a leading role in implementing a reach wide diversion management strategy consistent with the CHERP BIOP and including additional measures described below. MWCD's role for providing instream flows and water quality objectives will be defined in a revised update of MWCD's Draft Operations Plan (Appendix B) after SWRCB and Siskiyou County Superior Court's review and consideration of MWCD's Change petition(s) submitted to implement the proposed objectives of this agreement. The updated Operations Plan will incorporate the developed operational actions and methods of implementation of MWCD's flow and water quality objectives. Revised Operations Plan will be submitted after one full year of operation after Siskiyou County Superior Court review and supplemental change to the decree.

E.3.a3 MWCD will Implement additional summer instream flow releases of 2 cfs over CHERP commitments during Very Dry Water Years. As a result of receiving canal lining/piping identified in section E.2.a1, MWCD commits to provide up to an additional 2.0 cfs of instream flow during Very Dry water years when the flow volume target of 9.0 cfs released during the summer period is not met through either delivery of prior rights, environmental water and/or exchange water. MWCD will commit to providing these flows upon occurrence immediately after canal lining/piping.

E.3.a4: Assess and if feasible, add new point of re-diversion in lower Shasta River to allow flow to be released from Dwinnell Reservoir to seasonally deliver water for irrigation via the Shasta River rather than delivering via MWCD's main canal. This measure would increase streamflow for approximately 23 miles of the Shasta River miles when water quality released from MWCD is suitable (18 C or less) to be released. MWCD proposes up to 9.4 cfs of flow to be released for re-diversion and delivery for irrigation purposes within MWCD district. This measure would aid instream flow particularly in normal and drier years. MWCD has submitted a Change Petition to SWRCB including this measure, adding municipal and Fish and Wildlife as secondary benefits. If approved by SWRCB, MWCD will commit to determine feasibility and secure approved access by the fifth year of the SHA agreement, with full implementation scheduled by the 10th year of MWCD's SHA agreement.

E.3.a5 Assess and if feasible, add new Point of Diversion (POD) or point of re-diversion in lower Shasta River to deliver water for irrigation purposes via Parks Creek and the Shasta River when water quality is suitable (18 C or less). This water would be available for diversion and by-passed from Parks Creek POD in addition to values established in the Upper Parks Creek Flow Strategy. Proposed point of re-diversion would be close to City of Montague, adding increased streamflow for approximately 25 miles of Parks Creek and Shasta River during the spring. MWCD proposes up to 10.00 cfs of flow to be released for re-diversion and delivery to the MWCD district boundary for irrigation purposes while also aiding instream flow conditions. MWCD will commit to determine feasibility and secure SWRCB approval and approved POD and delivery access by close of the fifth year of the issuance of the permit. If approved by SWRCB and MWCD would seek funding with the intention to implement the project by the 10th year of the agreement.

E.3.a6 Dwinnell Reservoir: Investigate and if feasible, implement a retrofit of trash racks and gate adjustment on Dwinnell Reservoir spill gates of emergency tower to prevent debris from becoming lodged in adjustable gates when opened, preventing full closure. If investigation determines an assured method to always attain full closure of gates once opened, MWCD will seek Division of Dam Safety and other agency approval. The objective would be to use the adjustable emergency gates to provide flushing flows to enhance habitat and trigger sediment transport below Dwinnell Reservoir during wet and very wet years when block water would allow for increased releases in excess of flow capacity provided by the expanded Cross Canal capacity. Depending on design and agency approval requirements, including Division of Dam Safety, MWCD commits to having investigation completed prior to close of the sixth year of the issuance of the permit. Release values will be coordinated including consideration of protection of downstream infrastructure and restoration projects. Objective is to meet bankfull flow for channel maintenance of Upper Shasta Reach above Parks Creek confluence.

E.3.a7 Work with partners and to gain SWRCB approvals to implement water exchanges with downstream SHA Participants who have water rights to either Clear Springs and or Hidden Valley Springs, sources of cold water inputs during the period of the year when water temperatures exceed 18C. If implementable, MWCD requires the exchange site be gauged and tele-metered and will provide up to 1.50 cfs for Clear Springs and 1.50 cfs for Hidden Valley Springs, or match any volume that is provided for instream benefit. MWCD commits to further development of an Operations Plan per exchange site within one year of approval by SWRCB. MWCD will work with SHA involved SHA participants to seek funding for infrastructure to allow these project to occur.

E.3.a8 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

E.3.b1 Continue to evaluate need, alternatives and constraints for future fish passage above Dwinnell Reservoir. MWCD commits to develop an assessment by the closing of the 10th year of the issuance of the permit.

E.3.b2 Coordinate permitting and installation with Seldom Seen POD fish passage project on MWCD property. Site is on MWCD property. MWCD commits to provide access, coordinate with permitting and assist with implementation of the project to provide fish passage. MWCD commits to allow Seldom Seen participant access throughout the term of the agreement for construction and maintenance of the fish passage project, including cooperating on the maintenance of the proposed streamflow gage and water temperature monitoring site.

E.3.c. Instream Habitat Complexity

E.3.c1 Provide access and participate in implementation of LWD and gravel instream enhancement project on MWCD property below the Cross Canal on the Shasta River. MWCD commits to continue to work with participants and permitting entities for implementation within three years of the issuance of the permit. MWCD will provide up to 100 cu/yds of approved diameter bed load within 5 years of the issuance of the permit.

E.3.c2 Cooperate in hydrologic/geomorphic assessment of sediment transport and channel maintenance flow needs (“Assessments/Studies” below) and implement channel periodic maintenance flows as coordinated with NMFS, SHA, CDFW for Wet and Very Wet flow release schedules. MWCD commits to work with SHA, NOAA and CDFW to develop a scope by the close of the second year of the SHA agreement. MWCD commits to have the assessment completed by the close of the 7th year of the permit.

E.3.d. Riparian Condition/Function

E.3.d1 MWCD commits to develop riparian stand and seed source for over story riparian species on MWCD property surrounding Cold water habitat and cross canal. Maintain and enhance riparian habitat along Cross Canal, Cold water habitat and Shasta River within MWCD ownership. MWCD will commit to seek funds and will provide in-kind protection and maintenance during first two years of establishment. Tree will be planted by the end of the third year of the permit.

E.3.d2 MWCD will fence the property line East of the Shasta River on MWCD property below Dwinnell Reservoir (approximately 1,100') by the end of the 3rd year of the permit. MWCD will maintain riparian fence for term of agreement, if installed.

E.3.e. Substrate Quality:

E.3.e1: Based on results of Upper Shasta River hydrologic/geomorphic assessment of sediment transport and channel maintenance flow needs (“Assessments/Studies” below), implement channel periodic maintenance flows as coordinated with SHA, NMFS and CDFW under MWCD's Wet and Very Wet year water year determinations and corresponding flow release schedules. Wet and Very Wet year determinations identify “Block Water” where release schedule is intended to be released in the spring but the release volume and schedule for the determined volume of water is developed with NOAA, CDFW, and Upper Shasta SHA members with an intention being enhancing substrate quality. MWCD will provide up to 100 cubic yards of spawning gravel to at least 3 sites located in the upper Shasta every five years if block water release results are not determined sufficient to recruit spawning habitat.

E.3.f Pasture Management

Not Applicable

E.3.g Assessments/Studies

Access for Studies:

Based on results of Upper Shasta River hydrologic/geomorphic assessment of sediment transport and channel maintenance flow needs (“Assessments/Studies” below), implement channel periodic maintenance flows as coordinated with SHA, NMFS and CDFW under MWCD's Wet and Very Wet flow release schedule by the close of the 10th year of the agreement.

E.3.h Supplementation:

MWCD is open to Supplementation and associated monitoring when CHERP components are complete and the SHA agreement is active.

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 as stipulated in the Agreement. 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:

Covered Activity	MWCD -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 http://www.fs.fed.us/pnw/pubs/gtr526/ or an annual agency inspection can be requested.

<p>Irrigation Maintenance</p>	<p>B1 B2 B3 B4 B5 B6 B7 B8</p>	<p>All maintenance of instream irrigation facilities shall be monitored. Following are some examples of protocols:</p> <p>-Log of maintenance activities carried out within the calendar year be included in the yearly SHA report.</p>
<p>Riparian Grazing Management</p>	<p>C1 C2 C3</p>	<p>Riparian grazing management shall be monitored as follows:</p> <p>-Three to five permanent photo point stations will be established and marked at locations within each riparian pasture designed to show both vegetation changes before and after seasonal grazing activities, and long-term trends. Photo points shall be established using USDA Forest Service Photo Point Monitoring Handbook, 2002 http://www.fs.fed.us/pnw/pubs/gtr526/. Digital photographs will be taken at each photo point station once per year for trend monitoring, and before and after riparian pasture grazing takes place for annual implementation reporting.</p> <p>-Maintain a log of grazing activities carried out within the calendar year and include in the yearly Site Plan monitoring report. At a minimum, the log will include the following</p>

		<p>information: beginning and end dates of riparian pasture grazing; number of animals, monitoring practices during the riparian grazing period, and management actions taken as a result of monitoring results including management cues used to determine the time to move livestock out of the riparian pasture.</p> <p>-NMFS and CDFW may initiate periodic inspection of grazed riparian pastures to ensure riparian grazing management plan is effective.</p> <p>--NMFS, CDFW, or a qualified party, approved by CDFW or NMFS, may conduct redd surveys to determine the need for livestock restrictions in streams. In the event surveys indicate redds are not present, then livestock access will follow the procedures described in riparian grazing management plan.</p>
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.
Crossing Maintenance	F1 F2	- Three to five photo points using USDA Forest Service Photo Point Monitoring Handbook, 2002 http://www.fs.fed.us/pnw/pubs/gtr526/
Herbicide/Fertilizer/Pesticide Use	G1 G2 G3 G4 G5	- Participant 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	- Participant shall take photographs of the emergency site repairs and a detailed description of the repairs to be included in the annual report.
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G.2 Implementation and Effectiveness Monitoring Commitments

The Permittee agrees to the following monitoring actions:

Habitat Parameter	MWCD-Net Conservation Benefit Actions	Implementation Monitoring Technique	Effectiveness Monitoring Commitment? Technique?
Hydrology/Water Quality	<p>-Upper Parks Creek Flow Strategy: Participate in and play leading role in implementing a reach-wide flow strategy. E.3.a1</p> <p>-Upper Shasta River Flow Strategy: Participate in and play a leading role in a reach wide flow strategy. E.3.a2</p> <p>A.) Upper Shasta Flow Strategy: Implement additional summer instream flow releases of 2 cfs over CHERP commitments during Very Dry Water Years. E.3.a3</p> <p>B.) Upper Shasta Flow Strategy: Work with partners to assess and obtain approvals to implement water exchanges to provide</p>	<p>- Three to five photo points using USDA Forest Service Photo Point Monitoring Handbook, 2002 documenting functioning diversion, pipeline improvements and spring source enhancements.</p>	<p>- Diversion monitoring station will be maintained and operated as designed. Provide yearly data.</p>

	<p>up to 3.0 cfs of cold water with downstream SHA Participants during the summer as described in E.3.a7</p> <p>-Add new Point of Diversion: Assess and if feasible, construct, operate, and maintain new Point of Diversion (POD) in lower Shasta River to allow 9.4 cfs to remain instream to seasonally enhance flows in Upper Shasta River. E.3.a4</p> <p>-Add new Point of Diversion: Assess and if feasible, construct, operate, and maintain new Point of Diversion (POD) in lower Shasta River to allow up to 10 cfs to remain instream to seasonally enhance flows in Upper Parks Creek. E.3.a5</p> <p>-Investigate and if feasible, implement, operate, and maintain retrofit of trash racks and gate adjustment on spill gate of emergency tower to allow for larger releases of flow to Shasta River on wet</p>	<p>-Soil Moisture sensor data</p>	
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	<p>and very wet years. E.3.a6</p> <p>-Work with agency and NGO partners and to gain approvals to implement water exchanges to provide cold water with downstream SHA Participants during the summer as described in E.3.a7</p>		
Passage/Migration/Screening	<p>-Continue to evaluate alternatives and constraints for future fish passage above Dwinnell Reservoir, as described in E.3.b1</p> <p>-Coordinate permitting and installation with Seldom Seen POD fish passage project on MWCD property. E.3.b2</p>	<p>- Three to five photo points using USDA Forest Service Photo Point Monitoring Handbook, 2002 documenting fish passage and fish screen.</p> <p>-Water measuring protocol that is in concurrence with SB88 of diversion, submit diversion data.</p>	
Instream Habitat Complexity	<p>- Provide access and participate in implementation of LWD enhancement as deemed applicable by the Agencies as described in E.3.c1</p> <p>- Cooperate in hydrologic/geomorphic assessment of sediment transport</p>	<p>- Three to five photo points using USDA Forest Service Photo Point Monitoring Handbook, 2002 Habitat improvements</p>	

	and channel maintenance flow needs (“Assessments/ Studies” below) and implement channel periodic maintenance flows as coordinated with NMFS, SHA CDFW for Wet and Very Wet flow release schedules. E.3.c2		
Riparian Condition	<p>-Develop a Riparian cutting and seed source for over story riparian species on MWCD property below Dwinnell Reservoir. Maintain and enhance riparian habitat along Cross Canal, cold water habitat and Shasta River within MWCD ownership. E.3.d1</p> <p>-Protect riparian area along Shasta River under MWCD ownership by constructing a riparian fence on the east side of the Shasta River.</p>	<p>- Three to five photo points using USDA Forest Service Photo Point Monitoring Handbook, 2002 To document riparian grazing area, and crossing and stockwater systems in proper function.</p>	<p>-Survival rates of riparian planting will be reported by Shasta Valley RCD or other implementing organization for a minimum period of 3 years after planting occurs or term will be stipulated by the grants utilized for implementation.</p>
Substrate Quality	<p>-Operate and maintain periodic flow releases (using "Block water") from Wet and Very Wet Water years year determinations to release increased spring flows to Upper Shasta River as coordinated with NMFS and CDFW (as identified in Appendix F) with</p>	<p>- Three to five photo points using USDA Forest Service Photo Point Monitoring Handbook, 2002 To document fence maintenance.</p>	

	intention of enhancement spawning substrate. If results are not determined sufficient, MWCD will deliver up to 100 cubic yards of spawning gravel substrate to at least 3 sites in the Upper Shasta River reach every 5 years. E.3.e1		
Pasture Management	Not applicable.	- Three to five photo points using USDA Forest Service Photo Point Monitoring Handbook, 2002 To document pasture condition.	
Assessment/Studies	-Based on results of Upper Shasta River hydrologic/geomorphic assessment (E.3.e1) of sediment transport and channel maintenance flow needs (“Assessments/Studies” below), implement channel periodic maintenance flows as coordinated with SHA, NMFS and CDFW under MWCD's Wet and Very Wet flow release schedules, as described in E.3.e1.	-Reports of studies will be written/summarized/obtained and provided in the annual report	-Access to maintain existing pit tag array and trap and tag fish as deemed feasible by agency staff -Juvenile surveys for presence absence and for capturing and PIT tagging fish with 7 day notification of landowner.
Supplementation	- Allow access and support supplementation		

CDFW

Date

Montague Water Conservation District Deeds for Enrolled Property

1427

This Indenture made the 9th day of August one thousand nine hundred and fifty-seven

Between W. F. QUIGLEY and HELEN QUIGLEY, his wife,

RECORDED AT REQUEST OF MONTAGUE WATER CONSERV. DIST.

00 MIN. PAST 10 A.M. OFFICIAL RECORDS SECTION COUNTY, CALIF. AUG 13 1957

Vol 390 Page 478

Recorder Fee \$ no chg

MONTAGUE WATER CONSERVATION DISTRICT,

the parties of the first part,

the party of the second part.

Witnesseth: That the said parties of the first part, in consideration of the sum of Ten and no/100 dollars,

lawful money of the United States of America, to them in hand paid by the said party of the second part, the receipt whereof is hereby acknowledged, do by these presents grant, bargain, and sell unto the said party of the second part, and to its successors and assigns forever, all

that certain lot, piece or parcel of land situate in the County of Siskiyou

State of California, and bounded and described as follows, to-wit:

A fractional portion of the West 1/2 of Section 25, Township 43 North, Range 5 West, Mt. Diablo Meridian, described as follows:

Beginning at a point on the N'ly line of the Montague Water Conservation District property in the SW 1/4 of said Section 25, from which point the SW Corner of Section 25 bears N 80°19' W, 1221.21 ft. & S 0°05' W, 2000.04 ft.; thence N 2°45'20" W, 256.86 ft.; thence N 16°22'50" W, 160.76 ft.; thence N 3°48'20" E, 127.74 ft.; thence N 42°46'40" E, 165.33 ft.; thence N 8°27' W, 244.25 ft.; thence N 37°35'50" W, 127.23 ft.; thence N 23°27' W, 454.64 ft.; thence N 2°29'30" E, 304.06 ft.; thence N 83°19'10" W, 243.63 ft.; thence S 11°41'30" W, 200.35 ft.; thence S 12°43'30" E, 277.49 ft.; thence S 16°20' E, 320.38 ft.; thence S 28°28' E, 159.05 ft.; thence S 22°19'50" E, 193.87 ft.; thence S 7°17'20" W, 197.94 ft.; thence S 4°45'20" W, 170.02 ft.; thence S 10°25'20" W, 201.72 ft. to the North line of said Montague Water Conservation District property; thence S 80°19' E, 298.37 ft. along said North line to the point of beginning. Containing 10.0 acres, more or less.

SUBJECT to and saving, excepting and reserving unto the parties of the first part all rights of way and easements

Together with the tenements, hereditaments, and appurtenances thereto belonging or appertaining, and the reversion and reversions, remainder and remainders, rents, issues, and profits thereof.

To Have and to Hold the said premises, together with the appurtenances, unto the said part 7 of the second part, and to its successors ~~fore~~ and assigns forever.

In Witness Whereof the said part ies of the first part have executed this conveyance the day and year first above written.

Signed and Delivered in the Presence of

_____ }
_____ } *W. F. Douglas*
_____ } *Allen J. Gilday*

tion District property; thence S 80°19' E, 298.37 ft. along said North line to the point of beginning. Containing 10.8 acres, more or less.

SUBJECT to and saving, excepting and reserving unto the parties of the first part all rights of way and easements which the parties of the first part may require for the construction, maintenance, repair and rebuilding and use of ditches, flumes, pipe lines, culverts and all other conduits required for the transportation of water over and across the hereinabove described premises to the lands and premises owned by the parties of the first part in the areas adjacent to the above described premises or in the neighborhood thereof and reserving and saving unto the parties of the first part also the right to pasture their cattle thereon at will and to pass thereon and thereover with cattle.

Cowdery's Form No. 466--DEED--BARGAIN AND SALE--Lower Form.

~~INDEXED~~ COMPARED

Ege wood Calif
7-19-27

Mr J A Bremer

Dear Sir

We will give a right to go
through the field from canal to Dangle
and make ditch the District to flume
over ^{ditch} by canal and build ^{bridge} in middle of field
and abandon the two old ditches
through my field

Yours Respectly

J. L. Jones

This Indenture, Made this Seventh day of December A. D. 19 25

Between Joseph L. Jones also known as J. L. Jones of Edgewood, California, a widower the party of the first part, and MONTAGUE WATER CONSERVATION DISTRICT party of the second part

Witnesseth: That the said party of the first part, for and in consideration of the sum of Thirty thousand Dollars, lawful money of the United States of America, to him in hand paid by the said party of the second part, the receipt whereof is hereby acknowledged, do so by these presents grant, bargain, sell, convey and confirm unto the said party of the second part, and to its heirs and assigns forever, all those certain lot, s, piece, s or parcel, s of land situate, lying and being in the County of Siskiyou State of California and bounded and particularly described as follows, to wit:

The east half of the north east quarter and the north half of the northwest quarter of the northeast quarter of Section 2, T. 42 north, range 5 west, east half of southwest quarter, and east half of Section 35, all of Section 36 in township 43 North, range 5 west, the south half of southwest quarter and all that part of the north half of southwest quarter lying south of a line described as follows: Beginning at a point on the east line of the ^{NORTH} half of the southwest quarter of Section 25 from which the S. E. corner of said section bears S. 52° 49' E. 3179 feet; thence north 80° 19' W. 2725 feet to a point on west line of the north half of the southwest quarter of said Section 25 from which the S. W. Sec. corner of said Section bears S. 0° 05' W. 2075 feet, all in Section 25, Township 43 North, Range 5 West, M.D.M. containing 1263 acres more or less.

Together with all and singular the tenements, hereditaments and appurtenances thereunto belonging, or in anywise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof.

To Have and to Hold all and singular the said premises, together with

STATE OF CALIFORNIA }
County of Siskiyou } ss

On this 7 day of December in the year One Thousand Nine Hundred and Twenty Five before me, W. A. SIMON, a Notary Public, in and for the County of Siskiyou, personally appeared Joseph L. Jones

Recorded at the request of

215

Return to: RETURNED MAIL TO

MONTAGUE WATER CONSERVATION DISTRICT
MONTAGUE, CALIF.

RECORDED AT REQUEST OF
SISKIYOU CO. TITLE CO.

OFFICIAL RECORDS
SISKIYOU COUNTY, CALIF.

JUL 5 4 23 PM '68
Vol. 561 Page 119

Ernest T. Johnson
RECORDER FEE \$ 5.20 paid

This Deed of Trust, Made this 26th day of June, 1968.

Between ALLEN V. C. DAVIS and WARNER R. ODENTHAL, herein called TRUSTOR,

whose address is

SISKIYOU COUNTY TITLE CO, a corporation, herein called Trustee, and
MONTAGUE WATER CONSERVATION DISTRICT, herein called BENEFICIARY.

Witnesseth: That Trustor irrevocably GRANTS, TRANSFERS AND ASSIGNS TO TRUSTEE IN TRUST,
WITH POWER OF SALE, that property in the County of Siskiyou, State of California, described as: at Exhibit "A"

attached hereto and made a part hereof.

This Deed of Trust is also subject to the provisions, for reconveyance under the terms and conditions on Exhibit "A", all of which are incorporated herein the same as if set forth on this Deed of Trust itself.

For Reconveyance
Vol. 596 Page 246
ERNEST T. JOHNSON, Sls. Co. Recorder
E. C. Gault, Deputy

Partial Reconveyance
Vol. 581 Page 894
ERNEST T. JOHNSON, Sls. Co. Recorder
By: Ruth J. Barnett, Deputy

TOGETHER WITH the rents, issues and profits thereof, SUBJECT, HOWEVER, to the right, power and authority given to and conferred upon Beneficiary by Paragraph 5 of Part B of the provisions incorporated herein by reference to collect and apply such rents, issues and profits, For the Purpose of Securing payment of the indebtedness evidenced by a promissory note, of even date herewith, executed by Trustor in said sum of Six Hundred Thousand Dollars,

(\$ 600,000.00), any additional sums and interest thereon which may hereafter be loaned to the Trustor or his successors or assigns by the Beneficiary, and the performance of each agreement herein contained. Additional loans hereafter made and interest thereon shall be secured by this Deed of Trust only if made to the Trustor while he is the owner of record of his present interest in said property, or to his successors or assigns while they are the owners of record thereof, and shall be evidenced by a promissory note reciting that it is secured by this Deed of Trust.

A charge that does not exceed the maximum charge provided by law at the time of the request therefor by or for the Trustor will be made for any statement regarding the obligation secured hereby. By the execution and delivery of this Deed of Trust and the Note secured hereby the Trustor agrees that the provisions of Part A and the provisions of Part B of the Deed of Trust recorded in the office of the County Recorder of each of the following counties in the State of California on August 18, 1958, in the Book and at the page designated after the name of each County, which provisions are identical in each Deed of Trust, shall be and they are hereby incorporated herein and made an integral part hereof for all purposes as though set forth herein at length.

County	Book	Page	County	Book	Page	County	Book	Page	County	Book	Page
Alameda	8757	207	Lake	297	308	Nevada	249	189	Santa Cruz	1200	187
Butte	953	200	Lassen	141	195	Placer	709	49	Shasta	574	428
Colusa	258	186	Madera	724	392	Plumas	117	107	Siskiyou	409	195
Contra Costa	3212	102	Marin	1210	387	Sacramento	3569	412	Sonoma	1609	14
Del Norte	49	97	Mendocino	490	511	San Benito	242	73	Stanislaus	1498	193
El Dorado	441	242	Merced	1378	406	San Francisco	7349	350	Sutter	493	459
Glenn	373	314	Modoc	159	22	San Joaquin	2092	461	Tehama	333	571
Humboldt	500	187	Monterey	1890	155	San Mateo	3441	246	Trinity	74	173
Kings	716	577	Napa	577	204	Santa Clara	4151	640	Yolo	549	152

Request is hereby made that a copy of any Notice of Default and a copy of any Notice of Sale hereunder be mailed, pursuant to the provisions of Section 2924b of the Civil Code of California, to the Trustor at his address hereinbefore set forth.

Warner R. Odenthal, MONTAGUE WATER CONSERVATION DISTRICT
By: B. W. Messner, President
By: Davis Loebe, Secretary
STATE OF CALIFORNIA
County of Siskiyou

On June 11, 1968, before me, Vivian Russell, Notary Public, in and for said State, personally appeared S. A. MESSNER and BORIS GOERTZ, President and Secretary, respectively of MONTAGUE WATER CONSERVATION DISTRICT, known to me to be the persons whose name, S. A. MESSNER, subscribed to the within instrument, and acknowledged to me that he executed the same. My commission expires 10-20-70.

VIVIAN RUSSELL, Notary Public, California
Form N-10
RECORD ONLY IN COUNTIES LISTED
NOTARY PUBLIC - CALIFORNIA
COUNTY OF SISKIYOU
JUN 07 1968
Notarize the signature of Allen V. C. Davis & Warner R. Odenthal

Recorded Deed of Trust June 26, 1968

VOL 561 PAGE 119

SISKIYOU COUNTY
OFFICIAL RECORDS

Partial Reconveyance recorded in
Vol. 596 Page 313 OFFICIAL RECORDS
ERNEST T. JOHNSON, Sls. Co. Recorder
By: Ruth F. Barnett Deputy

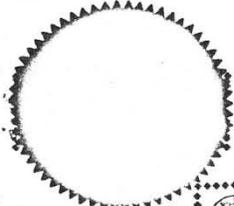
Partial Reconveyance recorded in
Vol. 598 Page 892 OFFICIAL RECORDS
ERNEST T. JOHNSON, Sls. Co. Recorder
W. S. Wheeler Deputy

Partial Reconveyance RECORDED IN
VOL. 634 PAGE 159 OFFICIAL RECORDS
P. K. BLEY, SISKIYOU COUNTY RECORDER
W. S. Wheeler DEPUTY

Partial Reconveyance RECORDED IN
VOL. 647 PAGE 186 OFFICIAL RECORDS
P. K. BLEY, SISKIYOU COUNTY RECORDER
By: Ruth F. Barnett DEPUTY

Reconveyance RECORDED IN
VOL. 625 PAGE 1597 OFFICIAL RECORDS
P. K. BLEY, SISKIYOU COUNTY RECORDER
E. J. Jacoby DEPUTY

STATE OF CALIFORNIA
COUNTY OF CONTRA COSTA } ss



GENERAL ACKNOWLEDGMENT
Form No. 16

ON June 26, 1968, before me, the undersigned, a Notary Public in and for said County and State, personally appeared W. A. BARRER R. ODEATHAL

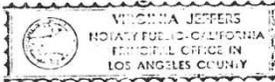
known to me to be the person... whose name... IS... subscribed to the within instrument, and acknowledged to me that... he... executed the same.

JOHN I. BARRON
Notary Public
Contra Costa County
State of California

John I. Barron
Notary Public in and for said County and State
JOHN I. BARRON
My Commission Expires Aug. 9, 1970

STATE OF CALIFORNIA,

County of Los Angeles } ss.
On this 22nd day of July in the year one thousand nine hundred and sixty eight before me the undersigned a Notary Public, State of California, duly commissioned and sworn, personally appeared Allen V. C. Davis



known to me to be the person... whose name... is... subscribed to the within instrument and acknowledged to me that... he... executed the same.
IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal in the County of Los Angeles the day and year in this certificate first above written.

Virginia Jeffers
Notary Public
VIRGINIA JEFFERS of California.
My Commission Expires... My Commission Expires May 14, 1969

Cowdry's Form No. 32—Acknowledgment—General
(C. C. Sec. 1189) PRINTED 6/19/67 71-0772

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SISKIYOU COUNTY
OFFICIAL RECORDS

EXHIBIT "A"

All that real property situate in the County of Siskiyou, State of California, described as follows:

PARCEL I: All that portion of the Southwest quarter of Section 25, Township 43 North, Range 5 West, M.D.M., lying Southerly of the following described line: Beginning at a point on the Westerly line of said Section 25 which lies North 0°05' E 2060.04 feet from the Southwest corner of Section 25; thence S. 80°19' E. 2680.0 feet more or less to the North-South centerline of said Section 25.

SAVING AND EXCEPTING THEREFROM a parcel of land being a portion of the Southwest quarter of Section 25, Township 43 North, Range 5 West, Mount Diablo Meridian, Siskiyou County, California, described as follows:
Commencing at the Southwest corner of said Section 25, thence Northerly along the Westerly line of said Section 25, North 0°26'12" East, 670.00 feet to the TRUE POINT OF BEGINNING; thence leaving said line and running Easterly, parallel to the Southerly line of said Section 25, South 89°07'00" East, 2396.22 feet to a point in the Easterly edge of Dwinell Lake at approximate elevation 2809, U.S.G.S. datum; thence Northerly along approximate contour 2809, North 3°23'02" West, 94.64 feet; thence continuing along said approximate contour, North 12°31'30" West, 118.00 feet to a point 450.00 feet Southerly from the North line of the Southeast quarter of the Southwest quarter of said Section 25; thence leaving said contour and running Easterly, parallel to said North line of the Southeast quarter of the Southwest quarter, South 89°34'18" East, 47.72 feet to a point 300.28 feet Westerly, measured at right angles, from the Easterly line of the Southwest quarter of said Section 25; thence Northerly, parallel to said line, North 0°22'16" East, 791.64 feet; thence North 79°57'48" West, 2444.42 feet to a point in the Westerly line of said Section 25; thence Southerly along said line, South 0°26'12" West, 1390.04 feet to the TRUE POINT OF BEGINNING.

PARCEL II: Section 35; Township 43 North, Range 5 West, M.D.M. The East 1/2 and the East 1/2 of the Southwest 1/4 Section 36, Township 43 North, Range 5 West, M.D.M. The West 1/2 of the Northeast 1/4; the Northwest 1/4; the North 1/2 of the Southwest 1/4; the Southwest 1/4 of the Southwest 1/4 and the Northwest 1/4 of the Southeast 1/4.

PARCEL III: Section 1, Township 42 North, Range 5 West, M.D.M. The North 1/2 of the Northwest 1/4 and the Southwest 1/4 of the Northwest 1/4.

PARCEL IV: All of Section 2, Township 42 North, Range 5 West, M.D.M.

PARCEL V: Section 3, Township 42 North, Range 5 West, M.D.M.

~~Parcel A:~~ The South 1/2 of the North 1/2 and the South 1/2.

~~Parcel B:~~ The North 1/2 of the Northeast 1/4 or Lot 2 of the Northeast 1/4.

PARCEL VI: Section 4, Township 42 North, Range 5 West, M.D.M. The Southeast 1/4 of the Southeast 1/4.

Section 9, Township 42 North, Range 5 West, M.D.M. The Northeast 1/4 of the Northeast 1/4 and the Northeast 1/2 of the Southeast 1/4 of the Northeast 1/4; being more particularly described as all that portion of Southeast 1/4 of the Northeast 1/4 of said Section 9 lying Northeasterly of a line described as:
BEGINNING at the Northwest corner of the Southeast 1/4 of the Northeast 1/4; thence Southeasterly in a direct line to the Southeast corner of the Southeast 1/4 of the Northeast 1/4.

PARCEL VII: Section 10, Township 42 North, Range 5 West, M.D.M. The North 1/2 and the Northeast 1/4 of the Southeast 1/4.

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SISKIYOU COUNTY
OFFICIAL RECORDS

EXHIBIT "A"
Continued

Section 11, Township 42 North, Range 5 West, M.D.M. The North 1/2 of the Northeast 1/4; the Northwest 1/4 and the Northwest 1/4 of the Southwest 1/4.

SAVING AND EXCEPTING FROM all the above described Parcels of land:

That land known as Dwinnell Reservoir and described generally as all land which would be submerged at any time if the water of said reservoir reached a point on Owner's dam designated as Dwinnell Dam and located in Section 25; Township 43 North, Range 5 West, M.D.M., which is 2809 feet above sea level, U.S. G.S. datum, and further excepting any and all existing works, structures and appurtenances of Owner in connection with the operation of Dwinnell Reservoir and Dwinnell Dam which may lie or be situated above the said elevation, including, but not by way of limitation, the dam, power facilities, if any, pumping stations, pumping sites, and other such works, structures and appurtenances.

ALSO SAVING AND EXCEPTING all that portion of the following described lands lying Easterly of the Easterly edge of Dwinnell Lake as established by a point on Dwinnell Dam which is 2809 feet above sea level, U.S.G.S. datum.

Parcel "A": A parcel of land being a portion of the Southwest quarter of Section 25, Township 43 North, Range 5 West, Mount Diablo Meridian, Siskiyou County, California, described as follows:

Commencing at the Southwest corner of said Section 25, thence Northerly along the Westerly line of said Section 25, North $0^{\circ}26'12''$ East, 670.00 feet; thence leaving said line and running Easterly, parallel to the Southerly line of said Section 25, South $89^{\circ}07'00''$ East, 2396.22 feet to a point in the Easterly edge of Dwinnell Lake at approximate elevation 2809, U.S.G.S. datum; thence Northerly along approximate contour 2809, North $3^{\circ}23'02''$ West, 94.64 feet; thence continuing along said approximate contour, North $12^{\circ}31'30''$ West, 118.00 feet to a point 450.00 feet Southerly from the North line of the Southeast quarter of the Southwest quarter of said Section 25; thence leaving said contour and running Easterly, parallel to said North line of the Southeast quarter of the Southwest quarter, South $89^{\circ}34'18''$ East, 47.72 feet to a point 300.28 feet Westerly, measured at right angles, from the Easterly line of the Southwest quarter of said Section 25; thence Northerly, parallel to said line, North $0^{\circ}22'16''$ East, 791.64 feet; thence S. $79^{\circ}57'48''$ E. = (S. $80^{\circ}19'$ E. Record) a distance of 304.60 feet to a point on the North-South centerline of Section 25; thence S. $0^{\circ}22'16''$ W. 1622.74 feet along the North-South centerline of Section 25 to the South line thereof; thence N. $89^{\circ}07'00''$ W. along the South line of Section 25 to the point of beginning.

Parcel "B": The Southeast 1/4 of Section 35 and the West 1/2 of the Northeast 1/4; the Northwest 1/4; the North 1/2 of the Southwest 1/4; the Southwest 1/4 of the Southwest 1/4 and the Northwest 1/4 of the Southeast 1/4 of Section 36, all in Township 43 North, Range 5 West, M.D.M.

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MWCD- Enrolled Water Rights:

Shasta River Decree-Enrolled Water Rights

148.

2.6 acres in the S $\frac{1}{2}$ N $\frac{1}{2}$	Sec. 3, T. 42 N., R. 5 W., M.D.B. & M.
5.3 acres in the SE $\frac{1}{4}$ N $\frac{1}{2}$	Sec. 3, T. 42 N., R. 5 W., M.D.B. & M.
15.9 acres in the NE $\frac{1}{4}$ S $\frac{1}{2}$	Sec. 3, T. 42 N., R. 5 W., M.D.B. & M.
2.3 acres in the NW $\frac{1}{4}$ S $\frac{1}{2}$	Sec. 3, T. 42 N., R. 5 W., M.D.B. & M.
3.0 acres in the SW $\frac{1}{4}$ S $\frac{1}{2}$	Sec. 3, T. 42 N., R. 5 W., M.D.B. & M.
0.2 acre in the N $\frac{1}{2}$ SE $\frac{1}{4}$	Sec. 3, T. 42 N., R. 5 W., M.D.B. & M.
18.5 acres in the NE $\frac{1}{4}$ NE $\frac{1}{4}$	Sec. 9, T. 42 N., R. 5 W., M.D.B. & M.
2.2 acres in the SE $\frac{1}{4}$ NE $\frac{1}{4}$	Sec. 9, T. 42 N., R. 5 W., M.D.B. & M.
5.8 acres in the N $\frac{1}{2}$ N $\frac{1}{2}$	Sec. 10, T. 42 N., R. 5 W., M.D.B. & M.
<hr/>	
97.9 acres--Total.	

287. MONTAGUE WATER CONSERVATION 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 Montague Water Conservation District Reservoir and Canal,

55,000 ACRE-FEET PER SEASON--PRIORITY JULY 23, 1923, or as much thereof as said district impounds in the Montague Water Conservation District Reservoir, situated in Secs. 1, 2, 3, 4, 9, 10, and 11, T. 42 N., R. 5 W., and Secs. 25, 35, and 36, T. 43 N., R. 5 W., M.D. B. & M., during the period between October first of each year and June fifteenth of the succeeding year, and thereafter withdraws from said reservoir and applies to beneficial use for the purpose hereinafter set forth, during the period between April first and October first, of each year; said water to be diverted from said Shasta River at a point which bears approximately N. 52° 43' E., approximately 2601 feet distant from southwest corner of Sec. 25, T. 43 N., R. 5 W., M.D.B. & M., being within the NE $\frac{1}{4}$ SW $\frac{1}{4}$ of said Sec. 25, and said water to be used for the irrigation of 19,500 acres within the boundaries of said Montague Water Conservation District as shown on Permit Map 2452 on file with the Division of Water Resources; provided, that on or before December 31, 1940, or on or before such time or times as may be hereafter fixed by order of this court, said Montague Water Conservation District shall complete the above appropriation and apply said water to beneficial use pursuant to the terms of Division of Water Rights Permit 2452, the orders of this court and the provisions of section 36f of the water commission act.

288. MONTAGUE WATER CONSERVATION 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 Parks Creek, through the Montague Water Conservation District Parks Creek Canal,

15,000 ACRE-FEET PER SEASON--PRIORITY JULY 30, 1923, or as much thereof as said district impounds in the Montague Water Conservation District Reservoir, situated in Secs. 1, 2, 3, 4, 9, 10, and 11, T. 42 N., R. 5 W., and Secs. 25, 35 and 36, T. 43 N., R. 5 W., M.D.B. & M., during the period between October first of each year and June fifteenth of the succeeding year, and thereafter withdraws from said reservoir and applies to beneficial use for the purpose hereinafter set forth, during the period between April first and October first of each year; said water to be diverted from said Parks Creek at a point which bears approximately N. 70° 30' W., approximately 2511.8 feet distant from the southeast corner of Sec. 29, T. 42 N., R. 5 W., M.D. B. & M., being within the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of said Sec. 29, and said water to be used for the irrigation of the lands within the boundaries of said district as described hereinabove in paragraph 287;

Shasta River Water Right: Permit #2452



e-WRIMS Public Summary Page

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Application ID: A003544 **Water Right Type:** Appropriative
Permit ID: 002452 [View Permit](#) **Water Rights Status:** Permitted (07/23/1923) [View Map](#)
License ID: None **Primary Owner:** MONTAGUE WATER CONSERVATION DISTRICT

Current Parties	Relationship	Effective Date
MONTAGUE WATER CONSERVATION DISTRICT	Primary Owner	09/15/1994
Need to report a change of ownership or agent? Click Here		

+ Historical Parties

Record Summary	
Application Acceptance Date	07/23/1923
Permit Issuance Date	04/03/1926
License Issuance Date	
Face Value Amount	35000.0
Subtypes (Statements Only)	

Name(s) of Sources of Water	County Location	Parcel Number	Diversion Site Name	Lat/Long Coordinates
SHASTA RIVER	Siskiyou			41.5409 ; -122.3744

Beneficial Uses	Acres	Direct Diversion Season	Collection to Storage Season
Irrigation	19500.0		10/1

Parks Creek Water Right: Permit #2453



e-WRIMS Public Summary Page

[\[Return to Water Right Search \]](#)

[\[Return to Water Right Search Results \]](#)

Application ID: A003555 **Water Right Type:** Appropriative
Permit ID: 002453 [View Permit](#) **Water Rights Status:** Permitted (07/30/1925) [View Map](#)
License ID: None **Primary Owner:** MONTAGUE WATER CONSERVATION DISTRICT

Current Parties	Relationship	Effective Date
MONTAGUE WATER CONSERVATION DISTRICT	Primary Owner	09/15/1994
Need to report a change of ownership or agent? Click Here		

+ Historical Parties

Record Summary	
Application Acceptance Date	07/30/1925
Permit Issuance Date	04/03/1926
License Issuance Date	
Face Value Amount	14000.0
Subtypes (Statements Only)	

Name(s) of Sources of Water	County Location	Parcel Number	Diversion Site Name	Lat/Long Coordinates
PARKS CREEK	Siskiyou			41.45286442 ; -122.44800054

Beneficial Uses	Acres	Direct Diversion Season	Collection to Storage Season
Irrigation	19500.0		10/1

**MWCD Operations Plan 2019
Shasta River - Dwinnell Reservoir**

**Montague Water Conservation District
Draft Water Operation Plan, January 13, 2019**

Background: The Montague Water Conservation District (MWCD) owns and operates Dwinnell Reservoir located on the Shasta River, tributary to the Klamath River, in Siskiyou County, California. MWCD holds two water right permits for water stored in Dwinnell Reservoir. One permit is for diversion to storage on the Shasta River while the other is for water delivered to storage from Parks Creek. Both diversions are governed and operated within the confines of the Shasta River Decree and Watermaster service required by Siskiyou County Superior Court.

SWRCB Permit No. 2452; Decree No. 287 (Shasta River at Dwinnell Dam)

Point of Diversion: N. 52°, 43' E., approximately 2601 feet from SW corner of Section 25, T43N, R5W, MDB&M, being within the NE¼ of SW¼ of said Section 25

Place of Use: 19,500 acres within District, as shown on map on file with SWRCB

Purpose of Use: Irrigation

Season of Diversion: October 1 to June 15, collected to storage in Dwinnell Reservoir

Season of Use: April 1 to October 1

Quantity: 35,000 acre-feet per annum

Priority date: July 23, 1923

SWRCB Permit No. 2453; Decree No. 288 (Parks Creek diversion to Dwinnell Reservoir)

Point of Diversion: N. 70°, 30' E., approximately 2511.8 feet from SE corner of Section 29, T42N, R5W, MDB&M, being within the SW¼ of SE¼ of said Section 29

Place of Use: 19,500 acres within District, as shown on map on file with SWRCB

Purpose of Use: Irrigation

Season of Diversion: October 1 to June 15, collected to storage in Dwinnell Reservoir

Season of Use: April 1 to October 1

Quantity: 14,000 acre-feet per annum

Maximum 150 cfs

Diversion:

Priority date: July 30, 1923

In 2017, MWCD received federal authorizations to implement its Conservation and Habitat Enhancement and Restoration Project (CHERP), a comprehensive water conservation and salmonid habitat enhancement program consisting of infrastructure improvements and modified operations. The term of CHERP's Section 7 permit through the U.S. Army Corps of Engineers (ACOE) is five years. Concurrent with the implementation of CHERP, MWCD is also developing a long term Safe Harbor Agreement (SHA) that is intended to continue for

approximately 20 years. MWCD is currently working toward finalizing a Template Safe Harbor Agreement (SHA) with the National Marine Fisheries Service (NMFS) and (California Department of Fish and Wildlife (CDFW). Under the Template SHA, MWCD has prepared a draft Site Plan that outlines Beneficial Management Activities and Avoidance and Minimization Measures MWCD is proposing to implement for the purpose of promoting the conservation, enhancement of survival, and recovery of the Southern Oregon/Northern California Coast Evolutionarily Significant Unit of coho salmon. MWCD’s draft Site Plan proposes activities and measures that are concurrent and complementary with CHERP, but also includes a number of additional enhancement measures.

As MWCD fully implements its water conservation measures identified in CHERP and SHA, a formal operations plan for MWCD is necessary for managing additional beneficial uses including environmental releases throughout the year dependent on varied water year types.

MWCD is managing its operations to provide water for the following responsibilities during specific times of the year:

<u>Storage Objective:</u>	<u>Timeline Range:</u>
Prior Rights	3/1-10/31
Municipal	4/1-12/15
Environmental	3/1-2/28
District Sales	4/1-9/30

Elements of the MWCD Water Management Plan: Upon full implementation of CHERP and through MWCD's SHA, MWCD will provide efficient deliveries of irrigation water to its District users, meet existing delivery responsibilities to prior rights holders, provide deliveries for municipal use by the City of Montague, and provide instream releases for environmental enhancement objectives. MWCD’s goal of maximizing beneficial uses of water is dependent upon clear objectives, scheduling and well defined management triggers and resulting options. Given that demand often exceeds supply, MWCD must determine the approximate volume of water available, and develop a schedule of timing, volume and priority of the multiple beneficial uses MWCD seeks to provide. MWCD's Water Operations Plan must be capable of:

- Responding to variable water year types
- Restricting use based on priority when supplies are low
- Providing for year-round beneficial uses including municipal, environmental and irrigation.
- Quickly responding to changes in available water
- Planning for and meeting beneficial uses on a priority scale month in advance

Managing for annual supply variability and multiple beneficial uses: Methods and indicators used by water districts to determine available water supply are numerous. Over time, MWCD has refined its operations by making management decisions based on actual condition at specific times of the year, and this approach has proven effective. MWCD now proposes to manage the release of approximately 2,600 to 8,200 acre-feet (af) annually, based on water year type, to the Shasta River for instream beneficial uses made available through water conservation. MWCD will also ensure protective flows by-pass its Parks Creek point of diversion prior to diverting water to storage in Dwinnell Reservoir.

Determination of releases of dedicated volumes throughout varied year types for instream beneficial use is a new use to plan for and manage, including year-round availability of release water. Pending infrastructure improvements under CHERP and SHA, MWCD will have the operational flexibility and capacity to manage water for instream benefit distinctly from other uses, concurrent or otherwise. New and existing infrastructure to provide/release of instream flows is expected to be utilized throughout the calendar year to enhance flows and habitat for all life stages of coho salmon and other salmonids.

In order to incorporate MWCD's CHERP and SHA instream flow release management into MWCD's existing operations, a refined management strategy is under development to ensure the instream flow volumes provided prior to the April 1 onset of irrigation and municipal deliveries are commensurate with supply and fairly apportioned with the volume of water expected to be conserved as a result of Main Canal lining actions planned in CHERP and SHA. In many years, MWCD's storage supply is less than demand. To plan for and operate under the premise that on some years supply cannot fully meet all of MWCD's responsibilities, this operations plan provides a method of curtailment and fair apportionment among these responsibilities, based on two general premises:

A.) An internal allocation prioritization system among beneficial uses.

B.) Management and operations based on a water year type determination system that is based on real-time storage volumes and predicted inflows.

A. Internal Allocation Priority: To address limited supply conditions, this Water Operations Plan establishes MWCD's internal priorities for its beneficial uses, always being mindful that MWCD and its users must remain viable for the District and its services to continue. MWCD has the following internal priority objectives for allocation purposes only.

1.) Prior Rights Agreements: Prior to the establishment of MWCD, a number water rights existed at or downstream of the current location of Dwinnell Dam on the Shasta River. Construction of Dwinnell Reservoir interrupted or destroyed the conduits and/or Points of Diversion (PODs) of five water rights holders (hereinafter termed Prior Rights Users). In exchange for allowing construction of Dwinnell Reservoir, MWCD agreed to provide the Prior Rights Users a mutually agreed-upon annual volume of water to be released at the rate and schedule of individual Prior Rights Users' choosing. From a priority standpoint, MWCD considers Prior Rights the highest internal priority as the District is legally bound to provide water to the Prior Rights Users. Therefore, MWCD's primary priority is to provide up to 3,382 af annually to Prior Rights Users during the period of March 1 – October 31. Of the 3,382 af total, 1,398 af are delivered via MWCD's Main Canal to the respective PODs while 1,984 af are released to the Shasta River for downstream re-diversion by Prior Rights Users.

Schedule of MWCD Prior Rights:

The water rights for Tracts 57, 58, 59, 60, 61, and 62 are held in Dwinnell Reservoir and released, by Watermaster, between March 1 and October 31 on demand by agreement with MWCD as follows:

<u>Present Owner</u>	<u>Delivery Conduit</u>	<u>Ac-Ft</u>	<u>Div. Number</u>
Richards, R. & D. Trust	MWCD Main Canal	1,200	153, 154, 157
Emmerson Investment Inc.	Shasta River	471	165, 166
Emmerson Investment Inc.	Shasta River	125	158
Mallett, B.	Shasta River	464	158, 160, 161
Lea, Debra	MWCD Main Canal	65	149
Lassen Canyon Nursery	MWCD Main Canal	133	149
Emmerson Investment Inc.	Shasta River	924	156, 157, 159
	Total	3,382	

Delivery Conduit and Volume Summary

Shasta River	1,984 af
<u>MWCD Main Canal</u>	<u>1,398 af</u>
Sub-total	3,382 af

2.) Municipal: Based on MWCD’s internal prioritization, municipal water deliveries to the City of Montague (City) is the second highest priority behind only Prior Rights responsibilities. Municipal water deliveries to the City have historically been combined with MWCD’s Main Canal delivery of irrigation water to district users. As a result of recently completed infrastructure improvements provided by emergency drought funds for the City, MWCD now has the ability to deliver municipal water more efficiently via the Shasta River while concurrently providing added instream habitat value. MWCD can also divert water for municipal purposes from the Little Shasta River but this source is typically only available between December 15 and April 15 due to the low priority of that water right. MWCD releases an average of approximately 1,200 af annually from Dwinnell Reservoir for municipal use. Municipal use is not recognized as a beneficial use for MWCD's storage rights, even though it has been a common practice for nearly 90 years. MWCD submitted a Change Petition to the SWRCB in 2015 including adding municipal use as an additional beneficial use.

3.) Instream Environmental: In the past, MWCD has participated in individual or collaborative spring pulse flow releases, fall flow transactions, and water forbearances for instream benefits on numerous occasions. Under full implementation of MWCD's CHERP and MWCD's Safe Harbor Agreement, MWCD will be releasing pre-determined volumes of water, based on annual water year type determinations and commensurate with estimated volumes of water conserved through lining high loss sections of the Main Canal, for instream benefits in accordance with release schedules outlined in the 2017 Biological Opinion issued by NMFS for CHERP. As such, MWCD considers instream environmental uses and MWCD’s irrigation uses (described below) to be coequal in priority. As such, the volume of water released for instream benefits by MWCD will

depend on water year type, but will remain commensurate with District irrigation use, except during Wet and Very Wet water years when MWCD would historically carry surplus water over to the next water year. Under CHERP, MWCD will be providing block volumes of water (in addition to pre-determined flow release schedule volumes and rates) for additional beneficial instream, to be released in coordination with NMFS and CDFW, during Wet and Very Wet water years.

3.) MWCD District Irrigation: Based on storage, anticipated spring inflow, and demand, the volume of water delivered to MWCD users varies greatly from year to year. After accounting for the two top priorities (prior rights and municipal), the average volume of water sold by MWCD in a normal water year is approximately 15,800 af delivered via the Main Canal for irrigation between April 1 and September 30. The average irrigation season for MWCD members is 133 days, but has varied from as little as 11 days during an extremely dry water year to as much as the full extent allowed under the Shasta River Decree. As described above, irrigation uses and instream benefits uses are coequal priorities under this Water Operations Plan, and MWCD will continue to provide variable annual volumes of water, based on water year type determinations.

4.) Minimum Reservoir Storage: MWCD recognizes the recreational value of a fishery in Dwinnell Reservoir managed by CDFW and Siskiyou County. Depending on water year type and demand, MWCD will target variable October 1 minimum storage volumes, ranging from 600 af in a Very Dry water year to 8,000 af or more in a Very Wet water year. October 1 reservoir storage targets are also used ensure water is available for instream flow releases for the remainder of the water year (i.e., through February 29)².

Internal Allocation Priority Summary Conclusions: Historically, MWCD has always had sufficient water storage to meet its prior rights responsibilities, municipal needs of the City of Montague, and end-of-year minimum storage targets to maintain reservoir uses. For example, the 2014 drought year resulted in the lowest ever reservoir storage in MWCD's 86-year history. However, even with only 9,000 af in storage on April 1, 2014, and an estimated additional 2,000 af inflow into Dwinnell Reservoir after April 1, MWCD implemented an internal priority allocation: Prior rights were fully met, municipal demand was significantly reduced but fully met, 14 days of MWCD irrigation occurred, and 2,250 af were provided for instream benefits. Finally, a target 2000 af remained in storage for multiple late season uses after October 1, 2014.

B. Dwinnell Reservoir Water Year Determination to Establish Instream

Environmental Release Schedule: Supply variation in water years require MWCD to manage for years of limited supply differently than years of normal or even excess supply. While highest priorities of meeting Prior Rights will be fully met, MWCD District use and instream enhancement allocations will vary based on water year type. In coordination with NMFS and CDFW, MWCD developed a water year type designation methodology specific to Dwinnell Reservoir to determine the volume of water provided for instream benefit to the Shasta River via MWCD's storage and incorporated infrastructure.

² For the purposes of MWCD's water operations, a water year extends from March 1 through February 29 of the following year.

The 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. Reservoir storage is estimated to be the most applicable indicator of available water to meet MWCD’s uses and obligations and downstream demands. Snowpack is representative of near-future water that may become available but is not yet in storage. The methodology uses five water year type designations: Very Dry, Dry, Normal, Wet, and Very Wet. The methodology is described in detail by Watercourse Engineering (2016) and summarized below.

For purposes of MWCD’s water year type designations, a water year extends from March 1 through February 29 of the following calendar year. Year type designations are evaluated on March 1, April 1, and, if necessary, May 1. The year type designations are determined based on Dwinnell Reservoir storage alone for March, but storage and snow pack (snow water content) for April and May. 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.

March 1 Year Type Determination: The March 1 year type designation is based only on storage in Dwinnell Reservoir. The storage criteria for each water year type are provided in Table 1 below.

Table 1. March 1 year type designation criteria

March 1 st Storage (af)	Year Type
Less than 17,000	Very Dry
17,000 - 23,999	Dry
24,000 - 35,999	Normal
36,000 - 42,999	Wet
43,000 or greater	Very Wet

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%	Very Wet
46,000 - 47,999	< 75%	Wet
	> 75%	Very Wet
48,000 or greater	N/A	Very 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%	Very Wet
45,000 - 46,999	< 75%	Wet
	> 75%	Very Wet
47,000 or greater	N/A	Very Wet

Environmental Flow Release Schedules: Upon full implementation of CHERP, MWCD will release variable volumes of water from Dwinnell Reservoir as identified by the above water year determination method as follows:

- Very Dry: 2,662 af
- Dry: 3,541 af
- Normal: 4,437 af
- Wet: 6,236 af (includes 684 af of unscheduled releases to be managed adaptively)
- Very Wet: 8,152 af (includes 1,154 af of unscheduled releases to be managed adaptively)

Tables 4 through 8 provide the daily release rates based on the water year type determinations. The initial release schedule is implemented on March 1 based on storage, as described above. Potential shifts to a higher or lower water year type release schedule may occur on April 1 and May 1. As such, the total volume released in any given CHERP water year (i.e., March 1 through February 29) may differ from the above volumes (for example, when a Normal water year schedule is implemented on March 1, but switched over to a Wet water year schedule on April 1).

The total release volumes for Wet and Very Wet water years include 684 af and 1,154 af blocks of water, respectively, that are not included in the releases schedules for those years. These blocks of water will be released adaptively in coordination with NMFS and CDFW for purposes such as flushing flows, habitat maintenance, or enhanced salmonid migration.

In the rare event that both prior rights users on the Shasta River request temporary cessation of water deliveries during the summer of a Very Dry water year, MWCD will provide an additional 2.0 cfs (in addition to the proposed CHERP flow release of 1.0 cfs) from Flying L wells (see below) until prior rights deliveries are resumed.

Furthermore, all water year schedules listed in Tables 4 through 8 include an August 21 increase to 5 cfs of CHERP releases. It is important to note that August 21 is simply a schedule placeholder representing the average date when prior rights deliveries of up to 8 cfs via the Shasta River have historically ended. Under CHERP, MWCD commits to releasing 5 cfs starting the day prior rights releases end until the end of August.

Use of Flying L Pumps: An important component of the CHERP water operations plan to maintain baseline conditions is the incorporation of MWCD's Flying L well/pumps to provide improved water quality through delivery of groundwater at a temperature of 12.2°C to the Shasta River. Under CHERP, water temperatures released from Dwinnell Reservoir will be monitored on MWCD property below the proposed cold water wetland habitat feature. As maximum daily release temperatures from Dwinnell Reservoir approach 18°C, MWCD will incorporate cold water from the Flying L wells to reduce water temperatures released into the Shasta River. MWCD will provide variable rates (up to a maximum of 5.5 cfs) of water from Flying L wells to maintain the water quality released to Shasta River during periods when water released from Dwinnell Reservoir exceed 18°C.

TABLE 4
PROPOSED CHERP FLOW RELEASES – VERY DRY YEAR (2,662 AF)

Date	Release Rate (cfs)											
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1	4	15	5	3	1	1	3	3	3	3	2	2
2	4	15	5	3	1	1	3	3	3	3	2	2
3	4	15	5	3	1	1	3	3	3	3	2	2
4	4	15	5	3	1	1	3	3	3	3	2	2
5	4	15	5	3	1	1	3	3	3	3	2	2
6	4	15	5	3	1	1	3	3	3	3	2	2
7	4	15	5	3	1	1	3	3	3	3	2	2
8	4	15	5	3	1	1	3	3	3	3	2	2
9	4	15	5	1	1	1	3	3	3	3	2	2
10	4	15	5	1	1	1	3	3	3	3	2	2
11	4	15	5	1	1	1	3	3	3	3	2	2
12	4	15	5	1	1	1	3	3	3	3	2	2
13	4	15	5	1	1	1	3	3	3	3	2	2
14	4	15	5	1	1	1	3	3	3	3	2	2
15	4	15	5	1	1	1	3	3	3	3	2	2
16	4	15	3	1	1	1	3	3	3	3	2	2
17	4	15	3	1	1	1	3	3	3	3	2	2
18	4	10	3	1	1	1	3	3	3	3	2	2
19	4	10	3	1	1	1	3	3	3	3	2	2
20	4	10	3	1	1	1	3	3	3	3	2	2
21	4	10	3	1	1	5	3	3	3	3	2	2
22	4	10	3	1	1	5	3	3	3	3	2	2
23	15	10	3	1	1	5	3	3	3	3	2	2
24	15	10	3	1	1	5	3	3	3	3	2	2
25	15	10	3	1	1	5	3	3	3	3	2	2
26	15	5	3	1	1	5	3	3	3	3	2	2
27	15	5	3	1	1	5	3	3	3	3	2	2
28	15	5	3	1	1	5	3	3	3	3	2	2
29	15	5	3	1	1	5	3	3	3	3	2	2
30	15	5	3	1	1	5	3	3	3	3	2	
31	15		3		1	5		3		3	2	

*If all prior rights on the Shasta River cease to call for water during summer rearing period, MWCD will provide 2.0 cfs to the Shasta River for instream benefit until prior rights are again resumed.

TABLE 5
PROPOSED CHERP FLOW RELEASES – DRY YEAR (3,541 AF)

Date	Release Rate (cfs)											
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1	4	15	10	5	3	3	3	3	4	3	2	2
2	4	15	10	5	3	3	3	3	4	3	2	2
3	4	15	10	5	3	3	3	3	4	3	2	2
4	4	15	10	5	3	3	3	3	4	3	2	2
5	4	15	10	5	3	3	3	3	4	3	2	2
6	4	15	10	5	3	3	3	3	4	3	2	2
7	4	15	10	5	3	3	3	3	4	3	2	2
8	4	15	10	5	3	3	3	3	4	3	2	2
9	4	15	10	5	3	3	3	3	4	3	2	2
10	4	15	10	5	3	3	3	3	4	3	2	2
11	4	15	10	5	3	3	3	3	4	3	2	2
12	4	15	10	5	3	3	3	3	4	3	2	2
13	4	15	10	5	3	3	3	3	4	3	2	2
14	4	15	10	5	3	3	3	3	4	3	2	2
15	4	15	5	3	3	3	3	3	4	3	2	2
16	15	15	5	3	3	3	3	3	4	3	2	2
17	15	15	5	3	3	3	3	3	4	3	2	2
18	15	15	5	3	3	3	3	3	4	3	2	2
19	15	15	5	3	3	3	3	3	4	3	2	2
20	15	15	5	3	3	3	3	3	4	3	2	2
21	15	15	5	3	3	5	3	3	4	3	2	2
22	15	15	5	3	3	5	3	3	4	3	2	2
23	15	15	5	3	3	5	3	3	4	3	2	2
24	15	15	5	3	3	5	3	3	4	3	2	2
25	15	10	5	3	3	5	3	3	4	3	2	2
26	15	10	5	3	3	5	3	3	4	3	2	2
27	15	10	5	3	3	5	3	3	4	3	2	2
28	15	10	5	3	3	5	3	3	4	3	2	2
29	15	10	5	3	3	5	3	3	4	3	2	2
30	15	10	5	3	3	5	3	3	4	3	2	
31	15		5		3	5		3		3	2	

TABLE 6
PROPOSED FLOW RELEASES – NORMAL YEAR (4,437 AF)

Date	Release Rate (cfs)											
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1	4	25	10	5	3	3	3	6	6	3	4	4
2	4	15	10	5	3	3	3	6	6	3	4	4
3	4	15	10	5	3	3	3	6	6	3	4	4
4	4	15	10	5	3	3	3	6	6	3	4	4
5	4	15	10	5	3	3	3	6	6	3	4	4
6	4	15	10	5	3	3	3	6	6	3	4	4
7	4	15	10	5	3	3	3	6	6	3	4	4
8	4	15	10	5	3	3	3	6	6	3	4	4
9	4	15	10	5	3	3	3	6	6	3	4	4
10	4	15	10	5	3	3	3	6	6	3	4	4
11	4	15	10	5	3	3	3	6	6	3	4	4
12	4	15	10	5	3	3	3	6	6	3	4	4
13	4	15	10	5	3	3	3	6	6	3	4	4
14	4	15	10	5	3	3	3	6	6	3	4	4
15	4	15	5	3	3	3	6	6	6	3	4	4
16	15	15	5	3	3	3	6	6	6	3	4	4
17	15	15	5	3	3	3	6	6	6	3	4	4
18	15	15	5	3	3	3	6	6	6	3	4	4
19	15	15	5	3	3	3	6	6	6	3	4	4
20	15	15	5	3	3	3	6	6	6	3	4	4
21	15	15	5	3	3	5	6	6	6	3	4	4
22	15	15	5	3	3	5	6	6	6	3	4	4
23	15	15	5	3	3	5	6	6	6	3	4	4
24	15	15	5	3	3	5	6	6	6	3	4	4
25	15	10	5	3	3	5	6	6	6	3	4	4
26	15	10	5	3	3	5	6	6	6	3	4	4
27	15	10	5	3	3	5	6	6	6	3	4	4
28	15	10	5	3	3	5	6	6	6	3	4	4
29	25	10	5	3	3	5	6	6	6	3	4	4
30	25	10	5	3	3	5	6	6	6	3	4	
31	25		5		3	5		6		3	4	

TABLE 7
PROPOSED CHERP FLOW RELEASES – WET YEAR (6.236 AF)*

Date	Release Rate (cfs)											
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1	8	25	10	5	3	3	3	10	10	10	4	4
2	8	20	10	5	3	3	3	10	10	10	4	4
3	8	20	10	5	3	3	3	10	10	10	4	4
4	8	20	10	5	3	3	3	10	10	10	4	4
5	8	20	10	5	3	3	3	10	10	10	4	4
6	8	20	10	5	3	3	3	10	10	10	4	4
7	8	20	10	5	3	3	3	10	10	10	4	4
8	8	20	10	5	3	3	3	10	10	10	4	4
9	8	20	10	5	3	3	3	10	10	10	4	4
10	8	20	10	5	3	3	3	10	10	10	4	4
11	8	20	10	5	3	3	3	10	10	10	4	4
12	8	20	10	5	3	3	3	10	10	10	4	4
13	8	20	10	5	3	3	3	10	10	10	4	4
14	8	20	10	5	3	3	3	10	10	10	4	4
15	8	20	5	3	3	3	10	10	10	10	4	4
16	15	15	5	3	3	3	10	10	10	10	4	4
17	15	15	5	3	3	3	10	10	10	10	4	4
18	15	15	5	3	3	3	10	10	10	10	4	4
19	15	15	5	3	3	3	10	10	10	10	4	4
20	15	15	5	3	3	3	10	10	10	10	4	4
21	15	15	5	3	3	5	10	10	10	10	4	4
22	15	15	5	3	3	5	10	10	10	10	4	4
23	15	15	5	3	3	5	10	10	10	10	4	4
24	15	15	5	3	3	5	10	10	10	10	4	4
25	15	10	5	3	3	5	10	10	10	10	4	4
26	15	10	5	3	3	5	10	10	10	10	4	4
27	15	10	5	3	3	5	10	10	10	10	4	4
28	15	10	5	3	3	5	10	10	10	10	4	4
29	25	10	5	3	3	5	10	10	10	10	4	4
30	25	10	5	3	3	5	10	10	10	10	4	
31	25		5		3	5		10		10	4	

*Note: 5,552 AF scheduled; 684 AF Block for flushing, habitat maintenance, migration, etc.

TABLE 8
PROPOSED CHERP FLOW RELEASES – VERY WET YEAR (8.152 AF)*

Date	Release Rate (cfs)											
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb
1	10	25	15	5	3	3	3	13	13	10	4	4
2	10	25	15	5	3	3	3	13	13	10	4	4
3	10	25	15	5	3	3	3	13	13	10	4	4
4	10	25	15	5	3	3	3	13	13	10	4	4
5	10	25	15	5	3	3	3	13	13	10	4	4
6	10	25	15	5	3	3	3	13	13	10	4	4
7	10	25	15	5	3	3	3	13	13	10	4	4
8	10	25	15	5	3	3	3	13	13	10	4	4
9	10	25	15	5	3	3	3	13	13	10	4	4
10	10	25	15	5	3	3	3	13	13	10	4	4
11	10	25	15	5	3	3	3	13	13	10	4	4
12	10	25	15	5	3	3	3	13	13	10	4	4
13	10	25	15	5	3	3	3	13	13	10	4	4
14	10	25	15	5	3	3	3	13	13	10	4	4
15	10	25	10	3	3	3	10	13	13	10	4	4
16	15	20	10	3	3	3	10	13	13	10	4	4
17	15	20	10	3	3	3	10	13	13	10	4	4
18	15	20	10	3	3	3	10	13	13	10	4	4
19	15	20	10	3	3	3	10	13	13	10	4	4
20	15	20	10	3	3	3	10	13	13	10	4	4
21	15	20	10	3	3	5	10	13	13	10	4	4
22	15	20	10	3	3	5	10	13	13	10	4	4
23	15	20	10	3	3	5	10	13	13	10	4	4
24	15	20	10	3	3	5	10	13	13	10	4	4
25	15	20	10	3	3	5	10	13	13	10	4	4
26	15	20	10	3	3	5	10	13	13	10	4	4
27	15	20	10	3	3	5	10	13	13	10	4	4
28	15	20	10	3	3	5	10	13	13	10	4	4
29	25	20	10	3	3	5	10	13	13	10	4	4
30	25	20	10	3	3	5	10	13	13	10	4	
31	25		10		3	5		13		10	4	

*Note: 6,998 AF scheduled; 1,154 AF block for flushing, habitat maintenance, migration, etc.

Parks Creek Water Diversion: MWCD has a right to divert Parks Creek flows into Dwinnell Reservoir from October 1st through June 15th. Under CHERP, MWCD has committed to increasing its existing bypass flow requirement during the period of October 1 through December 15 to facilitate adult coho salmon migration from 6 cfs to 15 cfs. During instances of high diversion, higher bypass volumes may be necessary to sustain sweeping velocities along the face of the fish screen. Under CHERP, the following seasonal bypass flows are provided at the Parks Creek diversion:

10/1-12/15	15 cfs
1/1-3/1	6 cfs
3/1-6/15	16 cfs

Bypass flows are monitored downstream of the diversion site at the *Parks Creek Below MWCD Diversion Near Edgewood* CDEC station. Upon completion of the Parks Creek diversion screening component of CHERP, the Parks Creek diversion will be regulated by an automated and programmable Obermeyer Weir gate.

CHERP Interim Operations: Until the CHERP infrastructure modifications are fully funded, constructed, and implemented, water conservation will not be available to provide the full CHERP flow schedules as a baseline. Instead, MWCD is implementing interim flow schedules. As facilities are upgraded, additional volumes of water will be delivered. The interim flow plan includes ongoing flow releases that are consistent with a December 2013 Settlement Agreement between MWCD, Klamath River Keeper, and the Karuk Tribe, along with two additional conservation measures:

- MWCD will release a total volume of 2,662 af for instream benefits in years when storage is less than 18,000 af on April 1 (consistent with a CHERP Very Dry Water Year type). This represents a net increase of 412 af above previous Settlement Flow releases.
- Previous Settlement Agreement flow releases did not include the use of the Flying L pumps to improve summer water temperature conditions. Under the interim flow plan, MWCD will utilize discharges from its Flying L pumps in consultation with NMFS to improve the water quality (i.e., temperature) of flow releases consistent with CHERP operations described above.

Proposed SHA Operations: MWCD's proposed Site Plan under the Template SHA includes a number of physical beneficial management activities, such as gravel augmentation, as well as water management activities. Under the SHA, MWCD would continue to work toward full implementation of CHERP and this Water Management Plan. However, as currently envisioned, MWCD's participation in the SHA would add the following water management activities above and beyond existing CHERP commitments:

Shasta River:

- Implement water exchanges with downstream Template SHA Participants who have water rights on either Clear Springs or Hidden Valley Springs, both

sources of important cold water inputs to the Shasta River, during the period of the year when water temperatures exceed 18°C. If implementable, MWCD will provide prior rights users up to 1.5 cfs for Clear Springs and 1.5 cfs for Hidden Valley Springs (or match any volume less than 1.5 cfs) in exchange for spring water that is provided for instream benefit. A detailed description of MWCD operations under these exchanges will be added to this Water Operations Plan when the SHA and exchange agreements are finalized.

- MWCD will investigate, and if feasible, implement a retrofit of trash racks and gate adjustment on spill gates of the Dwinnell Reservoir emergency tower to prevent debris from plugging the gates when opened. Assurance of proper gates operation will allow for elevated flow releases of adaptively managed block water volumes during Wet and Very Wet years from the spill tower to provide channel maintenance flows while avoiding large uncontrolled spill during restoration development periods. A detailed description of MWCD's potential future operations of the emergency tower will be added to this Water Operations Plan when the SHA and feasibility investigation are completed.

Parks Creek:

- MWCD will participate in the Upper Parks Creek Flow Strategy and commit to additional instream bypass flow standards beyond existing CHERP commitments described above. Upon completion of MWCD's infrastructure improvements at Parks Creek Diversion, MWCD will:

MWCD - Upper Parks Creek Flow Strategy - Instream flow targets at PCE:

E.3.a1 Upper Parks Creek Flow Strategy: MWCD will participate in a reach-wide flow strategy on upper Parks Creek including seeking funding for water conservation projects, and serve on an advisory panel to confirm implementation plans and monitoring. MWCD will participate throughout the term of this agreement. Upon completion of MWCD's infrastructure improvements at Parks Creek Diversion (described in E.2c), MWCD will expand the bypass terms committed to under CHERP to include the following terms proposed in the Upper Parks Creek Flow Plan:

- Bypass 21.0 cfs at the Parks Creek at Edgewood (PCE) gage, located at the downstream extent of Upper Parks Creek reach, prior to diverting to aid adult migration and spawning from 10/1-12/31. 21 cfs includes conserved water made available when water conservation measures are implemented by Upper Parks Creek stream reach participants.
- Bypass 6.0 cfs at PCE from 1/1-2/28 prior to diverting. MWCD will work with agencies and other participants in the Upper Parks Creek stream reach to evaluate if redds are sufficiently protected with 6.0 cfs of bypass by the close of the 5th year of the agreement. If redds are not sufficiently protected, up to 10.0 cfs may need to be bypassed at PCE to meet the biological objective.

MWCD will assure 10.0 cfs is at PCE after MWCD diverts more than 20 cfs from 1/1-2/28, bypass 21.0 cfs at PCE prior to diverting from 3/1-6/15. The 21 cfs bypass includes water conserved through conservation projects conducted by Parks Creek Ranch and Edson-Foulke Ditch when proposed upstream water conservation projects are completed. Bypass of conserved water by other participants is contingent on operating gages at PCE and participating diversions. In order to provide flow variability in Parks Creek, MWCD will provide the following bypass values as diversion volumes increase as presented below:

MWCD's Parks Creek Diversion By-pass at PCE from 3/1-6/15: In order to provide increased flow variation below MWCD Parks Creek diversion, MWCD agrees to increase by-pass values proportionality with diverted volume, verified downstream by CDEC stream flow gage PCE (PCE stream flow gage is the downstream extent of Upper Parks Creek reach). Proportionate by-pass to diversion values include:

- 1.) Stream flow in Parks Creek at PCE must equal 21.0 cfs or more before MWCD can begin diversion and can divert up to 20 cfs.
- 2.) Streamflow in Parks Creek at PCE must equal 30 cfs or more before MWCD can divert more than 20 cfs but less than 90 cfs, 30 cfs must be provided for instream flow at PCE.
- 3.) Stream flow in Parks Creek at PCE must equal 40 cfs or more before MWCD can divert more than 90 cfs but less than 150 cfs.