Hole-in-the-Ground (HIG) Ranch

Site Plan Agreement between
Emmerson Investments, Inc., NOAA’s National Marine Fisheries Service (NMFS,) and
California Department of Fish and Wildlife (CDFW)
for the Template Safe Harbor Agreement
for Conservation of Coho Salmon in the Shasta River

A. Introduction

This Site Plan Agreement for the Template Safe Harbor Agreement for Conservation of Coho Salmon in the Shasta River (Agreement), which is intended to provide conservation benefits for the Southern Oregon and Northern California Coast (SONCC) Evolutionarily Significant Unit (ESU) of coho salmon (Covered Species), is between the Hole-in-the-Ground Ranch, operated by Emmerson Investments, Inc. (Permittee), NOAA’s National Marine Fisheries Service (NMFS), and the California Department of Fish and Wildlife (CDFW).

This Site Plan Agreement, combined with the provisions of the Agreement, may serve as the basis for NMFS to issue a federal enhancement of survival permit (ESP) to the above named Permittee pursuant to section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended (ESA). The joint and respective responsibilities of NMFS, CDFW, and the Permittees are detailed in the Agreement. This Site Plan Agreement is subject to terms and conditions set forth herein and in the Agreement and ESP. The definitions included in Section 2 of the Agreement are incorporated herein by reference.

In accordance with Section 5.1 of the Agreement, this Site Plan Agreement includes the following:

• General description of the Enrolled Property, including map and water rights (Section B below);
• Description of Routine Agricultural Activities carried out on the Enrolled Property (Section C.1 below), applicable Avoidance and Minimization Measures (AMMs) (Section C.2 & G.1 below), and Beneficial Management Actions (BMAs) to be implemented by the Permittee, including a schedule and other terms and conditions for implementation (Section E below);
• Description of Baseline Conditions on the Enrolled Property (Section D below) and Actions Required to Maintain Baseline Conditions (Section E.1 below);
• Description of Elevated Baseline Conditions on the Enrolled Property if applicable (Section E.2 below) and description of Other Beneficial Management Activities on the Enrolled Property (Section E.3 below);
• Monitoring and reporting activities that the Permittee agrees to carry out (Section G below);
• Description of potential and existing funding sources and timeline for the Permittee to carry out BMAs, AMMs, and monitoring and reporting requirements (Section E, F, & G below); and
• Other information consistent with the terms and conditions of the Agreement and ESP (Section F, H & I below).

The AMMs, BMAs, and associated monitoring and reporting protocols described below derive from Appendix 2 and Appendix 3 of the Agreement. In the event there is any conflict between the AMMs, BMAs, and associated monitoring and reporting protocols as described below and as described in the appendices to the Agreement, the appendices to the Agreement control.

B. Enrolled Property

B.1 General narrative and map describing the Enrolled Property

Location

The Hole-in-the-Ground Ranch (Enrolled Property) is located north of Lake Shastina and west of Big Springs Road (Figure 1). The Enrolled Property shares a western and southwestern boundary with the Shasta Springs and Seldom Seen ranches, also owners by the Permittee. The south fence line is also common with the Hidden Valley Ranch (HVR). To the north lie the Cardoza Ranch and the Big Springs Ranch Wildlife Area. On the northeast and east are other small private landowners. Table 1 lists the Enrolled Property APNs.

The Enrolled Property is used primarily for beef cattle production and is currently managed as an integrated unit with other ranches owned by the Permittee. Three contiguous properties, including the Hole-in-the-Ground are managed for pasture for beef cattle, while the Hay Ranch is managed for hay for winter feed to support the three cattle ranches. Using hay from the Hay Ranch during the winter minimizes the amount of grazing necessary to maintain the cattle at the other sites, which allows the pasture grasses to be maintained at very high levels of ground cover. The high level of ground cover minimizes surface erosion and fine sediment contribution to the sensitive aquatic systems on the other three ranches, and inhibits the establishment of noxious weeds. Maintaining the cattle locally, year-round, helps control the introduction of non-endemic species, e.g. invasive plants. Streams flowing through the Enrolled Property include the Shasta River, Parks Creek, and Hole-in-the-Ground Creek. The confluences of the creeks with the Shasta River are off the property.

For the purposes of this Safe Harbor Agreement, activities on the Enrolled Property have the potential to influence the Upper Shasta River and Lower Parks Creek sub-reaches as identified in the Agreement.
Figure 1- Hole-in-the-Ground Ranch: Property Description
B.2 Legal Description of the Enrolled Property

Table 1- Legal Description of Property

<table>
<thead>
<tr>
<th>APN</th>
<th>ASSESSED ACRES</th>
<th>OWNER</th>
<th>REFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>020030030</td>
<td>400</td>
<td>EII</td>
<td>HOLE-IN-THE-GROUND RANCH</td>
</tr>
<tr>
<td>020030040</td>
<td>640</td>
<td>EII</td>
<td>HOLE-IN-THE-GROUND RANCH</td>
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<tr>
<td>020030080</td>
<td>440</td>
<td>EII</td>
<td>HOLE-IN-THE-GROUND RANCH</td>
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<td>020030100</td>
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<td>020040430</td>
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<td>EII</td>
<td>HOLE-IN-THE-GROUND RANCH</td>
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<tr>
<td>020060020</td>
<td>160</td>
<td>EII</td>
<td>HOLE-IN-THE-GROUND RANCH</td>
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</tbody>
</table>

B.3 Description of Water Rights and Usage

There are three sources of water for irrigation and stock watering on the Enrolled Property. The primary source of water is from an “In Lieu” or “Prior Rights” Agreement with Montague Water Conservation District (MWCD). The Permittee continues an agreement made by the owner of the Enrolled Property in the 1920’s, with the MWCD to be furnished storage waters from the reservoir (i.e., Lake Shastina) to the lands of the property owner for the loss of use of the natural flow of the river that was used for irrigation prior to the building of the MWCD dam in that era. The amount “shall be superior to the rights of the District,” and shall be delivered “at such times and in such amounts as ordered” by the property owner during each calendar year until the total agreed upon storage amount is delivered. The owners of the lands currently called the Seldom Seen Ranch, recorded similar agreements with MWCD.

Since the original agreement, diverters have cooperated to prevent waste or unreasonable use. The amount of water actually ordered by the Permittee every year has varied due to annual hydrologic variation in the total storage in the reservoir and irrigation demand but has been less than or equal to the combined amount reserved for the “Prior Rights” of the owner of the Seldom Seen (924 ac-ft) and the owner of the Hole-in-the-Ground (596 ac-
ft) ranches, when both properties have been under the same owner, as is the current condition.

The decreed water rights for the Enrolled Property to the use of the natural flow of the Shasta River are defined in paragraphs 72, 382, and 383 of the Shasta River Adjudication Proceeding, Judgment and Decree entered December 30, 1932 (Shasta River Decree). The Shasta River Decree establishes the relative rights of the various claimants according to the doctrine of prior appropriation. The above-described “Prior Rights Agreement” is based on these same rights. The Permittee has reviewed the records for the water rights for the Enrolled Property and certified the use described herein is considered otherwise legal under the Decree and Watermaster District.

The Enrolled Property also uses water from two springs (the second and third sources of water for irrigation and stock watering). One of the springs, “Clear Spring”, is diverted under License 4151 from the State Water Resources Control Board, Division of Water Rights. Clear Spring flows a few feet, unimpeded, from its source at the edge of the Shasta River and the river is used to convey the water right for re-diversion at the Pump Diversion, located 0.5 mile downstream. The license is for the purposes of both irrigation and stock water and is limited to the amount actually beneficially used for those purposes and shall not exceed 2.5 cfs to be diverted in the period “from about March 1 to about November 1 of each year, for irrigation and throughout the year as required for stock watering”. The POD is under the supervision of the Watermaster and as a practice, diverts less than the permitted amount to accommodate spring fluctuation and water quality for fisheries.

The second spring originates on the Seldom Seen Ranch (See Table 2) and is re-diverted at either POD on the Enrolled Property under a riparian claim. Surface flow generally only appears in wet years and it is not necessarily used in every year it develops. When available and use is anticipated, the flow is measured at its source on the Seldom Seen Ranch and the amount is offset by a corresponding amount of stored (In Lieu) water not released from Lake Shastina, thereby making the stored water allotment last until later in the irrigation season. Measurement records do not exist prior to 2003 and since diversion does not occur every year, the record since then is also sparse. The most recent recorded amount was for a maximum 1040 acre-feet annual use, as reported to the DWR-State Board on eWRIMS under ID S023972. In years when the spring flows, it appears as a small seep in Feb-April, but can quickly increase to more than two cfs, sometimes to as much as nine cfs. Usually sometime in June, if not sooner, the flow can quickly diminish to zero.

There are four Points of Diversion (POD) on the Enrolled Property.

Working downstream from the south property line on the Shasta River, the first POD is the Gravity Ditch/Diversion, consisting of a head gate on the river-right bank of the Shasta River. Head is created by a constructed roughened channel to divert roughly 4 cfs through a typical irrigation season. The Gravity Ditch supplies water to stock and irrigates pastures on the east side of the river. The POD is also known as DWR Diversion 165.

The second POD is the Clear Spring, as described previously.
The third POD is a pumping station and sump located approximately 250 feet off-channel, approximately 0.8 mile downstream of the Gravity Diversion. There are two pumps powered by electric motors, a 15 hp and 30 hp, which are used individually in different seasons and provide the capacity to pump the Enrolled Property’s entire water right to a gravity ditch for distribution. Depending on crop demand and water supply, typical operation is for one or the other pump to be operated to deliver water to the head of a distribution ditch that is higher than the river. This and lateral ditches supply irrigation water to pastures on the west side of the river and the east side of Parks Creek. This POD, the Pump Diversion, is also known as DWR Diversion 166. Both POD and other irrigation infrastructure may be seen in Figure 2.

Both head-of-ditch diversions (165 & 166) have screens that meet CDFW design criteria and were upgraded in 2007, with a grant to MWCD, to eliminate fish passage and water quality problems associated with the previous flashboard dam configurations. The Gravity Diversion is equipped with a flat-plate, self-cleaning fish screen and the fish screen at the Pump Diversion is a cone screen configuration.

A fourth POD on the Enrolled Property is on Parks Creek in Section 20 of Township 43N Range 04W (Longitude -122.44445E, Latitude 41.56325N). This is the diversion for the Cardoza Ranch and is not controlled by the Permittee, although the crossing at the diversion provides essential infrastructure for movement of livestock and equipment on the Enrolled Property.

Table 2 displays the water right amounts, points of diversion, and irrigated acres served by those rights on the Enrolled Property. The information presented in Table 2 is a good-faith effort to present the irrigation and stock water management by the Permittee for the purpose of understanding the potential changes through time and space from the ranch stewardship and the context for improving aquatic habitat conditions for the Covered Species. It may not be suitable for any other purpose. The variables displayed in the table are a compilation of data and estimates from a variety of sources and through a range of hydrologic conditions.
Figure 2- Hole-in-the-Ground Ranch: Water Use and Management
Table 2- Enrolled Property Water Rights

<table>
<thead>
<tr>
<th>Report</th>
<th>Diversion #/ Water Source</th>
<th>Description</th>
<th>Season</th>
<th>Licensed, Riparian, or Adjudicated Amounts</th>
<th>Ac-Ft per Season Diverted</th>
<th>Approx. Days per Season Diverted</th>
<th>Acreage Irrigated with Diversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watermaster</td>
<td>165/MWCD Reservoir</td>
<td>Prior Rights from MWCD Storage</td>
<td>March 1 – Nov 1</td>
<td>&lt;= 1520 AF</td>
<td>&lt;= 1520</td>
<td>155</td>
<td>132 (and Stock Watering)</td>
</tr>
<tr>
<td>Watermaster</td>
<td>166/ MWCD Reservoir</td>
<td>Clear Spring</td>
<td>March 1 – Nov 1</td>
<td>&lt;= 2.5 cfs</td>
<td>&lt;= 1210</td>
<td>180</td>
<td>400±</td>
</tr>
<tr>
<td>License #4151</td>
<td>Clear Spring/166</td>
<td>Clear Spring</td>
<td>March 1 – Nov 1</td>
<td>&lt;= 2.5 cfs</td>
<td>&lt;= 1210</td>
<td>180</td>
<td>400±</td>
</tr>
<tr>
<td>S023972</td>
<td>165,166/unnamed spring</td>
<td>Shasta River (re-divert from Seldom Seen Spring)</td>
<td>March 1 – Nov 1</td>
<td>Riparian</td>
<td>&lt;= 938</td>
<td>0 - 80</td>
<td>260</td>
</tr>
<tr>
<td>Watermaster</td>
<td>165/Shasta River Gravity Diversion</td>
<td>Nov 1 – March 1</td>
<td>&lt;= 0.25 cfs</td>
<td>&lt;= 5</td>
<td></td>
<td>121</td>
<td>Stock Water</td>
</tr>
<tr>
<td>License #4151</td>
<td>Clear Spring/166</td>
<td>Clear Spring</td>
<td>Nov 1 – March 1</td>
<td>&lt;= 2.5 cfs</td>
<td>&lt;= 5</td>
<td>121</td>
<td>Stock Water</td>
</tr>
</tbody>
</table>

C. Routine Agricultural Activities

C.1 Present Routine Agricultural Activities

The Enrolled Properties consists of 3100± acres. The Enrolled Property is managed as a cow-calf operation running about 500 pairs. Together with replacement heifers and bulls, the Enrolled Property carries about 650 to 700 head. Calving typically begins in early October and lasts through December. Calves are weaned, beginning at the end of July and shipped in August and September before the next round of calving, with some heifers kept each year for replacements.

Cattle are fed primarily by grazing irrigated pastures (720 acres) and dry land range (2360 acres) supplemented by hay. Supplemental feeding begins about the end of
November and lasts through the end of March, by which time pasture and range conditions are sufficient to sustain the herd.

As mentioned in the introductory section, water is conveyed principally in open, unlined ditches. Currently, a 1.5 mile section of the Pump Diversion distribution ditch is lined with concrete to improve efficiency. Deteriorated segments of that ditch have been repaired with new concrete with a grant through the Shasta Valley Resources Conservation District.

There are three rocked vehicle crossings on the Enrolled Property. These are also used as stock crossings. Four additional rocked fords are used for stock and ATVs only. All wet crossings serve as stock watering access as well. There are three crossings over culverts, all of which are used for livestock, ATVs, and vehicles/small equipment (e.g. backhoe). There is one stock watering point on Parks Creek that is not a crossing.

The following Routine Agricultural Activities will be implemented in accordance with the relevant AMMs described below in Section D.2.

**Irrigation Management**

- Positioning and repositioning head gates for irrigation and stock watering throughout irrigation season (and to a lesser extent through the winter season) as crop demand, stock water needs, and water supply dictate.
- Start pump at Pump Diversion.
- Ongoing maintenance, management, and repair of boulder weirs.
- Maintain measuring device(s).

**Irrigation Maintenance**

- Diversion intake maintenance and cleaning;
- Operation and maintenance of diversion measuring devices;
- Board or tarp removal/placement in ditches;
- Pump maintenance;
- Ditch cleaning and maintenance, including concrete lined sections;
- Operation and maintenance of fish screen, e.g., cleaning;
- Tailwater berm maintenance.

**Riparian Pasture Grazing Management**

None currently. See Beneficial Management Activities for proposal to implement riparian pasture grazing in three fields.

**Fence Maintenance**

- Maintain narrow-corridor riparian exclusion fencing.
- Install and maintain temporary electric fencing for riparian pasture boundaries.
- Install fixed fencing for riparian pasture boundaries.
• Maintain panels and/or fencing in riparian zone to limit livestock access to channel at water gaps, crossings, and property boundaries.
• Remove and/or replace panels and/or fencing at water gaps for high stream flow events.

Road Use and Maintenance

• Use and maintain three vehicle fords across Shasta River, and three piped (CMP) crossings, two over Hole-in-the-Ground Creek and one over Parks Creek.
• Use and maintain a little over one-quarter mile of road within 75 feet of the Shasta River on the Enrolled Property. The two road segments (500’ river-left, north of the north crossing; and three shorter segments on river-right, accessing the Gravity Diversion) receive light use, primarily of ATVs or, occasionally, pickups or a backhoe. Use of this road has increased significantly over the last ten years to accommodate personnel conducting fisheries and water quality investigations. Traffic is not expected to increase above current levels. Traffic is nevertheless light and the side slope between the road and the river is almost flat and covered with perennial grasses or riparian vegetation with very little sign of erosion. If used by heavier trucks or equipment, it would be to implement a Beneficial Management Activity and likely therefore not used during the wet season, except in an emergency.

Livestock and Vehicle Wet Crossings and Watering Lanes

• Use and maintain three vehicle fords across Shasta River.
• Periodic use of wetted fords for crossing cattle at seven designated crossings (inclusive of three vehicle fords).
• Crossings will be maintained for crossing vehicles and livestock and watering livestock.
• One instream stock watering only point will be maintained using panels or other effective livestock management equipment to limit access to approximately twenty-five linear feet of wetted channel to meet watering needs for up to 250 pairs.

Herbicide (Weed Management), Fertilizer, or Pesticide Use

Periodic use of herbicide by the County or the owner to control invasive plants at two hay barns and two sets of corrals occurs. All facilities are more than 500’ from a stream.
Figure 3 - Hole-in-the-Ground Ranch: Baseline Conditions
C.2 Avoidance and Minimization Measures

The Permittee has agreed to carry out and monitor AMMs that are relevant to their Routine Agricultural Activities as specified in Table G1 (Section G below) and as detailed in Appendix 3 of the Agreement.

D. Description of Baseline Conditions

Baseline Conditions are the habitat conditions for the Covered Species on the Enrolled Property when NMFS approves this Site Plan Agreement. The Enrolled Property is within the Upper Shasta River and Lower Parks Creek Reaches of the Covered Area. Baseline Conditions for the Enrolled Property are the conditions described in the Agreement for these reaches of the Shasta River and Parks Creek.

Elevated Baseline Conditions are certain Baseline Conditions improved as a result of certain Beneficial Management Activities described below.

Table 3 summarizes the Beneficial Management Activities required to maintain Baseline Conditions and to achieve Elevated Baseline Conditions on the Enrolled Property for the term of the Site Plan Agreement. The Beneficial Management Activities implement habitat enhancement actions recommended in the Agreement for the two reaches, the Upper Shasta River and Lower Parks Creek. Section E below describes the activities in more detail.
<table>
<thead>
<tr>
<th>Hydrology/Water Quality</th>
<th>Present Baseline Conditions (Section E1-Completed and Maintain)</th>
<th>Elevated Baseline Conditions (Section E2-Restore; Implement and Maintain)</th>
<th>Other Beneficial Management Activities (Section E3-Restore; Measures to Avoid and Minimize Impacts)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-Pump Diversion, which formerly impounded Shasta River, upgraded to roughened channel configuration and maintained and operated in compliance with current CDFW requirements for passage, bypass flows, and screening (2007)</td>
<td>-Cattle access to the channel will be excluded or restricted to crossings, watering access points, and/or limited season/stocking/duration that conserves water quality</td>
<td>-Agree to participate in studies to refine Upper Shasta River Flow Management Strategy, including role of Seldom Seen Spring Time Frame: For 10 years from ESP issuance</td>
</tr>
<tr>
<td></td>
<td>-Repaired and maintaining tailwater berms in pastures bordering stream channels</td>
<td>-Agree to continue maintenance of tailwater berms</td>
<td>-Prior to completion of diversion combining project, agree to collect further ditch efficiency data to accurately quantify efficiency savings to forebear after diversion combining project is implemented. Upon completion of the diversion combining project, agree to forebear diversion of a portion of Clear Spring</td>
</tr>
<tr>
<td></td>
<td>-Fencing completed in (or about) 2011 excluding cattle from accessing channel and banks</td>
<td>-Agree to continue current irrigation practices to minimize/eliminate tailwater</td>
<td></td>
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<tr>
<td>Habitat Parameter</td>
<td>Beneficial Management Activities</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Present Baseline Conditions (Section E1-Completed and Maintain)</strong></td>
<td><strong>Elevated Baseline Conditions (Section E2-Restore; Implement and Maintain)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Board &amp; canvas irrigation turn-outs upgraded to gates on ≥300 feet of ditch with grant through SVRCD (2013) -Modified irrigation practices to control tailwater and avoid its entering streamflow as surface water (2010) -Cooperated with studies &amp; surveys for project to alter neighbor’s diversion at W122.44445, N41.56325 -Participated in Irrigation Efficiency Study to evaluate opportunities for additional instream flow for fish habitat (Davids Engineering 2011) -Participated in Tailwater Assessment study (SVRCD/AquaTerra 2011) -Cooperated in Interim Instream Flow Needs study (McBain &amp; Trush, Inc., 2013) Participated in flow/diversion management experiments (CDFW 2013 - 2015)</td>
<td>Management Plan (Section E.2.a.) Time Frame: Underway; Completion Estimated within 5 years of ESP issuance -Agree to redesigning and rebuilding pumping facility at Pump Diversion to facilitate Upper Shasta River Diversion Management Plan (Section E.2.a) Time Frame: Underway; Completion Estimated within 5 years of ESP issuance proportionate to the efficiency savings along upgraded Gravity Ditch alignment, (estimated at 0.7 cfs) per Upper Shasta River Diversion Management Plan, (Section E.3.a.) Time Frame: Underway; Completion Estimated within 5 years of ESP issuance -Upon completion of the diversion combining project, agree to exchange with MWCD for Clear Spring water in late spring – summer (per Upper Shasta River Flow Management Strategy (Hole-in-the-Ground Section E.2.a.) Time Frame: Underway; Completion Estimated within 5 years of ESP issuance)</td>
<td></td>
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<tr>
<td></td>
<td><strong>Other Beneficial Management Activities (Section E3-Restore; Measures to Avoid and Minimize Impacts)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Habitat Parameter</td>
<td>Beneficial Management Activities</td>
<td>Other Beneficial Management Activities</td>
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<td>-------------------</td>
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<td>--------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Present Baseline Conditions (Section E1-Completed and Maintain)</td>
<td>Elevated Baseline Conditions (Section E2- Restore; Implement and Maintain)</td>
<td>5 years of ESP issuance</td>
<td></td>
</tr>
<tr>
<td>- Cooperated in studies to evaluate Hole-in-the-Ground Creek for water quality improvements, irrigation supply for neighboring property owner</td>
<td>- Agree to include Enrolled Property pastures in testing effectiveness of soil moisture sensor technology to increase diversion efficiency, implement routine use where appropriate, and adjust water management accordingly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Appropriative claim for Clear Spring managed to protect water quality</td>
<td>Time Frame: During first decade from ESP Issuance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Will work cooperatively to solve issue of warm surface water, from source not on Enrolled Property, entering Hole-in-the-Ground Creek near north property line</td>
<td>Time Frame: Within 5 years of ESP issuance</td>
<td></td>
</tr>
</tbody>
</table>

Habitat Parameter

Beneficial Management Activities

Other Beneficial Management Activities

5 years of ESP issuance

- Agree to include Enrolled Property pastures in testing effectiveness of soil moisture sensor technology to increase diversion efficiency, implement routine use where appropriate, and adjust water management accordingly

Time Frame: During first decade from ESP Issuance

- Will work cooperatively to solve issue of warm surface water, from source not on Enrolled Property, entering Hole-in-the-Ground Creek near north property line

Time Frame: Within 5 years of ESP issuance
<table>
<thead>
<tr>
<th>Habitat Parameter</th>
<th>Beneficial Management Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Present Baseline Conditions</strong>&lt;br&gt;(Section E1-Completed and Maintain)</td>
<td><strong>Elevated Baseline Conditions</strong>&lt;br&gt;(Section E2-Restore; Implement and Maintain)</td>
</tr>
<tr>
<td><strong>Passage/ Mitigation/ Screening</strong></td>
<td>-Until 2007, no known use of sub-reach by salmonids. In 2008, Permittee provided access for CDFW evaluation, subsequently documenting use of the sub-reach as rearing habitat <em>(CDFG, 2009, Shasta River Juvenile Coho Habitat and Migration Study)</em>&lt;br&gt;-Gravity Diversion and Pump Diversion, previously flashboard dams, reconstructed with roughened channel configuration with grant through MWCD (2007); maintained and operated in compliance with current CDFW requirements for passage, bypass flows, and screening</td>
</tr>
</tbody>
</table>
| **Instream Habitat Complexity** | -Dam-building beavers are not discouraged except where diversions, crossings, or fencing are impaired. Fall, 2015, there were 11 beaver dams in various stages of maintenance | | -Agree to provide access for addition of large wood enhancement, up to 15 sites, in the Shasta River *(Hole-in-the-Ground Section E.3.c.; Figure 5)*<br>*Time Frame: Within 10 years of ESP issuance*<br>-Post-alteration of Cardoza Diversion, agree to work collaboratively with Agencies to assess and, when matching funds are acquired,
<table>
<thead>
<tr>
<th>Habitat Parameter</th>
<th>Beneficial Management Activities</th>
<th>Other Beneficial Management Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riparian Condition</td>
<td>Present Baseline Conditions (Section E1-Completed and Maintain)</td>
<td>Elevated Baseline Conditions (Section E2-Restore; Implement and Maintain)</td>
</tr>
<tr>
<td></td>
<td>-Fencing completed on Shasta River and lower Parks Creek in (or about) 2011 excluding cattle from riparian habitat -Developed one off-channel stock watering tanks</td>
<td>-Will replace at least 20% of riparian fencing if needed due to high flow damage -Agree to maintain riparian exclusion fencing or, if modified, riparian pasture fencing with associated grazing plan -Agree to cap number of vehicle and livestock</td>
</tr>
<tr>
<td></td>
<td>-With additional funding, Permittee agrees to take part in riparian planting projects where existing riparian habitat is less than site-potential along the Shasta River. (Hole-in-the-Ground Section</td>
<td></td>
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Habitat Parameter

<table>
<thead>
<tr>
<th>Present Baseline Conditions (Section E1-Completed and Maintain)</th>
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Elevated Baseline Conditions (Section E2-Restore; Implement and Maintain)
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<th>Habitat Parameter</th>
<th>Beneficial Management Activities</th>
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</table>
| **Present Baseline Conditions**  
(Section E1-Completed and Maintain) | Elevate Baseline Conditions  
(Section E2-Restore; Implement and Maintain) | Other Beneficial Management Activities  
(Section E3-Restore; Measures to Avoid and Minimize Impacts) |
| access points to current number | (UCCE) Range Conservation Specialists  
(Attachment: UCCE Riparian Grazing Recommendations for Hole-in-the-Ground Ranch)  
**Time Frame:** Temporary fencing will be used for up to the first five years after ESP issuance.  
Permanent fencing will replace temporary by the sixth year after ESP issuance. | **E.2.c.) Time Frame:** Within 15 years of ESP issuance  
- If maintenance of existing riparian exclusion fencing becomes untenable, agree to consult with UCCE Range Conservation experts and develop and document an alternative riparian grazing plan  
- Hydrology of the pastures at Hole-in-the-Ground (HIG) Ranch will change post-move of the Cardoza diversion. HIG will continue to operate the vicinity as riparian pastures, in compliance with the attached Grazing Management Plan.  
- HIG will add, as appropriate, measures for |
<table>
<thead>
<tr>
<th>Habitat Parameter</th>
<th>Beneficial Management Activities</th>
<th>Other Beneficial Management Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Present Baseline Conditions (Section E1-Completed and Maintain)</td>
<td>Elevated Baseline Conditions (Section E2-Restore; Implement and Maintain)</td>
</tr>
<tr>
<td></td>
<td>Post-alteration of Cardoza Diversion, agree to work collaboratively with Agencies to assess and, implement riparian enhancement &amp;/or instream habitat improvement projects in Lower Parks Creek (Hole-in-the-Ground Section E.3.d.) Time Frame: Within 5 years of completion of diversion alteration project</td>
<td></td>
</tr>
<tr>
<td>Habitat Parameter</td>
<td>Beneficial Management Activities</td>
<td>Other Beneficial Management Activities</td>
</tr>
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<td>-------------------</td>
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</tr>
</tbody>
</table>
| **Substrate Quality** | **Present Baseline Conditions**  
(Section E1-Completed and Maintain) | **Elevated Baseline Conditions**  
(Section E2- Restore; Implement and Maintain) |
| -Cooperated in study to evaluate gravel composition and quality (McBain and Trush, et al., 2010)  
-Cooperated with MWCD to improve spawning habitat quality by pulse flows of water released (above irrigation demand) and allowed to flow unimpaired and un-diverted | -Seven livestock/vehicle crossings will be maintained as rocked fords (*Hole-in-the-Ground Sections E.2.c. and E.2.f.*) | -Agree to provide access to implement spawning gravel enhancement, up to 4 sites in the Shasta River (*Hole-in-the-Ground Section E.3.d.; Figure 5*)  
*Time Frame: Within 10 years of ESP issuance*  
-Post-alteration of Cardoza Diversion, agree to work collaboratively with Agencies to assess and implement spawning habitat enhancement projects in Lower Parks Creek (*Hole-in-the-Ground Section E.3.d.*)  
*Time Frame: Within 5 years of completion of diversion alteration project* |
E. Beneficial Management Activities

This section provides a detailed description of Beneficial Management Activities that are ongoing and those that will be implemented on the Enrolled Property for the benefit of the Covered Species.

E.1 Actions Required to Maintain Baseline Conditions

This section details the actions required to maintain Baseline Conditions. This includes any land and/or water management activities that are being implemented, or have been implemented, on the Enrolled Property that benefit the Covered Species and will be maintained over the duration of the Agreement. This section includes completed studies and research by Permittee and others that continue to contribute to the knowledge base informing the Agreement.

E.1.a. Hydrology/Water Quality

Increased delivery and irrigation efficiencies (Completed and Sustained)

- With funding provided by the Pacific States Marine Fisheries Commission under a grant from NMFS, in cooperation with CDFW, undertook an irrigation efficiency study.

- Cooperated in more than seven years of CDFW studies of juvenile salmonid distribution and habitat use with direct observations, PIT tag technology, water temperature monitoring, flow monitoring, etc.

- Replaced 500 feet of open ditch with pipe on the Gravity Ditch.

- Repaired concrete lining on 1500 feet of main Pump Diversion, Main Ditch, 2013.

- Upgraded irrigation turnouts on 300-400 feet of Pump Diversion, Alyssa Field Ditch, 2013.

- Manage, currently and for the foreseeable future, diversion of Appropriative Water Right for “Clear Spring” to protect water quality for instream habitat. Spring flow may fluctuate annually, seasonally and diurnally, so full right of 2.5 cfs is generally not diverted to accommodate the variability, thereby improving stream temperatures below the Pump Station POD and increasing volume of the summer rearing habitat for juvenile salmonids, especially 0+ coho and steelhead.

- Permittee agrees to maintain concrete lining on main delivery ditch of Pump Diversion.

- Permittee is cooperating with UCCE to experiment with the use of soil moisture sensors and related technology to optimize applied water, which may result in a reduction of diversion and, ideally, improved instream water quality.
Tailwater Reduction (Completed and Sustained)

- Since 2009, Permittee modified practices on Gravity Ditch to irrigate short and/or steep pastures, which require more frequent changes, during the day. The more distant, flatter, and longer pastures are irrigated at night.
- Permittee repaired and/or established tailwater berms at the low side of irrigated pastures.
- Permittee agrees to continue and refine irrigation practices that minimize applied water accumulating at the low side of fields.
- Permittee agrees to maintain tailwater berms and continue irrigation practices that reduce to insignificant or eliminate tailwater returning as warm surface flow to perennial streams.

Participation in reach-wide Diversion Management Plan (Completed)

- Participated in July, 2015 flow/diversion experiment in the upper Shasta River to evaluate alternative diversion coordination scenarios.
- Participated in MWCD pulse flow/environmental water release experiments with access for monitoring.
- Cooperated in McBain and Trush, Big Springs Complex Interim Instream Flow Needs study with access and data.
- Upgrade/repair/maintain diversion facilities (completed).
- Permittee has cooperated in studies to redesign neighbor’s diversion located on the Enrolled Property (-122.44445, 41.56325; the Cardoza Diversion) with access through the Enrolled Property and despite anticipated pasture management changes to accommodate a potential loss of sub-irrigated acreage.
- Permittee has cooperated in studies to evaluate Hole-in-the-Ground Creek for alternative water supply for neighbor’s property.

Water exchanges (Completed)

- In 2008, due to the research in which the Permittee cooperated, allowing CDFW personnel to study distribution and habitat use by coho juveniles in the Shasta River through the Enrolled Property, it was determined that coho were rearing downstream of Clear Spring. In that year, CDFW expressed concerns for late summer habitat water quality, specifically the water temperature. Permittee agreed to exchange diversion of water from Clear Spring for deliveries of MWCD stored water. The stored water was diverted at the Gravity Diversion, which is upstream of the Clear Springs diversion. In addition, the Pump Diversion, which is the POD for water from
Clear Springs, was not used for the balance of the irrigation season. By refraining from diverting at the Pump Station, cold water signature from the spring source was maintained further downstream increasing the amount of summer-rearing habitat available for coho and steelhead. Prior to 2008, it was not known that the reach of river between the Gravity and Pump diversions was utilized by these species during the summer. Indeed, it is likely that the reach was inaccessible to juveniles due to the configuration of the Pump diversion, a condition that was corrected in 2007. (See below, Section E.1.b. Remediation of identified on-site barriers.)

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

Research (Completed)

- Permittee conducted for one year and continues to participate in spawner surveys for all reaches with suitable spawning habitat.

- Permittee cooperated in more than seven years of CDFW studies of juvenile salmonid population estimates, distribution, and habitat use with direct observations, PIT tag technology, water temperature monitoring, flow monitoring, etc.

Remediation of identified on-site barriers (Completed)

- Modified Gravity Ditch Diversion from flashboard dam to roughened channel, eliminating potential juvenile coho barrier; improved fish screen; 2007.

- Modified Pump Diversion from flashboard dam to roughened channel, eliminating a large impoundment which contributed to degraded water quality downstream and created a barrier to juvenile coho; improved fish screen; 2007.

- Permittee agrees to maintain fish passage through roughened channel reaches.

E.1.c. Instream Habitat Complexity

None proposed, See Section E.3.c.

E.1.d. Riparian Function

Riparian Fencing (Completed and Sustained)

- Permittee, with matching funding from USFWS Partners in Conservation Program, has fenced 100% of Shasta River to exclude cattle grazing.

- Permittee, with matching funding from USFWS Partners in Conservation Program, has fenced 60% of Parks Creek to exclude cattle grazing.

- Permittee agrees to maintain riparian fencing.
• Permittee agrees to replace, out-of-pocket, at least 20% of riparian fencing if needed due to high flow damage. Partners for additional funding to replace fencing to 100% will be sought, if necessary.

Crossings on Fish-bearing Stream Reaches (Completed)

• Permittee has limited cattle and vehicle access to the Shasta River to three vehicle crossings and seven stock crossings (inclusive; i.e., vehicle crossings also serve as stock crossings when necessary).

• In the exclusion fenced portion, Permittee has limited cattle and vehicle access to Parks Creek and tributaries to two crossings and a watering lane -- two rocked fords, and one culvert crossing.

• Permittee agrees to maintain crossings and cap the number of livestock and vehicle access points to current number.

Off-Channel Stock watering (Completed)

• Permittee created two off-channel tanks/ponds for stock water to support riparian exclusion.

• Beaver management (completed).

• Permittee provided access and/or labor on several occasions to monitor and breach beaver dams.

E.1.e Substrate Quality

Riparian function measure (Completed) (Also see Section E.1.c., above)

• Cooperated in McBain and Trush study (McBain & Trush, et al., 2010) by allowing access for evaluation of gravel composition and quality. Summarizing the findings:
  o Reductions to spawning gravel supply and spawning gravel storage within main stem and tributary spawning areas have reduced spawning gravel availability and gravel quality for salmon spawning habitat.
  o The quantity of spawning gravel in the main stem Shasta River and in key tributary reaches can be increased, and the quality of existing spawning gravel can be improved.
  o Based on current and projected coho salmon population estimates by CDFW, spawning gravel inventory results suggested that the existing spawning gravel quantity is adequate to sustain current (and support projected) populations, but that the quality of existing spawning gravel may be limiting fry production and thus should be improved.
• For Chinook salmon, however, results suggested spawning gravel quantities may be limiting populations in high escapement years, and that gravel augmentation will be needed in the near future to sustain current spawning gravel supplies as well as allow Chinook salmon population to expand beyond current levels.

• An enhancement strategy was proposed that first focuses on coho salmon habitat (due to a significantly reduced population) and then focuses on Chinook salmon habitat.

E.1.f. Pasture Management

Pasteur Grazing Management (Completed and Sustained)

• Fall calving producing calves big enough to fully utilize upland, seasonal range, comprising more than half of the Enrolled Property.

• Rotation and stocking rates in irrigated and non-irrigated pasture managed to maintain optimum forage cover and heights based on water year type.
E.2 Actions Required to Achieve Elevated Baseline Conditions

This section and Figure 4 details the actions required to achieve and maintain Elevated Baseline Conditions. This includes any Covered Activities that will be implemented and maintained on the Enrolled Property during the term of the Agreement to improve unsuitable habitat conditions for the Covered Species.
E.2.a Hydrology/Water Quality

*Increased delivery and irrigation efficiencies*

- With acquisition of sufficient matching funds, Permittee agrees to complete, operate, and maintain a Diversion Combining Project, which includes replacing up to 4000 feet of open, mostly earth-lined Gravity Ditch with pipe. Upon completion, seepage loss savings (estimated at 0.7 cfs) will be exchanged for an equal volume of Clear Spring water retained in-stream and not diverted. Time Frame: Underway; Completion Estimated within 5 years of ESP issuance.

- In the interim, before completion of the Diversion Combining Project, Permittee agrees to collect further data to quantify ditch loss to be translated into efficiency savings with implementation of the completed Project.

- Permittee will seek matching funds to and establish fences to create riparian pastures or exclusion fencing on Hole-in-the-Ground Creek. Time Frame: Within 5 years of ESP issuance.

*Tailwater Reduction*

- Permittee agrees to work cooperatively with neighboring landowners to solve issue of warm surface water, from source not on Permittee, entering Hole-in-the-Ground Creek near north property line. Time Frame: Within 5 years of ESP issuance.

*Soil Moisture Monitoring Program*

- See Section E.3.a., below.

*Participation in reach-wide Diversion Management Plans*

- See Section E.3.a., below.

*Upgrade/repair/maintain diversion facilities*

- Permittee agrees to continue participating in studies to redesign neighbor’s diversion (which is located at 122.44445W, 41.56325N; Cardoza Diversion) and eliminate associated water quality issues. Participation includes providing access for personnel and equipment during design and construction, implementation monitoring, and effectiveness monitoring, and adjusting livestock management to accommodate project design, construction, monitoring, and post-construction changes in vegetation. Time Frame: Underway; Completion Estimated within 5 years of ESP issuance.

- Also see Diversion Combining Project, described above in Section E.3.a., below.
E.2.b  Passage/Migration/ Diversion Screening

Remediation of identified on-site barriers

- Permittee agrees to continue cooperating in project to move Cardoza Diversion, eliminate associated fish passage issues, and maintain fish passage at the new crossing. See Section E.2.a., above. Time Frame: Underway; Completion Estimated within 5 years of ESP issuance.

- Also See Section E.3.c. “Beaver Management”, below.

E.2.c  Instream Habitat Complexity

None proposes, see Section E.3.c.

E.2.d  Riparian Function/ Channel Structure

Riparian Fencing

- Permittee agrees to establish fences to create riparian pastures or exclusion fencing on remaining 40% of Parks Creek. Permanent fencing materials and alignment will be determined after ~5 year riparian grazing trials using temporary electric fence following recommendations from UCCE. Temporary fencing will be used for up to the first five years after ESP issuance. Permanent fencing will be established by the sixth year after ESP issuance.

- See E.2.a., above, regarding Hole-in-the-Ground Creek Riparian Fencing.

Prescribed Riparian Grazing Intensity/Frequency

- Riparian grazing plan, developed by UCCE Range Specialists for riparian pastures along Parks Creek at the Cardoza and Rattlesnake fields, will be implemented. See Attachment: UCCE Riparian Grazing Recommendations for Hole-in-the-Ground Ranch. Time Frame: Within 2 years of ESP issuance.

- Riparian grazing plan will be developed in consultation with UCCE Range Specialists for riparian pastures along Hole-in-the-Ground Creek and will be implemented. Time Frame: Within 5 years of ESP issuance.

Crossings

- Permittee agrees to cap number of crossings to current without consulting NMFS and CDFW.

- Permittee agrees to continue participating in project to restore stream function at crossing on site of Cardoza Diversion that is slated to be moved. Time Frame: Underway; Completion Estimated within 5 years of diversion being moved.
Riparian Habitat

- Five years, or more if agreed upon, after the alteration of Cardoza Diversion, Permittee will take part in evaluation of riparian conditions and planting projects where existing riparian habitat is less than site-potential along Parks Creek. Time Frame: Within 5 years of completion of diversion alteration project.

Channel Structure Improvement (e.g., instream LWD additions)

- Post-alteration of Cardoza Diversion, Permittee agrees to cooperate in evaluation and placement of instream LWD placement, as appropriate, in Parks Creek. Time Frame: Within 5 years of completion of diversion alteration project.

E.2.e Substrate Quality

Riparian function measures, See Section E.2.d., above.

Providing access to potential augmentation projects

- Post-alteration of Cardoza Diversion, Permittee agrees to evaluate and take part in gravel augmentation projects, as appropriate, in Lower Parks Creek. Time Frame: Within 5 years of completion of diversion alteration project.

See ‘Hydrology/Water Quality: Tailwater Reduction,” Section E.2.a., above.

See Riparian Function/Channel Structure, Section E.2.d., above.

E.2.f Pasture Management

Pasture Grazing Management – None proposed.
Figure 4- Hole-in-the-Ground Ranch: Proposed Conditions
E.3 Other Beneficial Management Activities

This section summarizes any other Beneficial Management Activities that will be implemented and maintained during the term of the Agreement to improve habitat conditions for the Covered Species.

E.3.a. Hydrology/Water Quality

*Increased delivery and irrigation efficiencies*

- With acquisition of sufficient matching funds, Permittee agrees to complete Diversion Combining Project, which includes replacing up to 4000 feet of open, mostly earth-lined Gravity Ditch with pipe. Upon completion, seepage loss savings (estimated at 0.7 cfs) will be exchanged for an equal volume of Clear Spring water retained in-stream and not diverted. Time Frame: Underway; Completion Estimated within 5 years of ESP issuance.

*Soil Moisture Monitoring Program*

- Permittee agrees to include Enrolled Property pastures in Covered Area for testing effectiveness of soil moisture sensor technology to increase irrigation efficiency, implement routine use where appropriate, and adjust water management accordingly.

*Participation in reach-wide Diversion Management Plans*

- Permittee agrees to continue participating in the Upper Shasta River Flow Management Strategy. Time Frame: For duration of ESP issuance.

*Upgrade/repair/maintain diversion facilities*

- Permittee agrees to continue participating in studies to redesign the Cardoza Diversion and eliminate associated water quality issues. Participation includes providing access for personnel and equipment during design and construction, implementation monitoring, and effectiveness monitoring, and adjusting livestock management to accommodate project design, construction, monitoring, and post-construction changes in vegetation. Time Frame: Underway; Completion Estimated within 5 years of ESP issuance.

- Also see Diversion Combining Project, described above.

*Water exchanges*

Permittee agrees to an exchange with MWCD for Clear Spring water, per Upper Shasta River Flow Management Strategy. The Permittee commits to an annual irrigation season plan that, generally, proceeds as follows:

- Assuming new infrastructure at the Gravity Diversion, and down-ditch, is in place to allow the full water right used on the Enrolled Property, to be diverted at the
HIG Gravity Diversion (See Section E.2.a. Upgrade/operate/repair/maintain diversion facilities and Diversion relocation/combination),

- Assuming there is a temperature monitoring station in the vicinity of the south property line and upstream of the HIG Gravity Diversion (currently “HVR DS PL” fulfills that role),

- Permittee may divert Clear Spring per the license, less any instream commitments exchanged for efficiency improvements in the Gravity Ditch, at the start of the irrigation season,

- Annually, when 18°C MWAM is reached at the water temperature monitoring station (currently “HVR DS PL”), HIG will receive a volume of “Exchange” water from MWCD to substitute for the volume of Clear Spring being diverted at which time,

- Permittee will cease diverting Clear Spring,

- Permittee will divert the combined diversion amounts for HIG Gravity and Pump diversions at only the Gravity Diversion,

- Annually, if below 18°C MWAM temperatures occur, nearing the end of the irrigation season (November 1), when air temperatures are averaging cooler, Exchange water may be curtailed and Clear Spring may be diverted at the HIG Pump Diversion.

   Time Frame: Within 5 years of ESP issuance.

*Diversion relocation/combination*

- See Diversion Combining Project, described above in Section E.3.a.

*Forbearance Agreement*

- Prior to completion of diversion combining project, agree to collect further ditch efficiency data to accurately quantify efficiency savings to forebear after diversion combining project is implemented.

- Upon completion of the diversion combining project, agree to forbear diversion of a portion of Clear Spring proportionate to the efficiency savings along upgraded Gravity Ditch alignment, (estimated at 0.7 cfs) per Upper Shasta River Diversion Management Plan, (Section E.2.a.).

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

*Remediation of identified on-site barrier – None proposed.*
E.3.c. Instream Habitat Complexity

- Permittee agrees to provide access for addition of large wood enhancement, up to 15 sites, in the Shasta River (Hole-in-the-Ground Section E.3.c.; Figure 5) Time Frame: Within 10 years of ESP issuance.

- Post-alteration of Cardoza Diversion, agree to work collaboratively with Agencies to evaluate and add instream LWD to Lower Parks Creek and implement instream habitat improvement projects including channel morphology modifications in Lower Parks Creek (Hole-in-the-Ground Section E.2.d.) Time Frame: Within 5 years of completion of diversion alteration project.

E.3.d Riparian Function

Riparian Fencing

- Hydrology of the pastures at Enrolled Property will change post-move of the Cardoza diversion. HIG will continue to operate the vicinity as riparian pastures.

- HIG will add, as appropriate, measures for cattle management to safeguard water quality including fencing the Parks Creek overflow channel. Such measures include temporary or permanent fencing depending on the need indicated by water quality in the area.

Beaver management

- Permittee agrees to create a management plan to, at a minimum, not deter dam building beaver activity except where it damages infrastructure, e.g. impairs irrigation control structures, inundates crossings, etc. When necessary, Permittee will work in conjunction with fisheries management personnel to physically breach dams during smolt outmigration, juvenile redistribution, and/or adult spawning periods, generally April to mid-June and November to January or provide alternate passage opportunities through or around the beaver dams. Time Frame: Within 5 years of ESP issuance.

Riparian Habitat

- With additional funding, Permittee agrees to take part in riparian planting projects where existing riparian habitat is less than site-potential along the Shasta River. Time Frame: Within 15 years of ESP issuance.

Riparian management (e.g. promote aquatic vegetation growth)

- Permittee agrees to maintain fences and utilize adaptive management approach to monitor, assess, and, where necessary, modify riparian management practices, whether exclusion or prescriptive grazing strategies.
E.3. e. Substrate Quality

*Riparian function measures*, See Section E.3.c., above.

*Providing access to potential augmentation projects*

- Permittee agrees to take part in project(s) to add gravel in Shasta River at up to 4 sites between Pump Diversion and north fence line (*Figure 5*). Existing riffles will be considered as priority sites.

**Figure 5- Hole-in-the-Ground Ranch: BMA – Habitat Improvements**
E.3. f  Pasture Management

Pasture Grazing Management – No additional proposed.

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

The Agreement, Site Plan Agreement and ESP take effect when signed by the Permittees, NMFS, and CDFW. The Agreement, Site Plan Agreement and ESP have a term of 20 years, which may be extended by mutual written consent of the Permittees, NMFS, and CDFW as stipulated in the Agreement. One (1) year prior to end of term of the Agreement, Site Plan Agreement and ESP, the Permittees, NMFS, and CDFW will meet to decide whether to extend the term of the Agreement, Site Plan Agreement and ESP.

G.  Monitoring and Reporting

AMMs are intended to minimize or reduce potential adverse impacts that may occur during implementation of BMAs or during Routine Agricultural Activities. The Permittee commits to implement the AMMs and the AMM monitoring protocols listed in Table G1 below and described in Appendix 3 of the Agreement.

Implementation monitoring includes those monitoring tasks associated with construction and implementation of BMAs (e.g. construction of habitat restoration projects) and associated AMMs. Implementation monitoring of BMAs serves to verify that habitat restoration projects are constructed as designed and managed as intended. The Permittee commits to monitoring actions as summarized in Table G2. Permittee also commits to all relevant AMMs included in Appendix 3 of the Agreement related to the implementation of the BMAs identified in Section E above.

AMM and implementation monitoring will be conducted by the Permittee, the SWCG, or a contractor.

G.1  Avoidance and Minimization Measures Monitoring

<table>
<thead>
<tr>
<th>Routine Agricultural Activity</th>
<th>Hole-in-the-Ground Ranch - AMM (See Appendix 3 of Agreement for full description)</th>
<th>AMM Monitoring Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Irrigation Management</td>
<td>A1</td>
<td>All maintenance of instream diversion structures shall be monitored as follows:</td>
</tr>
<tr>
<td></td>
<td>A2</td>
<td>- Log of what in-water work had occurred and what minimization measures were implemented will be included in the annual report</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- When construction or repair work is being done, Photo Point Monitoring will be completed in accordance with Appendix 3 of Agreement.</td>
</tr>
</tbody>
</table>
| **Irrigation Maintenance** | B1  
B2  
B3  
B4  
B5  
B6  
B7  | All maintenance of instream irrigation facilities shall be monitored. Following are some examples of protocols:  
- Log of maintenance activities carried out within the calendar year is included in the annual report. |
|--------------------------|---------|------------------------------------------------------------------------------------------------|
| **Riparian Grazing Management** | C1  
C2  
C3  | Riparian grazing management shall be monitored as follows:  
- 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 Point Monitoring will be completed in accordance with Appendix 3 of Agreement. 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.  
- Maintain a log of grazing activities carried out within the calendar year and include in the annual monitoring report. At a minimum, the log will include the following 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.  
- NMFS and CDFW may initiate periodic inspection of grazed riparian pastures to ensure riparian grazing management plan is effective. |
| **Fence Maintenance** | D1  
D2  | - A short description of fence maintenance activities will be included in the annual report. |
| **Road Maintenance** | E1  
E2  
E3  
E4  | - A short description of annual road maintenance activities will be included in the annual report. |
| **Crossing Maintenance** | F1  
F2  | - When work is being done, photo point monitoring will be completed in accordance with Appendix 3 of the Agreement. |
### Herbicide/Fertilizer/Pesticide Use

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Implementation and Effectiveness Monitoring Commitments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrology/Water Quality</td>
<td>- Permittee commits to log use of herbicide, fertilizer and pesticide activities carried out within the calendar year is included in the annual report.</td>
</tr>
</tbody>
</table>

### Flood Repair

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Implementation and Effectiveness Monitoring Commitments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flood Repair</td>
<td>- Permittee shall take photographs of the emergency site repairs and a detailed description of the repairs to be included in the annual report.</td>
</tr>
</tbody>
</table>

### G.2 Implementation and Effectiveness Monitoring Commitments

<table>
<thead>
<tr>
<th>Habitat Parameter</th>
<th>Hole-in-the-Ground Ranch – Beneficial Management Activity</th>
<th>Implementation Monitoring Technique</th>
<th>Effectiveness Monitoring Commitment/Technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrology/Water Quality</td>
<td>- Agree to redesigning, rebuilding, operating, and maintaining Gravity Diversion, including piping approx. 4000’ of conveyance, in order to facilitate Upper Shasta River Diversion Management Plan (Diversion Combining Project, Hole-in-the-Ground Section E.3.a.)&lt;br&gt;Time Frame: Underway; Completion Estimated within 5 years of ESP issuance&lt;br&gt;- Agree to evaluate 1707 dedication for Clear Spring offset for Exchanges and Efficiency Savings&lt;br&gt;Time Frame: Underway; Completion Estimated within 5 years of ESP issuance</td>
<td>- three to five photo points, before and upon completion of project, using the photo monitoring protocols described in the appendices to the Agreement; as well as reports of Licensee filed annually with SWRCB-DWR showing non-diversion of Clear Spring during summer irrigation&lt;br&gt;- Annual report will include results of evaluation; mandatory annual report of Licensee to SWRCB itemizes monthly diversion volumes</td>
<td>- Reasonable access for monitoring water quality parameters. Time Frame: duration of Agreement</td>
</tr>
<tr>
<td>Passage/Migration/Screening</td>
<td>- Cooperation in and adjustments for removal of diversion and upgrade of crossing on Parks Cr. at 122.44445W, 41.56325N.&lt;br&gt;Time Frame: Underway; Completion Estimated within 7 years of ESP issuance</td>
<td>- three to five photo points will be established, before and upon completion of diversion removal project, using the photo monitoring protocols described in the appendices to the Agreement.</td>
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</tr>
<tr>
<td>Habitat Parameter</td>
<td>Hole-in-the-Ground Ranch – Beneficial Management Activity</td>
<td>Implementation Monitoring Technique</td>
<td>Effectiveness Monitoring Commitment/Technique</td>
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<tr>
<td>Instream Habitat Complexity</td>
<td>- Access for addition of large wood enhancement, up to 15 sites on Shasta River and undetermined number of sites on Lower Parks Creek <em>(Hole-in-the-Ground Section E.2.d.; Figure 5)</em> Time Frame: Within 10 years of ESP issuance</td>
<td>- one to two photo points per LWD structure and per gravel placement site, will be established, before and upon completion of project, using the photo monitoring protocols described in the appendices to the Agreement.</td>
<td>- Reasonable access for monitoring salmonid use of LWD <em>Time Frame: until use is established; Adaptive Management Monitoring of, e.g. distribution, is addressed elsewhere</em></td>
</tr>
<tr>
<td></td>
<td>- Access to implement spawning gravel enhancement, up to 4 sites on Shasta River and undetermined number of sites on Lower Parks Creek <em>(Hole-in-the-Ground Section E.2.e.; Figure 5)</em> Time Frame: Within 10 years of ESP issuance</td>
<td>- Summary or copy of the report from an evaluation will be provided in the annual report and/or three to five photo points will be established, before and upon completion of project, using the photo monitoring protocols described in the appendices to the Agreement.</td>
<td>- Reasonable access for monitoring salmonid use of new habitat, post-diversion removal. <em>Time Frame: until use is established; Adaptive Management Monitoring of, e.g. distribution, is addressed elsewhere</em></td>
</tr>
<tr>
<td></td>
<td>- Post-alteration of diversion at 122.44445W, 41.56325N, agree to work collaboratively with Agencies to assess and, when matching funds are acquired, <strong>implement</strong> instream habitat improvement projects including channel morphology modifications in Lower Parks Creek <em>(Hole-in-the-Ground Section E.2.d.) Time Frame: Within 5 years of completion of diversion alteration project</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riparian Conditions</td>
<td>- Agree to develop and implement in beaver management plan <em>(Hole-in-the-Ground Section E.3.c)</em> Time Frame: Within 5 years of ESP issuance</td>
<td>- Completed plan to include parameters for seasonal dam monitoring for fish passage; dam removal or modification process when necessary; and variables to be reported; will be in annual report</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Agree to work collaboratively with Agencies to evaluate and implement riparian habitat enhancement: Shasta R., Lower Parks Cr. (post-diversion removal), and Hole-in-the-Ground Cr. <em>(Hole-in-the-Ground Section E.2.c.) Time Frame: Within 5 years of completion of diversion alteration project</em></td>
<td>- Report from an evaluation will be provided in the annual report and/or three to five photo points will be established, before and upon completion of project, using USDA Forest Service Photo Point Monitoring Handbook. 2002</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Agree to install balance of riparian fencing along Parks</td>
<td>- Three to five photo points will be established, before and upon completion of</td>
<td></td>
</tr>
<tr>
<td>Habitat Parameter</td>
<td>Hole-in-the-Ground Ranch – Beneficial Management Activity</td>
<td>Implementation Monitoring Technique</td>
<td>Effectiveness Monitoring Commitment/Technique</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------------------------------------------------------</td>
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<td>-----------------------------------------------</td>
</tr>
<tr>
<td>39</td>
<td>Creek (±40%) as riparian pasture borders consistent with recommendations of UCCE Range Conservation Specialists (<em>Site Plan Agreement Attachment: Tate &amp; Rivers, 2016</em>) <strong>Time Frame:</strong> Temporary fencing will be used for up to the first five years after ESP issuance. Permanent fencing will replace temporary by the sixth year after ESP issuance. - With additional funding, Permittee agrees to take part in riparian planting projects where existing riparian habitat is less than site-potential along the Shasta River. (<em>Hole-in-the-Ground Section E.3.c</em>) <strong>Time Frame:</strong> Within 15 years of ESP issuance - Permittee will seek matching funds and install riparian fencing along Hole-in-the-Ground Creek. <strong>Time Frame:</strong> Within 5 years of ESP issuance - three to five photo points will be established, before and upon completion of riparian plantings using the photo monitoring protocols described in the appendices to the Agreement. - three to five photo points will be established, before and upon completion of riparian fencing project along Hole-in-the-Ground Creek, using the photo monitoring protocols described in the appendices to the Agreement.</td>
<td>temporary fencing, annually if different than previous year. And 3-5 photo points after permanent fence alignment is installed. Points will be established using the photo monitoring protocols described in the appendices to the Agreement.</td>
<td>- Reasonable access for monitoring water quality parameters. <strong>Time Frame:</strong> duration of Agreement</td>
</tr>
<tr>
<td>40</td>
<td>Pasture Management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Assessment/Studies</td>
<td>- reports of studies will be written/summarized/obtained and provided in the annual report</td>
<td>- Reasonable access as needed for supplemental water temperature and/or flow data to augment Water Quality Monitoring Network</td>
</tr>
<tr>
<td>42</td>
<td>- Participate in studies to refine Upper Shasta River Flow Management Strategy <strong>Time Frame:</strong> For 10 years from ESP issuance - Provide access and collaborate with CDFW &amp; NMFS to conduct innovative studies of salmonids in the Upper Shasta R.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Supplementation</td>
<td>- The Permittee will allow access for salmonid supplementation as described in Section E.3.h.</td>
<td>- Allow access to monitoring supplementation activities</td>
</tr>
</tbody>
</table>
H. **Annual Report and Adaptive Management**

The Permittee will complete an annual report yearly and report as stipulated in the Agreement.

I. **Regulatory Assurances**

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

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

---

**Hole-in-the-Ground Ranch**

Signature: [Signature]

Date: [11-20-2020]

**Barry A. Thom**

Regional Administrator

NOAA’s National Marine Fisheries Service

West Coast Region

Date: [February 24, 2021]
SEPARATE SIGNATURE BLOCK FOR CDFW:

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

______________________________  ______________________________
California Department of Fish and Wildlife  Date
Appendix A

Legal Deeds
Corporation Grant Deed

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, BANK OF AMERICA NT & SA AS SUCCESSOR BY MERGER TO SECURITY PACIFIC NATIONAL BANK, a California Corporation hereby GRANT(S) to EMMERSON INVESTMENTS, INC., a California Corporation

the following described real property in the Unincorporated Area OF COUNTY OF SISKIYOU County of SISKIYOU State of California:

LEGAL DESCRIPTION ATTACHED HERETO AND MADE A PART HEREOF KNOWN AS EXHIBIT "A"

BANK OF AMERICA NT & SA AS SUCCESSOR BY MERGER TO SECURITY PACIFIC NATIONAL BANK

BY

James D. Clark
Vice President & Manager

AND

Craig L. Britton, Assistant Vice President

Seldom Seen Ranch.
EXHIBIT "A"

ALL THAT REAL PROPERTY IN THE STATE OF CALIFORNIA, COUNTY OF SISKIYOU, UNINCORPORATED AREA, DESCRIBED AS FOLLOWS:

PARCEL A

PARCEL I

Township 43 North, Range 5 West, M.D.M.

Section 22:

The Southwest 1/4 and the South 1/2 of the Southeast 1/4; also all that portion of the North 1/2 of the Southeast 1/4 and the South 1/2 of the Northeast 1/4 of Section 22, Township 43 North, Range 5 West, M.D.M., bounded and more particularly described as follows:

Beginning at a Juniper Post in a rock mound in the fence corner at or near the Southwest corner of the North 1/2 of the Southeast 1/4 of Section 22 marked one-sixteenth section corner, according to survey made by Albert F. Parrott; thence North 31° 24' 00" West, 498.10 feet to fence post marked Northeast corner and from which an iron pin in crack of rock bears Wasterly 69.4 feet and point on rock in center of Shasta River bears North 24° 30' 00" East, 49.8 feet; thence North 84° 28' 00" West, 317.7 feet, more or less, to an old rock wall; thence North 58° 00' 00" West, 2525.4 feet, more or less, along the meandering of old rock wall to the North and South centerline of said Section 22, Township 43 North, Range 5 West, M.D.M., and from which an old rock mound bears South 386 feet; thence South 1706 feet, more or less, to the Southwest corner of the North 1/2 of the Southeast 1/4 of Section 22; thence East 2640 feet, more or less, to the Place of Beginning.

Sections 23 and 26:

All that portion of the Southwest 1/4 of the Southwest 1/4 of Section 23 and the Northwest 1/4 of the Northwest 1/4 of Section 26, Township 43 North, Range 5 West, M.D.M., bounded and more particularly described as follows:

Beginning at a rock mound in fence corner marked one-sixteenth Section corner at the Northwest corner of the Southwest 1/4 of Section 23; thence South 55° 45' 00" East, 386.36 feet to fence corner, a post marked corner No. 3 from which a 10 inch Cottonwood Tree bears North 03° 47' 00" East, 12.6 feet marked corner No. 3 B.T.; thence South 38° 59' 00" East, 160.56 feet to corner No. 4 fence post marked corner No. 4; thence South 13° 10' 30" East, 144.2 feet to fence post marked corner No. 5; thence South 11° 25' 00" West, 233.61 feet to a 12 inch Juniper Tree marked corner No. 6; thence South 04° 44' 00" West, 572.61 feet to corner No. 7 from which an 18 inch Willow Tree bears South 33° 07'
45 Hole-in-the-Ground Ranch Site Plan Agreement, November 11, 2020

EXHIBIT "A" CONTINUED

00" East, 7 feet and the 1/4 section corner common to Sections 23 and 26, Township 43 North, Range 5 West, M.D.M., bears South 88° 41' 00" East, 1110 feet, North 89° 42' 00" East, 954.2 feet and East 216 feet; thence South 08° 22' 00" West, 205.25 feet to 8 inch Willow marked corner No. 8; thence South 41° 01' 00" East, 216.46 feet to corner No. 9; thence South 58° 00' 00" East, 154.6 feet to corner No. 10 on lower ditch bank; thence South 62° 56' 00" East, 109.8 feet to corner No. 11 on ditch bank; thence South 68° 57' 00" East, 78.3 feet to corner No. 12 on ditch bank; thence South 33° 57' 00" West, 79.5 feet to corner No. 13 fence corner marked corner No. 14 below ditch; thence South 44° 52' 00" West, 126 feet to corner No. 15, 8 feet above ditch from which a stake driven in a crack in rock bears Easterly 61.9 feet; thence South 32° 46' 00" West, 346 feet; thence South 18° 00' 00" West, 462 feet, more or less, to the South line of the Northwest 1/4 of the Northwest 1/4 of Section 26, Township 43 North, Range 5 West, M.D.M.; thence West 164 feet, more or less, to the section line common to Sections 26 and 27; thence North along section line 2640 feet, more or less, to the Place of Beginning.

Also, all that portion of the South half and the South half of the Northwest 1/4 of Section 26, Township 43 North, Range 5 West, M.D.M., lying Westerly of the West boundary of what was formerly Lake Shastina Tract No. 1000-9-3 and is now recorded in Town Map Book 6, page 35, Official Records of Siskiyou County as "Reversion to Acreage".

Section 27:

All

Together with a 60 foot wide non-exclusive easement over an existing road, for ingress, egress and public utilities situated in Section 26, Township 43 North, Range 5 West, M.D.M., Siskiyou County, California, being 30 feet in width on each side of the following described centerline of said existing road:

Beginning at a point located at the Westerly end of Riverside Drive (Valley View Drive), said point also being located on the Westerly boundary of Lake Shastina Tract No. 1000-9-1 as shown in Town Map Book 5, page 110, on file at the Siskiyou County Recorder's Office, thence on a Southwesterly projection of Riverside Drive (Valley View Drive) South 52° 01' 35" West for a distance of 433.72 feet; thence through a tangent curve concave to the Southeast, having a radius of 720.00 feet and a central angle of 36° 03' 33" for an arc distance of 478.27 feet; thence South 13° 58' 02" West for a distance of 26.70 feet; thence North 76° 01' 58" West for a distance of 61.87 feet; thence through a tangent curve concave to the South, having a radius of 350.00 feet and a central angle of 32° 44' 07" for an arc distance of 199.97 feet; thence through a
tangent curve concave to the North, having a radius of 350.0 feet and a central angle of 28° 55' 44" for an arc distance of 176.72 feet; hence North 79° 50' 21" West for a distance of 574.98 feet; thence through a tangent curve concave to the Northeast, having a radius of 300.00 feet and a central angle of 41° 16' 57" for an arc distance of 216.16 feet; hence North 38° 33' 24" West for a distance of 137.48 feet to the Westerly boundary of what was formerly Lake Shastina Tract No. 1000-9-3 and is now recorded in Town Map Book 6, page 35, Official Records of Siskiyou County as "Reversion to Acreage".

Basis of bearings for this easement description is the centerline of Riverside Drive (Valley View Drive) North 52° 01' 35" East as shown on Lake Shastina Tract No. 1000-9-1 recorded in Town Map Book 5, page 110, on file at the Siskiyou County Recorder's Office.

PARCEL II

Township 43 North, Range 5 West, M.D.M.

Section 26:

South 1/2, Northeast 1/4, South 1/2 of the Northwest 1/4.

Excepting from said lands, all that portion lying within the exterior boundaries of Lake Shastina Unit No. 1000-9-1 according to the map thereof filed April 27, 1972, in Town Map Book 5, pages 107 through 110 and Lake Shastina Unit No. 1000-9-2 according to the map filed June 13, 1972, in Town Map Book 5, pages 111 through 118.

Also excepting from said lands that certain parcel in Section 26, shown as the "Well Site" on the map on file in the Siskiyou County Recorder's Office in Parcel Map Book 4, page 181.

Also excepting from said lands in Section 26, all that portion of the Northeast 1/4 lying Northerly of Seldom Seen Ranch Road and Easterly of Lot 1, as said road and lot are shown on said Lake Shastina Unit No. 1000-9-1 map.

Also excepting from said lands in Section 26, all that portion of the Northeast 1/4 lying Easterly of Valley View Drive as said road is shown on said Lake Shastina Unit No. 1000-9-1 map.

Also excepting from said land in Section 26, all that portion lying Westerly of the West boundary of what was formerly Lake Shastina Tract No. 1000-9-3 and is now recorded in Town Map Book 6, page 35, Official Records of Siskiyou County as "Reversion to Acreage".
EXHIBIT "A" CONTINUED

Section 35:

All that portion of the Northeast 1/4 of Section 35, lying Westerly of the exterior boundary of Lake Shastina Unit No. 1000-9-2 according to the map of said unit on file in the Siskiyou County Recorder’s Office in Town Map Book 5, pages 111 through 118.

51-06-20-040-070;
51-03-20-050-320 & 330

PARCEL B

PARCEL I

Township 43 North, Range 5 West, M.D.M.

Section 19:

The Southeast quarter.

Section 20:

The West half.

Section 30:

The Northeast quarter.

Together with a 60 foot wide non-exclusive easement over an existing road, for ingress, egress and public utilities situated in Section 30, Township 43 North, Range 5 West, M.D.M., Siskiyou County, California, being 30 feet in width on each side of the following described centerline of said existing road:

Beginning at a point in the centerline of Slough Road (County Road No. 41.003) from which a 2 1/2 inch diameter brass disc set in concrete stamped "California Division of Highways" "2-5-245" bears South 09° 10’ 00” West, 6703.48 feet; thence North 65° 20’ 00” East, 116.00 feet; thence North 42° 32’ 04” East, 1019.09 feet; thence North 47° 06’ 22” East, 103.23 feet; thence North 18° 51’ 52” East, 106.06 feet; thence North 02° 52’ 42” East, 122.98 feet; thence North 15° 55’ 55” East, 97.91 feet; thence North 37° 33’ 02” East, 88.97 feet; thence North 43° 53’ 28” East, 723.81 feet; thence North 48° 24’ 54” East, 343.93 feet; thence North 68° 16’ 15” East, 421 feet, more or less to the South line of the Northeast quarter of Section 30, Township 43 North, Range 5 West, M.D.M.

Basis of bearings for this easement description is the bearing North 17° 02’ 35” West between California Division of Highway Monuments 2-5-245 and 2-5-246 as shown in record of Survey Book 4.
EXHIBIT "A" CONTINUED

page 53, Official Records of Siskiyou County. Distances are ground level. Multiply ground distance by 0.9998476 to obtain grid.

PARCEL II

Township 43 North, Range 5 West, M.D.M.

Section 15:
All

Section 16:
All

Section 17:
The East 1/2, the Southeast 1/4 of the Northwest 1/4 and the Northeast 1/4 of the Southwest 1/4.

Section 20:
The North 1/2 of the Northeast 1/4 and the Southeast 1/4 of the Northeast 1/4.

Section 21:
The North 1/2, the North 1/2 of the Southwest 1/4 and the Southeast 1/4 of the Southwest 1/4.

Section 22:
The Northwest 1/4 and the North 1/2 of the Northeast 1/4.

51-06-20-030-030, 040, 080, 100 & 110
51-06-20-040-430;
51-03-20-060-020
Appendix B

Riparian Grazing Management Plan
Hole-in-the-Ground Ranch

Draft Prescribed Riparian Grazing Management Recommendation (October 18, 2016)

Prepared by
Kenneth W. Tate, Professor and UCCE Rangeland Watershed Specialist, UC Davis
California Certified Rangeland Manager #79; CA Department of Forestry and Fire Protection
Certified Rangeland Professional #00-104; Society for Range Management
Carissa Koopmann Rivers, Livestock and Natural Resources Advisor, Siskiyou County, UCCE

Riparian Areas on the Enrolled Property

Approximately 2.5 miles of the Shasta River flows through the middle of this Enrolled Property, and 1.7 miles of Parks Creek flows through the west, west-central portion of this Enrolled Property (see Figure 2).

Some of the widest extent and best quality woody riparian corridors on the Shasta River in the Covered Area occur along the river as it flows through the Enrolled Property (B. Henderson, CDFW, pers. comm.). The entire Shasta River is narrowly corridor fenced to permanently exclude livestock through this reach, with 6 water gaps designed to allow livestock crossing and drinking water access. The fence is in excellent condition and effective at controlling livestock access to the river – there has been no grazing in this reach since 2010. This reach provides Coho spawning, rearing, out-migration, and emigration habitat. Noxious weeds are of limited extent in this reach.

The downstream end of the Lower Parks Creek reach on this Enrolled Property (approximately 930’) is also narrow-corridor fenced to permanently exclude livestock, with 2 water gaps designed to allow livestock crossing and drinking water access (Parks Creek Reach 1; see Figure 3). The fence is in excellent condition and effective at controlling livestock access to the river – there has been no grazing in this reach since 2011. This reach provides coho spawning, out-migration, and emigration habitat. Noxious weeds are of limited extent in this reach.

By the definitions used in the discussions regarding stream habitat restoration, the upper reach of Lower Parks Creek on this Enrolled Property is contained within an irrigated pasture, and is open to grazing by livestock during grazing bouts in this pasture, the Cardoza Field (Parks Creek Reach 2; see Figure 6). This reach currently provides coho out-migration and emigration habitat. As intermediate between spawning habitat downstream on Parks Creek and the Shasta River, and other tributaries, and cold water refugia habitat, upstream in the Middle Parks Creek reach, this reach holds potential for fry rearing habitat as water quality conditions improve as a result of the actions undertaken in this Agreement. This is a low gradient, fine substrate reach with high water table supporting primarily wetland herbaceous species dominated by Juncus (rushes) and Carex spp. (sedges). Noxious weeds are of limited extent in this reach.

Riparian Grazing Management Recommendations

Shasta River and Lower Parks Creek, Reach 1: Riparian Corridors. The Enrolled Property owner and managers have made a decision not to graze these riparian corridors – maintaining these units as livestock exclosures. Our recommendation is that managers maintain the riparian
corridor fences and water gaps in good working order, and check that the fences are effectively excluding livestock during grazing bouts in adjacent irrigated pastures and rangelands.

**Lower Parks Creek, Reach 2: Riparian Pasture.** The Enrolled Property owner and managers have expressed interest in developing an adaptive riparian grazing strategy to improve streambank vegetation and habitat conditions within this reach. Management goals include reducing bare streambank, enhancing *Juncus* and *Carex* spp. cover and vigor at the stream’s greenline. Accomplishing these short-term goals will in the longer-term lead to enhanced streambank stability, reduced stream channel width to depth ratio, and improved instream habitat conditions (e.g., cooler temperatures, increased hiding cover from predators, improved refuge from high velocities). Due to high water table – it is unlikely this reach has the potential to support a significant riparian woody population. However, the prescribed riparian grazing recommendation below will create the opportunity for riparian woodies to establish and grow if the reach does have the potential to support them.

**Riparian Grazing Infrastructure.**

We recommend that the upstream reach of Lower Parks Creek (Reach 2) be fenced to create a riparian pasture in which prescribed grazing can be implemented to achieve the short and long-term goals described above. The Cardoza diversion is located near the top of this reach, and is slated for removal. It is difficult to predict exactly how removal of this long-time hydrologic constraint will influence flood flows, base flows, and channel migration through this lower end of Parks Creek (Figures 4 and 6). At this time we recommend that the managers use portable electric fencing on the east side of Parks Creek in the Cardoza Field to establish a riparian pasture (Figure 6). This will allow rapid deployment of that east boundary so that prescribed grazing can be implemented soon, but allows the managers to adjust as needed based on observations of livestock behavior and channel response to removal of Cardoza diversion. Once the optimal placement of the east boundary is determined over 2 to 3 years of adaptation as needed, a permanent fence can be established if desired – or electric fence can continue to be utilized. Livestock drinking water within this riparian pasture will be from Parks Creek. At this time the establishment of fixed, hardened livestock creek crossings or drinking access points is not recommended. Livestock crossing/drinking behavior should be monitored during the first year of riparian grazing and this recommendation revisited and adapted as needed based upon livestock behavior and extent/intensity of stream channel disturbance.

**Recommended Seasons of Grazing and Livestock Management Decision Triggers.**

This reach of the creek, Reach 2 (the upper reach of Lower Parks Creek), is not considered to be coho spawning habitat, thus grazing bouts can occur in this grazing unit at any time during the standard irrigation-growing season (spring through fall). The unit should not be continually grazed year-round. It should be worked into the normal rotation of livestock throughout pastures on the Enrolled Property. Rest periods must occur during the growing season (i.e., early, mid, and/or late growing season rest from grazing should occur each year). Management decision triggers described below will ensure grazing intensity (e.g., stocking rate) and livestock impacts are in balance with short and long-term goals listed above.
Managers must have real-time indicators they can observe directly on the ground to make decisions about the readiness of riparian grazing units for grazing (e.g., sufficient forage for grazing), and when livestock need to be moved from a riparian unit to achieve conservation goals (e.g., excessive browse on recruiting riparian woody plans <5ft in height, excessive streambank disturbance). For this site we recommend that during any grazing bout, 1) physical hoof damage to stream banks be limited to no more than 20% of streambank per each side of stream; 2) minimum stubble height of browsed herbaceous vegetation at the stream greenline to not go below 3”; and that 3) browse on recruiting riparian woody plants (< 5ft in height – below cattle maximum browse height) be limited to no more that 20% of current year’s leader growth within the riparian unit. Once any of these three triggers is hit during a grazing bout, livestock should immediately be rotated out of the riparian unit.

Table 1. Management Triggers

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Trigger</th>
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<tbody>
<tr>
<td>Browse use on recruiting riparian woody species &lt; 5 ft. in height</td>
<td>20% of current years leader growth</td>
</tr>
<tr>
<td>Streambank Hoof action</td>
<td>20% of each side of a streambank</td>
</tr>
</tbody>
</table>

Recommended Grazing Monitoring and Documentation.

Siskiyou County UCCE and UC Davis will collaborate annually to provide hands-on, in-the-field training on assessing real-time status of the livestock management decision triggers recommended in the section above. We will base this training on standard, national methods developed in the “Multiple Indicator Monitoring (MIM) of Stream Channels and Streamside Vegetation” (http://www.blm.gov/nstc/library/pdf/MIM.pdf).

We recommend progress towards these management triggers be assessed every 2 to 3 days during all riparian grazing bouts. We recommend, and will provide training on, the establishment of permanent photo monitoring points in the riparian grazing unit. Photos should be taken at the beginning and end of each grazing bout (certainly within the first few years of grazing). Photo points should be established so that riparian woody species, herbaceous stubble height at the stream greenline, and streambank conditions can be clearly observed and thus conditions and outcomes documented. Finally, we recommend that dates on and off, and numbers of livestock by species and class used during each grazing bout be recorded for each riparian grazing unit.
Figure 6. Hole-in-the-Ground Ranch: Riparian Grazing, Parks Creek Reference Locations