



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1201 NE Lloyd Boulevard, Suite 1100
PORTLAND, OREGON 97232

Finding of No Significant Impact (FONSI)

Shasta River Template Safe Harbor Agreement Klamath River Basin, California

Background

NOAA's National Marine Fisheries Service (NMFS) prepared this Finding of No Significant Impact (FONSI) according to the guidelines and the National Oceanic and Atmospheric Administration's (NOAA) Administrative Order (NAO) 216-6, as amended, concerning requirements for compliance with the National Environmental Policy Act (NEPA). The environmental effects analysis in the attached environmental assessment (EA) dated November 19, 2020, supports this FONSI. NMFS also prepared the EA in accordance with the requirements of NEPA and agency guidelines.

Proposed Action

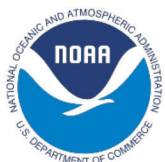
The proposed Federal action is issuance of fourteen Endangered Species Act (ESA) section 10(a)(1)(A) Enhancement of Survival Permits (ESPs) to Applicants listed in Table 1 of the EA in the Shasta River basin (Applicants), Siskiyou County, California. Under the proposed action, NMFS would enter into the Template Safe Harbor Agreement for Conservation of Coho Salmon in the Shasta River (Agreement), 14 related Site Plan Agreements, and issue the ESPs pursuant to ESA Section 10(a)(1)(A), in accordance with NEPA policy and guidelines.

Additional Description

Collectively, the Applicants own approximately 25,050 acres in the Shasta River basin and manage land and water for livestock and hay production. Grenada Irrigation District and Edson Foulke Ditch Company manage water and do not own an Enrolled Property. The ESPs, Agreement, Site Plan Agreements, and related ESA biological opinion include terms and conditions, an adaptive management program, and emergency, monitoring, and reporting requirements to achieve a net conservation benefit for the Southern Oregon Northern California Coast (SONCC) Evolutionarily Significant Unit (ESU) of coho salmon (the Covered Species), which is listed as threatened under the ESA.

NMFS would issue the permits for a 20-year period. The Covered Area encompasses the extent of the properties enrolled in the Agreement as shown in Figure 1 of the EA.

The Agreement and Site Plan Agreements were made and would be entered into by NMFS, the California Department of Fish and Wildlife (CDFW), and the Applicants listed in Table 1 of the EA. The Agreement establishes the general requirements for NMFS, under authority of ESA section 10(a)(1)(A) and implementing rule and policy, to issue ESPs to nonfederal landowners in the Shasta River basin for the purpose of promoting the conservation, enhancement of survival and recovery of the Covered Species.



Covered Activities include land and water management (referred to in the Agreement as Routine Agricultural Activities), including water diversion and delivery, wildlife, fisheries, and habitat management, and ranching operations including water diversions. The Agreement and Site Plan Agreements provide assurances to the non-federal landowners that future return of their lands back to Baseline Conditions or Elevated Baseline Condition (if specified) is authorized.

The ESPs authorize incidental take associated with the activities described in the Agreement and Site Plan Agreements. Section 10(a)(1)(A) of the ESA provides for the issuance of permits for any act that would otherwise be prohibited by ESA section 9, if the act would enhance the propagation or survival of the affected species. NMFS provides assurances through the ESPs that no new restrictions beyond those in the Agreement, Site Plan Agreements, and ESPs would be placed on the use of the Enrolled Properties should the Covered Species become more numerous as a result of the Covered Activities. The ESPs would assure the Applicants that no commitments of resources beyond what is agreed to in the Agreement and Site Plan Agreements would be required. The term of the Agreement, Site Plan Agreements, and proposed ESPs is 20 years from the time of signing, with potential extensions as described in the Agreement and Site Plan Agreements.

Alternatives Evaluated in the Environmental Assessment

Alternative 1: Issue Enhancement of Survival Permits (as described above).

Alternative 2: No Action. Under the No Action Alternative, NMFS would not issue ESPs and the voluntary Beneficial Management Activities (BMAs) identified in the Agreement and Site Plan Agreements would not be required to occur in the Covered Area. Beyond those actions currently included in the baseline (e.g. Montague Water Conservation District Conservation and Habitat Enhancement and Restoration Project), restoration, enhancement, and changes to operations and maintenance activities in the Shasta River watershed for the Covered Species in the Covered Area would not occur. This alternative is the baseline against which the action alternative is compared in the analysis of environmental consequences.

Selected Alternative

Alternative 1: Issue fourteen Enhancement of Survival Permits.

Conservation Measures / Terms & Conditions / Mitigation Measures / Measures to Reduce Impacts

Conservation efforts on non-federal properties are essential to the survival and recovery of the Covered Species because these properties provide significant portions of current and potential habitat. Safe Harbor Agreements provide an ESA mechanism and incentive to encourage proactive species conservation efforts by private and other non-federal property owners. Implementation and adherence to the following Template Safe Harbor Agreement components will reduce impacts and contribute to the recovery of the Covered Species:

- Diversion Reduction Schedules that will result in more water instream to benefit the Covered Species.

- BMAs (described in individual Site Plan Agreements for each Applicant) that conserve water and enhance instream and riparian habitat for the benefit of the Covered Species.
- Forbearance Agreement that ensures conserved water stays instream for the benefit of the Covered Species.
- Avoidance and Minimization Measures (AMMs) that minimize impacts from implementation of Routine Agricultural Activities and BMAs.
- Adaptive Management Program designed to improve understanding of how the system may respond to actions so as to achieve goals of the habitat enhancement.
- Terms and conditions described in the biological opinion including timely implementation of restorative actions.

Related Consultations

NMFS has completed an ESA section 7 and Essential Fish Habitat (EFH) consultation (NMFS 2020a) on the issuance of the ESPs to the Applicants for implementing the Agreement and Site Plan Agreements. NMFS has determined that the issuance of the ESPs will not jeopardize SONCC coho salmon or adversely modify their designated critical habitat. No adverse effects to EFH are identified.

NMFS issued a Federal Register Notice (FR 55145 October 15, 2019) in 2019 announcing receipt of the ESP applications under the ESA and received comments from Tribes (Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe) as well as the Shasta Valley Resource Conservation District, Siskiyou County Board of Supervisors, California Farm Bureau, Scott Valley and Shasta Valley Water Master Districts, Pacific Coast Federation of Fishermen Association as well as interested citizens and consultants. Comments were reviewed in detail and resulted in changes to the proposed actions.

NMFS contacted the Native American Heritage Commission for a review of the Sacred Lands File and invited Federally-recognized tribes (Karuk Tribe, Yurok, Pit River Tribe, and Quartz Valley Tribe) to consult on this undertaking. Non-federally recognized Tribes were also contacted (Klamath Tribe, Modoc Tribe, Shasta Indian Nation, Shasta Nation, Winnemem Wintu Tribe, and Wintu Tribe).

Cultural resources reports were completed for each Applicant and contain findings and management considerations to be implemented including archeological monitoring during significant ground-disturbing activities, such as use of heavy equipment. Archival research and an intensive survey of the Area of Potential Effects (APEs) resulted in the documentation of prehistoric and historic-era sites and artifacts. An evaluation of these resources indicated that none appear to retain the associations or characteristics that make them historically or scientifically important and none are recommended eligible per National Register of Historic Places (NRHP) criteria. Consequently, per the NHPA, no historic properties are contained within the APEs and no additional study or mitigation of project effects on these resources is necessary. NMFS completed consultation with the California State Historic Preservation Office (SHPO), and concluded that no historic properties would be affected by the proposed action; pursuant to 36 CFR § 800.4(d)(1), the SHPO does not object (SHPO 2020).

Significance Review

The Council on Environmental Quality (CEQ) Regulations state that the determination of significance using an analysis of effects requires examination of both context and intensity, and lists ten criteria for intensity (40 C.F.R. § 1508.27). In addition, the Companion Manual for National Oceanic and Atmospheric Administration Administrative Order 216-6A provides sixteen criteria, the same ten as the CEQ Regulations and six additional, for determining whether the impacts of a proposed action are significant. Each criterion is discussed below with respect to the proposed action and considered individually as well as in combination with the others.

1. Can the proposed action reasonably be expected to cause both beneficial and adverse impacts that overall may result in a significant effect, even if the effect will be beneficial?

Yes. NMFS has determined the proposed action will have benefits to the Covered Species and habitat through projects designed to improve habitat conditions including water quality, water quantity, and riparian habitat. Benefits to other species that depend on aquatic and riparian habitat are expected including bird species. Benefits to riparian vegetation and wetland habitats are also expected to occur. The EA (NMFS 2020b) and supporting analyses did not identify any adverse impacts that, after implementation of AMMs, remained significant. No significant irreversible adverse effects were identified associated with the proposed action. In summary, we expect the proposed action to result in beneficial effects to the Covered Species and habitat associated with implementation of the proposed conservation measures and BMAs included in the Safe Harbor Agreement and Site Plan Agreements.

2. Can the proposed action reasonably be expected to significantly affect public health or safety?

No. NMFS does not expect the proposed action to adversely affect public health or safety because the Covered Activities are generally restorative to the environment. The proposed action will not change road traffic, or result in increased pollution or noise. The proposed action would improve water quality and riparian habitat. AMMs would be implemented for all Covered Activities to reduce adverse effects to an insignificant level and to achieve a net conservation benefit for the Covered Species.

3. Can the proposed action reasonably be expected to result in significant impacts to unique characteristics of the geographic area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas?

No. The project area includes unique watershed and species characteristics, including wetland, riverine habitats, and species dependent on those habitats including ESA-listed SONCC coho salmon. The proposed action is expected to have beneficial effects on water quality, water quantity, and riparian habitat. It will implement restorative actions

that will improve existing conditions for the Covered Species but would not change the unique characteristics of the geographic area.

Within the Covered Area, Alternative 1 (the selected alternative) is expected to result in improved instream and riparian habitat conditions for each life stage of SONCC coho salmon and their Critical Habitat including juvenile outmigration, adult migration, juvenile rearing, and spawning. Alternative 1 is expected to result in a net conservation benefit for SONCC coho salmon and contribute to the recovery of the species.

Three plant species listed as endangered under the ESA were identified as potentially occurring in the Covered Area. However, there is no record of them actually having been identified in the Covered Area, and critical habitat has not been designated for these plant species. Therefore, it is reasonable to conclude that Alternative 1 will not affect listed plant species.

Many of the BMAs included in the proposed action are designed to enhance the quantity and quality of waterways including adjacent riparian and wetland habitat. Restoration actions include reconnecting historic river oxbows so that aquatic species can utilize these important habitats that have previously been inaccessible, increasing cold water refugia, installation of large wood to increase instream habitat complexity, planting and protecting riparian revegetation to improve bank stability and stream shade, installation of livestock exclusion fencing/off-channel stock watering to reduce impacts from cattle, and creation of off-channel habitat areas for winter refugia. Therefore, it is expected that Alternative 1 would provide multiple benefits and would positively affect aquatic habitats including riparian and wetland habitat in the Covered Area.

Cultural resources reports were completed for each Applicant and contain findings and management considerations to be implemented including archeological monitoring during significant ground-disturbing activities. Archival research and an intensive survey of the APE's resulted in the documentation of prehistoric and historic-era sites and artifacts. An evaluation of these resources indicated that none appear to retain the associations or characteristics that make them historically or scientifically important and none are recommended eligible per National Register of Historic Places (NRHP) criteria. Consequently, per the NHPA, no historic properties are contained with the APE's and no additional study or mitigation of project effects on these resources is necessary.

The Covered Area consists primarily of existing private agricultural lands. One of the Covered Activities under Alternative 1 is Routine Agricultural Activities, modified to reduce adverse effects through the AMMs. The action would authorize incidental take of SONCC coho salmon that may occur from Covered Activities while providing a net conservation benefit to Covered Species and safe harbor assurances to the Applicants that allow continued operation of farming and ranching on agricultural lands in the Covered Area.

4. *Are the proposed action's effects on the quality of the human environment likely to be highly controversial?*

No. The analysis of effects did not find that effects are not likely to be unknown or unique. NMFS coordinated with interested and affected parties including agencies and individuals with specific jurisdiction and expertise. The Site Plan Agreements, Agreement, and related documents were made available for a public comment period from October 15, 2019 to December 31, 2019 ((84 FR 59358 (November 4, 2019), 84 FR 55145 (October 15, 2019)). NMFS considered these comments received on the Federal Register Notice. Each public and Tribal comment received was considered by NMFS and some changes to the Safe Harbor Agreement and/or Site Plan Agreements were made based on public and Tribal comments. The manner in which comments were considered and incorporated into Site Plan Agreements is described in Appendix B of the EA. This process addressed controversy over the proposed action's effects to the quality of the human environment and further controversy is not likely.

5. *Are the proposed action's effects on the human environment likely to be highly uncertain or involve unique or unknown risks?*

No. The project would not affect the human environment in highly uncertain or unknown ways. The proposed action includes a wide range of conservation actions including water demand reductions, and projects that are regarded as high priority recovery actions, described in NMFS' SONCC coho salmon recovery plan under the ESA. The proposed BMAs include conservation actions that have been well studied and implemented for other efforts including for other safe harbor agreements. There are no unknown risks associated with implementation of the proposed action. Any uncertainty regarding habitat responses to water conservation and habitat enhancement is addressed through monitoring and adaptive management, which will provide feedback that can be used to adjust actions in the future, if appropriate.

6. *Can the proposed action reasonably be expected to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?*

No. The proposed action does not establish a precedent for future actions because NMFS has completed other Safe Harbor Agreements in California including for individual landowners and a programmatic Safe Harbor Agreement for Dry Creek in the Russian River. The proposed action does not represent a decision in principle about any future considerations because the Covered Actions are confined to a specific Covered Area as described in the Agreement and Site Plan Agreements.

7. *Is the proposed action related to other actions that when considered together will have individually insignificant but cumulatively significant impacts?*

No. NMFS' EA considers cumulative impacts and evaluated the proposed action while considering past, present, and reasonably foreseeable future actions, including other

activities occurring in the Covered Area. The issuance of the ESPs would not result in the irretrievable or irrecoverable loss of resources. A decision to issue the ESPs would not automatically result in the approval of future projects. Future permit applications, if any, would be subject to independent environmental evaluation, coordination with others, and permitting procedures.

8. *Can the proposed action reasonably be expected to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources?*

No. The proposed action is not likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or significant scientific, cultural, or historical resources. The project would not increase existing ongoing traffic levels.

Cultural resources reports were completed for each Applicant and contain findings and management considerations to be implemented including archeological monitoring during significant ground-disturbing activities, such as use of heavy equipment. Archival research and an intensive survey of the APE's resulted in the documentation of prehistoric and historic-era sites and artifacts. An evaluation of these resources indicated that none appear to retain the associations or characteristics that make them historically or scientifically important and none are recommended eligible per National Register of Historic Places (NRHP) criteria. Consequently, per the NHPA, no historic properties are contained within the APE's and no additional study or mitigation of project effects on these resources is necessary.

9. *Can the proposed action reasonably be expected to have a significant impact on endangered or threatened species, or their critical habitat as defined under the Endangered Species Act of 1973?*

No. NMFS does not expect the activity to adversely affect ESA-listed species or their designated critical habitat. Protected species that occur in the project area are described in the EA and potential impacts to listed species are evaluated (NMFS 2020a).

NMFS expects a significant benefit to all life stages of ESA-listed SONCC coho salmon through implementation of the BMAs proposed to improve habitat conditions (e.g. water quality and water quantity) that occur in the Covered Area.

Various ESA listed non-fish species may be found in the Covered Area, including:

- Yellow-billed Cuckoo (*Coccyzus americanus*, ESA - Threatened),
- the Northern Spotted Owl (*Strix occidentalis caurina*, ESA - Threatened),
- Greater Sandhill Crane (*Antigone canadensis tabida*, CESA - Threatened),
- Bank Swallow (*Riparia riparia*, CESA - Threatened),
- the wolf (*Canis lupis*, ESA - Endangered),
- the fisher (*Pekania pennanti*, ESA -Threatened),

- the North American wolverine (*Gulo gulo luscus*, ESA - Threatened),
- the Conservancy Fairy Shrimp (*Branchinecta conservatioi*, ESA - Threatened),
- the Vernal Pool Tadpole Shrimp (*Lepidurus packardi*, ESA - Endangered),
- the Vernal Pool Fairy Shrimp (*Branchinecta lynchi*, ESA - Endangered),
- and, the Oregon Spotted Frog (*Rana pretiosa*, ESA - Threatened).

However, as described in the EA, the selected alternative is expected to either not affect these species, or have a beneficial effect on these species.

10. Can the proposed action reasonably be expected to threaten a violation of Federal, state, or local law or requirements imposed for environmental protection?

No. Issuance of the permits would comply with Federal law and the proposal has undergone compliance reviews to ensure that the proposed action will not result in a violation of Federal, State, or local laws and requirements.

A General Condition required by the ESPs states, “The permit holder must obtain any other Federal, state, and local permits/authorizations necessary for the conduct of the activities provided for in this permit.”

11. Can the proposed action reasonably be expected to adversely affect stocks of marine mammals as defined in the Marine Mammal Protection Act?

No. Marine mammals do not occur in the Covered Area and are not expected to be adversely affected by the proposed action. Increased natural production of Shasta River salmon should increase the forage population of salmon in the Pacific Ocean and could increase the forage base for some marine mammal species occurring in marine ecosystems outside of the Covered Area.

12. Can the proposed action reasonably be expected to adversely affect managed fish species?

No. The proposed action will not adversely impact managed fish species. In contrast, the proposed action is a conservation program with the purpose of improving the viability of SONCC coho salmon and habitat in the Covered Area, which may indirectly benefit federally managed Chinook salmon.

13. Can the proposed action reasonably be expected to adversely affect essential fish habitat as defined under the Magnuson-Stevens Fishery Conservation and Management Act?

No. Ground disturbing activities associated with habitat enhancement projects may result in short term, localized increases in turbidity but not measurable adverse effects to EFH. The proposed action will improve EFH in the short- and long-term once projects are implemented. NMFS expects improvements to instream habitat, riparian habitat, habitat complexity, and water quality and water quantity.

14. Can the proposed action reasonably be expected to adversely affect vulnerable marine or coastal ecosystems, including but not limited to, deep coral ecosystems?

No. The proposed action will have no adverse effect on the marine environment or coastal ecosystems. The proposed action may increase the survival and reproduction of coho salmon in the Shasta River, which may increase their population in the ocean to the benefit of the marine ecosystem.

15. Can the proposed action reasonably be expected to adversely affect biodiversity or ecosystem functioning (e.g., benthic productivity, predator-prey relationships, etc.)?

No. NMFS does not expect the activities conducted under the permit to have a substantial effect on biodiversity or ecosystem function. Effectiveness and implementation monitoring will be conducted to assess the benefits of projects over time. NMFS expects improvements to water quality and quantity, which would improve ecosystem function and biodiversity in the Covered Area.

16. Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

No. The Applicants will not introduce or spread non-indigenous species. Noxious weeds are a concern in the Covered Area and a non-native weed management program will be implemented by landowners. Additionally, the removal and/or management of water impoundments will reduce habitats for non-indigenous fishes and help eradicate them.

Determination

Based on the information in this document and the EA, and in view of the information contained in the supporting documents prepared for the proposed action, it is hereby determined that the issuance of the fourteen ESA section 10(a)(1)(A) Enhancement of Survival Permits for implementation of the Shasta River Template Safe Harbor Agreement and associated Site Plan Agreements will not significantly impact the quality of the human environment as described above and in the supporting EA. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an environmental impact statement for this action is not necessary.



Barry A. Thom
Regional Administrator
West Coast Region
National Marine Fisheries Service

November 19, 2020
Date

References

National Marine Fisheries Service (NMFS). 2020a. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response: Issuance of Fourteen Section 10(a)(1)(A) Enhancement of Survival Permits associated with the “Template Safe Harbor Agreement for Conservation Coho Salmon in the Shasta River” and individual Site Plan Agreements, affecting private lands and state lands in the Upper Shasta River, Big Springs Creek, Parks Creek and their tributary streams in Siskiyou County, California. NMFS Consultation Number: WCRO-2020-02923.

National Marine Fisheries Service (NMFS). 2020b. Environmental Assessment Issuance of Fourteen 10(A)(1)(A) Enhancement of Survival Permits Associated with the Template Safe Harbor Agreement for the Conservation of Coho Salmon in the Shasta River Klamath River Basin, California. Prepared by NMFS Northern California Coastal Office, National Marine Fisheries Service, 1655 Heindon Road. Arcata, California 95521.

State Historic Preservation Officer (SHPO). 2020. Letter. From: Julianne Polanco, State Historic Preservation Officer. CA Department Of Parks and Recreation, Office of Historic Preservation. To: Alecia Van Atta. ARA, NMFS. Reply in Reference To: NOAA_2020_1110_001 Through NOAA_2020_1110_014. November 12, 2020.

ENVIRONMENTAL ASSESSMENT

**ISSUANCE OF FOURTEEN 10(a)(1)(A) ENHANCEMENT OF SURVIVAL PERMITS ASSOCIATED
WITH THE TEMPLATE SAFE HARBOR AGREEMENT FOR THE CONSERVATION OF COHO
SALMON IN THE SHASTA RIVER**

KLAMATH RIVER BASIN, CALIFORNIA

Prepared by:

NMFS Northern California Coastal Office
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1655 Heindon Road
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COVER SHEET

Title of Environmental Review: Issuance of Fourteen Section 10(a)(1)(A) Enhancement of Survival Permits Associated with the Template Safe Harbor Agreement for Conservation Of Coho Salmon in the Shasta River, Klamath River Basin, California

Evolutionarily Significant Unit (ESU): Southern Oregon Northern California Coastal (SONCC) ESU coho salmon

Responsible Agency/Official: Barry A. Thom
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Legal Mandate: Endangered Species Act (ESA) of 1973, as amended, and implemented – 50 CFR Part 223. This EA is being prepared using the 1978 CEQ NEPA Regulations. NEPA reviews initiated prior to the effective date of the 2020 CEQ regulations may be conducted using the 1978 version of the regulations. The effective date of the 2020 CEQ NEPA Regulations was September 14, 2020. This review began on June 11, 2020 and the agency has decided to proceed under the 1978 regulations.

Location of Proposed Activities: Private and state lands consisting of fourteen properties in in the Upper Shasta River, Big Springs Creek, Parks Creek and their tributary streams in Siskiyou County, California.

Activities Considered: Routine agricultural activities with associated avoidance and minimization measures, beneficial management activities, habitat improvement projects, and monitoring and reporting to improve and track habitat conditions for SONCC coho salmon and the potential future return of the enrolled properties to baseline conditions at the end of the Template Safe Harbor Agreement.

Table of Contents

List of Abbreviations and Acronyms	1
1 Purpose and Need	2
1.1 Background	2
1.2 Purpose and Need Statement	5
1.3 Public Involvement	5
1.4 Action Area	6
2 Description of Proposed Action and Alternatives	9
2.1 Alternative 1: Issue Enhancement of Survival Permits	9
2.1.1 Covered Activities	9
2.1.2 Conservation Strategy	11
2.1.3 Permit Term	14
2.2 Alternative 2: No Action	14
2.3 Alternatives Considered and Eliminated from Further Consideration	14
3 Affected Environment	14
3.1 Listed Species	14
3.1.1 Fish	14
3.1.2 Plants	20
3.1.3 Other Wildlife	20
3.2 Non-listed Species	22
3.2.1 Fish	22
3.2.2 Plants	22
3.2.3 Other Wildlife	23
3.3 Vegetation	23
3.4 Wetlands	23
3.5 Essential Fish Habitat	24
3.6 Invasive Species	24
3.7 Cultural Resources	24
3.8 Socioeconomics	26
3.9 Hydrology, Water Quality, and Water Quantity	26
3.10 Groundwater	27
3.11 Agriculture	28
3.12 Climate Change	28
4 Environmental Consequences	29
4.1 Alternative 1: Issue Enhancement of Survival Permits	29

4.1.1	ESA-Listed Species	29
4.1.2	Non-listed Species	32
4.1.3	Vegetation	33
4.1.4	Wetlands	33
4.1.5	Essential Fish Habitat	33
4.1.6	Invasive Species	34
4.1.7	Cultural Resources	34
4.1.8	Socioeconomics	35
4.1.9	Hydrology, Water Quality, and Water Quantity	35
4.1.10	Groundwater	36
4.1.11	Agriculture	37
4.1.12	Climate Change.....	37
4.2	Alternative 2: No Action.....	37
4.2.1	ESA-Listed Species	37
4.2.2	Non-listed Species	38
4.2.3	Vegetation	39
4.2.4	Wetlands	39
4.2.5	Essential Fish Habitat	39
4.2.6	Invasive Species	39
4.2.7	Cultural Resources	39
4.2.8	Socioeconomics	40
4.2.9	Hydrology, Water Quality, and Water Quantity	40
4.2.10	Groundwater	40
4.2.11	Agriculture	40
4.2.12	Climate Change.....	40
5	Cumulative Effects.....	41
5.1	Introduction.....	41
5.2	Geographic Scope	41
5.3	Timeframe.....	41
5.4	Past, Present, and Reasonably Foreseeable Future Actions.....	41
5.5	Cumulative Effects Summary	42
6	References Cited	45
7	Appendices.....	52
7.1	Appendix A.....	52

List of Tables

Table 1. Applicants and Enrolled Properties affiliated with the Agreement. 3

Table 2. Routine Agricultural Activities..... 7

Table 3. Summary of Projects and Associated Conservation Benefits Included in the Site Plan
Agreements for Enrolled Properties 12

Table 4. Non-Listed plant species potentially occurring the Covered Area, and their preferred
habitat characteristics..... 22

Table 5. Summary of cumulative effects to the resources analyzed in this EA under each of the
two alternatives. 43

List of Figures

Figure 1. The Covered Area for the EA, which includes all Enrolled Properties for the
Agreement..... 8

List of Abbreviations and Acronyms

AMM	Avoidance and Minimization Measure
BDA	beaver dam analog
BMA	Beneficial Management Activity
CDFW	California Department of Fish and Wildlife (formerly known as California Department of Fish and Game)
CESA	California Endangered Species Act
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CNDDDB	California Natural Diversity Database
CHERP	Conservation Habitat Enhancement and Restoration Program
DWR	Department of Water Resources
EA	environmental assessment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESP	Enhancement of Survival Permit
ESU	Evolutionarily Significant Unit
FMS	Flow Management Strategy
FR	Federal Register
GID	Grenada Irrigation District
GSP	Groundwater Sustainability Plans
IFN	Instream Flow Needs
HAPC	Habitat Areas of Particular Concern
HVR	Hidden Valley Ranch
LWD	Large Woody Debris
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MWCD	Montague Water Conservation District
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PAWS	post-assisted wood structures
PFMD	Pacific Fishery Management Council
SGMA	Sustainable Groundwater Management Act
TAC	Technical Advisory Committee
SONCC	Southern Oregon/Northern California Coast
SWCG	Shasta Watershed Conservation Group
US	United States
USFWS	United States Fish and Wildlife Service

1 Purpose and Need

1.1 Background

NOAA's National Marine Fisheries Service (NMFS) proposes to enter into a Template Safe Harbor Agreement for Conservation of Coho Salmon in the Shasta River (Agreement; Exhibit A of the Forbearance Agreement (Watermaster District and SWCG 2020)), and 14 associated Site Plan Agreements. The parties to the Agreement would include the California Department of Fish and Wildlife (CDFW), NMFS, and the landowners and irrigation districts listed in Table 1 (Applicants). Under the Agreement and Site Plan Agreements and pursuant to section 10(a)(1)(A) of the Endangered Species Act (ESA), NMFS would issue enhancement of survival permits (ESPs) to the Applicants. CDFW would participate both as a regulatory agency and as a property owner applying for an ESP for state lands covered by the Agreement (Big Springs Wildlife Area). All of the Applicants except CDFW formed a nonprofit 501(c)(5) called the Shasta Watershed Conservation Group (SWCG). The SWCG is comprised of representatives from Hidden Valley Ranch (HVR), Seldom Seen Ranch, Hole in the Ground Ranch, Shasta Springs Ranch, Cardoza Ranch, North Annex Property, Rice Livestock Company, Grenada Novy Ranch, NB Ranches, Inc., the Montague Water Conservation District (MWCD), and the Grenada Irrigation District (GID). The SWCG negotiated the Agreement with NMFS and CDFW. In addition, each Applicant would will enter into a Site Plan Agreement for their property that is subject to the Agreement (Enrolled Property). We refer to the combined extent of the Enrolled Properties that would be subject to the Agreement as the Covered Area (Figure 1).

Table 1. Applicants and Enrolled Properties affiliated with the Agreement.

Applicant	Permit Number	Enrolled Property
Outpost North Annex	23271	Belcampo-North Annex Property 8030 Siskiyou Blvd, Grenada, CA 96038
California Department of Fish and Wildlife	23276	Big Springs Ranch Wildlife Area 41° 35' 44.76 N 122° 27' 31.52 W
Cardoza Ranch	23278	Cardoza Ranch 3710 East Louie Road, Montague, CA 96064
Edson Foulke Ditch Company	23279	Edson-Foulke Point of Diversion 41° 43' 52.6 N 122° 47' 46.8 W
Grenada Irrigation District	23280	Grenada Irrigation District Point of Diversion 41° 38' 11.56' N 122° 29' 22.88 W
2019 Lowell L. Novy Revocable Trust	23284	Grenada-Novy Ranch Gazelle – 19931 Old Hwy 99 S, Gazelle, CA 96034 Grenada – 2426 County Hwy A-12, Grenada, CA 96034
Hidden Valley Ranch	23285	Hidden Valley Ranch 13521 Big Springs Road, Montague, CA 96064
Emmerson Investments, Inc.	23286	Hole-in-the-Ground Ranch 11825 Big Springs Road, Montague, CA 96064
Montague Water Conservation District	23287	Montague Water Conservation District 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
NB Ranches, Inc.	23434	Nicoletti Ranch 1824 DeSouza Lane, Montague, CA and 2238 DeSouza Lane, Montague, CA
Outpost Mole Richardson	23288	Parks Creek Ranch 25801 Old Hwy 99, Weed, CA 96094
Rice Livestock Company	23289	Rice Livestock Company 1730 County Highway A12, Montague, CA
Emmerson Investments, Inc.	23290	Seldom Seen Ranch 41° 54' 63.2 N 122° 38' 35.7 W
Emmerson Investments, Inc.	23291	Shasta Springs Ranch 21305 Slough Road, Weed, CA 96094

The main purpose of entering into the Template Safe Harbor Agreement and Site Plan Agreements for the Enrolled Properties is to promote the conservation, enhancement of survival, and recovery of the Southern Oregon and Northern California Coast (SONCC) Evolutionarily Significant Unit (ESU) of coho salmon (Covered Species), which is listed as “threatened” under the ESA, on non-federal lands in the Shasta River watershed. Activities covered by the

Agreement include land and water management and use, such as water diversion and delivery by irrigation districts, wildlife, fisheries, and habitat management, and ranching operations that either divert water from the properties listed in Table 1 (Covered Area) and/or are riparian to Parks Creek, Shasta River, Big Springs Creek, other smaller tributaries, or related springs. Land and water management and use activities are referred to in the Agreement as Routine Agricultural Activities. The Agreement and Site Plan Agreements provide assurances to the Applicants that activities they undertake to improve habitat conditions for SONCC coho salmon will not expose them to liability or additional regulatory requirements under the ESA. At the end of the Agreement, the Applicants may return their Enrolled Properties to Baseline Conditions or Elevated Baseline Conditions, as specified in their Site Plan Agreements.

The NMFS proposes to issue ESPs under Section 10(a)(1)(A) of the to the Applicants in accordance with the terms of the Agreement and Site Plan Agreements. These ESPs encourage voluntary conservation efforts by the non-federal landowners and provide the landowners with assurances that they would not be subject to future restrictions under the ESA if those efforts attract Covered Species to their Enrolled Properties or result in increased distribution or abundance of Covered Species.

The joint and respective responsibilities of NMFS, CDFW, and the Applicants are described in the Agreement. Each Applicant submitted to NMFS a Site Plan Agreement, which is a written agreement between NMFS, CDFW, and the Applicant specific to an Enrolled Property that includes:

- (1) a general description of the property, including a map and water rights;
- (2) a description of Baseline Conditions on the Enrolled Property;
- (3) if applicable, a description of Elevated Baseline Conditions for the Enrolled Property;
- (4) a description of Routine Agricultural Activities carried out on the Enrolled Property; measures that the Applicant will implement to avoid or minimize adverse effects to the Covered Species from activities carried out on the Enrolled Property (Avoidance and Minimization Measures, or AMMs); and activities the Applicant will undertake to benefit the Covered Species (Beneficial Management Activities, or BMAs);
- (5) monitoring and reporting requirements;
- (6) a description of potential funding sources and timeline for the Applicant to carry out BMAs, AMMs, and monitoring and reporting requirements; and
- (7) other pertinent information.

The Agreement, Site Plan Agreement, and ESP have a term of 20 years, which could be extended by mutual written consent of NMFS, CDFW, and the Applicants, as stipulated in the Agreement. The Site Plan Agreements document the agreed-upon Beneficial Management Activities to be undertaken by the Applicant on their Enrolled Property that are expected to benefit SONCC coho salmon.

In accordance with the National Environmental Policy Act (NEPA), NMFS has developed this environmental assessment (EA) to evaluate the effects of entering into the Agreement and associated Site Plan Agreements and issuing ESPs to the Applicants under Section 10(a)(1)(A) of the ESA. Our analysis focuses on the issuance of ESPs as the Proposed Action, since the ESPs would authorize the on-the-ground activities that may have environmental consequences.

This EA is consistent with NMFS's NEPA purpose, scope, and policies described in the Companion Manual for NOAA Administrative order 216-6A. This EA describes the environmental resources in the Covered Area, and within that area, analyzes the effects of the Proposed Action and a No Action Alternative on the environment and proposes mitigation measures to reduce any effects to less than significant levels.

1.2 Purpose and Need Statement

The purpose of the Proposed Action is to allow the Applicants to voluntarily conduct beneficial activities on non-federal lands that will enhance the survival and recovery of the Covered Species. The Proposed Action would accomplish this by providing the Applicants with assurances that no new ESA restrictions related to the Covered Species will be imposed on them as long as they comply with the terms of the Agreement, Site Plan Agreements, and ESPs. The Proposed Action would lead to implementation of several priority recovery actions identified in the SONCC coho salmon Recovery Plan, including increasing instream flows by securing unused water rights and establishing a water trust to benefit salmon, increasing cold water in the Upper Shasta basin, reducing water temperatures and increasing dissolved oxygen, increasing instream flows by improving the GID ditch diversion to decrease impacts to SONCC coho salmon, addressing passage concerns in Parks Creek, and reducing warm tailwater inputs into the stream (NMFS 2014). The Agreements and ESPs would allow the Applicants to implement habitat enhancement projects for SONCC coho salmon (BMAs) as well as Routine Agricultural Activities using the Avoidance and Minimization Measures identified in the Site Plan Agreements and ESPs.

The Proposed Action is needed to facilitate implementation of the Agreement and Site Plan Agreements, which are expected to promote the recovery of SONCC coho salmon on non-federal property within the Shasta River Valley in Siskiyou County, California. The Proposed Action would authorize incidental take of SONCC coho salmon caused by Routine Agricultural Activities and BMAs provided applicable AMMs and the terms and conditions of the Agreement are fully implemented. In addition, the Proposed Action is needed to further recovery of the SONCC coho salmon ESU and provide a net conservation benefit to the species.

Under the Proposed Action, NMFS would review the Agreement, Site Plan Agreements, and the Applicants' ESP applications and decide whether to enter into the Agreement and Site Plan Agreements and issue the requested ESPs pursuant to the requirements of Section 10(a)(1)(A) of the ESA, in accordance with NEPA policy and guidelines.

1.3 Public Involvement

The Parties to the proposed Agreement have engaged in a public process that included formation of a Technical Advisory Committee (TAC) consisting of technical advisors representing multiple groups, including: SWCG (landowners), California Trout, the Nature Conservancy, the Yurok Tribe, NMFS, CDFW, MWCD, GID, Emmerson Investments, and the Scott Valley and Shasta Valley Watermaster Districts. Participants in the TAC executed a nondisclosure agreement with the Applicants. This TAC process was important in developing many aspects of the Site Plan Agreements and Agreement. The Agreement, Site Plan Agreements, and related documents were made available for a public comment period from October 15, 2019 to December 31, 2019

(84 FR 59358 (November 4, 2019), 84 FR 55145 (October 15, 2019)). NMFS considered the comments received on the Federal Register Notice during the development of the EA and in its decision making process. Each public and tribal comment received was considered by NMFS and some changes to the Agreement and/or Site Plan Agreements were made based on comments. The manner in which comments were considered and incorporated into the Agreement and Site Plan Agreements is described in Appendix A.

1.4 Action Area

The action area for this EA is the Covered Area (Figure 1). Table 2 summarizes the Routine Agricultural Activities carried out by the Applicants in the Action Area, which encompasses lands adjacent to the Shasta River, Parks Creek, or Big Springs Creek that are primarily managed for agricultural production and rural residences.

Table 2. Routine Agricultural Activities

Property Title	Property Size (acres)	Property Use
Belcampo-North Annex Property (North Annex)	4,167	Pasture
Big Springs Ranch Wildlife Area	6,000	Wildlife Management, Fisheries Management, Pasture
Cardoza Ranch	497	Pasture
Edson Foulke Yreka Ditch Company	N/A	Ditch association operation of diversion point for pasture production, crop production, stock water, and delivery to storage. Diversion irrigates 488.1 acres
GID	5.81	A special district that owns and operates four parcels including the point of diversion, a lift station, and a parcel along the main ditch. GID provides water to over 60 users who irrigate up to 1,477 acres
Hidden Valley Ranch	431	Pasture
Novy Ranches	659	Pasture
Hole in the Ground Ranch	3,100	Pasture
MWCD	228	Pasture
NB Ranches, Inc. (Nicoletti)	357.2	Pasture
Parks Creek Ranch	5,100	Pasture
Rice Livestock Company, Inc. (Rice Livestock)	2,100	Pasture
Seldom Seen Ranch	1,421	Pasture
Shasta Springs Ranch	5,900	Pasture

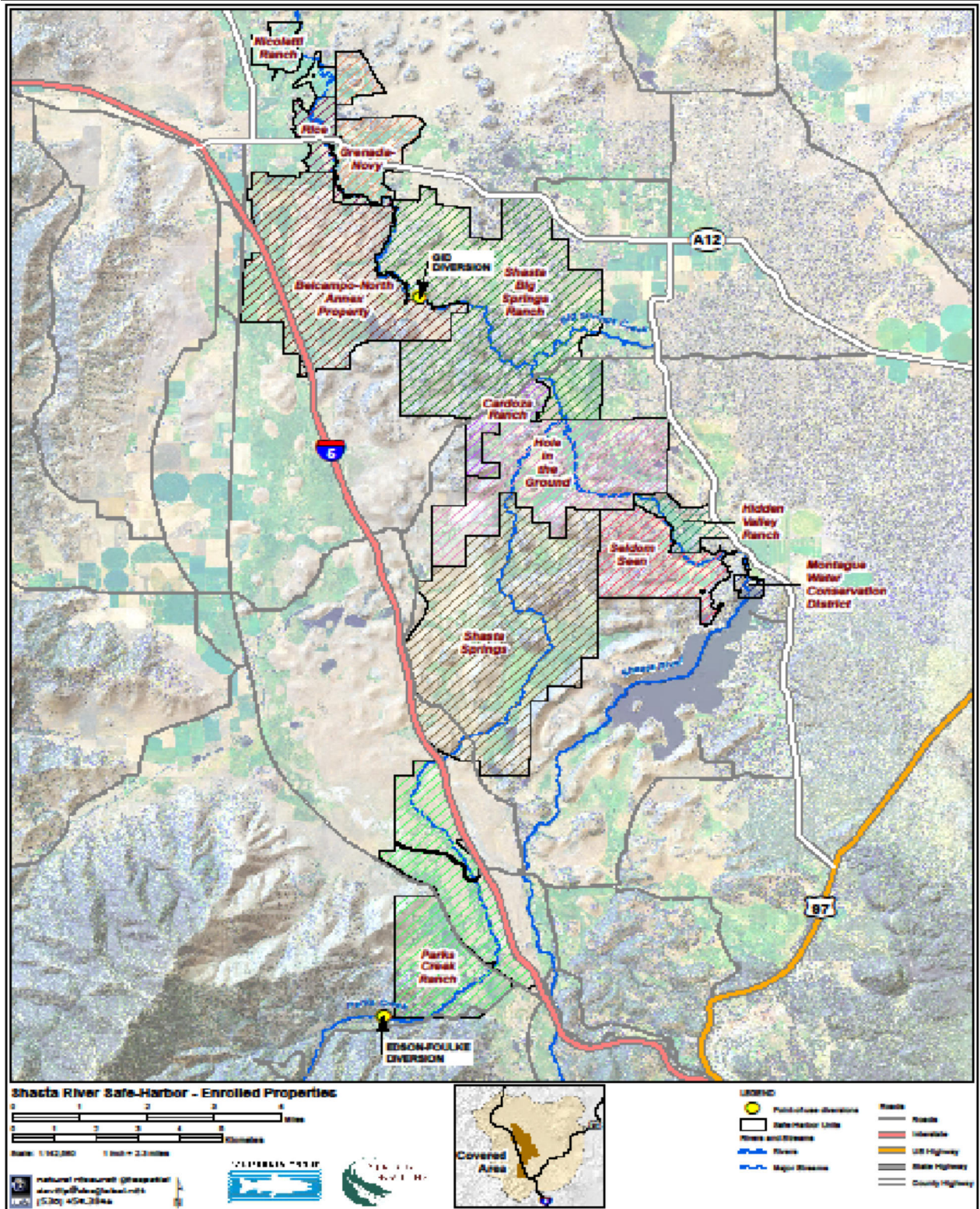


Figure 1. The Covered Area for the EA, which includes all Enrolled Properties for the Agreement.

2 Description of Proposed Action and Alternatives

2.1 Alternative 1: Issue Enhancement of Survival Permits

Alternative 1 is the Proposed Action, under which NMFS would issue ESPs to the Applicants for SONCC coho salmon. The ESPs would authorize incidental take associated with the activities described in the Agreement and Site Plan Agreements. Section 10(a)(1)(A) of the ESA provides for the issuance of ESPs for any act that would otherwise be prohibited by ESA section 9, if the act would enhance the propagation or survival of the affected species. NMFS provides assurances through the Agreement that no new ESA restrictions beyond the Agreement, Site Plan Agreements, and ESPs would be placed on the use of the Enrolled Properties should the Covered Species become more numerous as a result of the activities covered by the Agreement (Covered Activities). The term of the proposed Agreement, Site Plan Agreements, and ESPs is 20 years from the time of signing, with the potential for extensions as described in the Agreement.

2.1.1 Covered Activities

“Covered Activities” as defined in the Agreement includes Routine Agricultural Activities, Beneficial Management Activities, Avoidance and Minimization Measures, Return to Baseline (or Enhanced Baseline if applicable), and associated monitoring and reporting activities. More specifically, Covered Activities include the following 15 categories of activities:

- 1) Routine Agricultural Activities - means lawful practices for production of livestock, pasture and hay, and other crops, including, but not limited to, cultivation, growing, harvesting, and replanting of pasture and other crops; diversion of water, irrigation, irrigation run-off; preparation for market, vehicle operation, watering, and moving of livestock, and operation and maintenance of facilities associated with the production of livestock, pasture, and hay performed by a Permittee as described in the Permittee’s Site Plan Agreement.
- 2) Water Diversion and Diversion Facilities –includes diversions of surface water through conduits or openings from streams, channels, or sloughs within the geographic scope of the Agreement by a Permittee in accordance with a valid water right.
- 3) Irrigation Management and Maintenance - 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/sump.
- 4) Pasture Grazing and Riparian Grazing Management - includes the movement of cattle between pastures, as well as harrowing, mowing, and haying of pastures.
- 5) Fence Maintenance - includes 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 and stock-water access.
- 6) Road Use and Maintenance - includes grading, rocking, laying base, and culvert replacement.
- 7) Livestock and Vehicle Wet Crossings - includes moving livestock, vehicles, ATVs, and equipment across flowing streams or intermittent channels, stock water access, and/or the construction, maintenance, and use of stream crossings at designated locations where

potential Covered Species spawning gravels, incubating eggs, and fry are not present, and use of wet crossings, which are also only allowed where the Covered Species is absent.

- 8) Herbicide (Weed Management), Fertilizer and Pesticide Use -includes weed management, in the form of livestock grazing, use of California legal weed spray products, manual removal, burning, and mowing.
- 9) Flood or Emergency Events - includes immediate work needed to prevent loss of or damage to property from emergencies, including flood, fire, storm, earthquake or other unexpected natural events.
- 10) Beneficial Management Activities (BMAs) – includes activities implemented to benefit the Covered Species, as specified in the Site Plan Agreement for each Enrolled Property. This term also includes associated Avoidance and Minimization Measures (AMMs). The primary objective of the Agreement and Site Plan Agreements is to enhance, restore, or maintain habitat to benefit the Covered Species. The suite of potential BMAs that could be implemented under the Agreement include: barrier modification and fish passage, fish screen installation or replacement, instream habitat structures and improvements, riparian habitat restoration, bioengineering and fencing, off-channel and side-channel restoration, road and trail erosion control, and water conservation measures. All potential BMAs include associated monitoring.
- 11) Instream Habitat Structures and Improvements – includes placement of large woody debris (LWD), boulder structures, and post-assisted wood structures (PAWS) or beaver dam analog structures (BDAS) to increase rearing habitat, and placement of imported spawning gravel.
- 12) Beaver Management – includes 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 has raised the water level to cause unwanted flooding of ranch infrastructure, landowners are permitted to modify the structure and discourage future beavers from utilizing the site once NMFS and CDFW have assessed the situation and agree on the extent of dam modification.
- 13) Barrier Modification for Fish Passage Improvement - includes projects that improve Covered Species passage through beaver dams, existing culverts, diversions, dams, bridges, and paved and unpaved fords through replacement, removal, or retrofitting.
- 14) Bioengineering and Riparian Habitat Restoration - includes the following types of projects: natural regeneration, livestock exclusion fencing, bioengineering, and revegetation
- 15) Removal of Small Dams (permanent and flashboard) - includes permanent, flash board, and seasonal dams.

The Agreement and Site Plan Agreements describe each activity in greater detail and also the associated AMMs for each activity. The specific activities that will be implemented by each Applicant on their Enrolled Property are described in individual Site Plan Agreements, and summarized in Table 3 below.

The BMAs implemented by the Applicants would include conservation and habitat enhancement activities on the Enrolled Properties for the benefit of the Covered Species. These activities include actions required to maintain Baseline Conditions and, if applicable, to achieve Elevated

Baseline Conditions, and other beneficial land and water management activities implemented to restore or enhance habitat for the Covered Species. An ESP will provide that, so long as the permittee is complying with the terms of the Agreement, Site Plan Agreement, and ESP, the permittee will not be liable for incidental take of Covered Species resulting from: Routine Agricultural Activities, Beneficial Management Activities, and Return to Baseline.

Under the Agreement, the Applicants commit to continuing practices that maintain the Baseline Conditions, or Elevated Baseline Conditions, and to enhance or restore conditions for SONCC coho salmon (Table 3).

2.1.2 Conservation Strategy

The Agreement and Site Plan Agreements describe actions to conserve SONCC coho salmon through specific projects that would provide a net conservation benefit for the Covered Species. Details of these BMAs are provided in the Agreement, individual Site Plan Agreements, and summarized in Table 3.

Table 3. Summary of Projects and Associated Conservation Benefits Included in the Site Plan Agreements for Enrolled Properties

Beneficial Management Activity	Conservation Benefit	Belcampo-North Annex Property (North Annex)	Big Springs Ranch Wildlife Area	Cardoza Ranch	Edson Foulke Yreka Ditch Company	Grenada Irrigation District	Hidden Valley Ranch	Novy Ranches	Hole in the Ground Ranch	Montague Water Conservation District (MWCD)	NB Ranches, Inc. (Nicoletti)	Parks Creek Ranch	Rice Livestock Company, Inc. (Rice Livestock)	Seldom Seen Ranch	Shasta Springs Ranch
Place spawning gravel	Increase spawning habitat	X	X				X	X	X	X				X	
Install large woody debris	Provide predator escape and resting cover, increase spawning habitat, improve migration corridors, improve pool to riffle ratios, and add habitat complexity and diversity.	X	X			X	X	X	X	X	X	X	X	X	
Improve fish passage	Provide access to upstream habitat and increase the duration of accessibility (both within and between years).		X	X				X	X	X			X	X	X
Diversion screening	Reduce the potential for stranding and bypass flow heating in the ditch.			X	X		X	X		X		X		X	X
Riparian restoration and revegetation	Improve habitat through increased stream shading that is intended to lower stream temperatures, increase future recruitment of LWD to streams, and increase bank stability and invertebrate production.	X	X	X	X		X	X	X	X	X	X		X	
Livestock exclusion fencing/off-channel stock watering	Improve the conditions of stream banks, water quality and the riparian corridor		X	X				X	X	X	X	X			

Table 3 (continued). Summary of Projects and Associated Conservation Benefits Included in the Site Plan Agreements for Enrolled Properties

Beneficial Management Activity	Conservation Benefit	North Annex	Big Springs Ranch Wildlife Area	Cardoza Ranch	Edson Foulke Yreka Ditch Company	Grenada Irrigation District	Hidden Valley Ranch	Novy Ranches	Hole in the Ground Ranch	Montague Water Conservation District (MWCD)	Nicoletti	Parks Creek Ranch	Rice Livestock	Seldom Seen Ranch	Shasta Springs Ranch
Beaver management	Beaver dams create favorable habitat conditions for rearing coho salmon by providing slow water habitats with abundant woody cover. However, beaver dams may impede upstream migration of adults depending on the amount of flow available during the migration.	X	X			X	X		X	X	X	X	X	X	X
Create off-channel habitat	Provides rearing habitat for juveniles and improves hydrologic connection between floodplains and main channels	X	X								X	X			X
Tailwater capture and re-use	Allows the landowner to intercept tailwater and convey it to another place of use to utilize for irrigation, thereby reducing demand for surface water diversion.		X	X			X				X	X			
Reduce tailwater return	Prevents tailwater from entering the river.		X				X	X			X	X	X		X
Piping ditches	Reduces water loss including from evaporation and absorption.	X		X		X	X	X	X		X		X		
Line canals	Improves irrigation efficiency and dedicates conserved water instream to benefit Covered Species									X					
Move/Improve diversion point	Eliminates fish passage issues at existing diversions and improves efficiency.			X	X				X	X			X	X	
Cross fencing and soil moisture sensors	Optimizes irrigation application rate efficiency			X				X	X		X	X	X		
Diversion structure improvements	Facilitates better control and monitoring of water delivery for water conservation				X							X	X		X
Water exchange	Maintains/improves in-stream flows and water quality						X		X	X					X

2.1.3 Permit Term

The term of the proposed ESPs is 20 years following the signing date. One year prior to the expiration date of an ESP, the Parties will meet to decide whether to extend the term of the Template Safe Harbor Agreement. In addition, each Permittee, NMFS, and CDFW will meet to decide whether to extend the term of its Site Plan Agreement and renew its ESP.

2.2 Alternative 2: No Action

Under the No Action Alternative, NMFS would not issue ESPs. Under this alternative, the BMAs described in the Agreement and Site Plan Agreement would not be implemented in the Covered Area. Restoration, enhancement, and changes to operations and maintenance activities in the Shasta River watershed for the Covered Species in the Covered Area would likely not occur.

This alternative is the baseline against which the action alternative will be compared in the analysis of environmental consequences.

For the purpose of this analysis, this alternative would not meet the Purpose and Need for the Proposed Action, and the habitat conditions described in the Affected Environment section below would persist, and actions needed on non-federal lands to enhance the survival and recovery of the Covered Species would likely no occur.

2.3 Alternatives Considered and Eliminated from Further Consideration

The Site Plan Agreements resulted from extensive discussions and negotiations among landowners, agency staff, and other stakeholders. During the TAC review and discussions, a range of different environmental alternatives were suggested, including alternative flow scenarios. These alternative flow scenarios were found by the applicants to be unacceptable due to the impacts they would have on agricultural needs. Therefore, these alternatives are not considered in detail in this EA. The Management Strategy (FMS)(NMFS and AquaTerra 2020) synthesizes the considerations that went into selection of instream flows, the technical basis for these flows, and how these flows will provide a net conservation benefit for SONCC coho salmon.

3 Affected Environment

This section describes existing environmental conditions within the Covered Area. The subsections below provide descriptions of the natural and human-built environment potentially affected by approval of the Proposed Action (the issuance of ESPs) or the No Action Alternative.

3.1 Listed Species

3.1.1 Fish

Potentially occurring ESA-listed fish species in the Covered Area were determined in coordination with the USFWS (USFWS 2020) and CDFW (CDFW 2020). Of listed species

considered, only SONCC coho salmon was determined to have the potential to occur within the Covered Area.

The following documents, key points of which are summarized below, are some of the main resources NMFS considered in analyzing effects to SONCC coho salmon:

- Final rule affirming the listing of the SONCC coho salmon ESU as threatened (70 FR 37160 (June 28, 2005)),
- Final rule designating critical habitat for the SONCC coho salmon ESU (64 FR 24049 (May 5, 1999)),
- The SONCC coho salmon recovery plan (NMFS 2014)
- the most recent NMFS five-year status review for SONCC coho salmon (NMFS 2016), and
- Appendix 1 of the Agreement: Covered Species, Biological Requirements and Habitat Conditions.

The SONCC Coho Salmon Recovery Plan identifies key stressors on SONCC coho salmon in the Shasta River (NMFS 2014). SONCC coho salmon habitat within the Covered Area includes habitat for adult migration and spawning, spring juvenile redistribution and outmigration, summer rearing, and juvenile over-wintering. Key stressors in the Shasta River include seasonally impaired water quality and altered hydrologic function. Habitat requirements for SONCC coho salmon, habitat conditions in the Covered Area, and recommendations for habitat enhancement actions in the Covered Area, are described in detail in Appendix 1 of the Agreement: Covered Species, Biological Requirements and Habitat Conditions.

3.1.1.1 SONCC Coho Salmon Abundance and Productivity

Although long-term data on coho salmon abundance are scarce, the available evidence from short-term research and monitoring efforts indicate that spawner abundance has declined since the previous status review (Williams et al. 2011) for populations in this ESU (Williams et al. 2016a). In fact, most of the 30 independent populations in the ESU are at high risk of extinction because they are below or likely below their depensation threshold, which can be thought of as the minimum number of adults needed for survival of a population. The productivity of a population (i.e., production over the entire life cycle) can reflect conditions (e.g., environmental conditions) that influence the dynamics of a population and determine abundance. In general, declining productivity equates to declining population abundance. Available data show that the 95 percent confidence intervals for the slope of the regression line include zero for many populations in the SONCC coho ESU, indicating that whether the productivity is decreasing, increasing, or stable cannot be determined (McElhany et al. 2000, NMFS 2014).

3.1.1.2 SONCC Coho Salmon Spatial Structure and Diversity

The distribution of SONCC coho salmon within the ESU's range has been reduced and fragmented, as evidenced by an increasing number of previously occupied streams from which SONCC coho salmon are now absent (NMFS 2001, Good et al. 2005, Williams et al. 2011, Williams et al. 2016a). Extant populations can still be found in all major river basins within the

ESU (70 FR 37160 (June 28, 2005)). However, extirpations, loss of brood years, and sharp declines in abundance (in some cases to zero) of SONCC coho salmon in several streams throughout the ESU indicate that the SONCC coho salmon's spatial structure is more fragmented at the population-level than at the ESU scale. The genetic and life history diversity of populations of SONCC coho salmon is likely very low and is inadequate to contribute to a viable ESU, given the significant reductions in abundance and distribution.

3.1.1.3 Status of Critical Habitat

In designating critical habitat for the SONCC coho salmon ESU, NMFS identified the following five essential habitat types (PBFs): (1) juvenile summer and winter rearing areas; (2) juvenile migration corridors; (3) areas for growth and development to adulthood; (4) adult migration corridors; and (5) spawning areas. Within these areas, essential features of coho salmon critical habitat include adequate: (1) substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) safe passage conditions (64 FR 24049 (May 5, 1999)). The condition of SONCC coho salmon critical habitat, specifically its ability to provide for their conservation, has been degraded from conditions known to support viable salmonid populations. NMFS has determined that currently depressed population conditions are, in part, the result of the following human induced factors affecting critical habitat: overfishing, artificial propagation, logging, agriculture, mining, urbanization, stream channelization, dams, wetland loss, and water withdrawals (including unscreened diversions for irrigation). Impacts of concern include altered stream bank and channel morphology, elevated water temperature, lost spawning and rearing habitat, habitat fragmentation, impaired gravel and wood recruitment from upstream sources, degraded water quality, lost riparian vegetation, and increased erosion into streams from upland areas (Weitkamp et al. 1995, 70 FR 37160 (June 28, 2005), 64 FR 24049 (May 5, 1999)). Diversion and storage of river and stream flow has dramatically altered the natural hydrologic cycle in many of the streams within the ESU. Altered flow regimes can delay or preclude migration, dewater aquatic habitat, and strand fish in disconnected pools, while unscreened diversions can entrain juvenile fish.

3.1.1.4 Factors Related to the Decline of Species and Degradation of Critical Habitat

The factors that caused declines include hatchery practices, ocean conditions, habitat loss due to dam building, degradation of freshwater habitats due to a variety of agricultural and forestry practices, water diversions, urbanization, over-fishing, mining, climate change, and severe flood events exacerbated by land use practices (Good et al. 2005, Williams et al. 2016b). Sedimentation and loss of spawning gravels associated with poor forestry practices and road building are particularly chronic problems that can reduce the productivity of salmonid populations. Reduced flows can cause increases in water temperature, resulting in increased heat stress to fish and thermal barriers to migration.

New information since this SONCC coho salmon ESU was listed suggests that the earth's climate is warming, and that this change could significantly impact ocean and freshwater habitat conditions (Intergovernmental Panel on Climate Change 2014), which affects survival of coho

salmon. Of all the Pacific salmon species, coho salmon are likely one of the most sensitive to climate change due to their extended freshwater rearing. Additionally, the SONCC coho salmon ESU is near the southern end of the species' distribution and many populations reside in degraded streams that have water temperatures near the upper limits of thermal tolerance for coho salmon. Water temperature is likely to increase overall, with higher maximum temperatures along with higher minimum temperatures in streams. Increases in winter and spring temperature regimes are likely to include, but are not limited to, depletion of cold water habitat, variation in quality and quantity of tributary rearing habitat, alterations to migration patterns, accelerated embryo development, premature emergence of fry, increased bio-energetic and disease stresses on fish, and increased competition among species. In addition, the increase in summer water temperatures are likely to be especially dramatic since flows in many streams are expected to continue decreasing as a result of decreasing snowpack (Luers et al. 2006, Crozier et al. 2008, Doppelt et al. 2008, Crozier 2016). This loss of snowpack will continue to create lower spring and summertime flows while additional warming will cause earlier onset of runoff in streams.

3.1.1.5 SONCC coho salmon in the Shasta River

3.1.1.5.1 Juvenile Outmigration

Smolt emigration in the Shasta River coincides with the drop in flows from irrigation water withdrawal, typically in mid-April. Because there are significant water diversions and impoundments in the Shasta River, the unnatural and steep decline of the hydrograph following the start of the irrigation season in April decreases the quantity of rearing habitat and causes water temperatures to increase more quickly than would occur otherwise. These changes can displace young-of-year coho salmon, forcing them to redistribute in search of suitable rearing habitat and thereby increasing their risk of mortality (Gorman 2016). Similarly, the reduction in water quality and quantity likely has a negative impact to emigrating coho salmon smolts, increasing their risk of mortality.

3.1.1.5.2 Adult Migration

Migration timing of adult coho salmon entering the Shasta River typically begins in about the middle of October. The run typically begins to decrease quickly after the second week of December. Flow levels throughout the Shasta River typically increase after October 1st when most of the irrigation diversions upstream are turned off at the end of the season. Therefore, in most years, physical and hydrologic conditions in the lower Shasta River have improved by mid-October providing suitable conditions for adult coho salmon migratory access to spawning habitats in the upper Shasta River near Big Springs Creek. However, access to spawning habitats in Parks Creek can be delayed until base flow levels increase following the first series of fall storm events that typically occur during November. The irrigation season in Parks Creek does not end until November 1, a month later than irrigation diversions for the majority of the Shasta River watershed. In addition, there are several stock water diversions that continue to divert substantial volumes of water throughout the winter season. In dry water years, these diversions exacerbate low flow conditions in Parks Creek and can adversely impact or delay adult migration of coho salmon entering Parks Creek

3.1.1.5.3 Juvenile Rearing

Historically, instream river conditions, fostered by unique cold spring complexes, created abundant summer rearing and off channel overwintering habitat that were favorable for production of coho salmon in the Shasta River basin. However, a reduction in the frequency of large flood flows along with the elimination of sediment transport processes downstream of Dwinnell Dam have resulted in coarsening of the bed and reduction in habitat diversity immediately downstream of the dam. The loss of woody debris, pools, side channels, springs, and accessible wetlands from land use conversions have also contributed to reduced summer and winter rearing capacity for juvenile coho salmon (NMFS 2014). The current distribution of rearing coho salmon reflects the limited cold water refugia habitats generally associated with cold water springs or areas where cold hyporheic flows enter the channel either from gravel bars or bank seeps created by beaver dams or irrigation tailwater. This remaining suitable rearing habitat for coho salmon only comprises a small fragment of the current Shasta River stream network and of the modeled IP in the basin (NMFS 2014).

Juvenile rearing is currently confined to the mainstem Shasta River from RM 17 to RM 23, Big Springs Creek, Lower Parks Creek, Shasta River Canyon, Yreka Creek, and the upper Little Shasta River. Juvenile rearing can extend several kilometers upstream to cold water refugia habitats that are currently created by cold springs and spring creeks that enter the upper Shasta River (i.e., Hidden Valley Springs and Clear Springs) and Parks Creek (Kettle Springs). Juvenile coho salmon have been observed further upstream to about river kilometer 64 which is upstream of Hidden Valley Springs. Dwinnell Dam is located at approximately river kilometer 65.3. High water temperatures and erratic flow conditions created by delivery of water via the Shasta River channel to priority water right holders downstream of Dwinnell Dam appear to limit juvenile coho use of the river channel immediately downstream of Dwinnell Dam (NMFS 2017). Adams and Bean (2016) Adams and Bean (2016) found that over 70% of coho salmon fry PIT tagged in the upper Shasta River downstream of Big Springs Creek confluence migrated upstream to cold water refugia habitats in May and June of 2013 when water temperatures increased to 20°C.

Stream temperatures for summer rearing are poor throughout much of the mainstem Shasta River from its mouth upstream to near the confluence of Big Springs Creek. The onset of the irrigation season in the Shasta River watershed has a dramatic impact on discharge when large numbers of irrigators begin taking water simultaneously. This results in a rapid decrease in flows below the diversions, stranding coho salmon as channel margin and side channel habitat disappears and in some extreme cases channels can become entirely de-watered. Low stream flows can decrease rearing habitat availability for juvenile coho salmon. Further alterations to stream channel function from agricultural practices includes a reduction in the number of beaver ponds, which provide important habitat attractive to rearing coho salmon (NMFS 2014).

Streamflow in the Upper Shasta River is primarily controlled through releases from Dwinnell Reservoir, which is owned and operated by the Montague Water Conservation District (MWCD). Dwinnell Reservoir was constructed on the Upper Shasta River in 1928 with the purpose of storing water for irrigation use during the growing season. MWCD holds appropriative water right permits (Permit Numbers 2452 and 2453) which give MWCD the right to divert and store a

total of 49,000 acre-feet of water from the upper Shasta River (35,000 acre-feet) and Parks Creek (14,000 acre-feet) annually. There are several ways in which MWCD can release water to the Upper Shasta River downstream of Dwinnell Dam. These include releases of irrigation water to meet prior water right holders downstream, short term voluntary release of water and participation in water lease agreements to improve instream conditions for salmonids, and release of environmental water as agreed to under their Conservation and Habitat Enhancement and Restoration Program (CHERP) which was developed coincident with a Settlement Agreement with the Klamath River Keeper and Karuk Tribe.

Under the CHERP, once water conservation projects have been completed to their main canal, MWCD will increase instream environmental releases by an average of 4,400 acre-feet below Dwinnell Dam as a conservation measure to improve conditions for coho salmon. The environmental water will be used to support fisheries habitat enhancements through a combination of (a) releases of stored water from Dwinnell Reservoir to the upper Shasta River, (b) bypassing additional flows at its Parks Creek Diversion, (c) augmenting flows in the upper Shasta River through groundwater releases, and (d) potential water exchanges with downstream diverters. MWCD also proposes to implement other infrastructure improvements to support fisheries enhancement and recovery within the upper Shasta River and lower Parks Creek. These improvements include the enlargement of its Cross Canal that delivers released flow from Dwinnell Reservoir to the Shasta River and construction of wetland and cold water refugia habitat immediately downstream of Dwinnell Dam. All of these efforts will improve rearing conditions for coho salmon downstream of Dwinnell Dam.

The Shasta River LWD is depleted due to anthropogenic land use changes, including grazing and agricultural practices. Additionally, water diversions have likely lowered the water table throughout the basin, thereby limiting growth of riparian vegetation and channel forming wood. The lack of large wood in the Shasta River creates a deficit of shade and shelter, and decreases habitat complexity and pool volumes, all necessary components for over-summering juvenile survival.

3.1.1.5.4 Spawning Habitat

The Shasta River, with its cold flows and high productivity, was once especially productive for anadromous fishes. The current distribution of spawners is limited to the mainstem Shasta River from RM 17 to RM 23, Big Springs Creek, lower Parks Creek, and the Shasta River Canyon (Chesney and Knechtle 2015). The reduction of LWD recruitment, channel margin degradation, and excessive sediment has limited the development of complex stream habitat necessary to sustain spawning habitat in the Shasta Valley. Persistent low flow conditions through the end of the irrigation season (October 1) can also constrain the timing and distribution of spawning adult coho salmon. Unlike the majority of the Shasta Valley, the irrigation season in Parks Creek doesn't end until November 1, and there are also several stock water diversions that continue to divert throughout the fall and winter season. Therefore, persistent low flow conditions, particularly in dry years can limit the extent of spawning, and may in some years prevent coho salmon from spawning in Parks Creek. Potential migration barriers located at the Interstate 5 crossing on Parks Creek and within a degraded section of channel located further upstream

below a railroad trestle crossing may also impede adult coho salmon access to habitats upstream. Although most of the land is privately owned in the upper Parks Creek watershed and, therefore, difficult to access or survey, no coho salmon have been documented upstream of the Interstate 5 crossing (NMFS 2017).

In some reaches, particularly in the lower canyon and the reach below the Dwinnell Dam, limited recruitment of coarse gravels is likely contributing to a decline in abundance of spawning gravels (Ricker 1997). The causes of the decline in gravels include gravel trapping by Dwinnell Dam and other diversions, bank-stabilization efforts, and historical gravel mining in the channel. In a 1994 study of Shasta River gravel quality, Jong (1997) found that small sediment particles and fines (<4.75mm) were present in quantities associated with excessive salmon and steelhead egg mortality. Jong (1997) also concluded that gravel quality had deteriorated since 1980 when the DWR performed similar work in the Shasta basin. Greenhorn Dam blocks the movement of gravel down Yreka Creek, and alters the Yreka Creek hydrograph.

3.1.2 Plants

Potentially occurring listed plant species in the Covered Area are based on review of USFWS data (USFWS 2020), and California Natural Diversity Database (CNDDB) data (CDFW 2020). Three plant species listed as endangered under the ESA, Applegate's milk-veitch (*Astragalus applegatei*), Gentner's fritillary (*Fritillaria gentneri*), Yreka phlox (*Phlox hirsute*), and one ESA Candidate Species, the whitebark pine (*Pinus albicaulis*) were identified as potentially occurring in the Covered Area, or to have occurred there historically. However, there is no record of them having been identified in the Covered Area. Critical habitat has not been designated for any of these species.

3.1.3 Other Wildlife

3.1.3.1 Birds

Potentially occurring listed bird species in the Covered Area based on review of USFWS data (USFWS 2020), and CNDDB data (CDFW 2020). There are four species of bird listed under either the ESA or the California Endangered Species Act (CESA) that were identified to potentially occur in the Covered Area, or to have occurred there historically. These include: 1) the Greater Sandhill Crane (*Antigone canadensis tabida*, CESA - Threatened), 2) Bank Swallow (*Riparia riparia*, CESA - Threatened), 3) Yellow-billed Cuckoo (*Coccyzus americanus*, ESA - Threatened), and 4) the Northern Spotted Owl (*Strix occidentalis caurina*, ESA - Threatened). Neither the Yellow-billed Cuckoo nor the Northern Spotted Owl have been recorded in the Covered Area. However, there are historical observations of both the Bank Swallow and the Greater Sandhill Crane in or near the Covered Area, so those species are further discussed below.

3.1.3.1.1 Bank Swallow

Bank Swallows are colonial nesters, and nest primarily in riparian and other lowland habitats west of the desert. They require vertical banks/cliffs with fine-textured/sandy soils near stream, river, lakes, or the ocean to dig nesting holes. Bank Swallows have been observed at several locations in or near the Covered Area, including in 2008 on the Shasta River 1.5 Miles ENE off I-5 at Pumphouse Road, and in 1993 just west of Dwinnell Dam on Lake Shastina, and are presumed extant in the Covered Area. (CDFW 2020).

3.1.3.1.2 Greater Sandhill Crane

Greater Sandhill Crane nest in wetland habitats in northeastern California, and winter in the California Central Valley. They prefer grain fields within four miles of a shallow body of water, which they use as a communal roost site, and utilize irrigated pasture as loafing sites. Two pairs of Greater Sandhill Cranes were observed in 2000 east of Grenada, about 0.7 miles south of Barton Lake, and are presumed extant in the Covered Area (CDFW 2020).

3.1.3.2 Mammals

Potentially occurring listed mammal species in the Covered Area are based on review of USFWS data (USFWS 2020), and CNDDDB data (CDFW 2020). One mammal species listed as endangered under the ESA, the wolf (*Canis lupis*), and two mammal species listed as Proposed to be Threatened under the ESA, the fisher (*Pekania pennanti*) and the North American wolverine (*Gulo gulo luscus*) were identified as potentially occurring in the Covered Area, or to have occurred there historically. However, there is no record of them having been identified in the Covered Area, and critical habitat has not been identified for these species.

3.1.3.3 Crustaceans

Potentially occurring listed crustacean species in the Covered Area are based on review of USFWS data (USFWS 2020), and CNDDDB data (CDFW 2020). Two crustacean species listed as endangered under the ESA, the Conservancy Fairy Shrimp (*Branchinecta conservatioi*) and the Vernal Pool Tadpole Shrimp (*Lepidurus packardii*), and one crustacean species listed as threatened under the ESA, the Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) were identified as potentially occurring in the Covered Area, or to have occurred there historically. However, there is no record of them having been identified in the Covered Area, and the Covered Area is outside the Critical Habitat for all of these species.

3.1.3.4 Amphibians

Potentially occurring listed amphibian species in the Covered Area are based on review of USFWS data (USFWS 2020), and CNDDDB data (CDFW 2020). One amphibian species listed as threatened under the ESA, the Oregon Spotted Frog (*Rana pretiosa*) was identified as potentially occurring in the Covered Area, or to have occurred there historically. However, there is no record of the Oregon Spotted Frog having been identified in the Covered Area, and the Covered Area is outside of Oregon Spotted Frog Critical Habitat.

3.2 Non-listed Species

3.2.1 Fish

The proposed action has the potential to effect numerous non-listed fish species that potentially occur in the Covered Area. These include both native species (e.g., Chinook salmon (*Oncorhynchus tshawytscha*), steelhead/rainbow trout (*Oncorhynchus mykiss*), sculpin species (*Cottus sp.*), speckled dace (*Rhinichthys osculus*)) and non-native species (e.g., brown trout (*Salmo trutta*)), many of which have been identified in the Covered Area (CDFW 2020). Life history and habitat requirement characteristics are variable among species, but there is overlap in required habitat characteristics in that all fish species require water of reasonable quality and quantity.

3.2.2 Plants

The proposed action has the potential to effect numerous non-listed plant species that potentially occur in the Covered Area. However, a complete list of those plants has not been generated. Therefore, this document will only discuss non-listed plant species that CDFW categorizes as sensitive or rare that have been identified as potentially occurring in the action area. Eight such species have been identified, and they are described along with their habitat preferences in Table 4, below (CDFW 2020).

Table 4. Non-Listed plant species potentially occurring the Covered Area, and their preferred habitat characteristics.

Common Name	Species	Habitat Characteristics
wooly balsam root	<i>Balsamorhiza lanata</i>	Cismontane woodland. Open woods, grassy slopes. Volcanic substrates.
Shasta chaenactis	<i>Chaenactis suffrutescens</i>	Lower montane coniferous forest, upper montane coniferous forest. Sandy or serpentine soils.
alkali hymenoxys	<i>Hymenoxys lemmonii</i>	Great basin scrub, lower montane coniferous forest, meadows and seeps. Subalkaline soils.
subalpine aster	<i>Eurybia merita</i>	Upper montane coniferous forest.
brittle prickly pear	<i>Opuntia fragilis</i>	Pinyon and juniper woodland. Volcanic soils.
hairy marsh hedge-nettle	<i>Stachys pilosa</i>	Great basin scrub, meadows and seeps. Mesic sites.
coast fawn lily	<i>Erythronium revolutum</i>	Bogs and fens, broadleafed upland forest, north coast coniferous forest. Mesic sites. Streambanks.
Henderson's triteleia	<i>Triteleia hendersonii</i>	Cismontane woodland. Open slopes and roadbanks.

3.2.3 Other Wildlife

The proposed action has the potential to effect numerous non-listed animal species that potentially occur in the Covered Area. However, a complete list of those species has not been generated. Therefore, this document will only discuss non-listed animal species that CDFW categorizes as sensitive or rare that have been identified as potentially occurring in the action area. Only one such species has been identified in the Covered Area, the American badger (*Taxidea taxus*). American badger are most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. American badger prey on burrowing rodents, and dig burrows themselves (CDFW 2020).

3.3 Vegetation

Various plant communities occur within the Covered Area including, but not limited to, western juniper woodland, montane hardwood conifer forest, montane riparian woodland, annual grassland, agricultural fields, and disturbed/ruderal areas. The proposed action is expected to affect predominantly riparian vegetation. Therefore, only riparian vegetation is further discussed in this document.

A healthy riparian corridor provides multiple benefits for wildlife, including SONCC coho salmon. Healthy riparian communities improve stream bank stability, provide shade to help maintain cold water resources, and may provide a source of wood to the stream channel to create cover and improve habitat diversity for coho salmon. Riparian plant communities vary in composition and quality throughout the Covered Area. Some areas support large and contiguous cover of woody trees and shrubs, while other areas are highly altered or fragmented. There is also varying hydrological and sediment transport dynamics in the Covered Area that support different types of riparian plant communities in different reaches. Additional description of vegetation in the Covered Area, and related monitoring planned as part of the Proposed Action is described in the Adaptive Management Program for the Agreement (Appendix 3 of the Agreement), and in Covered Species, Biological Requirements and Habitat Conditions (Appendix 1 of the Agreement).

One of the proposed actions includes control of invasive vegetation. This activity is described in the Invasive Species section below.

3.4 Wetlands

Wetland loss is one of the major factors that NMFS has identified as having negatively affected SONCC coho salmon Critical Habitat. Wetland loss has also been identified as a concern in the Shasta River basin, where wetland loss has contributed to reduced summer and winter rearing capacity for juvenile coho salmon (NMFS 2014).

Wetland habitat in the Covered Area is described in additional detail in Appendix 1 of the Agreement, and summarized as follows. Throughout much of the Covered Area, wetland vegetation often extends beyond the banks. The riparian habitat of Upper Parks Creek can be described as four percent wetland. In Reach 5, herbaceous emergent and wetland vegetation dominates 79 percent of the reach, and open water dominates approximately 20 percent, primarily in the upstream portion.

3.5 Essential Fish Habitat

Section 305(b) of the MSA directs Federal agencies to consult with NMFS on all actions or proposed actions that may adversely affect Essential Fish Habitat (EFH). The MSA (section 3) defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” Adverse effect means any impact that reduces quality or quantity of EFH, and may include direct or indirect physical, chemical, or biological alteration of the waters or substrate and loss of (or injury to) benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality or quantity of EFH.

The Pacific Fishery Management Council (PFMC) described and identified EFH, adverse impacts, and recommended conservation measures for Pacific salmon (PFMC 2014). EFH for Pacific salmon, which in the Klamath Basin includes coho salmon and Chinook salmon, has been designated for the mainstem Klamath River and its tributaries from its mouth to Keno Dam, and upstream to Lewiston Dam on the Trinity River, tributary to the Klamath River. The EFH for Pacific salmon in the Shasta River watershed includes waters currently or historically accessible to salmon within the Shasta River watershed ecosystem, which includes the Covered Area (PFMC 2014). Habitat Areas of Particular Concern (HAPC) have been identified in Appendix A to the Pacific Coast Salmon Fisheries Management Plan (50 CFR § 660.412). HAPC for salmon are: complex channel and floodplain habitat, spawning habitat, thermal refugia, estuaries, and submerged aquatic vegetation. Therefore, in the Covered Area, EFH designation includes those freshwater HAPC for coho salmon and Chinook salmon that area associated with migration, holding, and rearing habitat in the Shasta River downstream of Dwinnell Dam, and Parks Creek downstream of the diversion, and any other parts of the Covered Area that are accessible to anadromous fish.

3.6 Invasive Species

The Covered Area is characterized by ranchlands primarily managed for livestock grazing and other agricultural uses. Numerous non-native species, including noxious weeds, occur throughout the Covered Area. Herbicide and pesticide use among the Applicants varies but is limited overall. Most herbicide use is limited to over-the-counter products such as Round-up, Milestone, or Capstone; and application follows the manufacturer’s label directions for use including application rates, temporal periods, and aquatic habitat buffers. Herbicide use in riparian zones is limited to spot use in specific problematic areas. Herbicide application is typically limited to areas subject to routine maintenance such as fence lines, pump stations and other structures, ditches, and roadways. Third party herbicide application may occur under the Siskiyou County weed abatement programs, outside of Applicants’ control, but would most likely be along county roads. Several Applicants do not apply any herbicides or pesticides.

3.7 Cultural Resources

As this project is subject to an ESA permit, the effort is defined as a federal undertaking requiring compliance with the National Historic Preservation Act (NHPA) (16 USC 470 et seq.), as amended. Therefore, a series of cultural resource inventories were completed to evaluate the

risks of the proposed action to any cultural resources that may be present in the Covered Area. Those reports, for each Permittee/permit number, include:

- Edson Foulke Ditch Company/23279
 - A Cultural Resources Investigation for the Upper Parks Creek Water Conservation Assessment (Rich 2020)
- Cardoza Ranch/23278
 - Cultural Resources Survey Report for the National Marine Fisheries Service, West Coast Region. Shasta River Template Safe Harbor Agreement Project, Cardoza Property (Coleman 2019a).
 - Cardoza Ranch Pipeline Project (Jones 2018a)
- California Department of Fish and Wildlife/23276
 - Cultural Resources Survey Report for the National Marine Fisheries Service, West Coast Region. Shasta River Template Safe Harbor Agreement Project, Big Springs Ranch Property (Coleman 2019b).
- Outpost North Annex/P23271
 - Cultural Resources Survey Report for the National Marine Fisheries Service, West Coast Region. Shasta River Template Safe Harbor Agreement Project Belcampo North Annex Property (Coleman 2019c)
- Grenada Irrigation District/23280
 - A Cultural Resources Survey for the Grenada Irrigation District Enclosed Lateral Project (Rich 2019)
- Emmerson Investments, Inc. Hole-in-the-Ground Ranch/23286
 - Cultural Resources Survey Report for the National Marine Fisheries Service, West Coast Region. Shasta River Template Safe Harbor Agreement Project, Hole in the Ground Ranch Property (Coleman 2019d)
- NB Ranches, Inc./23434
 - Cultural Resources Survey Report for the National Marine Fisheries Service, West Coast Region. Shasta River Template Safe Harbor Agreement Project, Nicoletti Property (Coleman 2019e)
- 2019 Lowell L. Novy Revocable Trust/23284
 - Cultural Resources Survey Report for the National Marine Fisheries Service, West Coast Region. Shasta River Template Safe Harbor Agreement Project, Novy Ranch Property (Coleman 2019f)
- Rice Livestock Company/23289
 - Cultural Resources Survey Report for the National Marine Fisheries Service, West Coast Region. Shasta River Template Safe Harbor Agreement Project, Rice Ranch Property (Coleman 2019g)
- Hidden Valley Ranch/23285
 - Shasta River Riparian Protection and Enhancement Project, Hidden Valley Ranch (Vaughan 2014)
 - Cultural Resource Survey for the Hidden Valley Ranch Efficiency Project (Jones 2016a)
 - Upper Shasta Habitat Restoration Project (Jones 2018b)

- Emmerson Investments, Inc. Shasta Springs Ranch/23291
 - Cultural Resource Survey for the Kettle Springs Improvement Project (Jones 2016b)
 - Cultural Resources Survey Report for the National Marine Fisheries Service, West Coast Region. Shasta River Template Safe Harbor Agreement Project, Shasta Springs Ranch Property (Coleman 2019h)
- Montague Water Conservation District/23287
 - Montague Water Conservation District Cultural Resources Inventory and Evaluation Addendum 2 (Baxter and Allen 2014)
 - Montague Water Conservation District, Dwinnell Enhancement (Raskin and Rich 2017)
- Outpost Mole Richardson/23288
 - A Cultural Resources Investigation for the Upper Parks Creek Water Conservation Assessment (Rich 2020)
- Emmerson Investments, Inc. Seldom Seen Ranch/23290
 - Cultural Resource Survey for the Hidden Valley Ranch Efficiency Project (Jones 2016a)
 - Upper Shasta Habitat Restoration Project (Jones 2018b)

Each cultural resources report contains findings and management considerations to be implemented including archeological monitoring during significant ground-disturbing activities, such as use of heavy equipment. Archival research and an intensive survey of the Area of Potential Effect (APE) resulted in the documentation of prehistoric and historic-era sites and artifacts. An evaluation of these resources indicated that none appear to retain the associations or characteristics that make them historically or scientifically important and none are recommended eligible per National Register of Historic Places (NRHP) criteria. Consequently, per the NHPA, no historic properties are contained within the APE's and no additional study or mitigation of project effects on these resources is necessary.

3.8 Socioeconomics

Proposed Action includes Routine Agricultural Activities, habitat improvement projects, and monitoring, which would be completed either by the applicant, or an approved contractor. Analysis of the proposed action includes an MSA analysis of effects to EFH for Pacific salmon including Chinook salmon, which support economically valuable commercial and recreational fisheries.

3.9 Hydrology, Water Quality, and Water Quantity

Key stressors in the Shasta River basin identified in the SONCC Coho Salmon Recovery Plan (NMFS 2014) include seasonally impaired water quality and altered hydrologic function. The most vital habitat in the Shasta River basin are its cold springs, which create cold water refugia for juvenile coho salmon, decrease overall water temperatures throughout the basin, and allow for successful summer rearing of individuals in natal and non-natal creeks and mainstem areas. The habitat parameters believed to be most important for coho salmon recovery and influenced by ranching and farming management activities, include hydrology/water quality, and floodplain function.

The availability of instream flow and water quality data varies considerably between reaches as described in Appendix 1 of the Agreement: Covered Species, Biological Requirements and Habitat Conditions. The level of detail describing the current status of these parameters within each reach also varies accordingly. McBain & Trush, Inc. (2013) developed Instream Flow Needs (IFNs) estimates for salmonid species that use the upper Shasta River and the lower eight miles of Parks Creek, also referred to as the Big Springs Complex. The study estimates the instream flows necessary to keep individual fish at specific life stages in good condition by determining suitable physical and thermal habitat conditions that must be provided by minimum instream flows. It should be noted that although habitat conditions provided by these minimum IFNs are intended to maintain individual fish in good condition, the recommended flows are not designed to meet the needs of riparian vegetation, geomorphic processes, or river-wide productivity. In their study, they developed flow recommendations for the Shasta River downstream of Parks Creek (Mid-Shasta Reach), Parks Creek downstream of I-5 crossing (Mid and Lower Parks Creek Reaches), and for the Upper Shasta River just upstream of the Parks Creek confluence (Upper Shasta River Reach). In addition, previous experimental flow releases have been conducted in the upper Shasta River and in Parks Creek to evaluate the potential effects that various flow management strategies have on water temperature (AquaTerra Consulting 2015, 2016, 2017).

Water quality and water quantity monitoring are required under the Agreement and are important for advancing the understanding of current instream flow and water quality conditions in the Covered Area, which is further described in Adaptive Management Program. Effectiveness Monitoring for hydrology and water temperature will consist of installation and operation of fixed monitoring stations located throughout the reaches within the Covered Area.

One goal of the FMS (NMFS and AquaTerra 2020), which is intended to help achieve the desired outcome of improved instream conditions for coho salmon, is to preserve and enhance aquatic and riparian habitat, specifically habitat conditions for each life stage of coho salmon. The FMS evaluates reach specific water quality and quantity limitations, and identifies actions that can benefit flow for coho salmon.

3.10 Groundwater

As mentioned in the Hydrology, Water Quality, and Water Quantity section above, the most vital habitat in the Shasta River basin are its cold springs, which create cold water refugia for juvenile coho salmon, decrease overall water temperatures throughout the basin, and allow for successful summer rearing of individuals in natal and non-natal creeks and mainstem areas. High summer water temperatures and low flow adversely affect rearing conditions during summer. Currently, rearing habitat is limited to small areas of thermal refugia associated with either spring flow contributions or direct connections with groundwater.

The Shasta Basin is categorized as medium priority under the California Sustainable Groundwater Management Act (SGMA)(DWR 2020). Under SGMA, local public agencies and Groundwater Sustainability Agencies in high- and medium-priority basins are required to develop and implement Groundwater Sustainability Plans (GSPs) or Alternatives to GSPs. GSPs are detailed road maps for how groundwater basins will reach long-term sustainability. The

Siskiyou County Flood Control and Water Conservation District intends to develop a GSP for the Shasta Basin, and has created a groundwater advisory committee that will provide feedback and recommendations regarding GSP development and activities (Siskiyou County 2018).

3.11 Agriculture

The Covered Area consists primarily of existing private agricultural land utilized for production of livestock, pasture and hay, and other crops, including, but not limited to: cultivation, growing, harvesting, and replanting of pasture and other crops; diversion of water, irrigation, irrigation run-off; preparation for market, vehicle operation, watering, and moving of livestock, and operation and maintenance of facilities associated with the production of livestock, pasture, and hay.

3.12 Climate Change

New information since this SONCC coho salmon ESU was listed suggests that the earth's climate is warming, and that this change could significantly impact freshwater habitat conditions (Intergovernmental Panel on Climate Change 2014), which affects survival of coho salmon. Of all the Pacific salmon species, coho salmon are likely one of the most sensitive to climate change due to their extended freshwater rearing. Additionally, the SONCC coho salmon ESU is near the southern end of the species' distribution and many populations reside in degraded streams that have water temperatures near the upper limits of thermal tolerance for coho salmon.

For Northern California and southern Oregon, most models project heavier and warmer precipitation. Extreme wet and dry periods are projected, increasing the risk of both flooding and droughts (DWR 2013). Annual precipitation could increase by up to 20 percent over northern California. A greater proportion of precipitation events occurring during the mid-winter months is likely to occur as intense rain and rain-on-snow events that are likely to lead to higher numbers of landslides and greater and more severe floods (Luers et al. 2006, Doppelt et al. 2008). Overall, summer base flow conditions will commence earlier, and winter rain dominated flow conditions will increase commence earlier. Risks to coho salmon from increased flooding, for example red scour, will be attenuated by Dwinnell Dam, while increased seasonality of low base flows are likely to increase risks from elevated water temperatures and reductions to suitable salmon habitat.

Climate change poses a potential threat to salmonids within the Shasta Valley, particularly SONCC coho salmon. The impacts of climate change in this region will likely have the greatest effects on juveniles, followed by smolts and adults. Currently, the climate in the Shasta Valley area is generally warm, and long-term regional average temperature models show a temperature increase; with average ambient temperatures increasing by as much as 3°C in the summer and 1°C in the winter, while annual precipitation in this area is predicted to trend downward over the next century. Additionally, snowpack in upper elevations of the Klamath Basin are predicted to decrease with changes in response to temperature and precipitation changes (California Natural Resources Agency 2009)

4 Environmental Consequences

The environmental consequences of the two alternatives evaluated in this EA are described in this section:

1. Issue Enhancement of Survival Permits (ESPs), and
2. No Action (No issuance of ESPs).

4.1 Alternative 1: Issue Enhancement of Survival Permits

Under Alternative 1, NMFS would issue the ESPs, and the Parties would implement the activities described in the Agreement, Site Plan Agreements, and ESPs. Alternative 1 would protect and enhance aquatic and riparian habitat through implementation of BMAs including barrier removals, instream flow enhancement strategies, and physical habitat enhancements for the conservation of the SONCC coho salmon in the Covered Area. These activities, and associated benefits, are summarized for each property in Table 3 above.

Following implementation, the Proposed Action is expected to result in a long-term improvement in habitat for SONCC coho salmon, resulting in long-term fisheries and ecosystem benefits that extend beyond the Covered Area. Effects of the Proposed Action would be positive towards maintaining the quality of the human environment.

The ESPs will authorize take of SONCC coho salmon incidental to the rights, obligations, and activities contemplated in the Agreement and Site Plan Agreements provided that such take is consistent with maintaining the Baseline Conditions or Elevated Baseline Conditions identified in Site Plan Agreements.

The environmental consequences of the Proposed Action on the resources described in the Affected Environment section above (i.e., listed species; non-listed species; vegetation; wetlands; Essential Fish Habitat; invasive species; cultural resources; socioeconomics; hydrology, water quality, and water quantity; groundwater, agriculture; and climate change) are discussed below. There is no indication that the Proposed Action will have an effect on any other resource and as a result no other resources are discussed (e.g., traffic, air quality, noise, etc.).

4.1.1 ESA-Listed Species

4.1.1.1 Fish

The one listed fish species expected to occur in the Covered Area is the SONCC coho salmon ESU. Anticipated effects of Alternative 1 to SONCC coho salmon are described in detail in the ESA Section 7 Biological Opinion on the issuance of the ESPs (NMFS 2020a), and in the Net Conservation Benefits document (NMFS 2020b), and are summarized by lifecycle below.

4.1.1.1.1 Juvenile Outmigration

Alternative 1 is expected to significantly improve conditions for juvenile outmigration. Currently, smolt emigration in the Shasta River coincides with a drop in flows from irrigation

water withdrawal, and there are significant water diversions and impoundments in the Shasta River. This resulting hydrology causes water temperatures to increase more quickly than would occur otherwise increasing the risk of mortality for juvenile coho salmon.

Several components of the Agreement are intended to alleviate stressors on juvenile outmigration. BMAs such as diversion screening and projects to improve fish passage will improve migratory conditions. Implementation of the FMS across the Covered Area is expected to result in improved water temperatures at the reach scale as water conservation projects are implemented and channel structure and riparian health improve over time. Implementation of the FMS, under the Agreement, is anticipated to provide improved instream flow and water quality relative to those conditions that current exist, and the greatest improvements are anticipated to occur during the spring and summer seasons when fry and juvenile coho salmon are present and migrating. Under the FMS, spring flows, when juvenile SONCC coho salmon are migrating, will better mimic natural snow melt hydrology and peak flow will generally meet or exceed minimum instream objectives recommended by for the upper Shasta River and Parks Creek.

4.1.1.1.2 Adult Migration

Alternative 1 is expected to improve conditions for adult migration. In most years, physical and hydrologic conditions in the lower Shasta River have improved by mid-October providing suitable conditions for adult coho salmon migratory access to spawning habitats in the upper Shasta River near Big Springs Creek. However, access to spawning habitats in Parks Creek can be delayed until base flow levels increase following the first series of fall storm events that typically occur during November. The FMS, which guides the development of the Agreement and the Site Plan Agreements, maintains specific adult migration focused seasonal flow objectives, and associated landowner commitments, under five potential water year types, that will increase flow during critical times for adult migration.

4.1.1.1.3 Juvenile Rearing

Alternative 1 is expected to significantly improve conditions for juvenile rearing. Historically, the most vital habitat in the Shasta River basin were its cold springs, which created cold water refugia for juvenile coho salmon, decreased overall water temperatures, and allowed for successful summer rearing of individuals in natal and non-natal creeks and mainstem areas. These areas have been significantly adversely affected by water withdrawals, agricultural activities, and riparian vegetation removal. These land use changes have compromised juvenile rearing areas by creating low flow conditions, high water temperatures, insufficient dissolved oxygen levels, and excessive nutrient loads.

Many of the BMAs are designed to specifically benefit juvenile rearing habitat by beneficially affecting water quality and quantity during times of year when juvenile coho salmon are rearing. Projects to optimize cold water spring inputs may include developing alcoves, off-channel and side-channel habitat, installing spring boxes or piping springs to the river to improve habitat conditions at a specific location. Many of the Site Plan Agreements include LWD installations, which are expected to improve juvenile summer and winter rearing habitat. In addition, riparian

restoration and revegetation projects, and livestock exclusion fencing/off-channel stock watering, are expected to improve habitat for this life stage.

The FMS includes flow objectives for both spring and summer rearing habitat, and outlines reach and water year specific targets that will improve conditions relative to the baseline.

4.1.1.1.4 Spawning Habitat

Alternative 1 is expected to significantly improve SONCC coho salmon spawning habitat. Currently, persistent low flow conditions, particularly in dry years can limit the extent of spawning, and may in some years prevent coho salmon from spawning in Parks Creek.

Many of the BMAs are expected to improve spawning habitat, most notably the placement of spawning gravel. However, other BMAs will also improve spawning habitat, whether through the recruitment of new gravels (e.g., LWD installation), providing improved ease of access, or by improving water quality and quantity, as discussed in the FMS.

4.1.1.1.5 Summary

Within the Covered Area, Alternative 1 is expected to have a positive effect on each lifestage of SONCC coho salmon that we considered, which includes all life stages that the Proposed Action is anticipated to affect: juvenile outmigration, adult migration, juvenile rearing, and spawning. Therefore, Alternative 1 is expected to have an overall positive effect on SONCC coho salmon, relative to environmental baseline conditions.

4.1.1.2 *Plants*

Three plant species listed as endangered under the ESA were identified as potentially occurring in the Covered Area. However, there is no record of them actually having been identified in the Covered Area, and critical habitat has not been designated for them. Therefore, it is reasonable to conclude that Alternative 1 will not affect listed plant species, and no further consultation with USFWS is required.

4.1.1.3 *Other Wildlife*

4.1.1.3.1 Birds

Four species of bird listed under either the ESA or CESA that were identified to potentially occur in the Covered Area, or to have occurred there historically, namely: 1) the Greater Sandhill Crane 2) Bank Swallow, 3) Yellow-billed Cuckoo, and 4) the Northern Spotted Owl. Neither the Yellow-Billed Cuckoo nor the Northern Spotted Owl have been recorded in the Covered Area, so it is reasonable to conclude that Alternative 1 will not affect these species. However, there are historical observations of both the Bank Swallow and the Greater Sandhill Crane in or near the Covered Area.

Bank Swallows nest in riparian habitat and have been observed in the Covered Area on the Shasta River. The covered BMAs intended to improve riparian habitat, including riparian revegetation and restoration, are designed to improved habitat for SONCC coho salmon, but may have the ancillary benefit of improving conditions for Bank Swallows as well.

Greater Sandhill Crane nest in wetland habitats, and they prefer grain fields within four miles of a shallow body of water, which they use as a communal roost site, and utilize irrigated pasture as loafing sites. Because the proposed action is likely to improve wetland habitat, as discussed in the Wetland section below, it is possible that Alternative 1 will also have a positive effect on Greater Sandhill Crane habitat.

4.1.1.3.2 Mammals

Three species of listed mammals, (i.e., wolf, fisher and wolverine) were identified as potentially occurring in the Covered Area, or to have occurred there historically. However, there is no record of them actually having been identified in the Covered Area, and critical habitat has not been identified for these species. Therefore, it is reasonable to conclude that Alternative 1 will not affect listed mammal species.

4.1.1.3.3 Crustaceans

Three species of listed crustacean (i.e., the Conservancy Fairy Shrimp, the Vernal Pool Tadpole Shrimp, and the Vernal Pool Fairy Shrimp) were identified as potentially occurring in the Covered Area, or to have occurred there historically. However, there is no record of them actually having been identified in the Covered Area, and the Covered Area is outside the Critical Habitat for all of these species. Therefore, it is reasonable to conclude that Alternative 1 will not affect listed crustacean species.

4.1.1.3.4 Amphibians

One species of listed amphibian (i.e., the Oregon Spotted Frog) was identified as potentially occurring in the Covered Area, or to have occurred there historically. However, there is no record of this species actually having been identified in the Covered Area, and the Covered Area is outside of its Critical Habitat. Therefore, it is reasonable to conclude that Alternative 1 will not affect listed amphibian species.

4.1.2 Non-listed Species

4.1.2.1 Fish

The proposed action has the potential to effect numerous non-listed fish species that potentially occur in the Covered Area. These include both native species (e.g., Chinook salmon, steelhead/rainbow trout, sculpin species, speckled dace) and non-native species (e.g., brown trout). Life history and habitat requirement characteristics are variable among species, but Alternative 1 is expected to positively impact non-listed fish by improving the aquatic environment in general. In addition, piscivorous non-listed fish species, may benefit under

Alternative 1 through increase prey abundance. Therefore, Alternative 1 is expected to positively affect non-listed fish species.

4.1.2.2 Plants

The proposed action has the potential to effect numerous non-listed plant species that potentially occur in the Covered Area. In the Affected Environment section we identified eight sensitive or rare species that occur in the Covered Area. However, of those species, only one is associated with riparian habitat that are likely to be significantly affected by the Proposed Action. Therefore, Alternative 1 is expected to have only a minor positive affect on non-listed plants.

4.1.2.3 Other Wildlife

One non-listed sensitive or rare mammal was identified as potentially occurring in the Covered Area, the American badger. American badger are not associated with riparian habitats, or other habitats that are likely to be affected by the proposed action. Therefore, it is reasonable to conclude that Alternative 1 will not affect sensitive-non listed mammals or other wildlife species.

4.1.3 Vegetation

Because the proposed action will mostly affect the riparian environment, this EA focuses on effects to riparian vegetation. Riparian plant communities vary in composition and quality throughout the Covered Area. Some areas support large and contiguous cover of woody trees and shrubs, while other areas are highly altered or fragmented. Many of the BMAs are designed to improve the conditions of the riparian corridor, including installation of riparian fencing and improved grazing management of riparian pastures, and control of invasive plant species. Therefore, it is expected that Alternative 1 will have a positive effect on vegetation in the Covered Area.

4.1.4 Wetlands

Many of the BMAs that would be implemented under the Proposed Action are designed to positively affect the quantity and quality of wetland habitat in the Covered Area, including the construction of wetlands and cold water refugia, installation of LWD, riparian restoration and revegetation, installation of livestock exclusion fencing/off-channel stock watering, and creation off-channel habitat. Therefore, it is expected that Alternative 1 will have a positive effect on wetlands in the Covered Area.

4.1.5 Essential Fish Habitat

The Covered Area includes areas designated as EFH for various life-history stages of Pacific salmon. Specifically, EFH for coho salmon and Chinook salmon in the Covered Area consists of their migration, holding, and rearing habitat downstream of Dwinnell Dam and Parks Creek downstream of the diversion. A complete analysis of anticipated effects of Alternative 1 to EFH is described in detail in an MSA consultation that is attached to the ESA Section 7 Biological

Opinion on the issuance of the ESPs (NMFS 2020a). Also, the Net Conservation Benefits document (NMFS 2020b) describes anticipated effects to SONCC coho EFH in the Covered Area. All of the BMAs are specifically intended to benefit SONCC coho salmon, and the Net Conservation Benefit document (NMFS 2020b) describes an overall positive impact of Alternative 1 to SONCC coho salmon, and many of the habitat improvements that are intended to benefit coho salmon will also benefit Chinook salmon. Therefore, it is expected that Alternative 1 will result in benefits to EFH in the Covered Area.

4.1.6 Invasive Species

Numerous non-native species plant species occur throughout the Covered Area. One of the activities covered under Alternative 1 is invasive plant removal and control. This can occur in the form of livestock grazing, use of California legal weed spray products, manual removal, burning, and mowing. The described BMAs also include riparian revegetation by native species, which can help to diminish impacts by invasive species on riparian habitat. Therefore, it is expected that Alternative 1 will have a positive impact on issues associated with invasive species in the Covered Area.

4.1.7 Cultural Resources

Cultural resources include prehistoric and historical archaeological sites, historic structures, and traditional cultural properties (places that may or may not have human alterations, but are important to the cultural identity of a community or Native American tribe). The extent of potential effects of the alternatives on these resources includes the action area.

As described above in Section 3.7, each cultural resources report contains findings and management considerations to be implemented including archeological monitoring during significant ground-disturbing activities, such as use of heavy equipment. Archival research and an intensive survey of the APE's resulted in the documentation of prehistoric and historic-era sites and artifacts. An evaluation of these resources indicated that none appear to retain the associations or characteristics that make them historically or scientifically important and none are recommended eligible per National Register of Historic Places (NRHP) criteria. Consequently, per the NHPA, no historic properties are contained with the APE's and no additional study or mitigation of project effects on these resources is necessary. NMFS completed consultation with the California State Historic Preservation Office (SHPO), and concluded that no historic properties would be affected by the Proposed Action; pursuant to 36 CFR § 800.4(d)(1), the SHPO does not object (SHPO 2020).

Compared to the No-action Alternative, the Proposed Action would provide a conservation benefit to the Covered Species, which is an important part of Tribal tradition and identity. Tribes are connected to the historical salmon runs and restoration of salmon runs provides important cultural, ceremonial, and religious opportunities to Tribes.

4.1.8 Socioeconomics

Agencies, such as US Forest Service, Reclamation and CalFire, as well as local agencies that fund, carry out, or permit actions would not face a substantially increased regulatory burden under the proposed action, similar to the No-action Alternative. As under the No-action Alternative, there would be no new regulatory costs for persons visiting the action area for recreational fishing opportunities, persons or organizations engaged in water management, timber harvest, grazing, or other similar activities.

The Proposed Action includes Routine Agricultural Activities, habitat improvement projects, and monitoring, which would be completed either by the Applicant, or an approved contractor. Effects of Alternative 1 that benefit EFH for Pacific Chinook salmon, which support economically valuable commercial and recreational fisheries, have the potential to have positive socioeconomic impacts downstream of the Covered Area. In addition, under Alternative 1, implementation of the BMAs would have a positive impact on the local economy by employing some contractors to complete the restoration and monitoring activities, and by covering Routine Agricultural Activities under the ESA.

4.1.9 Hydrology, Water Quality, and Water Quantity

One of the main intended effects of Alternative 1 is improvements to hydrology, water quality, and water quantity to benefit SONCC coho salmon (NMFS and AquaTerra 2020). Many of the proposed BMAs have the potential to beneficially affect water quality and quantity. Riparian restoration and revegetation can improve habitat through increased stream shading that is intended to lower stream temperatures, and increase future recruitment of LWD to streams. Installation and recruitment of LWD can increase water quality by creating more pool habitat, which allows for temperature refugia via stratification, and can positively affect temperature by improving surface water/ground water interface dynamics. Livestock exclusion fencing/off-channel stock watering can improve water quality by reducing turbidity. Off-channel/side channel habitat projects can improve hydrologic connection between floodplains and main channels. Tailwater capture and re-use allows the landowner to intercept tailwater and convey it to another place of use to utilize for irrigation, thereby reducing demand for surface water diversion. Reduction in tailwater return prevents tailwater, which typically has degraded water quality, from entering the river. Several of the BMAs described can help reduce water loss in the system by improving efficiency, including piping ditches, lining canals, moving or improving diversion points, and modernizing diversion structures, all of which will result in reduction in water diversion amounts. Projects that optimize cold water spring inputs may include developing alcoves, off-channel and side-channel habitat, 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 improve, or not impair, water quality conditions. Construction of some of the proposed BMAs (e.g., LWD installations) are expected to have short term localized negative impacts to water quality, which will be minimized by following the associated AMMs.

In addition, monitoring is required under the Agreement and is an important component that will further the understanding of current instream flow and water quality conditions in the Covered

Area. The monitoring stations will assist in documenting spatial and temporal changes in water quantity and temperature at the reach scale following implementation of BMAs and provide information needed to implement the Adaptive Management Program.

Finally, implementation of the FMS, under the Agreement, is anticipated to provide improved instream flow and water quality relative to those conditions that currently exist. Participants will reduce water diversion for irrigation to help meet biological flow targets identified in McBain & Trush Inc. (2013) as described in the Diversion Reduction Schedule, which is Table 1 in the Adaptive Management Program, Appendix 3 of the Agreement. The FMS dictates reach and water-year-type specific flow targets that will be an improvement over current conditions, and seek to address life-stage specific stressors for the Covered Species. Specifically, spring flows will better mimic natural snow melt hydrology and peak flows will generally meet or exceed minimum instream objectives recommended by McBain & Trush Inc. (2013) for the upper Shasta River and Parks Creek.

Therefore, it is expected that Alternative 1 will have a positive effect on hydrology, water quality, and water quantity in the Covered Area.

4.1.10 Groundwater

As mentioned in the Water Quality and Quantity section above, the most vital habitat value in the Shasta River basin is its cold springs, which create cold water refugia for juvenile coho salmon, decrease overall water temperatures throughout the basin, and allow for successful summer rearing of individuals in natal and non-natal creeks and mainstem areas. High summer water temperatures and low flow adversely affect rearing conditions during summer. Currently, rearing habitat is limited to small areas of thermal refugia associated with either spring flow contributions or direct connections with groundwater.

Several of the BMAs that would be implemented under the Proposed Action have the potential to improve use of groundwater. Implementation of the FMS is expected to improve water temperatures at the local site scale where either cold spring water or groundwater contributions to the channel are anticipated. As part of the FMS, summer base flow management seeks to optimize cool water habitats throughout the reach through the use of cold groundwater and spring water contributions. These contributions would be possible through the use of groundwater pumping and exchanges of warm river water to irrigate fields for cold spring water contributions to the river. Water exchanges will go into effect on both Hidden Valley Ranch and Hole in the Ground Ranch once 18°C is measured at real-time monitoring stations downstream. MWCD will also begin to operate the Flying L groundwater pumps, which release groundwater to the Upper Shasta River below Dwinnell Dam, water temperatures in the main canal reach 18°C. In addition, BMAs such as the creation of off-channel and side-channel habitat can increase exchange between the ground-water and surface-water interface. Therefore, it is expected that Alternative 1 will more efficiently utilize groundwater to benefit the Covered Species.

With regards to effects to groundwater itself in the Shasta Basin, the Siskiyou County Flood Control and Water Conservation District intends to develop a GSP for the Shasta Basin, under SGMA. The development of the GSP will help to prevent any negative impacts to the groundwater supply in the Covered Area, including any effects of the Proposed Action.

4.1.11 Agriculture

The Covered Area consists primarily of private agricultural land. One of the Covered Activities under Alternative 1 is Routine Agricultural Activities. Given that Routine Agricultural Activities will be able to continue and will be covered against ESA incidental take for the Covered Species, Alternative 1 will not result in major changes to agriculture practices.

4.1.12 Climate Change

Under Alternative 1, no significant effects to climate change are expected. Because agricultural activities would remain largely unchanged, there would be no change in activities that would result in changes to greenhouse gas emissions or other pollutants that are likely to significantly contribute to environmental conditions associated with climate change.

4.2 Alternative 2: No Action

Under Alternative 2, NMFS would not issue the ESPs, and the Parties would not implement the activities described in the Agreement and Site Plan Agreements. Alternative 2 would not protect and enhance aquatic and riparian habitat through implementation of the BMAs intended for the conservation of the SONCC coho salmon in the Covered Area. In addition, the Applicants would not have ESA take coverage for the Covered Species in the Covered Area, and could potentially be subject to ESA liability if their actions on their Enrolled Properties resulted in take of SONCC coho under the ESA's definitions.

The environmental consequences of not implementing the Proposed Action on the resources described in the Affected Environment section above (i.e., listed species; non-listed species; vegetation; wetlands; Essential Fish Habitat; invasive species; cultural resources; socioeconomics; hydrology, water quality, and water quantity; groundwater, agriculture; and climate change) are discussed below.

4.2.1 ESA-Listed Species

4.2.1.1 Fish

Under Alternative 2, there would likely be no change to coho salmon limiting factors and threats currently affecting fish species in the action area. Existing conditions would reflect expected conditions under Alternative 2.

The one listed fish species expected to occur in the Covered Area is the SONCC coho salmon ESU. Under Alternative 2, none of the beneficial activities for SONCC coho salmon included in Alternative 1 would occur. Limiting factors in the Shasta River for SONCC Coho salmon described in the Recovery Plan (NMFS 2014) would persist. SONCC coho salmon habitat

within the Covered Area includes habitat for adult migration and spawning, spring juvenile redistribution and outmigration, summer rearing, and juvenile over-wintering, and key stressors in the Shasta River include seasonally impaired water quality and altered hydrologic function. Under Alternative 2, the FMS that is intended to improve these conditions would not be implemented. Therefore, under Alternative 2, effects to SONCC coho salmon would be the same as under the environmental baseline.

4.2.1.2 Plants

Three plant species listed as endangered under the ESA were identified as potentially occurring in the Covered Area. However, there is no record of them actually having been identified in the Covered Area, and critical habitat has not been designated for them. Therefore, it is reasonable to conclude that Alternative 2 will not affect listed plant species as compared with the environmental baseline.

4.2.1.3 Other Wildlife

A suite of listed non-fish animals were identified as potentially occurring the Covered Area, as discussed in the Affected Environment Section above, including birds, mammals, crustaceans, and amphibians. However, given that Alternative 2 results in no change relative to current conditions, and allows current activities to continue, it is reasonable to conclude that Alternative 2 will not affect any of these listed wildlife species compared with the environmental baseline.

4.2.2 Non-listed Species

4.2.2.1 Plants

The proposed action has the potential to effect numerous non-listed plant species that potentially occur in the Covered Area. However, given that Alternative 2 results in no change relative to current conditions, and allows current activities to continue, it is reasonable to conclude that Alternative 2 will not affect any of these non-listed plant species in a manner different from the environmental baseline.

4.2.2.2 Fish

Given that Alternative 2 results in no change relative to current conditions, and allows current activities to continue, it is reasonable to conclude that Alternative 2 will not result in different effects to any non-listed fish species from what occurs under the environmental baseline.

4.2.2.3 Other Wildlife

One non-listed sensitive or rare mammal was identified as potentially occur in the Covered Area, the American badger. However, American badger are not associated with riparian habitats, or other habitats that are likely to be affected by the proposed action. Further, given that

Alternative 2 results in no change relative to current conditions, and allows current activities to continue, it is reasonable to conclude that Alternative 2 will not affect any of these non-listed wildlife species relative to the environmental baseline.

4.2.3 Vegetation

As described in the Affected Environment section above, various plant communities occur within the Covered Area. However, given that Alternative 2 results in no change relative to current conditions, and allows current activities to continue, it is reasonable to conclude that Alternative 2 will not affect any of these plant communities relative to the environmental baseline.

4.2.4 Wetlands

As described in the Affected Environment section above, wetlands occur to varying degrees in stream reaches within the Covered Area. Under Alternative 2, none of the BMAs described in the Agreement that could benefit wetlands would be implemented. Given that Alternative 2 results in no change relative to current conditions, and allows current activities to continue, it is reasonable to conclude that Alternative 2 will not affect wetlands in the Covered Area relative to the environmental baseline.

4.2.5 Essential Fish Habitat

As described in the Affected Environment section above, EFH for Pacific Salmon occurs throughout the Covered Area. Under Alternative 2, none of the BMAs described in the Agreement that could benefit EFH would be implemented, and degraded EFH conditions described in the Affected Environment section above would persist. Given that Alternative 2 results in no change relative to current conditions, and allows current activities to continue, it is reasonable to conclude that Alternative 2 will not affect EFH in the Covered Area.

4.2.6 Invasive Species

Numerous non-native species plant species occur throughout the Covered Area. However, given that Alternative 2 results in no change relative to current conditions, and allows current activities including invasive species removal for agricultural purposes to continue, it is reasonable to conclude that Alternative 2 will not affect any of the invasive species in the Covered Area.

4.2.7 Cultural Resources

Cultural resource inventories have been completed on all of the properties where activities would occur under Alternative 1, and findings from these reports and associated surveys were largely negative for cultural resources. Also, under Alternative 2, no new ground disturbing activities would be undertaken. Given that Alternative 2 results in no change relative to current

conditions, and allows current activities to continue, it is reasonable to conclude that Alternative 2 will not affect any of the invasive species in the Covered Area.

4.2.8 Socioeconomics

Under Alternative 2, ranching and water diversion activities would likely continue in the Covered Area as they are under current conditions. However, under Alternative 2, the Applicants would not have ESA take coverage for the Covered Species in the Covered Area and could potentially be liable for take on their properties under the ESA, if any of the activities they carry out directly or indirectly result in take of SONCC coho salmon. If the Applicant faced liability for take or other ESA-related restrictions as a result of their land and water management activities, that could have a negative impact on socioeconomics in the Covered Area.

4.2.9 Hydrology, Water Quality, and Water Quantity

Under Alternative 2, ranching and water diversion activities would likely continue in the Covered Area as they are under current conditions. Given that Alternative 2 results in no change relative to current conditions, and allows current activities including water diversions for agricultural purposes to continue, it is reasonable to conclude that Alternative 2 will not affect hydrology, water quality, and water quantity in the Covered Area.

4.2.10 Groundwater

Under Alternative 2, ranching and water diversion activities would likely continue in the Covered Area as they are under current conditions. Given that Alternative 2 results in no change relative to current conditions, and allows current activities including water diversions for agricultural purposes to continue, it is reasonable to conclude that Alternative 2 will result in no change of how groundwater is utilized or impacted relative to current conditions.

4.2.11 Agriculture

Under Alternative 2, ranching and water diversion activities would likely continue in the Covered Area as they are under current conditions. However, under Alternative 2, the Applicants would not have ESA take coverage for the Covered Species in the Covered Area, and would potentially be liable for take on their properties, under the ESA. While the SHA process is voluntary and no further action would be directly required by the Applicants, it is possible that ESA related actions could affect ranching activities in the future, and thereby have a negative impact on agriculture in the Covered Area.

4.2.12 Climate Change

Under Alternative 2, no significant effects to climate change are expected. Because agricultural activities would remain unchanged, there would be no change in activities that would result in

changes to greenhouse gas emissions or other pollutants that are likely to significantly contribute to environmental conditions associated with climate change.

5 Cumulative Effects

5.1 Introduction

The NEPA defines cumulative effects as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR 1508.7). Council on Environmental Quality (CEQ) guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective, but rather, the intent is to focus on those effects that are truly meaningful. In other words, if several separate actions have been taken or are intended to be taken within the same geographic area, all of the relevant actions together (cumulatively) need to be reviewed, to determine whether the actions together could have a significant impact on the human environment. Past, present, and reasonably foreseeable future actions include those that are Federal and non-Federal.

5.2 Geographic Scope

The geographic scope for the cumulative effects analysis for cultural resources includes the Covered Area, which encompass the areas where cumulative effects may occur for these resources.

5.3 Timeframe

The timeframe for the cumulative effects analysis is from pre-1914 water rights through the proposed 20-year permit timeframe.

5.4 Past, Present, and Reasonably Foreseeable Future Actions

Past actions affecting the resources, ecosystems, and human communities of concern are the long history of resource management throughout the area and the construction of dams and other barriers that are impassible to anadromous fish, along with ranchland management, mining, and fishing activities. Relevant past actions include those that resulted in the current SONCC coho salmon habitat conditions in the Covered Area, as described in the SONCC coho salmon recovery plan (NMFS 2014), the most recent NMFS five-year status review for SONCC coho salmon (NMFS 2016), and Appendix 1 of the Agreement: Covered Species, Biological Requirements and Habitat Conditions. Again, factors limiting the Shasta River coho salmon population in the Covered Area include impaired water quality, altered hydrologic function, impaired mainstem function, increased disease/predation/ competition, lack of floodplain and channel structure, degraded riparian forest conditions, altered sediment supply, migration barriers, and adverse hatchery-related effects (NMFS 2014). The most relevant past action was the transition from the native landscape into ranching and agricultural land, which in many cases impaired water quality, altered hydrologic function, and degraded riparian forest. Construction

of major migration barriers such as Dwinell Dam, construction of which began in 1926, and various lesser passage impediments that have been constructed to divert and impound water for agricultural purposes have also impaired water quality, altered hydrologic function, altered sediment supply, and acted as migration barriers.

Present activities that may contribute to cumulative effects include current ranchland management and rural residential land uses. While relevant current actions include the ongoing use of the Covered Area for these purposes, including the related diversion and impoundment of surface and spring water, some relevant restoration and conservation actions in or near the Covered Area are also occurring. The MWCD is actively engaged in implementing the CHERP. The CHERP includes development of a long term water conservation and flow enhancement program to improve conditions for coho salmon downstream of Dwinnell Dam. Under the CHERP, MWCD proposes to increase instream environmental releases below Dwinnell Dam as a conservation measure to improve conditions for coho salmon. Another SHA in the Shasta Basin near to the Covered Area, the Hart SHA, was completed (83 FR 49912 (October 3, 2018)), and is also anticipated to provide a net conservation benefit for SONCC coho salmon in the Shasta basin. A search of the California Environmental Quality Act (CEQA) database, CEQAnet (<https://ceqanet.opr.ca.gov/>), for project in Siskiyou County revealed many projects of varying degrees of relevance to the Proposed Action and proximity to the Covered Area. However, it should be noted that all of these projects are analyzed separately under NEPA, and are considered in the environmental baseline for the Proposed Action.

Reasonably Foreseeable Future Actions considered in this analysis are the Applicants' future ranchland management and rural residential land uses. Potential actions in the Covered Area include state angling regulation changes and discharge of stormwater and agricultural runoff. Most of these actions would require state, and federal permits and would undergo individual or programmatic consultation and permitting. No known specific and reasonably certain future state or private activities are expected to occur within the Covered Area, other than current ranchland management and rural residential land uses. Again, although long-term trends in climate change are likely to place additional stress on the conservation and recovery of the SONCC coho salmon ESU, NMFS does not expect that climate change would be significant enough to have an appreciable effect on SONCC coho salmon during the 20-year life of the ESPs.

5.5 Cumulative Effects Summary

Because the future land-use activities in the Covered Area are anticipated to be affected more so by the Proposed Action than by any other reasonably foreseeable future actions, the overall cumulative effects are similar to the effects discussed in the Environmental Consequence section above under Alternative 1. The cumulative impacts of potential other projects and the Proposed Action are anticipated to improve natural resource conditions for Covered Species in the Shasta River watershed and also be beneficial for many of the other resources analyzed in this EA. The cumulative effects under each alternative are summarized for each resource in Table 5.

In summary, cumulative negative impacts effects from of NMFS' proposed action, would be minor, if at all measurable, on all resources. Cumulative positive environmental effects are likely, owing to development and implementation of voluntary conservation measures that will provide a net conservation benefit to the Covered Species in the Action Area.

Table 5. Summary of cumulative effects to the resources analyzed in this EA under each of the two alternatives.

Resource Analyzed	Alternative 1 - Proposed Action	Alternative 2 - No Action
Listed Species	<p>Significant benefit – implementation of the BMAs is expected to improve habitat conditions (e.g., water quality and water quantity) for all life-stage of SONCC coho salmon that occur in the Covered Area.</p> <p>And two listed bird species that potentially occur in the Covered Area and utilize riparian or wetland habitats are also likely to benefit under Alternative 1.</p>	No change
Non-listed Species	<p>Some benefit – non-listed species that occur in the Covered Area and share some habitat requirements with SONCC coho (e.g., Chinook salmon and steelhead) are also likely to benefit from the habitat improvements expected under Alternative 1.</p>	No change
Vegetation	<p>Benefit – since many of the BMAs are designed to improve the conditions of the riparian corridor, including installation of riparian fencing and improved grazing management of riparian pastures, and control of invasive plant species, it is expected that Alternative 1 will have a positive effect on vegetation in the Covered Area.</p>	No change
Wetlands	<p>Benefit – since the BMAs included in the Proposed Action are designed to positively affect the quantity and quality of wetland habitat, due to installation of LWD, riparian restoration and revegetation, installation of livestock exclusion fencing/off-channel stock watering, and creation off-channel habitat, it is expected that Alternative 1 will have a positive effect on wetlands in the Covered Area.</p>	No change
Essential Fish Habitat	<p>Benefit – Since the BMAs are designed to benefit SONCC coho salmon habitat, and many of the habitat improvements that are intended to benefit coho salmon will also benefit Chinook salmon, it is expected that Alternative 1 will result in many improvements to EFH in the Covered Area.</p>	No change
Invasive Species	<p>Benefit – since the BMAs include riparian revegetation by native species, which can help to diminish impacts by invasive species on riparian habitat, it is expected that Alternative 1 will have a positive impact on issues associated with invasive species in the Covered Area.</p>	No change

Resource Analyzed	Alternative 1 - Proposed Action	Alternative 2 - No Action
Cultural Resources	No effect – given the results of cultural resource surveys on all of the Enrolled Properties, is not expected that the proposed action will have impacts on cultural resources in the Covered Area.	No change
Socioeconomics	Benefit – since the BMAs would employ some contractors to complete the restoration and monitoring activities, and cover Routine Agricultural Activities under the ESA, it is expected that Alternative 1 will have a positive effect on socioeconomics in and around the Covered Area.	No change
Hydrology, Water Quality, and Water Quantity	Benefit – Implementation of the BMAs and the FMS is anticipated to provide improved instream flow and water quality relative to the conditions that currently exist.	No change
Groundwater	No change - The development of the SGMA GSP will help to prevent any negative impacts to the groundwater supply in the Covered Area, including any effects of the proposed action.	No change
Agriculture	No change - Since routine agricultural activities will be able to continue under Alternative 1, the Proposed Action will not result in changes to agriculture practices.	No change
Climate Change	No change - Because agricultural activities would remain largely unchanged under Alternative 1, there would be no change in activities that would result in changes to greenhouse gas emissions or other pollutants that are likely to significantly contribute to environmental conditions associated with climate change.	No change

This EA and supporting analyses did not identify any effects that, after implementation of AMMs, remained significant. No significant irreversible effects were identified associated with the Proposed Action. In summary, we expect the Proposed Action to result in many beneficial effects associated with implementation of the proposed conservation measures and BMAs included in the Agreement.

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7 Appendices

7.1 Appendix A

This appendix includes public comments received during the public comment period described in the Public Involvement section of the attached EA. Each comment row identifies the associated commenter, and describes NMFS's associated response.

#	Commenter	Comment	Response
1	Shasta Valley Resource Conservation District	<p>“We believe the Shasta Safe Harbor Application and permit process is a continuation of ongoing voluntary conservation efforts by Shasta Valley rangers and farmers to improve environmental conditions for salmonid species . . . We support and encourage collaborative and adaptive long-term conservation work among private landowners and partners.” [p.1]</p>	<p>Comment noted.</p>
2	County of Siskiyou Board of Supervisors	<p>“This SHA, as well as other individual actions and SHA’s, are a piece of the larger puzzle to improving anadromous fisheries in the entire Shasta and Klamath River watersheds. As such, this SHA should not be solely relied upon by regulators to move Coho salmon beyond its ESA listing.” [p.2]</p>	<p>The Template Safe Harbor Agreement (Agreement) is an effort to implement some of the actions identified in NMFS (2014) recovery plan for SONCC coho salmon. This effort is in addition to other conservation efforts including the Klamath River Restoration Conservation Measure (KRRCM) and the SONCC Coho Salmon Recovery Plan. These efforts strive to further the recovery of protected anadromous fish in the Klamath and Shasta river basins. The Final SONCC Coho Recovery Plan provides a comprehensive roadmap for the recovery of coho salmon, which requires implementation of actions that conserve and restore the key biological, ecological, and landscape processes that support the ecosystems upon which coho salmon populations depend. The Agreement will further some of those key actions in the Shasta River. KRRCM is a product of the Magnuson-Stevens Act and focuses on anadromous salmonids, particularly coho salmon, working to revitalize and restore fish habitat and populations. The measure is funded for the 2013-2023 period and is intended to offset adverse impacts of regional growth, promote the survival and recovery of SONCC coho salmon, and improve their designated critical habitat.</p>

3	County of Siskiyou Board of Supervisors	<p>“[A]ctions during drought years in this reach should be carefully coordinated between agencies and irrigators, and options for re-evaluation depending on the year type should be implemented rather than a one-size-fits-all approach.” [p.2]</p>	<p>We agree that careful coordination between agencies and irrigators will aid in implementation of the site plan agreements and Agreement and benefit the SONCC coho salmon (the Covered Species). Section 6.4.2 of the Agreement states that “The SWCG will make reasonable attempts to facilitate coordination between the Permittees.” In places, adjustments for different water years are accounted for in the site plans and SHA. For example, the Shasta Safe Harbor Master Flow Chart indicates different diversion limitations in different water year types. In particular, the Montague Water Conservation District is subject to different requirements in “Very Dry Years,” “Dry Years,” “Normal Years,” “Wet Years,” and “Very Wet Years.” For other entities, the Master Flow Chart indicates that diversion is likely to vary based on year type.</p>
4	County of Siskiyou Board of Supervisors	<p>“[C]onserved water flow dedications should occur after projects are completed and actual water savings are realized. The Board appreciates the established flow schedule, but irrigators need assurance that the SHA provides flexibility within specific dedications that account for weather and water year type.” [p.2]</p>	<p>In places, the Agreement includes flexibility for irrigators based on different water year types. For example, the Shasta Safe Harbor Master Flow Chart indicates different diversion limitations in different water year types. In particular, the Montague Water Conservation District is subject to different requirements in “Very Dry Years,” “Dry Years,” “Normal Years,” “Wet Years,” and “Very Wet Years.” For other entities, the Master Flow Chart indicates that diversion is likely to vary based on year type. There are also provisions in the Agreement and the Forbearance Agreement (Section 6.2.2) that provide for flexibility in emergency situations, uncontrollable forces and failure to perform. Adaptive management combined with monitoring data will also allow landowners (also referred to as Permittees) to adjust to changing circumstances over time in coordination with NMFS and CDFW. In addition, the Forbearance Agreement includes a 5-year interim term that includes a determination of actual water savings. Site plan agreements that commit to Section 1707 water dedications will be permissive- meaning water will be kept instream at the landowner’s discretion. Several site plan agreements have interim measures that will result in conservation benefits while waiting for funding to complete a larger project that will result in the full benefit. Cardoza is a great example of this.</p>

5	County of Siskiyou Board of Supervisors	<p>“If Coho are in need of immediate actions to prevent further harm and declining numbers, activities such as those outlined in the SHA should be expedited and met with support and urgency for completion.” [p.2]</p>	<p>Nothing in the Agreement prevents landowners from expediting actions under the Agreement. Similarly, nothing prevents the agencies from taking action to further the SONCC coho salmon recovery on a faster schedule or to prevent harm to the species or declining numbers if new information becomes available that indicates expedited actions are necessary. However, under the Agreement, landowners will have no obligation to expedite measures in the event that we obtain new data or information suggesting the species is in decline. Offering regulatory assurances to landowners is a key part of obtaining commitments for voluntary conservation efforts needed to recover SONCC coho. If we retained authority to change the implementation schedule as circumstances change, landowners may not be willing to enter into this voluntary conservation agreement. The Agreement includes an Adaptive Management Program to ensure that anticipated conservation benefits are achieved. Under the Agreement, NMFS may terminate an ESP and related site plan agreement if needed to avoid jeopardy to any ESA-listed species or adverse modification or destruction of critical habitat.</p>
6	County of Siskiyou Board of Supervisors	<p>“We are concerned regarding some of the ‘activity completions’ language for two of the Upper Parks Creek permit applications, which are not found in the other permit applications nor in previously issued NMFS SHA’s. . . . [T]he language states that ‘take authorization will not be effective until Permittee implements the flow strategy in Section E.3 of the site plan’ and that the permit will expire if flow objectives are not met.” [p.3]</p>	<p>This ‘activity completions’ language is contemplated in the Agreement to account for specific circumstances at Edson Foulke and Parks Creek Ranch: “7.3. Delayed Permit Effectiveness. Edson Foulke and Parks Creek Ranch may be issued ESPs with delayed permit effective dates. In the event either Edson Foulke or Parks Creek Ranch do not implement the flow strategies contained in their respective Site Plan Agreements within three years after the issuance of their respective Permits, then those Permits may expire. Thereafter, NMFS and CDFW reserve the right to meet and confer with the other Permittees to determine if changes to Site Plan Agreements are needed to address the expiration of such Permits.”</p>

7	County of Siskiyou Board of Supervisors	<p>“Fish numbers are not necessarily a function of the successfulness of the SHA, but are also a function of conditions outside of the reach of the SHA, and consideration must be made concerning this evaluation factor.” [p.3]</p>	<p>Comment noted. This was considered during development and evaluation of the Agreement. NMFS determined that use of habitat indicators as a surrogate for fish numbers was reasonable including for the reasons you described.</p>
8	County of Siskiyou Board of Supervisors	<p>“To achieve the bypass flow goals outlined under the site plans, projects have to be completed, implemented and fully operational. While landowners will apply for grant funding and implement projects as efficiently and timely as possible, unsuccessful grant applications and project delays may be expected, as with any program. If landowners are diligently working to obtain funds and implement projects, permits should not be at risk if timelines are not specifically met.” [p.3]</p>	<p>The degree to which other permits would be “at risk” if timelines are not specifically met are governed by Section 6.8.2 of the Agreement. NMFS can also terminate based on failure to comply with the Agreement, site plan agreement, or ESP, including but not limited to failing to implement the Beneficial Management Activities (BMAs) identified in the Permittee’s site plan agreement. Or, if NMFS believes that realization of the net conservation benefit on an enrolled property is unlikely as a result of actions of a third party. Delay alone coupled with diligent efforts to conduct conservation activities would be unlikely to justify termination under this provision. If NMFS were to seek to terminate a permit for failure to obtain project approval, this section would govern our efforts. Actions taken under this section are subject to the dispute resolution process outlined in the Agreement, which allows landowners an opportunity to be heard and to explain to NMFS that they are diligently working to obtain funds and/or implement projects. Several of the Permittees have been proactively working with NGOs, prior to the Agreement being finalized, in pursuing and obtaining grant dollars. Other site plan agreements have interim measures that will allow for some net conservation benefits to accrue while waiting for funding to complete a larger project that would result in a greater net conservation benefit. Cardoza is a great example of this approach.</p>

9	California Farm Bureau Federation	“The California and Siskiyou County Farm Bureaus support the voluntary actions being undertaken by our members to achieve improved habitat for fish through a multi-layered approach while maintaining their individual agricultural production capabilities.” [p.1]	Comment noted.
10	David Webb	“I need to know a lot more about the net benefits assessment that you will ultimately need to do. . . . [C]an you send me whatever policy directives you have to follow on this, along with whatever specifics you have been thinking of for the Shasta River please.” [p.1]	Please see our website for further information on SHAs and our policy directives: https://www.fisheries.noaa.gov/west-coast/habitat-conservation/safe-harbor-agreements-west-coast#:~:text=Safe%20Harbor%20Agreements%20are%20a,of%20their%20good%20stewardship%20practices . NMFS SHA policy can also be found at 64 Fed. Reg. 32717 (June 17, 1999).
11	Eli Asarian	“I’m confused about [Exhibit B, Abbreviated Shasta Safe Harbor Mast Flow Chart]. There [is] no caption to the table; I don’t see the Exhibit referred to in any of the other documents, and its unclear how the “bypass” flows listed relate to the Safe Harbor agreements. Are these baseline, elevated baseline, or something else?” [p.1]	Exhibit B to the application package is the Abbreviated Shasta Safe Harbor Master Flow Chart and summarizes the landowners flow commitments and curtailments as detailed in each of the respective site plan agreements to show how they provide benefits throughout the reaches in the area covered by the Agreement (Covered Area). Landowners have committed to forbearing the specific water amounts reflected in Exhibit B, which will be monitored according to a separate Forbearance Agreement.
12	Scott Valley and Shasta Valley Watermaster District	“Overall there are many positive aspects of the SWCG’s approach that has addressed critical concerns of SSWD staff as the project developed during the past year. <u>The most positive aspect of the SWCG’s approach is the voluntary curtailment of water in a cooperative process within the Agreement Area.</u> The inclusion of a five-year adaptive management plan works to ensure the concepts can be accurately and efficiently implemented. <u>Alternative diversion strategies must include an assessment by the SSWD to ensure we can efficiently supervise the diversion of water without causing harm to any user, including those in the SWCG.</u> ” [p.1]	The landowners are working closely with the Watermaster District to ensure that resources will be in place to support the SSWD’s efficient participation in this effort. Actions include the annual \$1500 payment by each landowner per Section 6.5.3 of the Agreement to maintain an effectiveness monitoring network to help in management of flow strategy within the covered area as detailed in the Adaptive Management Program included in the Agreement. This Adaptive Management Program has performance indicators, success criteria, identifies responsible parties, reporting and analysis requirements, and an adaptive management element, as well as a 5- year check-in to determine the effectiveness of the Agreement. Funding from certain landowners has also covered outside legal fees to draft the Forbearance Agreements.

13	Scott Valley and Shasta Valley Watermaster District	<p>“There seems to be a preference for using SB88 as a monitoring standard for participants. Management and supervision of decreed water rights is already being accomplished by the SSWD, for most diversions in the Agreement Area, and we have recognized a significant flaw in SB88 when attempting to use it for field management activities. SB88 defines an electric method of recording flow volume. The data collected using electric devices is used to support annual water use statements made by individual diverters but it is not verified to ensure devices are functional. SB88 fails to contribute to on-the-ground management and supervision of water diversions unless devices are in perfect working condition all seasons of the year, often they breakdown mid-season and the Deputy Watermaster must rely on manual measurements to ensure prioritized decreed rights are being met. The installation of measuring devices under Water Code 4100- 4104 is required by SSWD and measurement data is collected and maintained by the Deputy Watermaster in order to complete annual statements of use submitted to the SWRCB. <u>SSWD is open to discussing solutions for using data loggers and other devices having a clearly defined maintenance agreement that includes prompt repair.</u>” [p.1-2]</p>	<p>NMFS would like to have a continuous record of diversion amounts per the SB88 standard that is reported annually by the Permittees to ensure commitments are being upheld. The Adaptive Management Program has been revised to stipulate that the gage monitoring equipment will be maintained and calibrated by the landowner in cooperation with the WMD to ensure accurate measurement of water per this standard.</p>
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14	Scott Valley and Shasta Valley Watermaster District	<p>“Regarding site plans, in general, <u>it is not fully clear who is monitoring and maintaining devices in many cases.</u> Some site plans have additional requirements for 1707 and/or 1740, why do some have this requirement and others do not? SSWD is concerned that bypassed and dedicated flows may not be realized without proof of current diversion volumes. We recommend NOAA and the SWCG include SSWD in future discussions about these proposed activities.” [p.2]</p>	<p>The Adaptive Management Program describes which entity is responsible for maintaining effectiveness monitoring and diversion monitoring devices. Table 1 in the Adaptive Management Program (Safe Harbor Agreement water quality monitoring locations) details the various entities including the SWCG and their agents, individual Permittees, NMFS, CDFW, and NGOs such as TNC and CalTrout or their agents that will maintain effectiveness monitoring stations. Monitoring data will be collected annually following the calendar year beginning on January 1st and ending on December 31st. Monitoring reports and data gathered during the reporting period by the Permittees shall be provided to the parties by March 1st of each year. The SWCG will consolidate the information into a single annual report, then NMFS and CDFW shall review the information and issue an Annual Implementation Report (AIR) by June 30th. The AIR will be made available to the public. The landowners and the SSWD are also entering into a Forbearance Agreement which will specify in more detail which parties are responsible for monitoring and maintaining water measurement devices. Per the monitoring protocols in the Agreement, landowners are responsible for monitoring other aspects of their site plan agreements and providing results in their annual reports. Certain landowners are considering additional 1707 or 1740 requirements, in addition to the Forbearance Agreement because they have post-1914 non-adjudicated rights and are therefore concerned that forbearing water for the term of the Agreement will subject them to relinquishment if they do not formally seek 1707 or 1704 status. In addition, many funding sources require assurances in the way of a 1707 to secure project benefits that would come from flow enhancement projects. Both the SWCG and the agencies recognize the critical importance of engaging the SSWD in this process and are committed to doing so.</p>
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15	Scott Valley and Shasta Valley Watermaster District	<p>“Conflicts with the SSWD’s responsibility and data differences may occur. The information provided for public review does not include protection for the SSWD in the event of conflict or unintended consequences by the agreement. <u>The omission of indemnification or other acceptable protection for the SSWD is a critical concern and should be addressed as soon as possible, see Conclusion.</u>” [p.2]</p>	<p>NMFS can’t offer SSWD indemnification, but the landowners are providing indemnification in the Forbearance Agreement.</p>
16	Scott Valley and Shasta Valley Watermaster District	<p>“The extent of bypassed flow appears to be an open-ended question and not clearly defined. SSWD understands NOAA will review for actual instream benefits and we look forward to seeing those results. We recommend a review by water year types be completed for all identified bypass flows, it could be difficult for some diverters to deliver the volumes identified in dry and very dry years. SSWD does not oppose reasonable verification points provided they do not create harm to any other water user and is defensible by the SSWD. <u>Further understanding regarding the term “protection” of bypassed water is needed, we recommend NOAA and the SWCG include SSWD in future discussions about this proposed activity. Coordinated supervision is SSWD’s preferred method to address all water demands in system with multiple jurisdictions.</u>” [p.2]</p>	<p>NMFS worked with the landowners and the SSWD to address this concern with more specific language in the Forbearance Agreement, which will consider the need to monitor at each bypass and based on water year types. NMFS coordinated with SSWD to determine where verification points will be located. These considerations include existing gauges already established at certain stream reaches, as well as new updated gauges at certain bypasses where more specificity regarding instream benefits may be needed. NMFS intends for GID to be the point of compliance in the interim until the Novy-Rice-Zenkus riffle is built, or another site/ riffle is identified that can be rated and used as the downstream compliance point. NMFS is engaged in discussions with the SSWD and other agencies to determine regulatory- and standard-based reasonable expectations for protecting bypassed water. We agree that coordinating closely with the SSWD to efficiently and adequately supervise this monitoring will be critical to the success of this project.</p>
17	Scott Valley and Shasta Valley Watermaster District	<p>“<u>Please ensure all documents use the legal name Scott Valley and Shasta Valley Watermaster District.</u>” [p.2]</p>	<p>We have revised accordingly.</p>
18	Scott Valley and Shasta Valley Watermaster District	<p>“<u>Programmable/automated headgates must have a manual override for the Deputy Watermaster.</u>” [p.2]</p>	<p>Where feasible, this will be provided.</p>

19	Scott Valley and Shasta Valley Watermaster District	“Pages 68 and 105 mention a “reach-wide diversion management strategy (or plan)” but we cannot locate this document nor a description of it. <u>Please provide a copy for review.</u> ” [p.2]	See Exhibit B to the application package (Abbreviated Shasta Safe Harbor Master Flow Chart). NOAA provided the reach wide diversion management strategy to SSWD during our meeting in Yreka on December 11, 2019.
20	Scott Valley and Shasta Valley Watermaster District	“Minor issues on page 88, item 18 referring to head gates, and on page 89 item 19 re: cold water inputs (are those new diversions or old diversions at new locations?).” [p.2]	This section of the Agreement addresses general implementation of Avoidance and Minimization Measures (AMMs). The actions described on pages 88 and 89 refer to head gates and cold water inputs in general. For information regarding specific head gates or cold water inputs, please see the specific site plan agreements.
21	Scott Valley and Shasta Valley Watermaster District	“SSWD requests that diversion numbers be identified for all bypassed volumes.” [p.2]	This is provided in Exhibit B to the application package (the Abbreviated Shasta Safe Harbor Master Flow Chart)
22	Scott Valley and Shasta Valley Watermaster District	“Page 3, Hidden Valley Ranch – October 1 to December 31 appears to be duplicated, same information on two rows.” [p.2]	We will delete in the final document.
23	Scott Valley and Shasta Valley Watermaster District	“Page 4, Big Springs Ranch – need clarification on consumed portion, is this suggesting an amount in addition to the 15.81 cfs?” [p.2]	Comment noted. The consumed amount refers to a portion of the landowner’s appropriative rights that will be used for a specific need. The range of cfs will be taken from the 15.81 cfs, not in addition to the 15.81 cfs. Page 4 of Exhibit B to the application package (the Abbreviated Shasta Safe Harbor Master Flow Chart) states that the total water rights bypassed is 15.81 cfs, of which between 0.77-9.29 is the consumed portion protected via the 1707.
24	Scott Valley and Shasta Valley Watermaster District	“Page 7, Novy Ranches, Novy-Rice-Zenkus Diversion – reduction to 3.0 cfs is a variable number. The table should explain the bypass amount is not specified when it is a variable.” [p.3]	We changed the text in Exhibit B, Shasta Safe Harbor Flow to reflect that the bypass amount is variable.

25	Scott Valley and Shasta Valley Watermaster District	“Page 7, Rice Livestock, Huseman Diversion – Is the second row a continuation of information in the first row, or is there missing information?” [p.3]	The second row is a continuation of the information in the first row.
26	Scott Valley and Shasta Valley Watermaster District	“Page 7, Rice Livestock, Novy-Rice-Zenkus Diversion – first row should have 4 cfs, not 540 cfs.” [p.3]	We have corrected the table accordingly.
27	Scott Valley and Shasta Valley Watermaster District	“Page 8, NB Ranches – April 1- April 6 does not include a bypass volume. Also, is this volume for 6 days in addition to the first row for April 1 to September 30?” [p.3]	There will be no diversions from April 1 - April 6 at this location. This means 11.9 cfs will be bypassed during these 6 days.
28	Scott Valley and Shasta Valley Watermaster District	GID’s site plan: “GID’s spring contribution to instream flow should not impact priority users within the agreement area because those rights are already being met, the SSWD does not expect involuntary curtailment to occur during this time, however we recommend coordinated supervision during dry water type years.” [p.3]	NMFS agrees and GID intends to coordinate on supervision during dry years.
29	Scott Valley and Shasta Valley Watermaster District	GID’s site plan: “GID is not contributing verifiable bypass flow during July and August therefore no impact is foreseen during this time.” [p.3]	Comment noted, but unclear as to requested information.
30	Scott Valley and Shasta Valley Watermaster District	GID’s site plan: “ <u>The contribution in September will require coordinated supervision with the Deputy Watermaster if the available supply fails to meet priority needs.</u> ” [p.3]	NMFS agrees, and GID intends to coordinate on supervision during dry years.
31	Scott Valley and Shasta Valley Watermaster District	Cardoza Site Plan: “Page 3, ‘Siskiyou County Watermaster’ is incorrect. <u>Please ensure all documents use the legal name Scott Valley and Shasta Valley Watermaster District.</u> ” [p.3]	Revised accordingly.
32	Scott Valley and Shasta Valley Watermaster District	Cardoza Site Plan: “Page 3, remove ‘verbal communication by Tim Beck...’ and replace with ‘Paragraph 1 of the Shasta River Decree.’” [p.3]	Revised accordingly.

33	Scott Valley and Shasta Valley Watermaster District	<p>Cardoza Site Plan: “This site plan is of the most concern to SSWD due to the move in point of diversion. SSWD staff met with project consultants and diverters to discuss the proposed move and we understand the wishes of the diverter to relocate this diversion. SSWD understands the current location is problematic for installing and upgrading diversion and fish screen structures and the proposal for moving the diversion to a location on the mainstem Shasta River will depend on water from Parks Creek to supply the diversion. <u>Due to priority and procedures that administer field schedules independent of each other, the SSWD cannot make assurances that Cardoza’s new point of diversion would be fully supplied without an agreement by Parks Creek water users to make water available.</u>” [p.3-4]</p>	<p>Conveyance assessments have been conducted to affirm sufficient flow is supplied to the proposed POD from Parks Creek to provide water for diversion and meet instream objectives. The implementation of the Cardoza project also includes a gaging station in Parks Creek to ensure that the Parks Creek water is available prior to diverting the water right from the Shasta River.</p>
34	Scott Valley and Shasta Valley Watermaster District	<p>MWCD Site Plan: “The extent of bypassed flow appears to be an open-ended question and not clearly defined. SSWD understands NOAA will review for actual instream benefits and we look forward to seeing those results. We recommend a review by water year types be completed for all identified bypass flows, it could be difficult for some diverters to deliver the volumes identified in dry and very dry years. SSWD does not oppose reasonable verification points provided they do not create harm to any other water user and is defensible by the SSWD. <u>Further understanding regarding the term “protection” of bypassed water is needed, we recommend NOAA and the SWCG include SSWD in future discussions about this proposed activity. Coordinated supervision is SSWD’s preferred method to address all water demands in system with multiple jurisdictions.</u>” [p.4]</p>	<p>The agencies worked with the landowners and the SSWD to address this concern with more specific language in the Forbearance Agreement, which considers the need to monitor at each bypass based on water year types. NMFS also supports reasonable verification points and worked with the SSWD to identify where these points will be located. We considered existing gauges already established at certain stream reaches, as well as new updated gauges at certain bypasses where more specificity regarding instream benefits may be needed. NMFS also engaged with the SSWD and other agencies to determine regulatory- and standard-based reasonable expectations for protecting bypassed water. NMFS agrees that coordinating closely with the SSWD to efficiently and adequately supervise this monitoring will be critical to the success of this effort.</p>

35	Scott Valley and Shasta Valley Watermaster District	MWCD Site Plan: “SSWD staff met with project consultants and diverters to discuss the proposed project. <u>At this time SSWD staff would like to have a better understanding of processes stated in pages 47, 48, 49,61 and 67 before making comment.</u> ” [p.4]	MWCD worked with the SSWD and the SHA participants to develop a mutually agreeable implementation and monitoring process as set forth in the Forbearance Agreement. MWCD is also working with the SWRCB on a petition submitted to the SWRCB in 2016. NOAA convened a meeting to discuss implementation of the coordinated flow schedule and the SSWD was invited to participate.
36	Scott Valley and Shasta Valley Watermaster District	<u>MWCD Site Plan: “SSWD recommends further discussions with MWCD be completed to develop coordinated supervision with the Deputy Watermaster.”</u> [p.4]	MWCD has met with the SSWD, provided detail and addressed concerns. NOAA convened a meeting to discuss implementation of the coordinated flow schedule and the SSWD was invited to participate.
37	Scott Valley and Shasta Valley Watermaster District	“We understand bypass flow targets at specified points of measurement must occur to ensure the success of the project and to properly manage diversions and instream flow within the Agreement Area. <u>A full understanding of how the project will be implemented is needed before a complete analyses can be accomplished, SSWD requests further communication with the SWCG to obtain information for filling in the blanks and to provide clarification where needed.</u> ” [p.4]	The agencies and landowners, in consultation with SSWD, worked together to develop the necessary additional information, including a presentation of the Flow Management Strategy and coordination on the accuracy and efficiency of the Forbearance Agreement. Please see responses to comments 5 and 21 for additional details. NOAA convened a meeting to discuss implementation of the coordinated flow schedule and the SSWD was invited to participate.
38	Scott Valley and Shasta Valley Watermaster District	“Regardless of the outcome on the issues above it is clear that any changes to the diversion of water by the SWCG participants will have special and additional attention and demands on SSWD staff. <u>When the SSWD has to implement new additional services to only a portion of our designated service areas, the costs must be borne by those people alone.</u> ” [p.4]	The landowners have committed to a certain annual fee to support additional services, and are considering other mechanisms for additional ad hoc funding as necessary.

39	Scott Valley and Shasta Valley Watermaster District	<p>“The SSWD recognizes there is an increased risk for litigation if prior consultation is not completed by SSWD staff. To reduce this risk, SSWD strongly suggests that all participants follow SSWD policy and request an analysis and integrate the results into the project before submitting supplemental decrees and other change petitions. <u>SSWD highly recommends the SWCG and NOAA consider this risk and include indemnification for the SSWD’s Board of Directors, employees and contractors.</u>” [p.4]</p>	<p>We have considered this risk. The Forbearance Agreement addresses this issue. NMFS cannot take actions beyond the scope of its statutory authority.</p>
40	Scott Valley and Shasta Valley Watermaster District	<p><u>“The inclusion of a five-year adaptive management plan will work to improve SSWD’s confidence that the responsibility to supervise the diversion of water is defensible</u> and does not conflict with the efforts to modify decreed places of use, this is the reason that coordinated supervision and consultation with SSWD is a critical necessity when planning for the SWCG’s proposed project, and others like it.” [p.4]</p>	<p>We will ensure that the five-year adaptive management plan remains in the Forbearance Agreement. The Adaptive Management Program, which is part of the Agreement, also requires a 5-year check in process.</p>
41	PCFFA, IFR, SCS	<p>“On initial review we find that there are some projects proposed that appear to be extremely beneficial to Coho and which could meet the criteria for Safe Harbor and a Categorical Exemption within the National Environmental Policy Act (NEPA). However, we believe that many of the other proposals do NOT meet the criteria for Safe Harbor or recovery under the Endangered Species Act and will not meet the temperature criteria outlined in the <i>Stenhouse et al.</i> temperature study. The fact that some of the smaller landowners are making major changes in their diversions on operations to benefit Coho salmon as part of the project is great. We request that similar additions be made to some of the larger landowners’ and diverters’ applications that reflect that same level of commitment to balancing farming and recovery of the species. If these changes are not made then we request that those applications be denied.” [p.1]</p>	<p>NMFS made a determination that each site plan agreement provides a net conservation benefit for the Covered Species (NCB Finding Memorandum). NMFS used the best available information on species and habitat requirements in making this determination including the recovery plan (NMFS 2014), 5-year status reviews, and other documents. The Agreement is not by itself designed to serve as a comprehensive recovery effort. The purpose of a safe harbor agreement is to allow and encourage management activities that are beneficial to the species without subjecting the landowner to take liability for improving the species habitat or abundance. A safe harbor agreement must provide a net conservation benefit that contributes to the recovery of the species.</p>

42	PCFFA, IFR, SCS	<p>“The ongoing take that is protected under this Agreement impacts well established public trust resources (water and fisheries), and areas that are not owned by the landowners in question (public water bodies and upstream and downstream habitat). This makes this Agreement very different than the other Safe Harbor Agreements we have reviewed. Despite this, in some of the restoration activities and bypass flows proposed under the Agreement these are very minimum flows, or even just studies of flow, or vaguely promised future actions.” [p.2]</p>	<p>Parties to the Agreement are entering into a Forbearance Agreement that includes monitoring requirements. Additionally, each site plan agreement documents landowner commitments to implement monitoring. Failure to implement these commitments could result in loss of permits. The primary consideration in determining whether to enter into a safe harbor agreement and grant permits is based on finding a net conservation benefit.</p>
43	PCFFA, IFR, SCS	<p>“In many instances, landowners are simply asking for a free pass for the highly destructive <i>status quo</i>. Unspecified and unsustainable “take” from large scale streambed alterations, riparian grazing, large diversions, continued toxic chemical use and creek crossings will be covered by this Agreement. Landowner actions need to minimize this take and their actions must lead to recovery. Yet many of the applications and site plans do not meet this standard. We request that these applications be reworked to meet the criteria of recovery and to clearly demonstrate how overall temperature and habitat goals for this watershed will be reached.” [p.2]</p>	<p>NMFS will assess each site plan to determine whether actions will result in a net conservation benefit. Large-scale streambed operations are not authorized in any of the Permittees’ site plan agreements. Riparian grazing is approved by NMFS and CDFW only between May 1 and November 1 to protect the for Covered Species. The Agreement requires that Avoidance and Minimization Measures (AMMs) be implemented and monitored. Landowners that currently allow for riparian grazing have agreed to develop riparian grazing management plans with University of California Cooperative Extension, and those management plans are to be reviewed by NMFS and CDFW. Pesticide use is proposed for noxious weed control and only under specific conditions with implementation of AMMs to avoid surface waters. All road crossings are existing and are required to pass fish and adhere to the 2010 4th edition of the Department’s California Salmonid Stream Habitat Restoration Manual for in-stream crossings. The purpose of a SHA is to allow and encourage management activities that are beneficial to listed species without subjecting the landowner to additional take liability. A SHA must provide a net conservation benefit that contributes to recovery of the species. SHAs are only part of the overall recovery effort for SONCC coho salmon. <i>See</i> National Marine Fisheries Service, Final Recovery Plan for the Southern Oregon/Northern California Coast Evolutionary Significant Unit of Coho Salmon (2014).</p>

44	PCFFA, IFR, SCS	<p>“If these criteria are not met, then we request a NEPA analysis or Biological Opinion for the proposal based on impacts of the level of existing take that would be covered in this Agreement and the lack of a cumulative impacts analysis. We ask for this because nowhere in these applications do we see an analysis of current Coho numbers, historical numbers, current estimated take or recovery goals, an analysis on how temperature and habitat goals will be achieved, nor do we see milestones and timelines for achievement of habitat goals or recovery. We have found this type of basic information in the overviews of the other Safe Harbor Agreements that we have reviewed. While we understand this information can be harder to come up with for fisheries species than for species such as birds, and therefore may be estimates, we believe that at least a clear description of recovery goals and an analysis of how the proposed actions will meet these goals are key to a legal and beneficial Safe Harbor Agreement.” [p.2]</p>	<p>The permits associated with the Agreement will authorize take resulting from lawful activities within the enrolled lands, from the time the Agreement is signed until permit expiration, as long as the conditions of the Agreement are met. The Permittee may continue current land-use practices, undertake new ones, or make any other lawful use of the property, even if such use results in incidental take of Covered Species, as long as Baseline Conditions, as described in the site plan agreement, are maintained, the conditions of the Agreement are met, and the level of take is within the quantified level of take authorized under the permit. The Agreement and site plan agreements describe all routine agricultural activities, BMAs, AMMS, and associated monitoring and reporting requirements that will be allowed under the Agreement. Cumulatively, these activities may result in short-term and/or long-term impacts and direct and/or indirect impacts to the covered species. Take may also result from monitoring and other species management activities, such as relocation of the covered species. All effects are analyzed in the NCB Finding Memorandum, including an assessment of beneficial effects and adverse effects. NMFS prepared an environmental assessment under NEPA and carried out intra-agency ESA section 7 consultation for the Agreement to ensure that all effects to the environment and the Covered Species were fully considered.</p>
45	PCFFA, IFR, SCS	<p>“Safe Harbor mechanisms such as this one are formal agreements between the government and private property owners in which the landowners agree to engage in activities beneficial to endangered species and which therefore cover legal activities. While some of the applications under review in this instance cover critical restoration activities, such as changes in diversions to eliminate temporary dams or installation of riparian fencing, many of the actions that would be covered in this Agreement do not meet this standard. They also do not yet meet the criteria for a Take Permit as currently proposed.” [p.2-3]</p>	<p>A key component of a safe harbor agreement is that the actions taken by the property owner must result in a net conservation benefit that contributes to the recovery of the listed species. Section 10(a)(1)(A) of the ESA provides for the issuance of permits for any act that would otherwise be prohibited by section 9, if the act would enhance the propagation or survival of the affected species. A well-designed conservation agreement should, by its nature, enhance the survival of the covered species. ESA section 10(a)(1)(A) provides the mechanism for permitting take under an SHA. The take may assume many forms, but it must be in compliance with the SHA.</p>

46	PCFFA, IFR, SCS	<p>“While we were unable to find examples of large-scale Safe Harbor Agreements that cover whole watersheds, we were able to find analysis of some that broadly covered land management. In these examples large scale existing take was not covered. While some of the covered actions in these applications could have beneficial impacts, the level of existing take for some of these landowners is far greater, remains a direct threat to the existence of the species and will not be offset by proposed minor actions. This Agreement as currently written proposes covering currently illegal activities that could lead to the local extirpation of Coho salmon, and that have already led to the local extirpation of Spring Chinook salmon, and could even lead to a listing of Fall Run Chinook salmon in the future.” [p.3-4]</p>	<p>Take associated with an SHA can be incidental to ongoing activities, including conservation measures and the property owner’s otherwise lawful activities, and return to the baseline condition that occurs sometime in the future after conservation benefits have accrued for a period of time. NMFS ESA section 10(a)(1)(A) permits do not cover any illegal activity. The Agreement contains program-level guidance for the Permittees involved in this effort, while the site plan agreements contain specific implementation details for each enrolled property. NMFS’s section 10 permits under the Agreement are specific to an enrolled property rather than broad-based as your comment indicates. Diversion of water rights in the Agreement area is enforced by the Scott Valley and Shasta Valley Watermaster under the authority of the Shasta River Decree, dated 1932, as well as the California Division of Water Resources (DWR). The SSWD manages and enforces adjudicated water rights in the Covered Area and downstream of that area under the authority Shasta River Decree, dated 1932. While the State Water Resources Control Board currently oversees riparian rights, we anticipate that the SSWD will oversee the riparian rights within the Covered Area under the terms of the Forbearance Agreement. We are not aware of any information suggesting that illegal activities would be covered under the Agreement. The Permittees state that they are in compliance with all requirements imposed by the SWRCB on their water use and will continue to comply with all use limitations imposed by the SWRCB and the Shasta Valley Watermaster District.</p>
47	PCFFA, IFR, SCS	<p>“We believe, however, that with some additional work this Agreement could become beneficial, but at this point most of the proposed restoration activities are so minor in comparison to the cumulative “take” of the existing status quo that they will not lead to the recovery of Coho salmon in the covered part of the watershed, but will simply allow continued declines, albeit perhaps only a little slower.” [p.4]</p>	<p>The BMAs should provide a net conservation benefit to the Covered Species on an enrolled property to meet the SHA standard. NMFS analyzed whether a net conservation benefit would be attained for each enrolled property and documented its affirmative determinations in the NCB Finding Memorandum. Each site plan agreement includes BMAs that will improve riparian conditions, access to habitat, instream habitat complexity, water quality and stream temperatures and increase thermal refugia in the Covered Area.</p>

48	PCFFA, IFR, SCS	<p>“This proposal also has issues that should be addressed outside of the recovery of Coho salmon. The Shasta River is a stronghold for Tribal, California Public Trust and commercially harvested salmon species, and the watershed has been identified as one of California’s most important salmon streams. It is also the Klamath River’s first spring-fed watershed, which makes it extremely important to fisheries survival in the light of climate change and upcoming mainstem impacts of Klamath Dam removal. Therefore, if NMFS is to get a state consistency determination, the state and/or NMFS should perform a public trust resource impact analysis.” [p.4]</p>	<p>During development of an SHA with non-Federal property owners, NMFS considers whether proposed plans might affect Tribal rights or trust resources. NMFS consults with affected Tribes in a meaningful, government-to-government manner and carefully considers the Tribes’ concerns and clearly states the rationale for any recommended final decision and explains how the decision relates to the federal government’s trust responsibilities. It is important that NMFS identify and evaluate any anticipated effects of a proposed SHA upon Native American Tribal trust resources during the planning process.</p>
49	PCFFA, IFR, SCS	<p>“We, therefore, request that either: 1) major changes that include hard targets for fencing, flows, end of impoundments, and fish passage be made to many of the applications, or 2) applications that do not meet the legal standards for recovery and benefits to beneficial uses of the state and Coho salmon be tabled at this time; 3) that only restoration activities be covered under this Agreement, or 4) an EIS/EIR be created that outlines alternatives, public and Tribal trust impacts, cumulative impacts, the historic levels of Coho, and likely benefits, impacts and mitigations.” [p.4]</p>	<p>Hard targets for fencing, removing impoundments, and fish passage have been identified in the individual site plan agreements. Hard targets for flows have also been identified for water exchange triggers and passage flows during various parts of the year. Certain site plan agreements also provide for Elevated Baseline Conditions, meaning that habitat improvements will be achieved and maintained after termination of the Agreement. NEPA requires that federal agencies consider and analyze the impacts of their actions on the human environment. Issuing the Agreement requires compliance with NEPA, and NMFS has conducted a NEPA analysis for this project. In addition, issuance of the permits is subject to the provisions of section 7 of the ESA. NMFS has conducted an intra-service consultation to ensure that implementation of the Agreement and issuance of ESA § 10(a)(1)(A) permits is not likely to jeopardize listed species or destroy or adversely modify designated critical habitat.</p>

50	PCFFA, IFR, SCS	<p>“It is troubling to us that some of the larger proposed projects, such as the Parks Creek Ranch and many of the Emmerson Holdings proposals seem to include only the most minimal actions possible, and the benefits to Coho remain vague or non-committal. Others such as the Cardoza Ranch proposal include actions, such as the end of an impoundment and change in point of diversion that meet the purpose and intent of Safe Harbor. It would seem to us that the larger landowners, who have the most impacts, should be doing more to provide restoration efforts on their properties in proportion with their much larger impacts.” [p.4]</p>	<p>NMFS made a finding for each enrolled property that the actions carried out under the property’s site plan agreement will result in a net conservation benefit for the Covered Species. Each enrolled property proposes BMAs. For example, one of the site plan agreements your comment refers to is Parks Creek Ranch, which proposes the following BMAs: tail-water collection and re-use project to reduce/eliminate tailwater re-entering Parks Creek. Collected tail-water will be used in lieu of diverting stream flow at site #6. Project will eliminate up to 0.85 cfs of tail-water reentry; work with GID to install pipeline to increase delivery efficiency and reduce diversion from Shasta River; participate in a reachwide flow management strategy; participate in diversion facilities assessment, design and implementation to combine operate and maintain diversions #1, #2 and the Parks Creek Ranch Edson-Foulke right. The project would include significant installation of pipeline and flood irrigation risers to improve irrigation delivery efficiency and irrigation efficiency to conserve water and meet the objectives of the Upper Parks Creek Flow Strategy. In addition, 2.8 cfs (1.2 cfs 1st priority, 1.6 cfs 23rd priority) would be provided for instream benefit. The landowner will participate in diversion facilities assessment, design and implementation to combine, operate, and maintain diversions #3, #4, #5 and potentially #6 to improve irrigation delivery efficiency and irrigation efficiency to conserve water and meet the objectives. Design and implement efficient alternative livestock watering system to aid adult migration and spawning by reducing diversion volume to 1.2 cfs. Install soil moisture sensors to maximize water use efficiency.</p>
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51	PCFFA, IFR, SCS	<p>“We also find that many of the applications rely on future funding or studies that have a high likelihood of never occurring. Many applications also include actions that might lead to water savings but there is no guarantee of what those savings will actually be, including no guarantee that any water saved and returned to the river will not simply be diverted from the river by the next highest water right holder. This is disturbing because of the large take that is already occurring from excessive water diversions generally.” [p.4]</p>	<p>NMFS cannot consult on actions that are not reasonably certain to occur and NMFS has determined that the projects included in the Agreement have a high likelihood of receiving funding. A Forbearance Agreement entered into by the landowners is intended to ensure that any water saved and returned to the river will not simply be diverted from the river by the next highest water right holder within the agreement area. The Shasta River Decree has been in place since 1932. The decree grants legal water rights, based on the state’s prior appropriation regime, to private landowners and requires the water to be put to beneficial use to maintain those rights. The water rights within the Shasta watershed are managed and enforced by the Shasta Watermaster under the authority of the 1932 Decree. Each water user pays assessments to the Scott and Shasta Valley Watermaster District to fund this monitoring and enforcement. The Permittees have committed additional funding, per Section 6.5.3 of the Agreement, of \$1,500 per year to increase funding maintaining the effectiveness monitoring network to help us evaluate the Agreement’s effectiveness over time. This monitoring system will allow for more data collection and more certainty going forward. This data can be used, along with the adaptive management process, to make necessary changes throughout the duration of the Agreement to ensure that landowners are maximizing the benefit they can provide to Shasta River coho salmon.</p>
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52	PCFFA, IFR, SCS	<p>“For instance, many of the properties that will be covered completely divert creeks during crucial times of year, use an excess of water that is far beyond established needs of their crops, freely allow animals to trample habitat, use chemicals that have been demonstrated to kill fish, or have dams (permanent or temporary) that lack fish passage or bypass flows. In some cases where bypass flows are proposed they are extremely minimal even though much more water is being used than their crops demand, leading to extreme tailwater issues. These actions violate many state and federal laws including streambed alteration laws, fish passage and minimum flows at dams laws, take laws, and violations of California’s Porter Cologne Act. More importantly many of the diversions that will be covered are themselves an unreasonable use of water, which therefore violate state water quality laws or are a violation of the California State Constitution, and are therefore not eligible for a consistency determination. We ask that these highly illegal actions not be covered and that changes be made to applications and site plans to end these wasteful water practices in accordance with the California State Constitution.”</p> <p>[p.5]</p>	<p>Whether a diversion is consistent with California state water law is determined by the relevant state agencies and state courts. NMFS is not aware of any information suggesting that any illegal activities would be covered under the Agreement. The site plan agreements do address the concerns noted here, including the following: landowners’ use of water is based on legal water rights as established by the 1932 Shasta River Valley Decree and enforced by the Scott and Shasta Valley Watermaster under the authority of the Decree; large-scale streambed alterations are not authorized in any of the site plan agreements; riparian grazing is only approved by NMFS and CDFW between May 1 and November 1 to protect the Covered Species; and the Permittees that currently allow for riparian grazing agree to develop riparian grazing management plans with University of California Cooperative Extension; those management plans are to be reviewed by NMFS and CDFW; pesticide use is proposed for noxious weed control only and only under specific conditions with implementation of AMMs to avoid surface water contamination; all road crossings are existing and are required to pass fish; all instream work requires adherence to the 2010 4th edition of the Department’s California Salmonid Stream Habitat Restoration Manual. All site plan agreements were developed in conjunction with relevant state and federal government agencies.</p>
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53	PCFFA, IFR, SCS	<p>“Based on our current reading and understanding of the proposed applications we request the following actions</p> <ol style="list-style-type: none"> 1) A full accounting of estimated water savings that include hard numbers for increased instream flows that benefit both Coho and Chinook salmon during different life cycles and will lead to the recovery of the species; 2) Requirements for riparian protection setbacks from farming and grazing during all times of year; 3) Reasonable diversion schedules that fit the land use of permittees with related CF&GC Sec. 1707 permits for remaining water rights instream that are not needed for the covered land use; 4) A requirement that activities on covered lands will not drive across or dam creeks during key times in Coho and Chinook development; 5) A requirement that pesticides and herbicides that have been demonstrated to hurt fish are not used during important times of year without appropriate riparian protection buffer zones, and; 6) The phasing out of flood irrigation and systems of open ditches on covered properties.” <p>[p.5]</p>	<p>This information is already provided in the SHA application materials. Flow management regimes were studied and developed by hydrologists collaborating with conservation organizations and the participating agencies. The outcomes of these studies are represented in Attachment 1 to the NCB Finding Memorandum (Flow Management Strategy), and are tied to the net conservation benefit standard required by the SHA policy. The participating landowners have committed to these bypass and flow regimes through the Forbearance Agreement, which has been reviewed and approved by the participating agencies and will be enforced by the Shasta Valley Watermaster District. The Agreement will further elements of the SONCC Recovery Plan, which is the vehicle for species recovery. Under the site plan agreements, riparian grazing is limited to limited periods within the growing season for enrolled properties engaged in farming and grazing practices. Riparian grazing is approved by NMFS and CDFW only between May 1 and November 1 to protect the Covered Species. The parties that currently allow for riparian grazing agree to implement AMMs and to develop riparian grazing management plans with University of California Cooperative Extension, and those management plans are to be reviewed by NMFS and CDFW. See Attachment 1, Flow Management Strategy, for specific numbers regarding diversion schedules and bypass flows. Certain landowners with non-adjudicated rights will seek Section 1707 permits in addition to their participation in the Forbearance Agreement. Under the Agreement, all road crossings are existing and are required to meet fish passage guidelines and the 2010 4th edition of the Department’s California Salmonid Stream Habitat Restoration Manual for any in-stream crossings, and landowners have committed to adhering to AMMs associated with low water crossing used on enrolled properties. See our response above re pesticide use. Comment noted, but this has not been required in individual site plan agreements, and it is not proven that converting to sprinkler/alternative irrigation provides a greater benefit.</p>
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54	McBain Associates	<p>“Given the uncertainty of how the BMAs and AMMs will perform, and the interim nature of the flow recommendations used, we have concern that the 20-year Safe Harbor Agreement term may be too long without clear check-in steps along the way that address big picture evaluation of progress towards the Safe Harbor Agreement goal.” [p.1]</p>	<p>Section 6.6 of the Agreement requires reporting and check-in on an annual basis. Permittees are required to prepare a report on the implementation of their site plan agreements for the prior year. SWCG is required to provide NMFS and CDFW a consolidated annual report on the implementation of the Agreement by March 1, which NMFS and CDFW are required to review by May 1 and work with SWCG and Permittees to address comments or questions. NMFS will produce an Annual Implementation Report (AIR) documenting implementation of the Site Plan Agreements and actions taken towards achievement of net conservation benefit by June 30 of each year. The Parties are also required to pick an independent consultant to report on effectiveness monitoring pursuant to Section 6.5.2. See Section 6.6.5. Amendments are also permitted under Section 6.7. We have concluded that 20 years is a sensible term that will allow for the conservation benefits of the Agreement to occur but still provide flexibility for necessary conservation actions that may be required in the future. There are advantages and disadvantages to a shorter term, and we believe the advantages of a twenty-year term surpass the disadvantages. The investments of time and money for project design, permitting, and implementation, the nature of grant cycles, and the variability of the natural processes tied to the full realization of the proposed habitat improvements all dictate a longer commitment by all parties.</p>
55	McBain Associates	<p>“The Adaptive Management Plan (AMP) does provide some process for annual check-ins, but those annual reporting check-ins tend to focus on annual monitoring results without stepping back for a big picture review of program trajectory, and 20-year time step is too long for that. Therefore, we recommend that an intermediate check-in step be added to Section 5.2.5 for a 5-year time step where the agencies and Covered Parties review program trajectory, re-evaluate the Safe Harbor Template (if needed), and revisit BMAs and AMMs.” [p.1-2]</p>	<p>The Adaptive Management Program has been revised to include a 5-year check-in process to evaluate effectiveness of the program, perform a site visit to confirm implementation of BMAs has occurred as intended and provide a process for modification of BMAs or AMMs. See Section 6 of the AMP. Any recommendations to modify existing BMAs or AMMs must be mutually agreed to by the Permittee, NMFS, and CDFW. The Adaptive Management Program and the annual reports will facilitate the kind of “big picture review” suggested by the commenter. The Forbearance Agreement also has a 5-year interim term built into it so that flows can be adaptively managed based on new and improved data.</p>

56	McBain Associates	“Please clarify what “approximately 20 years after the effective date” means, seems vague.” [p.2]	The effective date, as defined in Section 5.2.4.A of the Agreement, is the date that: (i) the Site Plan Agreement is signed by both NMFS and the Permittee; (ii) the ESP is issued by NMFS and signed by the Permittee; and (iii) NMFS, CDFW, and the Permittee sign the Agreement. The Agreement, the site plan agreement, and the related permit will all expire 20 years after the effective date. Per the Agreement, the exact expiration date of each permit and agreement will be stated on each document, so there will be no ambiguity regarding expiration dates.
57	McBain Associates	“Section 6.2.2, add fuel spill and oil leaks to the list of emergency notice” [p.2]	Comment noted. It is our understanding that fuel spill and oil leaks will be reported to the appropriate local, state, and federal agencies under relevant laws. <i>See</i> Cal. Gov. Code § 8607.25.5, Cal. Wat. Code § 13272.
58	McBain Associates	“Section 6.5.1, this isn’t necessarily true, as the agencies will also be responsible for some of the monitoring activities per the AMP”	The responsibilities for monitoring are laid out in the Agreement, Appendices, and within each site plan agreement.
59	McBain Associates	“Section 6.5.3, on the surface, \$1,500 seems very inadequate to implement the effectiveness monitoring. We assume this funding will be applied to stream gaging, water temperature, and secondary habitat monitoring elements (Table 2 in AMP), and NOT agency monitoring in Table 6, but please clarify what this funding covers. A total anticipated budget would also be helpful to assess how reasonable the funding levels will be to adequately monitor effectiveness.”	\$1,500 is the commitment per Permittee to maintain the effectiveness monitoring network only, the parameters for which is outlined in the Adaptive Management Program. If more is required to maintain the monitoring gage sites, it will be the responsibility of the landowners to address those costs. Annual monitoring and reporting requirements are also identified for the Permittees, such as flow gauging of diverted volumes at diversions, and continuance of that monitoring is the responsibility of the Permittees. Secondary habitat monitoring is identified in the Adaptive Management Program including evaluation by agencies as funds allows. The intent is for the Agreement to serve as a partnership, where the entire burden is not borne by the landowners. Monitoring costs identified during development of the Agreement were estimates. The parties negotiated the amount indicated in the documents understanding this financial commitment cannot be borne by the permittees in total. The information from the monitoring devices is not only to help inform compliance immediately, it is also a resource for other individuals and organizations. As such, when the data becomes public, it makes sense for NGO donations and public funds to be part of the complete monitoring funding package. We also recognize that if landowners were to “drop out” of the Agreement due to the costs of participating, an opportunity for public-private partnerships to improve SONCC coho salmon habitat on private lands would also be diminished.

60	McBain Associates	“Section 6.7.2 and 6.7.3, probably need to add CDFW to several of the approvals.”	Comment noted. We have revised accordingly.
61	McBain Associates	“Page 28, second paragraph. NMFS estimates that the Shasta River core population should have at least 4,700 spawners.”	Comment noted.
62	McBain Associates	“Page 65, bullet 3, and Pg. 66, number A4: Push-up dams should not be considered as a preferred option for use as a flow barrier or weir in reaches that have overwintering coho salmon. Even with the precautions in place under Pg. 66, number A5, the increased turbidity and use of heavy equipment can have adverse effects on Coho Salmon, as well as other native fish and wildlife species.”	Comment noted. We have revised accordingly.
63	McBain Associates	“Page 65, last sentence. The flow measurement accuracy listed here is inconsistent with those listed on Page 109 of the AMP, suggest using the criteria here for page 109.”	Comment noted. The section reference in the comment was revised to be consistent with the language in the Adaptive Management Program.
64	McBain Associates	“Page 68, number B6. The Covered Species will be present and potentially under stressful flow and/or thermal conditions during the June 15-November 1 period (at least June 15-September). Realizing that instream work needs to be done, there should be BMP details on how to do this instream work, including block netting and fish removal, minimization of downstream turbidity, and others. Perhaps there is an accompanying document that provides those details, but B6 should reference the required BMP.”	Comment noted. Block netting and fish removal best management practices and techniques are listed under the AMMs titled “Requirements for Covered Species Relocation and Dewatering Activities.”
65	McBain Associates	“Page 68, number B8: We recommend that wording should be included to ensure no non-native fishes are released into the river when releasing water from off-channel impoundments, ponds, and tailwater basins.”	Comment noted. We will insert this wording.

66	McBain Associates	<p>Referring to Appendix 4: “The Adaptive Management Plan (AMP) is a good step forward and provides much of the detail on how the Agreement would be implemented. The steps listed at the bottom of page 102 contributes to an AM process, but there are more steps to a formal AM process. Avoiding the rabbit hole of the formal AM process, the key function that this AMP needs to achieve is a strong and rapid feedback loop between management actions and performance towards the Safe Harbor Agreement goal (...contribute ...to the recovery of the Covered Species). This feedback loop needs to be on a variable time scale: 20 years is much too long, and for many performance metrics, 1-year is too short.”</p>	<p>A five -ear check-in process has been added to the Adaptive Management Program to address this concern. The check-in will be used to evaluate the effectiveness of the program by using the feedback loop identified in the program.</p>
67	McBain Associates	<p>Referring to Appendix 4: “The AMP provides annual reporting and a process for discussing changes in AMM’s and BMA’s, but any changes to AMM’s and BMA’s are “voluntary”. While we understand the rationale for relying on voluntary changes, it is difficult to have a lot of confidence that future needed changes will actually occur if all are voluntary. Thus, future cooperation, trust, and collaboration will be a key component to make this approach work, and in a timely manner to avoid extirpation of coho salmon and beginning actual recovery.” [p.2-3]</p>	<p>Assurances are commitments by NMFS to a non-federal property owner with regard to future ESA regulatory obligations for covered species and/or habitat. For this safe harbor agreement, these commitments are outlined in the Agreement and site plan agreements. The regulatory assurances depend on the Permittee complying with all obligations in the Agreement, site plan agreement, and the ESA section 10(a)(1)(A) permit. Absent a finding of jeopardy to an ESA-listed species or adverse modification or destruction of their critical habitat, the Permittee is assured that NMFS will not require additional or different management activities to be undertaken for purposes of ESA compliance without his or her consent. A SHA is a mechanism that allows private property owners a means to voluntarily conduct activities that contribute to the recovery of listed species and be provided assurances that additional restrictions will not be imposed as a result of their voluntary conservation actions to benefit the covered species. Collaborative stewardship with non-federal property owners involving the proactive management of listed species can help to achieve the goal of the ESA to recover threatened and endangered species. NMFS views SHAs from a partnership perspective.</p>

68	McBain Associates	<p>“The AMP should be able to address, as quickly as possible, “are our AMM’s and BMA’s resulting in actual improvements in coho salmon populations, or at least improvements in juvenile coho health, survival, and productivity?””</p>	<p>The annual report will allow for the agencies to assess whether implementation targets are being met. In addition, some of the gaging will be “real time,” so the agencies will have the ability to analyze improvements in stream conditions as they are occurring. The ample reporting requirements in the Agreement also ensure that the parties are tracking and aware of the efficacy of the BMAs and Adaptive Management Program. We have concluded that the Adaptive Management Program is sufficient to allow for improvements in efficacy of Agreement implementation. Some of the BMAs being implemented by Permittees are based on the amount of water available or certain instream minimum flow requirements.</p>
69	McBain Associates	<p>“Most of the performance metrics in the AMP focus on secondary metrics, such as flow targets, and the ecological metrics (fish passage, instream habitat) are vague and unquantified.”</p>	<p>The performance metrics in the Adaptive Management Program focused on targets over which the landowners have reasonable control, such as flow inputs. In deciding on metrics, it was critical that we choose metrics that are directly influenced by landowners.</p>
70	McBain Associates	<p>“The most direct link to the Safe Harbor Agreement goal appears to be in the Validation Monitoring section on page 123, where expectations of “ improved distribution, abundance, and survival of coho salmon over time” are listed, but it is uncertain whether this monitoring will actually be conducted (“CDFW’s continued monitoring will be contingent on staff availability and funding”). What happens if monitoring information that is foundational for understanding whether the Safe Harbor Agreement goal is being met is not collected? Even if that information was being collected, what happens if the goal is not being met? For example, if in Coho Salmon outmigration numbers do not improve after meeting a significant number of the AMMs and BMAs after X years, then further evaluation and additional actions should be taken.”</p>	<p>There are several factors outside of the landowners’ control that contribute to salmonid population fluctuations such as water year, ocean and in-river harvest, disease, ocean survival, etc. NMFS uses habitat surrogates for these reasons. The Agreement provides mechanisms to address non-compliance.</p>

71	McBain Associates	<p>“Currently, it is not clear how the adaptive management plan will be adaptive. We recommend that there should be a process in the agreement on to analyze how improvements in water quality, habitat, and hydrological AMMs and BMAs relate (or not) to biological “validation” monitoring data, and steps to take if coho salmon outmigration numbers do not increase. This is a critical step to ensure the goal of the Safe Harbor Agreement is achieved rather than just the terms of the agreement be met.”</p>	<p>The inclusion of adaptive management strategies in SHAs allows for mutually agreed upon changes to the conservation measures to occur in response to changing conditions or new information. The primary purpose of adaptive management is to examine alternate strategies for meeting the goals and objectives of the SHA through research, evaluation, and/or monitoring, and then, if necessary, adjusting future actions according to what was learned in order to meet those goals and objectives. In an adaptive management framework, if the expected results of a management activity are not achieved, the management activity is either modified or an alternative activity is undertaken in order to achieve the expected results. In this case, changes must be mutually agreed upon by the Permittee, NMFS and CDFW.</p>
72	McBain Associates	<p>“Lastly, there is no discussion on who will manage this whole process. Good management and leadership will be key to successful implementation of the Safe Harbor Agreement and meeting its goal. Therefore, there should be an illustration of the different groups and organizations, and their roles and responsibilities, and would probably be most appropriate in Section 5 of the AMP.”</p>	<p>The parties to the Agreement and the site plan agreements include NMFS, CDFW, SWCG, and individual Permittees. The SSWD is also a committed participant. The Adaptive Management Program describes the parties responsible for monitoring and reporting. Monitoring efforts will be conducted by various entities as identified in the Agreement and site plan agreements, including the SWCG and their agents, individual Permittees, NMFS, CDFW, and NGOs such as TNC and CalTrout. Monitoring data will be collected annually following the calendar year beginning on January 1st and ending on December 31st. Annual reports providing data gathered during the report period by the Permittees shall be provided to the parties by March 1st of each year. SWCG will consolidate the annual reports and provide the consolidated report to NMFS and CDFW by April 1st each year. By May 1st, NMFS and CDFW will review the reports and work to address any questions or comments. Finally, NMFS will prepare an Annual Implementation Report, which will be available to the public, by June 30th.</p>

73	McBain Associates	<p>“The Figure 3 map should be printed in 11X17 scale so that the monitoring sites and reach boundaries can be better interpreted. More importantly, the gage locations in both Figure 3 and Table 1 should clearly show which gages are flow target locations for the flows in Exhibit B. Lastly, the scale causes some of the gages to be plotted on top of each other so we can’t see what is underneath (e.g., MPD and PME).”</p>	Comment noted.
74	McBain Associates	<p>“Page 104, second paragraph, a higher level goal should be to increase juvenile health and productivity. The objectives listed are intended to achieve that, and should also include rearing habitat abundance or capacity (not just diversity).”</p>	Comment noted. We will add this to the higher-level goals.
75	McBain Associates	<p>“Table 1. The compliance gages need to be clearly identified, all compliance gages should be Real Time so that non-compliance can be quickly identified and remedied (rather than waiting a month), and hopefully those gages are all Public (seems inappropriate for compliance gages to be Private). Why wouldn’t Parks Creek at the mouth have a rating curve to compute flow? Also, Public versus Private needs to be defined.”</p>	<p>“Public” is defined as being published and available on CDEC. Private means password protected with access provided to the agencies. PBS (Parks Creek at Big Springs) will be rated to ensure there is adequate flow to fulfill the Cardoza diversion at the new location and this will be a public site on CDEC. The downstream compliance point will be the GID riffle in the interim. If a riffle is constructed due to the Novy Rice Zenkus (NRZ) fish passage barrier removal project, the downstream compliance point will be the NRZ riffle if it is deemed rate-able, if not an alternative site downstream of A-12 will be identified.</p>

76	McBain Associates	<p>“For certain gages, unimpaired flows should be estimated (Parks Creek, Big Springs, and other springs) on a daily time step, so we know how much water is in the system, and that we ensure that compliance with bypass flows targets are realistic w/respect to how much water is in the system.”</p>	<p>Comment noted. There is a lack of long term hydrologic data describing flow characteristics for the stream reaches within and upstream of the Covered Area. Information describing historic management of diversions is often lacking in detail, both in the amount of water diverted at each point of diversion and how those amounts likely changed through time as water availability decreases between spring and summer. Records maintained by the Watermaster lack this detail as well or appear to missing entirely. This will be rectified under the Avoidance and Minimization Measures stipulating that all diversions be monitored per SB88 standard and reported in the annual report. Given the lack of data, it would be challenging to estimate unimpaired flow at any gage with natural accretion from spring flow contributions and tailwater returns, which all tend to fluctuate during the irrigation season and between water years, and the mechanisms responsible for these fluctuations are poorly understood. We think the effectiveness monitoring network proposed in the Adaptive Management Program, as well as the required point of diversion monitoring per the AMMs, will allow us to establish if bypass amounts are being carried out and if instream contributions are adequate, given the amount of water available on any given year. Water conservation projects proposed under the Agreement are intended to reduce diversion volumes and improve irrigation management resulting in improved flow conditions in the Shasta River and Parks Creek. The Flow Management Strategy considered recommendations from studies conducted by McBain & Trush, Inc. (2013) and McBain et al. (2014) and was designed to improve conditions for coho salmon during their instream life history.</p>
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77	McBain Associates	<p>The description of gaging on page 108 needs to be strengthened, because all of the flow targets depend on this. There are two components: accuracy of the data, and gage maintenance. Both are critical. One of the purposes of taking regular streamflow measurements is to ensure that the equipment is working properly during the site visit. Nine measurements may not be enough to do this. Should also consider redundancy to reduce risk of data gaps. For example, a secondary stage recorder can be easily installed for redundancy, and the cost is minimal compared to the lost data. As implied on page 108, it is critical that this work be done by qualified technicians, including installation, site maintenance, flow measurement collection, rating curve development, record generation, QA/QC process, and equipment maintenance. There should then be 3rd party review of records, and finalization based on that review. As stated, the stream gaging program should follow USGS standards (Rantz, 1982a and 1982b) and meet SB88 requirements, at minimum for low and moderate flows (flood flows are less important and add considerable cost). Given the unique nature of gaging needs in the Shasta Valley, we recommend that the contractor selected to conduct the gaging prepare a gaging plan that is reviewed by NMFS or CDFW, and potentially USGS. Lastly, a short Station Summary Report for each location will provide a helpful overview of the years gaging efforts (we can provide simple example of this).” [p.3-4]</p>	<p>The Adaptive Management Program has been revised to address the concerns about maintenance and QA/QC. Comment noted regarding redundancy of monitoring network elements.</p>
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78	McBain Associates	<p>“Similarly, the water temperature monitoring section needs more details on methods to ensure that water temperature differences from management actions can be accurately documented. The first step is to ensure that sensors are properly validated prior to and after deployment in the stream, and spot measurements taken periodically during monitoring (during streamflow measurement trips) to provide additional validation data. The data needs to undergo a careful QA/QC program to review the water temperature data following retrieval of the sensors (e.g., EPA 2014, Wisconsin Department of Natural Resources 2004).” [p.4]</p>	<p>Comment noted. The Adaptive Management Program has been revised to address these concerns.</p>
79	McBain Associates	<p>“Page 110, 2nd paragraph should also discuss expected increases in depth associated with large wood, in addition to cover and velocity refugia.”</p>	<p>Comment noted, and we have revised accordingly.</p>
80	McBain Associates	<p>“The description of secondary habitat monitoring elements in Table 2 is too general. If the purpose of the monitoring is to enable detection in improvements of physical habitat, then the methods need to be robust enough to detect these improvements. Photo point monitoring is inferential, but is vague and typically not good enough to detect changes. Mapping could be, but more detail is needed to evaluate capability. For example, while repeat riparian mapping from Google Earth imagery for large scale changes in riparian vegetation may work, it will not be sufficient to capture more nuanced changes to riparian vegetation that would be important to physical habitat recovery.”</p>	<p>The performance metrics in the Adaptive Management Program focus on targets over which the landowners have reasonable control, such as flow inputs. In deciding on metrics, it was critical that we choose metrics that were directly influenced by the landowners.</p>

81	McBain Associates	<p>“Page 113, assessing water temperature success criteria should be ongoing. The flow experiments that will take place after implementation of BMAs after year 5 may provide information on water flow management for water temperature, but it is also not necessary to perform these experiments to analyze the effects of BMAs on water temperature. We recommend that the stream temperatures and criteria be (re)assessed on an annual basis once the data is certified.”</p>	Comment noted.
82	McBain Associates	<p>“Top of page 114, we appreciate the cautionary reminder of the limitations of the MA & HSU (2013) study with respect to Tier 2 and Tier 3 fish in good condition criteria. However, the follow-up sentence states that “...the TAC is optimistic that use of these IFN estimates are useful to develop the flow strategy within the Covered Area will be sufficient to reverse the current declining trend in population abundance... and contribute to the recovery of the Covered Species.” This will hopefully be the case, but it points to the high likelihood that more will be needed to meet the goal of the Safe Harbor Agreement and achieve Tier 2 and Tier 3 criteria needed for fish in good condition below Dwinnell Dam. Also, meeting the goal of the Safe Harbor Agreement and fish in good condition extends beyond the boundary of the Covered Area (e.g., Shasta Canyon), so the expectations need to be carefully stated. Additional management actions both within and outside the Covered Area obviously isn’t the sole responsibility of the Covered Parties, but the document needs to clearly state that there is likely still a lot more work to do to achieve the goal of the Safe Harbor Agreement and fish in good condition for the ESU. While we are hopeful, meeting Tier 1 criteria alone will likely not achieve the goal of the Safe Harbor Agreement and fish in good condition requirement. Much of this work will need to either improve the BMAs and AMMs, or supplement them with additional management actions as we learn from implementation of the BMAs and AMMs (and corresponding assessment of juvenile fish production and adult escapement).” [p.4-5]</p>	Comment noted.

83	McBain Associates	<p>“Page 115, the CHERP flows should be a huge benefit to fish production in the mainstem Shasta River, this should result in a very significant improvement to habitat conditions below Dwinnell Dam. One important question could be to evaluate how future changes to Lake Shastina inflows will change the cold-water pool and projected storage conditions in the reservoir, to evaluate whether there will be improvements or challenges to meet the target flows downstream of Dwinnell Dam. Some results from a water operations analysis should be provided to illustrate whether this is a future benefit or a risk.” [p.5]</p>	<p>Comment noted. Future inflows to Lake Shastina are outside the scope of the Agreement.</p>
84	McBain Associates	<p>Page 115, water year types. We have significant concerns of using a water year type based on Lake Shastina Reservoir storage. Page 33, paragraph 2, line 1 states that a substantial amount of water stored in Lake Shastina (~50%) is lost to evaporation and leakage (Vignola and Deas 2005). This would indicate that storage levels are volatile and are loosely affiliated with inputs from the upper river.” In addition, flows into Lake Shastina from the upper Shasta River are already impaired from upstream diversions. approach for water year typing and rely less on reservoir storage (but with some off-ramps for unavoidable conditions).” [p.5]</p>	<p>The water year types, the criteria for which are based on reservoir storage and snowpack, vary between months, and are based on the March 1st storage estimate at Dwinnell Dam, because releases from Dwinnell are dictated by the Conservation and Habitat Enhancement and Restoration Project (CHERP), which was approved by NOAA Fisheries in 2017. CHERP implements a number of beneficial activities, including a fish screen at a diversion from Parks Creek, construction of off-channel rearing habitat for juvenile coho salmon, and a new water management strategy to ensure sufficient water is released from Dwinnell dam into the Upper Shasta River to benefit coho. Flows into the Shasta are dependent on these releases, which are in turn dependent on the water year types defined in the CHERP. These releases were developed to ensure that suitable hydrogeological conditions would be in place for all stages of coho salmon in <i>very dry</i> water years, serving as a baseline. As water year types improve, increased flow releases will further improve conditions for all life stages. As noted in the Agreement appendices, in wet and very wet years, an additional block of water will be released adaptively for other purposes such as sediment flushing, habitat maintenance, or to enhance migration.</p>

85	McBain Associates	<p>“Unfortunately, we have not been able to obtain the Watercourse Engineering (2016) report that describes the water year classification approach, so the details on the specific blending of storage and snowpack/runoff forecast may or may not be appropriate. Ideally, the water year type would be mostly based on forecasted unimpaired runoff, with potentially some off-ramps for unavoidably poor Lake Shastina storage conditions. But these unavoidably poor storage conditions need to be defined so that we are not in a perpetual poor storage condition due to upstream diversions and/or poor water management in the reservoir. We have had some conversations with the California Nevada River Forecast Center to add a computational node that estimates unimpaired runoff from the upper Shasta River (and potentially Parks Creek) that could be a better” [p.5]</p>	<p>As noted in the Agreement, a process of examining changing year type within a year is included to accommodate the potential changes in spring time conditions that may lead to more or less water available for the upcoming period. This process allows for “off-ramps” for unavoidably poor conditions.</p>
86	McBain Associates	<p>“Lastly, there are efforts underway for the State of California to provide funding to DWR to conduct LiDAR based snowpack monitoring via the Airborne Snow Observatory (ASO) program for the Sierra Nevada and Klamath Mountains, which would provide highly accurate forecasts of snowpack, which would then allow accurate estimates of unimpaired runoff from the upper Shasta River and Parks Creek.” [p.5]</p>	<p>We look forward to this information being available. The Forbearance Agreement has a 5-year interim check-in so that flows can be adaptively managed based on new and improved data points.</p>
87	McBain Associates	<p>“Page 115, last paragraph. The block water is helpful, the timing of these needs to be explained. Exhibit B says “fall/winter”, but it would be helpful to have more flexibility in the timing, particularly if these releases could happen in the spring for juvenile growth and smolt outmigration.” [p.5]</p>	<p>The description of this block of water that will be available in wet and very wet years indicates that it will be released “adaptively for other purposes,” which allows for ample flexibility in timing. It specifically notes that one of these purposes could be to enhance migration.</p>

88	McBain Associates	<p>“Page 121, Table 5. The 6 cfs for the upper Shasta River from May 15-September 30 contradicts the text on Page 115, where it is stated that the flow experiments using Flying L pumps suggested 11 cfs provided greatest overall benefit to water temperatures. Should Table 5 be updated to reflect the 11 cfs conclusion? If not, please explain and resolve apparent discrepancy. Also, we are unclear where the performance indicators in the table came from. It would be helpful to include citations in the table as a new column, or in the table caption (if one source).” [p.5]</p>	<p>Overall, the Flow Management Strategy aims to increase instream cfs by an additional 3-8 cfs to reach 6.5-33 cfs during the spring rearing, redistribution and emigration season, 2-10 cfs to reach 5-13 cfs during the summer rearing season, and 3 cfs to reach 8-14 cfs during the adult migration and spawning. This is a significant increase in instream flows during all life stages. The 6 cfs standard in Table 5 is derived from the recommended minimum instream flow needs proposed by McBain and Trush for summer rearing habitats. The metric is meant to serve as a floor rather than a ceiling for summer rearing habitats in the Upper Shasta River.</p>
89	McBain Associates	<p>“Page 121 and 122 Success Criteria. The success criteria appears to be achieved if the frequency of meeting or exceeding the target is increased. This is a pretty low bar for success. If flows meet or exceed the target by 1 day in the middle of winter, does this mean the criteria is met? If there is a reasonable chance that the targets should be met (there is adequate water in the system), then the criteria should be that the targets should be met X % of the days (hopefully 95% to 100%). Equally important, there should be some negative criteria included, such as “did the stream dry up” or “did flow or temperature drop below some critical threshold”. One bad day could eliminate all of the benefits achieved for the rest of the year. If some more flexibility is needed, then the targets should be prioritized by critical life history stage. For example, there could be more flexibility in the winter on meeting the Table 5 targets, but less so during adult migration and juvenile rearing and smolt outmigration. The last part of the paragraph references (re)assessment annually, but this is pretty squishy for such an important performance metric. Additionally, the wording of this section suggests that an individual water year type and variability may be used as a rationale to avoid a non-success conclusion for meeting the flow target. If it is a drier year, meeting the flow targets is just as important, if not more important, and this should not be used as a rationale. A more specific plan for how to incorporate water year type variability into in stream flow target evaluations is needed, otherwise it appears that the “water year variability” rationale could be too easily used to explain away not meeting the flow targets.” [p.5-6]</p>	<p>Comment noted. The success criteria for flows are tied to water conservation measures undertaken during the irrigation season and not necessarily to hard flow targets. Tailwater, accretions, and riparian water use make it difficult or impossible to determine flow targets throughout the irrigation season.</p>

90	McBain Associates	<p>“Page 122 and 123, riparian vegetation. The proposed riparian mapping approach will be too coarse to detect modest and subtle (but important) changes in riparian vegetation. There are some inexpensive ways to greatly improve the riparian vegetation assessment, such as drone photos with field mapping and/or field transects, that would better evaluate riparian vegetation trajectory in response to BMA’s and AMM’s on a much shorter time scale (5-year would be better than 10-year proposed at the top of page 123).” [p.6]</p>	<p>Comment noted. The annual report will summarize if riparian planting has occurred. We revised the Adaptive Management and Monitoring plan to include a 5-year check-in meetings, which would include site visits to the enrolled properties to evaluate success of BMA implementation. We expect these check-in meetings, as well as the monitoring photos, will allow the opportunity to assess vegetation changes over time as recommended in your comment.</p>
91	McBain Associates	<p>“Page 123, instream habitat. Again, pretty squishy evaluation, not sure how much value this will have.” [p.6]</p>	<p>Comment noted.</p>
92	McBain Associates	<p>“Page 123, Validation Monitoring. This is probably the most important piece to relate BMAs and AMMs to the Safe Harbor Goal. The metrics of distribution, abundance, and survival of coho is good, should also add growth/health as another metric, give the importance of outmigrant size to its chances of returning as an adult, as well as the ability of a larger smolt to leave the system earlier when water quality would be better in the mainstem Klamath River (also increasing chances to return as an adult). Also add “migration” to the coho salmon life history phases.” [p.6]</p>	<p>Comment noted. See our comment above regarding use of habitat surrogates for the Agreement rather than population metrics.</p>
93	McBain Associates	<p>“Page 124, Validation Monitoring. Again, this is probably the most important piece of monitoring; however, it is unclear how it will be used to evaluate whether the agreement goal is being met. Presence/absence surveys and PIT tagging may be helpful to understand movement and distribution, but shouldn’t we be interested in increased smolt production? A primary question should be “are we getting more fish or not, and if yes or no, why?” If the spawning surveys (and carcass surveys) are combined with juvenile abundance estimates, it would enable better cause and effect linkage between the BMAs and AMMs.” [p.6]</p>	<p>Comment noted. CDFW will conduct spawner surveys and downstream migrant trapping as funding and staff resources allow.</p>

94	McBain Associates	<p>“Page 124, Validation Monitoring. This biological monitoring is contingent on CDFW staff availability and funding, which is worrisome. What happens if CDFW can’t perform this most basic biological monitoring to evaluate whether the Safe Harbor Agreement is meeting its primary goal? This biological data will be necessary to determine whether Safe Harbor actions are facilitating the intended biological responses. This could be a fatal flaw, and some sort of contingency plan needs to be developed to ensure that this monitoring be done, such that the Safe Harbor Agreement goal can be evaluated. Otherwise, the benefits of this whole effort will be speculative, and recovery may or may not occur. For the Safe Harbor Agreement to work, there needs to be better commitment to this critical validation monitoring, with specific criteria to determine whether sub-objectives of the Safe Harbor goal are being met.” [p.6-7]</p>	<p>Comment noted. We have considered this and determined it is unreasonable to put the burden and cost of enumerating salmonid status and trends at different life stages on the Permittees. There are several factors outside of the Permittees’ control that contribute to salmonid population fluctuations such as water year, ocean and in-river harvest, disease, ocean survival, etc. That is why we decided to use flow, temperature, and habitat as monitoring elements rather than population numbers. CDFW cannot commit to having the budget to conduct this type of monitoring in the future.</p>
85	McBain Associates	<p>“Page 124, Table 6. Where will this validation monitoring occur? Need the location so we can help assess its ability to evaluate the Safe Harbor Agreement Goal. Hopefully these monitoring locations will be in places that can isolate the individual BMAs and AMMs (e.g., mouth of Parks Creek).” [p.7]</p>	<p>Comment noted. The locations are provided in the Agreement appendices.</p>
96	McBain Associates	<p>“Page 125, Top of page, we appreciate that many factors influence coho salmon survival, but efforts should be made to link local changes in habitat to local changes in juvenile coho growth and survival. Monitoring coho salmon response in the Covered Area should be compared with a reference site within the basin, and outside the basin, to enable association of Safe Harbor action to coho response, and isolate other effects not associated with the Safe Harbor actions.” [p.7]</p>	<p>Comment noted. Although it would be informative to determine the effectiveness of BMAs, a lack of dedicated funding prevents the Agreement participants from linking local changes in habitat to salmonid growth and survival.</p>

97	McBain Associates	<p>“In addition to the Big Springs reference site suggestion in the second bullet below, monitoring data in the Shasta River should be compared to monitoring data in another north coast stream to identify both internal and external factors to coho response. For example, if coho spawning counts are increasing elsewhere in the Klamath River basin, but not in the Shasta River, this would suggest that ocean and downstream conditions is not causing the disproportionate response of coho recovery in the Shasta River. And likewise, if juvenile production and/or adult escapement is disproportionately higher than other basins, it would contribute to evidence that the Safe Harbor actions are helping in the Covered Area.” [p.7]</p>	<p>Comment noted. We have considered and we added language to monitoring as part of the Adaptive Management Program that suggests that these data will be compared to other life cycle monitoring stations in the SONCC domain.</p>
98	McBain Associates	<p>“Page 124, Table 6. There should also be an assessment of thermal refugia, perhaps it is part of the juvenile surveys and PIT tagging task, but is unclear. From Page 118 of MA & HSU (2013), "Ultimately, management decisions should be based on the response of fish to local refugia and estimates of survival based on physical/thermal habitat as well as biological factors.” This is a key point in that we need a better understanding of when, where, and how juvenile coho are using refugia/hotspots in the Big Springs complex. Meeting reach- specific IFN thresholds is necessary but not likely not sufficient to “reverse the current declining trend in population abundance”. Juvenile coho production is not uniform along the channel – and certain sub reaches punch well above their weight in sustaining juvenile production from the basin. Those places have been identified by several studies, and more emphasis should be placed on protecting those critical reaches. Without: (1) identifying and really protecting local thermal refugia and (2) improving the quality of foraging habitat (especially degraded margin and overbank habitat) in hotspots – the BMAs and AMMs alone may not achieve recovery.” [p.7]</p>	<p>Comment noted. We have considered this suggestion, and although it would be informative to determine the effectiveness of BMAs, a lack of dedicated funding prevents the Agreement participants from assessing the extent of thermal refugia and the response of fish to these areas.</p>

99	McBain Associates	<p>“Page 125, Evaluation. With all the caveats about other factors influencing coho salmon survival and environmental/biological variability, there are ways to isolate and reduce the variability to better assess the effectiveness of BMAs and AMMs quantitatively rather than just qualitatively. For example, if Big Springs will be largely unimpaired, it can potentially be used as an index reach for the validation monitoring elements in Table 6 on other reaches. The comparison isn’t intended to judge the other reaches against Big Springs reach, but to enable understanding variability within reaches and between reaches to better tease apart the effectiveness results for individual reaches. For example, adult escapement on Parks Creek may be low, but is this due to an overall low escapement in the entire Klamath Basin or due to ineffectiveness of our BMAs and AMMs? Having a virtually unimpaired index reach like Big Springs would help answer these questions.” [p.7-8]</p>	Comment noted.
100	McBain Associates	<p>“Page 126, top of page. The voluntary language is a bit concerning, and really depends on the good faith efforts of the parties to make this work, and in a timely manner. It seems like voluntary is ok as long as substantial progress is being made to achieve the Safe Harbor Goal, but if not, we need to be able to quickly adjust our BMAs and AMMs to meet the goal. What happens if no volunteering occurs? Does the Safe Harbor Agreement Termination Clause get invoked? Perhaps a sentence explaining what happens if 1) the Goal is not being met, and 2) revised BMAs and AMMs are not conducted.” [p.8]</p>	<p>An SHA is a mechanism that allows private property owners a means to voluntarily conduct activities that contribute to the recovery of listed species and be provided assurances that additional ESA restrictions will not be imposed as a result of their voluntary conservation actions to benefit listed species. Collaborative stewardship with non-federal property owners involving the proactive management of listed species can help to achieve the goal of the ESA to recover threatened and endangered species. NMFS views SHAs from a partnership perspective. The Agreement contains mechanisms to address non-compliance and termination of permits.</p>

101	McBain Associates	<p>“Page 126, Table 6. It looks like this is where the Adaptive Management loop would occur if there was one. The Outcome column is important, but is pretty vague, which leads to concern about whether rapid improvements in the BMAs and AMMs will actually occur.” [p.8]</p>	<p>Comment noted.</p>
102	McBain Associates	<p>“Page 127, Monitoring and reporting responsibilities section is helpful, and the questions are good. The 4th and 5th bullets (is the BMAs sufficient to detect a response at different scales?), we would hope that these have been thought through already when the BMAs were developed in the first place (why develop a BMAs if the response is undetectable?). If this assessment of proposed BMAs has already occurred, then perhaps mention it in the paragraph above, and modify these bullets as an evaluation of those prior assessments.” [p.8]</p>	<p>Comment noted. We feel that some BMAs will still need to be evaluated after implementation to determine if improvements are measureable.</p>
103	McBain Associates	<p>“The 6th bullet should prioritize critical life stages, not necessarily all life stages. So suggest changing “all” to “priority”, and then state what those are (juvenile rearing in spring, smolt outmigration, summer rearing).” [p.8]</p>	<p>Comment noted. We have considered and made revisions where appropriate.</p>
104	McBain Associates	<p>“8th bullet should also focus on timing (I would assume we’d prioritize spatial distribution (due to improved water temperatures) during the summer rearing period.” [p.8]</p>	<p>Comment noted. We have considered and made revisions where appropriate.</p>
105	McBain Associates	<p>“Lastly, the final bullet unfortunately does not appear to be in the monitoring program per Table 6 (particularly juvenile survival and abundance), so we’re not sure how this question will be able to be answered. We feel that this question is the most important one in the list, so we recommend that the monitoring be expanded to enable rigorous evaluation of this question. We also recommend adding a bullet point that links monitoring to next steps. For example, if a positive response in critical life stages of coho salmon was not measured, what modifications to the BMAs should be made?” [p.8]</p>	<p>Comment noted. We included the following question: did the abundance and/or survival of freshwater life stages of coho salmon improve following the implementation of BMAs within the Covered Area or the Shasta River basin? Answering this question will require several years of population status and trends data , eg., downstream migrant trap and spawner surveys, however, it is important consideration for the overall validation monitoring plan and the Adaptive Management Program.</p>

106	McBain Associates	Page 128, Section 6, fourth sentence. Recommend modifying the sentence to be “in other words, once a Permittee agrees to BMAs identified in his or her Site Plan Agreement, <u>and the BMAs are properly implemented</u> , the Permittee...” [p.8]	Comment noted. The language is adequate as stated.
107	McBain Associates	Comments on Exhibit B: “Our most substantial comment is that the flows in the table should be extended into the Shasta Canyon and compared to the flow targets contained in the Shasta River Canyon Instream Flow Needs Assessment report (MA and HSU 2014). Ideally, implementation of the Safe Harbor Agreement bypass flows will also satisfy instream flow needs in the Shasta Canyon, or at least contribute to meeting downstream instream flow needs thresholds.” [p.8]	At this time, the Agreement, Diversion Reduction Table, and Flow Management Strategy govern instream flows only in the Covered Area. We are hopeful that the bypass flows will benefit instream flow needs in the Shasta Canyon and agree that this is the ideal outcome. We did not find it appropriate to tie the Agreement’s goals or metrics to areas outside the Covered Area, so we have not extended the Flow Management Strategy into the Shasta Canyon or require a comparison to the flow targets in the Shasta River Canyon Instream Flow Needs Assessment Report. Such comparisons may be useful and can be made even if they are not required by the Agreement.
108	McBain Associates	Comments on Exhibit B: “For each Entity Name, the location of where the flow targets will be measured needs to be identified on Figure 3 in the AMP, and the gage code from Figure 3 and Table 1 should be included in each Bypass Flow cell for a particular entity. It was difficult to crosswalk the bypass flow targets with the location of those target flows.” [p.8-9]	Final documents providing information on flow targets and monitoring locations have been through significant revisions to improve clarity.

109	McBain Associates	<p>“The block water releases in Wet and Very Wet years is a good idea; however, the timing seems too limited. The text says “fall/winter”, yet the season is October 1-December 31. If operationally possible, it would be much better to add flexibility to the timing of this block water release to include the spring to facilitate juvenile growth and smolt outmigration.” [p.9]</p>	<p>The description of this block of water that will be available in wet and very wet years indicates that it will be released “adaptively for other purposes,” which allows for flexibility in timing. It specifically notes that one of these purposes could be to enhance migration. We do not find it appropriate or helpful to limit the timing any more than this.</p>
110	McBain Associates	<p>“Page 3, appears to be an error beginning in row 7-10, we assume that these rows should be assigned to a different Entity Name (Belcamp? NB Ranches?)” [p.9]</p>	<p>We have reviewed this, and there does not appear to be an error. Those flows represent MWCD during very wet years.</p>
111	McBain Associates	<p>“For those bypass flow targets that are from springs where unimpaired flows are variable (e.g., Hidden Valley Ranch), the bypass flow variability needs to be better described. The variability appears to be left to interpretation whether these targets include diversions or not. The seasonality of the variable bypass flows appears to be in the non-diversion periods, but it should be clarified. For example, if the bypass flow targets are estimates of unimpaired flow variability (0.5 cfs to 3 cfs), a qualifier should be added to clarify that these flows are unimpaired and no diversions are occurring. The Kettle Springs Creek bypass flows are better described (page 6), but even that could use some cleanup (clarify what the “2.85-6.35” refers to).” [p.9]</p>	<p>These bypass flow targets represent the amount committed to being bypassed when spring flows are available, i.e. all remaining spring production not used under those ranches’ appropriate or riparian rights will be left in-stream either directly or via the improved bypass infrastructure built for the cold water substitution with MWCD.</p>
112	McBain Associates	<p>“Similarly, for those Entities that are not diverting during some parts of the year, the table should add those rows with a bypass flow of “unimpaired” to clarify that no diversions are occurring.” [p.9]</p>	<p>We have revised accordingly.</p>

113	McBain Associates	“Bottom of page 5, last row, elaborate on Bypass Flow location and make sure it is on a map (Figure 3).” [p.9]	We have revised accordingly.
114	McBain Associates	“Cardoza, page 6 middle row in the Season or Lifestage cell, where is Parks Big Springs real-time monitoring location? Make sure a consistent code is used and it is properly labeled on Figure 3.” [p.9]	We have revised accordingly.
115	McBain Associates	“Cardoza, page 6 next row down in the Bypass Flow cell, there is reference to “this life stage”, but no life stage described.” [p.9]	This references dates – June 16 to September 30 – that reflect the juvenile salmonid life stages of outmigration, snowmelt streamflows, and summer baseflows.
116	McBain Associates	“Bottom of page 6, May 21-September 6 row, the Bypass Flow description is confusing, please clarify what this means.” [p.9]	We have revised accordingly.
117	McBain Associates	“Novy-Rice-Zenkus Diversion on page 7, April 10-Nov 1 Bypass Flow cell looks like it has some typos, including 540 cfs (assume ac-ft).” [p.9]	We have revised to reflect 4 cfs for instream benefit.
118	McBain Associates	“Overall, the Bypass Flow column for the entire table needs to be carefully reviewed and elaborated upon so that it is clearer and readers can fully understand what the bypass flow is, and where it is being measured.” [p.9]	Final documents providing information on flow targets and monitoring locations have been through significant revisions to improve clarity.
119	McBain Associates	“Change McBain and Trush references to MA & HSU, 2013 throughout table.” [p.9]	We have revised accordingly.

120	McBain Associates	<p>Comments on the Application of MA & HSU (2013) to the Template Safe Harbor Agreement: “As noted in the AMP on page 114, and as we stated in the report “Prescribing annual flexibility for minimum instream flow needs was beyond the scope and authority of this study,” but such flexibility is essential to population recovery. Therefore it’s important that it is understood that the interim minimum instream flow from MA & HSU (2013) may not maintain fish at the population level (Tier 2) and community level (Tier 3), and therefore should not be expected to fully recover anadromous salmonid populations in Covered Area (or the Shasta Basin), nor will those flows necessarily result in fish in good condition per Moyle et al. (1998); we just don’t know yet. A comprehensive fisheries and instream flows needs study would need to assess the Tier 2 and Tier 3 needs, and be conducted over multiple years to understand the seasonal and inter-annual variability in flow that affect the geomorphic, hydrological, and ecological processes that anadromous salmon have evolved to utilize and are dependent upon.” [p.9-10]</p>	<p>We understand that the interim minimum instream flow from MA & HSU (2013) may not maintain fish at the population level. We also understand that meeting these targets does not create an expectation for the species to recover fully. Nevertheless, these targets are useful as a point of comparison and to improve conditions for SONCC coho salmon. With respect to future studies assessing Tier 2 and Tier 3 needs, the Agreement should provide useful data that will contribute to future studies.</p>
121	McBain Associates	<p>“Page 36, bullet 1: The instream flows cited in this document are from MA & HSU (2013) and are stated as providing “adequate” conditions for spawning and migration. We feel it is important the word adequate is replace with minimum in all instances in the Safe Harbor Agreement where results from MA & HSU (2013) are cited, so that it is clear that flows below the minimum would not maintain individual fish in good condition.” [p.10]</p>	<p>Comment noted. We have revised where appropriate. We understand that the interim instream flows from MA & HSU (2013) are minimums.</p>

122	McBain Associates	<p>“Page 47, paragraph 1: The minimum instream flows cited (8 to 10 cfs) for suitable migration and spawning conditions in the Mid Parks Creek Reach (Upper Parks in MA & HSU (2013)) are not what were presented in MA & HSU (2013). We recommended minimum flows of 11 to 15 cfs for adult salmon migration and spawning to be in agreement with MA & HSU (2013).” [p.10]</p>	<p>Page 63 of MA & HSU (2013) states: “For coho salmon and steelhead trout, using a threshold mRCT of 0.8 ft., the minimum IFN for adult upstream migration would be 8 cfs to 10 cfs (again adjusting for aquatic macrophyte effects observed at the LPC site).” In addition, riffle crest depths were also analyzed (Podlech) for .6' and provided an alternative value for adult migration.</p>
123	McBain Associates	<p>“In addition, paragraph 2 recommends to “Conduct further flow studies to support a diversion management plan; develop and implement a coordinated diversion management plan to enhance fall winter flows”. We are unsure if future flow studies were conducted and if not, we are not sure how a safe harbor agreement can be reached for the Upper Parks Creek study area.” [p.10]</p>	<p>The Upper Parks Creek flow strategy considers and provides instream flow variability dependent on the range of available flows and identified 10 cfs as the minimum during adult migration and spawning. During wetter periods, MWCD commits to ensure 21 cfs is instream prior to diverting during adult migration and spawning periods to provide additional flows and protects freshets that are critical for migrating adults.</p>
124	McBain Associates	<p>“Page 49, bullet 1: Again, MA & HSU (2013) recommended minimum flows of 11 to 15 cfs for adult salmon migration and spawning in the Mid Parks Creek Reach. The 11 cfs threshold should be used in dry and normal years based on current channel morphology and spawning gravels in the reach. Needed habitat improvements in this reach may change channel morphology and the quantity and quality of spawning gravel. During wetter years, a higher flow threshold would benefit spawners by increasing the quantity and hydraulic diversity of spawning habitat.” [p.10]</p>	<p>Page 63 of MA & HSU (2013) states: “For coho salmon and steelhead trout, using a threshold mRCT of 0.8 ft., the minimum IFN for adult upstream migration would be 8 cfs to 10 cfs (again adjusting for aquatic macrophyte effects observed at the LPC site).” In addition, a critical riffle analysis conducted on Parks Creek determined the Mid Parks Creek reach to be passable to adult coho salmon at 9.3 cfs, which is in general agreement with the MA & SU (2013) observation of 9.9 cfs in the same reach. Further, during wetter periods, MWCD commits to ensure 21 cfs is in stream prior to diverting during adult migration and spawning periods to provide additional flows and protects freshets that are critical for migrating adults.</p>

125	McBain Associates	<p>“Page 50, paragraph 3 through Pg. 51, paragraph 1: During the MA & HSU (2013) study, we observed that this reach is impaired from grazing and channel modification as noted on page 50 of the Safe Harbor Agreement. MA & HSU (2013) recommended 10 cfs threshold for physical habitat needs in Mid Parks Creek. However, modeled water temperatures in this reach were so high under current conditions, that achieving the 10 cfs threshold in Mid Parks and would have impaired water temperature at downstream sites. Therefore, we recommended 2 cfs to minimize impacts on summer sites where cold water was currently available. However, if physical habitat recovery (especially riparian fencing and cattle exclusion from the riparian zone, and new riparian planting) is properly conducted under the Safe Harbor Agreement with increasing flows from spring sources in Mid Parks Creek, then those temperature boundary conditions may be cooler, in which case a higher flow would greatly benefit salmonids in this reach and downstream.” [p.10]</p>	<p>The Forbearance Agreement has a 5-year interim term to allow for adaptive management and flexibility to adjust flows if needed. The aim of the flow management strategy in Mid Parks Creek is to meet cfs objectives earlier in the migration and spawning life stage, greatly increase flow volumes during the spring rearing, redistribution and emigration life stage, and ensure that base flows during summer rearing are colder and habitat is increased.</p>
126	McBain Associates	<p>“Page 53, bullet 1: MA & HSU (2013) recommended minimum flows of 11 to 15 cfs for adult salmon migration and spawning in the Lower Parks Creek Reach and not the 8 to 10 cfs cited in the Safe Harbor Agreement. In addition, we feel that the restoration efforts and fencing to exclude cattle at Kettle Springs and the creek (cited on pg. 52, paragraph 3) will contribute to improved water temperatures ideal for Coho Salmon.” [p.10-11]</p>	<p>Again, page 63 of MA & HSU (2013) states: “For coho salmon and steelhead trout, using a threshold mRCT of 0.8 ft., the minimum IFN for adult upstream migration would be 8 cfs to 10 cfs (again adjusting for aquatic macrophyte effects observed at the LPC site).” Specific to the Lower Parks Creek (LPC) reach, MA & HSU (2013) determined a flow of 8.1 cfs to be passable for adult coho salmon and steelhead. Kettle Spring Creek has already been fenced.</p>

127	McBain Associates	<p>“Page 54, bullet 1: In wetter years, under unimpaired conditions, Coho and steelhead would have had sustained access to foraging on off-channel benches and floodplains which can be extremely productive rearing environments for juvenile salmonids. The 20-25 cfs threshold we recommended as a minimum flow for inundating floodplain and marginal habitat under current conditions. However, as noted earlier -- interannual variability is key to population recovery, and prescribing a 20-25 cfs threshold for all years may impair the ability of Coho Salmon and steelhead to forage on productive benches during wet years (or years with a late snowmelt pulse). However, these flows may be adequate in drier and normal years. Critically - - the elevation and productive potential of those “benches” and off channel habitats are affected by cattle grazing and riparian colonization as well as streamflow and channel morphology. The instream flow needs threshold should be revisited after habitat improvement and fencing work is complete as part of the site plan agreements for this reach This could be done with time-lapse cameras to monitor bench inundation, and a nearby stream gage to correlate the time and flow.” [p.11]</p>	<p>Comment noted. We have considered this in revising project documents. We note that the Forbearance Agreement has a 5-year interim check in to allow for adaptive management and flexibility to adjust flows if needed to address inter-annual variability needs.</p>
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128	McBain Associates	<p>“It is also important to point out that source of instream flows and associated temperature boundary conditions may change the summertime 7 cfs threshold. For example, if increased instream flows are delivered to the stream via a reduction in diversions from springs, temperatures in this reach will be cooler and a threshold of 10 to 12 cfs may be appropriate. If increased instream flows are from warmer irrigation return flows, than lowering the flow threshold would decrease the impact of warm water irrigation return on downstream rearing habitat. To be clear, we are not recommending warmer incoming flows as a justification for lower instream flow, but the opposite: that cooler water with higher flows (10-12 cfs) will transform this reach from an objective of “minimize negative impacts downstream” to a “greatly increase production capacity” objective.” [p.11]</p>	<p>Comment noted. The majority of the bypassed water will be from reducing diversions from both springs and the stream and also from reducing tailwater contributions. The monitoring of flows and temperatures as defined in the Adaptive Management Program will inform us if these additional flows have the anticipated effects and if adjustments are needed through adaptive management.</p>
129	McBain Associates	<p>“The gravel augmentation component should draw upon (as is still relevant) from the Spawning Gravel Evaluation and Enhancement Plan (McBain & Trush et al., 2010).” [p.11]</p>	<p>Comment noted.</p>

130	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>“While any improvement to habitat conditions and instream flows is better than none, a net conservation benefit that justifies take coverage in the Shasta River basin must be significant given the fact that over the past 125 years landowners dramatically altered habitat and Shasta River flows to the point of crisis -- Coho are nearly extirpated from the river. Thus, a net conservation benefit can be realized only if we set Shasta River Coho on a trajectory toward recovery as opposed to merely slowing the rate of extinction.” [p.4]</p>	<p>An important requirement of a SHA is that its proposed management activities are reasonably expected to result in a net conservation benefit to the covered species. Net conservation benefits must contribute, directly or indirectly, to the recovery of listed species. This contribution toward recovery may vary and may be temporary or permanent. Realization of the benefits will be affected by the duration of the agreement, activities to be conducted, and location of the activities. For this project, net conservation benefit means the cumulative benefits of the Beneficial Management Activities on an enrolled property, taking into account the term of the Agreement and permit and any adverse effects attributable to activities carried out on the property. Such benefit may be an increase in the Covered Species’ population and/or the enhancement, restoration, or maintenance of its habitat. The site plan agreements establish baseline conditions for the Covered Species that must be maintained at the time end of the Agreement. The Agreement and permit would allow the Permittee to incidentally take Covered Species above the agreed-upon Baseline Conditions. Take associated with the Agreement can be incidental to ongoing routine agricultural activities, implementation of BMAs, and return to Baseline Conditions, provided prescribed Avoidance and Minimization Measures (AMMs) are implemented. We evaluated all effects from implementation of the Agreement and site plan agreement for each enrolled property in the NCB Finding Memorandum.</p>
131	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>“In determining whether an SHA is reasonably expected to provide a net conservation benefit, NMFS must consider the length of the SHA and any off-setting adverse effects attributable to the incidental taking allowed by the Enhancement of Survival Permit.” [p.5]</p>	<p>Comment noted. We documented this information in our NCB Finding Memorandum.</p>

132	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>“Critically, the Safe Harbor Policy states that net conservation benefits must be sufficient to contribute to the recovery of the covered species and these conservation benefits “should be reasonably expected to occur during the Agreement.” 64 Fed. Reg. at 32721 (emphasis added). In other words, net conservation benefits that are uncertain to occur cannot serve as support for an SHA because it is not reasonable to expect those benefits.” [p.5]</p>	<p>Comment noted. NMFS assessed net conservation benefits for each site plan agreement. Adaptive management is used to address uncertainty related to the Covered Species or the effects of the BMAs. NMFS supports the use of adaptive management principles in SHAs and associated permits as a means to retain the flexibility necessary to ascertain and ensure the effectiveness of conservation measures both currently being implemented and those to be implemented in the future.</p>
133	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>“We appreciate all the hard work and negotiations that the agencies and landowners have gone through to produce the fourteen draft Shasta River SHA agreements. Unfortunately, we do not believe that these fourteen agreements--even if fully implemented, which is uncertain--are sufficient to prevent the continued decline of Shasta River’s imperiled Coho salmon population. Furthermore, we are seriously concerned that the near complete lack of transparency and accountability means that the agreements will not be properly implemented or monitored for compliance with the terms. The agreements contain so many elements that are uncertain (e.g., to be determined at a later date, if feasible) that it is difficult to understand what the actual obligations are and what the actual expected results will be, contrary to the Safe Harbor Policy requirements and the ESA.” [p.5]</p>	<p>Implementation monitoring will be used to ensure that the BMAs identified in the site plan agreements are being implemented and that the terms and conditions of the permit are being met. A large portion of the species habitat occurs on property owned by non-federal entities. Conservation efforts on non-federal property are essential to the survival and recovery of the Covered Species. A SHA is a mechanism that allows private property owners a means to voluntarily conduct activities that contribute to the recovery of endangered species and be provided assurances that additional restrictions will not be imposed as a result of their voluntary conservation actions to benefit listed species. Collaborative stewardship with non-federal property owners involving the proactive management of listed species can help to achieve the goal of the ESA to recover threatened and endangered species. NMFS views SHAs from a partnership perspective. An SHA sets forth specific management activities that the non-federal property owner will voluntarily undertake or forgo to provide a net conservation benefit to listed species, and provides the property owner with safe harbor assurances. A key component of an SHA is that the actions taken by the property owner must result in a net conservation benefit that contributes to the recovery of the listed species. For this project, each site plan agreement sets forth specific BMAs and AMMs that will be implemented, and NMFS analyzes each site plan agreement separately in the NCB Finding Memorandum. There are some BMAs that require studies prior to design and implementation. NMFS accounts for the expected timing of these actions in the NCB Finding Memorandum.</p>

134	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	“Further, we assert that the current Shasta River habitat is so degraded and the population of Coho is so compromised it may be wholly inappropriate to enact any SHAs on the Shasta.” [p.5]	The Agreement is in addition to other conservation efforts ongoing in the Shasta basin and will improve instream habitat for SONCC coho salmon.
135	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	“As proposed, neither the Template Agreement nor the cumulative benefits of the fourteen associated Ranch Plans offer the sustained and considerable improvement over baseline conditions that are necessary to avoid extinction. Accordingly, the agencies should require a significantly heightened baseline on any Shasta SHA or else enforce the Endangered Species Act through promulgation of Incidental Take Permits.” [p.5-6]	The Agreement and BMAs will implement some of the actions identified in the NMFS (2014) recovery plan and are expected to result in a net conservation benefit to the Covered Species. This contribution toward recovery may vary and may be temporary or permanent. The net conservation benefit test requires NMFS to assess the benefits that accrue to the species while the SHA is in place, and the off-setting adverse effects attributable to the incidental taking allowed by the enhancement of survival permit. The resulting net conservation benefit must be sufficient to contribute, either directly or indirectly, to the recovery of the covered species.
136	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	“any reasonable Safe Harbor agreement must include adequate monitoring and oversight coupled with an array of triggers and contingencies should the proposed projects fail to achieve desired outcomes. Related monitoring needs to be real time and publicly accessible.” [p.10]	Monitoring is required and described in the Agreement and site plan agreements. There is currently very little data available, especially on diversion quantities in this watershed. Because of the Agreement, numerous diversion monitoring stations will be installed that will provide important data about water usage. This data will allow for real-time adjustments through the adaptive management process. This increased monitoring and information obtained through the Agreement will improve management of water for the Covered Species. The Adaptive Management Program includes success criteria and performance indicators, and have been revised to provide specificity in identifying who is responsible for actions and maintenance of equipment. Additions also include a QA/QC section and a 5-year check-in requirement. The Adaptive Management Program allows for mutually agreed upon changes to management activities to occur in response to changing conditions or new information. Adaptive management is a structured process designed to improve understanding and management by helping us learn from implementation and the consequences of implementation. The main strength of adaptive management is that we can manage in the face of uncertainty and learn by doing. It allows for adjusting actions according to what was learned in order to meet the Agreement’s goals. Annual reports will be available upon request, once finalized. The public will be able to access the raw data unless it is commercially sensitive or otherwise exempt from disclosure.

137	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>“The plans include landowner a contribution of \$1,500 each. CDFW’s annual cost for rotary trap operation and upper basin monitoring as described above was approximately \$180,000 annually. It is not possible to monitor these SHA adequately with this amount of money. A detailed budget with all monitoring actions and costs must be provided for review, and overall Safe Harbor participant financial responsibility clearly stated. This problem is further complicated by the fact that all participants may not successfully survive the review process or remain in the program meaning monitoring costs may change.” [p.10]</p>	<p>The \$1,500 landowner contribution will go toward monitoring, rating, and maintenance of stream gages. If more is required to maintain the monitoring gage sites, it will be the responsibility of the Permittees to address those costs. Annual monitoring and reporting requirements are required of the Permittees. Flow gauging of diverted volumes is a component of the program associated with water conservation, and landowners are required to do this monitoring in order to be in compliance with the Agreement.</p>
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138	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p>“We have developed seven principles that the Shasta Safe Harbor effort needs to include in order to be acceptable. Full flow of springs (with the exception of de minimus diversions for stockwater or drinking water) must be allowed to flow undiverted and unimpounded through complex habitat for as long as possible until they warm up or mix with warm downstream waters. Upper Parks Creek Flow Strategy winter bypass flows of 6cfs for 1/1-2/28 is insufficient. No SHAs for properties with illegal diversions. The SHAs should not facilitate increases in basin-scale consumptive water use, unless there are extremely compelling localized ecological benefits. The SHAs should not facilitate upgrades to water diversion and conveyance infrastructure when such diversions could actually increase due to removal of infrastructure constraints that previously limited diverters from exercising their full water rights. The SHAs should be re-designed to specifically facilitate transparency and accountability, rather than their current approach to this topic which is to avoid transparency and accountability. The SHA should be limited to a 10 year term. [p.11-13]</p>	<p>NOAA and CDFW have worked with Permittees to increase spring flows for instream benefit. The volume of spring contribution is specific to each spring source and instream objective. Diversion for irrigation is proposed to continue at numerous springs, while also increasing spring contributions to the river. The Upper Parks flow strategy seeks a minimum target of 10 cfs for adult migration and spawning. During wetter periods, MWCD commits to ensure 21 cfs is instream prior to diverting during adult migration and spawning periods to provide additional flows. 6 cfs was determined to be adequate flow to inundate redds that may occur in this reach, since this is outside the irrigation period, it is likely that more flow could be available during this period above the 6 cfs. Take associated with the Agreement may be incidental to ongoing routine agricultural activities, implementation of BMAs, and returning to Baseline Conditions, provided all applicable AMMs are implemented. The Agreement and permit do not allow or provide take coverage for unlawful activities. State water rights are outside NMFS’s purview, however all adjudicated diversions in the Covered Area are authorized by the Shasta River Decree and supervised by the SSWD or are riparian rights that are exercised under the Water Code; landowners with riparian rights are voluntarily subjecting the management of these rights to the SSWD via the terms of the Forbearance Agreement. Other appropriated rights have been authorized by the SWRCB. We are not aware of any increases in basin-scale consumptive water use as a result of the Agreement. Diversion and conveyance improvements identified in the Agreement are generally combined with a commitment to reduce the diversion amount, which would result in leaving water instream at the point of diversion. The annual reports and the 5-year check in per the Adaptive Management Program will be available for review and will facilitate transparency and accountability. The duration of an SHA is made on a case-by-case basis. The participants here agreed that a 20 year timeframe as reasonable, and a 5-year review/check-in is required.</p>
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139	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	"NOAA should rely on a [different] approach for the safe harbor applicants and require the same criteria as the California Waterboard for evaluating the likely legality of riparian and pre-1914 water right claims." [p.14]	To assess whether the Agreement, site plan agreements, and permit should be approved/issued, we applied the appropriate ESA standards. Principally, this means determining that there is a net conservation benefit from each site plan agreement. As discussed elsewhere in these responses, NMFS determined that each site plan agreement meets the net conservation benefit standard, as documented in our NCB Finding Memorandum. The legality of water rights under state law is not under the purview of NMFS. In submitting their permit applications, the landowners certified that their water rights are legitimate. The Agreement and permits pertains to lawful activities only.
140	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	"Irrigation conveyance efficiency improvements do not reduce consumptive use; therefore, there is no consumed fraction available for a 1707 dedication. In the context of the proposed SHA, this leads to an overstatement of the potential in stream benefits of conserved water." [p.25]	Implementation of irrigation efficiencies have been demonstrated to reduce diversion volumes at the point of diversion, which will result in several other benefits including improved water temperatures and less warm tailwater entering the Shasta River. Piping large open ditches can result in some reductions in evaporation and transpiration losses along the length of the open conveyance and reduce ditch loss to deep percolation. These actions will result in a certain amount of conserved water, which is site specific.
141	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	"It does not appear to us that there is anything in the 14 proposed SHAs that would result in any substantial increase in basin-scale instream flows, let alone by 45 cfs." [p.25]	Please see the diversion reduction table and Flow Management Strategy, delineating the specific amounts of water that each landowner is committing to leave instream during specific seasons. A Flow Management Strategy was prepared and was the basis of Exhibit B; it is included in the NCB Finding Memorandum as Attachment 1.
142	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	"The ranches applying for SHAs are contributing to violations of E. coli water quality standards in the Shasta River and that these ranches may not be in compliance with the North Coast Regional Water Quality Control Board's Shasta River TMDL Conditional Waiver of Waste Discharge Requirements. Have all properties applying for SHAs developed ranch plans that have been approved by the Regional Board as being in compliance with the Waiver?" [p.26]	Permittees are responsible for complying with the more stringent of the requirements (Waiver or the Agreement). We agree that it makes sense for these to be consistent where possible.

143	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>“There is no monitoring budget, nor mention of an annual cost-adjustment for inflation in the SHA, so in subsequent years the monitoring budget will become increasingly inadequate as inflation (which has averages approximately 2% in recent decades) compounds over the 20 year SHA period. What will happen if/when the budget is inadequate for monitoring and reporting? Will the SHA agreements end, or will the SHAs continue without adequate monitoring data? For the SHA monitoring to be effective, this budget shortfall must be addressed.” [p.27]</p>	<p>The landowners are responsible for the monitoring described in the Agreement and the maintenance of flow and temperature measuring devices in order to be in compliance with their permits.</p>
144	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>“Fish and Game Code 5937 states that sufficient water needs to be left instream to keep fish in good condition. (Grantham 2014). The current SHA fails to explain how this statute will be complied with or enforced. Understanding what flows or flow study meets the criteria of 5937 has proven difficult in some watersheds as many flow studies fail to clarify what legal standards apply.” [p.28]</p>	<p>Please see the diversion reduction table and Flow Management Strategy, delineating the specific amounts of water that each landowner is committing to leave instream during specific seasons. The standard for approval of an SHA is net conservation benefit.</p>
145	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>“At the very least it is clear that California DFW cannot agree to permit take that fail to meet minimal requirements of California law. We argue that without providing clarity on how the proposed SHA fits into some larger regulatory framework that would actually provide for species recovery to meet public and tribal trust obligations, it cannot legally approve such take permits either.” [p.28-29]</p>	<p>The Agreement and BMAs implement some of the actions identified in NMFS (2014) recovery plan and are expected to result in a net conservation benefit to the covered species. This contribution toward recovery may vary and may be temporary or permanent. The net conservation benefit standard requires NMFS to assess the benefits that accrue to the species while the Agreement is in place and the off-setting adverse effects attributable to the incidental taking allowed by the enhancement of survival permit. The resulting net conservation benefit must be sufficient to contribute, either directly or indirectly, to the recovery of the listed species.</p>

146	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>“In order for us (or NMFS) to understand the scope and scale of the net conservation benefits provided by this SHA, we need quantitative estimates of the cumulative benefits to instream flow and water temperature.” [p.29]</p>	<p>NMFS is utilizing the Flow Management Strategy, which details the specific amounts of water that each landowner is committing to leave instream during specific seasons. The Flow Management Strategy was also specifically designed to benefit water temperature during specific life stages.</p>
147	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>“in order to understand the net conservation benefits of SHA implementation versus current conditions, we should compare 1) the total length (and/or area) of stream in the Shasta River watershed with water temperatures cool enough for juvenile Coho salmon to persist through the entire summer now and after implementation; and 2) how many days (or hours) during spawning season are flows sufficient for adult Coho salmon to migrate freely into their Parks Creek spawning grounds and successfully spawn now versus after projects are implemented?” [p.29]</p>	<p>In addition to information in the NMFS (2014) recovery plan and other relevant information for the Shasta River basin, the agencies relied on the McBain & Trush flow study to establish specific targets for each life stage of coho, corresponding to different times of year. NMFS assessed each site plan agreement and determined that each agreement would provide a net conservation benefit.</p>
148	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>“This bundle of agreements addresses nearly ½ of the irrigated ground in the Shasta River. Other diverters downstream may want or need safe harbor coverage themselves at a future date. Fairness to them means that the impacts of the current applicants are proportional to all of their impacts.” [p.29]</p>	<p>Parties of the SWCG are voluntarily participating in the Agreement. Other landowners and entities could apply for an SHA in the future.</p>
149	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>“p. 71: “ 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...” It would be appropriate to define what is meant by non-invasive species. Is this defined by a specific list somewhere (i.e., a certain category listed at https://www.cal-ipc.org/plants/inventory/)? Some invasive species can be good pasture grasses. Is non-invasive intended to mean native? Native seed can be more expensive and harder to get, and may not be suited to survival in areas subjected to summer irrigation.” [p.29]</p>	<p>Comment noted. The Cal-IPC Inventory is the standard go-to invasive plant resource. There are five categories of invasiveness: limited, watch, alert, moderate, and high. Some pasture/forage plants (e.g. Kentucky bluegrass) are listed as “limited” by Cal-IPC. The “alert” “watch,” “moderate,” and “high” categories in the current Cal-IPC Inventory will not be allowed in seed mixes.</p>

150	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>p. 75: “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).”</p> <p>The Habitat Restoration Manual does not include some important techniques such as beaver dam analogues. Thus, there is a contradiction between this sentence and other portions of the SHA which specifically endorse beaver dam analogues. Furthermore, future editions of the manual may be published that includes additional approaches than are currently included, and removal of some not found to be effective. [p.30]</p>	Comment noted. Beaver Dam Analogs may be constructed under the Agreement.
151	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>p. 77: The section on beaver management does not say anything about lethal management (i.e., killing). To make sure everyone is on the same page, it might be good to mention whether lethal management is allowed as a last resort (if non-lethal management fails, and how it will be decided what the threshold is for failure), or if it is not allowed. In most cases, non-lethal management such as flow control devices are effective, but some cases (particularly dams on channelized streams/ditches) it is not effective. Or perhaps it is best left vague? [p.30]</p>	Beavers are known to colonize and persist in some areas and are known to create high quality summer rearing habitat. However, dams may impede adult upstream migrations at lower streamflows. Each site plan agreement includes development and implementation of a beaver dam management plan to reduce migration barriers.

152	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>p.86: “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.”</p> <p>This is not necessarily true. If not specified in the SHAs or required by funding agencies, tailwater could certainly be used to irrigate new areas rather than reduce diversions. Using captured tailwater for irrigation does not lead to “reducing demand for surface water diversion” but rather “ offers the potential for reducing demand for surface water diversion.” [p.30]</p>	Comment noted.
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153	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>p. 98: “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.”</p> <p>Are these criteria something that have been thought about carefully by people knowledgeable about Shasta River revegetation efforts, or is this just an excerpt pulled out of a generic manual? 50% survival is pretty high for real-world situation, even with intensive care and management. Also, wouldn't it be better to have 5 of 20 (25%) plantings survive than 2 of 4 (50%) plantings survive (i.e., how cares about the percent)? Depending on the level of effort required for the surveys, this could be onerous but have marginal benefit for the fish. Since this is a fish-focused plan, effort may be better focused on other stuff (water). Since these criteria are mitigation for specific projects, it might be better for this to be negotiated on a case-by-case basis with mitigation ratios, etc. when the projects actually occur, rather than have it listed as one-size-fits-all criteria in the SHA. [p.30]</p>	Comment noted.
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154	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	p. 109: Water temperature: “At the end of each water year a qualified hydrologist will review and analyze all collected data, correct and amend data as appropriate and develop a certified packet for each station.” What happens to the packet once it is developed and certified? To provide transparency and accountability, please add specific mention that the packets will be available to the public in raw electronic form so it can be used in analysis. [p.31]	Annual reports will be available upon request. The public will be able to access the raw data unless it is commercially sensitive or otherwise exempt from disclosure.
155	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	p. 112: “The evaluation will compare the number of days between May 1 and September 30 when water temperatures remain less than 18°C” To ensure clarity, please specify exactly what temperature metric is being referred to here. Daily maximum, right? [p.31]	The temperature metric referenced is the daily maximum water temperature
156	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	p. 127: Monitoring and Reporting Responsibilities Implementation and Effectiveness Monitoring: “Reports and data gathered during the report period by the Permittees shall be provided to NMFS and CDFW by March 1st of each year. ” ... “NMFS and CDFW will work collaboratively with the Permittees or their representative to incorporate the findings of each annual reporting effort into a single Draft Effectiveness Monitoring Annual Report for the Covered Area by May 1st” ... “The Final Effectiveness Monitoring Annual Report shall be available to the public from the NMFS or CDFW upon request.” This seems like a system specifically designed to avoid transparency and accountability. The Tribes and public need access to all the report and raw data. Do NMFS and CDFW envision signing legally binding confidentiality agreements to shield these data and reports from public view? If NMFS and CDFW received data and reports, do they not become available to the public by default via Freedom of Information Act requests and California Public Records Act requests? [p.31]	This system is not designed to avoid transparency or accountability. Rather, it is designed to present data in a manner that is helpful for the public to understand the effects of this agreement, whether those effects are positive or negative. The parties have no plans to sign confidentially agreements to shield the data from the public. NMFS, CDFW, SWCG, and individual landowners are parties to the Agreements and site plan agreements, which is why the reporting requirements concern those parties. Final reports and raw data will be available upon request unless otherwise exempt from disclosure.

157	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	p. 128: Modification of BMAs or AMMs “a Permittee will not be liable for incidental take of Covered Species resulting from: Routine Agricultural Activities, Beneficial Management Activities, and Return to Baseline.” Presumably, much of the SHA implementation projects would be publicly funded. This will likely require permittees to commit to several decades of maintenance when they sign funding contracts. Are the permittees aware of that? To ensure everyone is on the same page, it seems like it would be a good idea to include text in the SHAs mentioning that funding agencies are likely to require maintenance. [p.31]	The Permittees are aware of the obligations that may be attached to their specific project funding, therefore, we did not add this clarifying language to the text of the Agreement.
158	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<u>Montague Water Conservation District (MWCD)</u> Key conclusions Not enough improvements proposed to justify take coverage. Much of what is proposed in the MWCD SHA is part of MWCS Conservation Habitat Enhancement Restoration Plan (CHERP) which is already required as part of the Karuk Tribe/Riverkeeper lawsuit settlement and the Army Corps 404 permit. Thus, these actions are more properly characterized as baseline conditions. Most of the remaining actions proposed in the SHA appear to be contingent upon MWCD receiving a California Water Code section 1707 instream flow dedication for canal lining which is not legally viable as there is no reduction in consumptive use. Therefore, we see little concrete benefit in the MWCD SHA other than goodwill. Aside from that, water savings associated with lining the Montague Canal are enough to preclude the need for the Parks Creek Diversion. Removal of the Parks Creek Diversion along with adequate seasonal flushing flows released from the dam would serve as a solid basis for a SHA application. For details on how the Parks Creek diversion can be removed without adversely impacting irrigation deliveries, review Karuk Tribe comments on MWCD Proposed Biological Assessment for the Implementation of CHERP filed with NMFS July 23, 2016. [p.33]	Projects proposed by the Montague Water Conservation District (MWCD) under CHERP were considered to be part of the environmental baseline under the Section 7 consultation and were not counted towards the net conservation benefit assessment. Only separate new actions identified in the site plan agreements were evaluated. Exchanging water from Dwinnell with spring source water is not a condition of the CHERP settlement but an additional commitment and was included in the Agreement commitments. While the implementation timeframe is concurrent, commitments in MWCD’s site plan agreement are in addition to CHERP and exceed CHERP actions. MWCD’s additional commitments under the Agreement beyond CHERP are considerable and include stream reach based enhancements on the Shasta River and Parks Creek, in coordination with other Permittees. MWCD is working with the SWRCB on the Section 1707 process. Delivery loss efficiencies that yield conserved water are beneficial and recognized under Section 1707. Removal of the Parks Creek diversion is not a condition of this Agreement. MWCD is committing to meet additional flow conditions on Parks Creek, which were not contemplated in CHERP. MWCD is proposing additional bypass flows that are proportionate to the volume of water diverted on Parks Creek and will add a point of re-diversion leaving water in Parks Creek to the Shasta River including seven miles below the downstream boundary. MWCD commitments to enhance flows. Parks Creek diversion is critical and essential to continuance of MWCD.

159	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Montague Water Conservation District (MWCD)</u></p> <p>1) Will the SHA create or improve rearing or spawning habitat that is accessible to juveniles and adults? Access to the habitat is unlikely. Numerous barriers to migration are present throughout the reach from the dam to the downstream end of the Hole in the Ground Ranch including beaver dams diversion structures. Conditions at the beaver dams are dynamic with fish passage being uncertain. The landowners and MWCD have been unwilling to assist time-sensitive migrations in the past. It is unlikely that the habitat that is being constructed will be accessible to Coho. In addition, MWCD denies the existence of any release mechanisms existing in their release tower, despite being regularly inspected by the California Division of Safety of Dams, and has refused to consider releases sufficiently large enough to move debris, beaver dams, fine sediment, and gravel.</p>	<p>Diversions that were identified as potential barriers were evaluated for passage and were either slated to be rectified in the site plan agreements, as was the case for the Seldom Seem Point of Diversion (POD) or were determined to be passable, with requirements to evaluate on regular intervals to ensure they continue to be passable, in the case of Hidden Valley Ranch’s POD.</p> <p>The beaver management strategy addresses passage conditions associated with beaver dams. We disagree that Montague refused to consider releases sufficiently large enough to move debris, beaver dams, fine sediment, and gravel. They are increasing the capacity of the cross canal to provide flushing flows and instream habitat features for salmonids. The block water identified in the flow schedule will allow for such releases to occur in the future.</p>
160	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Montague Water Conservation District (MWCD)</u></p> <p>2) Will the SHA cool stream temperatures or reduce warming? Possibly. However, the modeled temperatures were in the sub-optimal range for Coho. 3D modeling was needed but not used to determine the effects of water released from the dam on small inflow cold water rearing habitat. Temperature alone is not the only consideration. Other water quality concerns exist for reservoir waters to be released that are not addressed or monitored (Vignola 2005). Also Shasta River TMDL staff report, especially including peer review comments from Charles C. Coutant. These actions are more accurately considered part of baseline as CHERP implementation is already required. [p.33]</p>	<p>See response to Comment 158. See also Comment 165 and response thereto.</p> <p>“Increased flow (either total annual, spring or summer) results in increased smolt migration and survival.” Final SONCC Recovery Plan at 118. Increased stream flows also positively correlate with smolt migration time, rate of survival, and adult coho abundance. <i>Id.</i></p> <p>MWCD’s instream commitment to this project is in excess of CHERP. Exchanging water from Dwinnell with spring source water is not a condition of the CHERP settlement but an additional commitment for the Agreement. While the implementation time-step is concurrent, BMA commitments in MWCD’s site plan agreement are in addition to settlement and CHERP</p>

<p>161</p>	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>Montague Water Conservation District (MWCD)</u> 3) Will the SHA produce significantly more instream flow of clean water? Depending on the volume released, ground water should help to improve water quality in the reach directly below the dam. We don't know much about the quality of the water released from the dam during the summer (other than it is very warm and smells bad). Prior rights water should be piped to Roggenbuck and Emmerson properties as it will degrade the quality of the water in channel and spring accretions.</p>	<p>The suggestion of piping prior rights water to Hidden Valley Ranch and Emmerson properties was first considered and rejected in project scoping exercises in 2011 due in part to costs, required access easements across neighboring properties, and maintenance responsibilities and the associated costs. Of greatest concern is the danger of a potential pipeline failure, which would result in a complete loss of adjudicated water availability until repairs are accomplished. This would be devastating given the time it takes for funding resources and work to be accomplished. Further, removal of Hidden Valley Ranch's and Hole in the Ground's prior rights to a pipeline would remove 9 cfs of water from the river from the dam to the respective points of diversion. This could be detrimental to fish regardless of the water quality conditions as this amount would not be otherwise available from other sources such as ground water. Modeling conducted by Water Course Engineering suggests that in-channel flow of released prior rights water had a benefit instream by increasing thermal mass of any cold water released to the river, resulting in a cooler temperature signal further downstream than by removing the prior right all together from the channel (by putting warmer water from Dwinnell into a pipe and delivering to prior rights). NMFS staff were involved in modeling and trials that demonstrated flow mass of 9-11 cfs, 5 cfs of which was cold water from Flying L pumps resulted in the best scenario for improvement in the Upper Shasta reach. If implementation of the Agreement indicates a different condition, MWCD has stated they are not opposed to piping prior rights when released flow exceeds a defined temperature threshold. By summer in most years, the prior rights water will not be poor quality stored water from Dwinnell. It will be an equal amount of groundwater, pumped by MWCD at their Flying L well and delivered by pipe to the river, to roughly the same location as the cross-canal delivery of the stored water. The upstream POD of Hidden Valley Ranch is at the property line between Hidden Valley and Hole in the Ground ranches; any volume of water warms during the summer months, so the Hidden Valley and the Hole in the Ground diversions are at strategically great locations to divert that warmed water to minimize impacts to the next inflow of high quality, cold water at Hidden Valley and Clear Spring. Poor quality summer-time water stored in the reservoir, which historically would have made up the prior rights allotments, will be kept in the canal to supply MWCD water users.</p>
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162	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Montague Water Conservation District (MWCD)</u> 5) Will the SHA improve fish passage for juveniles and adults? As discussed in number 1, fish passage is uncertain and unlikely.</p>	<p>Diversions that were identified as potential barriers were evaluated for passage and were either slated to be rectified (as described in the site plan agreements), as was the case for the Seldom Seem POD, or determined to be passable; with some requirement to evaluate on regular intervals to ensure they continue to be passable, in the case of Hidden Valley Ranch's POD. The beaver management strategy addresses passage conditions associated with beaver dams. We disagree that Montague refused to consider releases sufficiently large enough to move debris, beaver dams, fine sediment, and gravel. They are increasing the capacity of the cross canal to provide flushing flows and instream habitat features for salmonids. The block water identified in the flow schedule will allow for such releases to occur in the future.</p>
163	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Montague Water Conservation District (MWCD)</u> 7) Will these projects improve survival and production of Coho to the extent that species can make progress towards recovery? It's unlikely that Coho will have adequate access to the habitat that is being built. Even if Coho can access the restored areas it is not clear that the restoration proposed is sufficient to provide a substantial net benefit over baseline conditions.</p>	<p>NMFS assessing the potential net conservation benefit for each site plan agreement. Actions identified in the Agreement and site plan agreements are based on recovery actions identified in NMFS (2014) and other information on the Shasta River basin. The following actions are intended to increase habitat access and improve fish passage by increasing instream flows and decreasing water temperatures: construct a fish screen for the Parks Creek diversion; develop barrier modification projects, 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); optimize cold water spring inputs; combine or move points of diversion; and continued work to complete the Seldom Seem legacy diversion. The beaver management strategy addresses passage conditions associated with beaver dams. In addition, the Seldom Seem barrier is funded for remediation. We disagree that Montague refused to consider releases sufficiently large enough to move debris, beaver dams, fine sediment, and gravel. They are increasing the capacity of the cross canal to provide flushing flows and instream habitat features for salmonids. The Agreement is only part of the overall effort to promote recovery for SONCC coho salmon.</p>

164	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Montague Water Conservation District (MWCD)</u> p. 56: “Present Baseline Activities” “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. “ It is also unclear whether the water releases proposed are identical to those already promised in the CHERP, and/or are already planned releases for the City of Montague, making them part of existing baseline, or if the release of water in addition to the above is actually proposed. The historic pulsed releases of hot water from Dwinnell Reservoir during summer poses potentially significant problems for Coho salmon attempting to rear in the Shasta River.</p>	MWCD’s instream commitments under the Agreement are distinct from CHERP actions. Exchanging water from Dwinnell with spring source water is not a condition of CHERP but an additional commitment under the Agreement. While the implementation time step is concurrent, commitments of MWCD’s site plan agreement are in addition to CHERP.
165	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Montague Water Conservation District (MWCD)</u> p. 56: “Present Baseline Activities” “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.” The meaning of the second sentence is unclear, is there a word missing? Please rephrase to clarify. If this means that only water less than 18C will be used to provide these deliveries to Montague via the Shasta River, we support that as long as it will be sufficiently below 18C for Coho to continue to rear downstream of the dam once it begins to heat.</p>	Comment noted. “Releases will only be from sources to Shasta River when release temperatures are less than 18C.” To clarify, this means that only water that is less than 18C will be used to provide these deliveries.

166	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Montague Water Conservation District (MWCD)</u> p. 66: “MWCD agrees to increase by-pass values proportionality with diverted volume, verified downstream by CDEC stream flow gage PCE” How can the Parks Creek flow gage downstream of the MWCD diversion (PCE) be used for real-time diversion management decisions when the gage only provides stage, not flow rate? And how will the agencies and public assess compliance without such information? Why not upgrade the gage reporting infrastructure to incorporate the stage-discharge information so that the CDEC gage reports flow rate in cfs? This would substantially increase transparency and accountability, which should be a goal of the safe harbor agreements.</p>	<p>We considered this information as we made gaging decisions. Based on funding from landowners for this project and from fees paid to the SSWD for water rights enforcement, the parties are determining which gages will receive upgrades as a component of project implementation. The gage at PCE needs to be relocated to a more stable rate-able location, which will likely be funded with public dollars, data from which would then be publicly available. Several other new monitoring devices, including a gage in upper Parks Creek, will also be installed that will provide new information and data.</p>
167	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Montague Water Conservation District (MWCD)</u> p. 67 and 68 - propose some additional instream flow releases from Dwinnell Reservoir, including for use as water exchanges in place of downstream landowners diverting water from cold springs. While we enthusiastically support the general concept of using warm river water for irrigation in place of cool spring water, these releases as proposed are contingent on MWCD receiving a 1707 instream flow dedication for canal lining which is not possible because there is no reduction in consumptive use.</p>	<p>MWCD has agreed to bypass water for the purposes of the exchange and will provide water as part of the diversion reduction schedule. MWCD’s water is under a license. Any water delivered instream would be better protected from downstream diversion with a 1707, which adds fish and wildlife as a beneficial use. Section 1707 does have a provision that identifies ditch loss that goes to deep percolation as consumed water. The Section 1707 will also stipulate and allow for MWCD water to be used on these downstream PODs for the purposes of the spring water exchange.</p>

<p>168</p>	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>Montague Water Conservation District (MWCD)</u> The reservoir “loses” large quantities of water through evaporation (Dong et al. 1974 estimated 6,000 acre-feet per year) and groundwater seepage. Estimates of groundwater seepage losses range from 6,500 acre feet to 42,000 acre feet (Vignola and Deas 2005). These losses limit the volume of accumulated water within the reservoir, but it is not clear that MWCD should legally be allowed to keep storing additional water (i.e., beyond the 49,000 af) just because its reservoir is leaky and much of the water is lost. MWCD may not have the right to continue storing additional water once reservoir inflows exceed 49,000 af, yet in most years MWCD continues to store nearly all water that enters the reservoir. A legal argument can be made that after 49,000 af has flowed into the reservoir, all additional inflows should be released downstream. However, water quality is degraded after storage, so a greater benefit could be achieved by trading that water for spring water or groundwater downstream.</p>	<p>The validation of how these storage rights are used via MWCD is under the jurisdiction of the State Water Resources Control Board. MWCD has storage rights that totals 49,000 acre feet of stored water. 49,000 acre feet of storage is rarely obtained. MWCD does not deliver volumes reaching or in excess of 49,000 for irrigation. MWCD also provides water for prior rights -- water rights that existed prior to the establishment of the MWCD. MWCD also proposes to add fish and wildlife and municipal uses as additional beneficial uses. Based largely on storage, a water year type is determined as is an identified volume water provided for instream benefit. Volume provided for instream benefit varies proportionately to water year type. Storage loss from MWCD is connected to numerous springs that are critical and supports an elevated ground water, supporting water quality. MWCD provides cold water to the Shasta River to enhance water quality. Exchanges for spring water are proposed by MWCD with those who divert from springs. MWCD and spring water right holders are working with the SWRCB to develop a supported process for conducting such transactions. MWCD commits to continued investigations to enhance conditions in the Shasta River below Dwinnell Reservoir. MWCD is participating in the Forbearance Agreement while simultaneously pursuing a Section 1707.</p>
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<p>169</p>	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>Montague Water Conservation District (MWCD)</u> p. 67 and 68 - propose assessments of whether it is feasible to add a point of re-diversion downstream near Montague, so that some of the water that MWCD currently diverts at Parks Creek and Dwinnell Reservoir could flow further downstream before it is diverted. These assessments are worth pursuing, but will not necessarily result in on-the-ground changes, so should not be considered a major benefit of the SHA. Additional investigations and appropriate testing needs to be done to ensure water exchanges and substitutions provide water of the appropriate quality. The proposed actions include no winter flushing flows to clean fine sediment from the river channel, disrupt streamside vegetation so trees can root, or transport sediment. This continued failure to provide flushing flows contributes greatly to the river's state of impairment such that the proposed modest actions offered do little to guarantee that Coho survival will be improved above the current baseline condition.</p>	<p>The additional point of re-diversion could provide considerable more flow to both Parks Creek and/or the Shasta River. The Forbearance Agreement includes a 5-year interim term check-in to allow for adaptive management and flexibility to adjust flows if needed; and can accommodate providing for winter flushing flows when needed. Further, as noted on p. 115, in wet and very wet years, an additional block of water from CHERP flows will be released adaptively for other purposes such as sediment flushing, habitat maintenance or to enhance migration. The spring water that would be involved in the substitution is cold (less than 14°C) and is already being released to the Shasta to some degree with favorable results relative to both temperature and DO.</p>
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170	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Montague Water Conservation District (MWCD)</u></p> <p>In its operations, MWCD appears to be routinely failing to meet numerous other laws, including: Since 1928 and even under proposed Safe Harbor, failing to release sufficient water to keep fish in good condition, CA Fish and Game code section 5937. Failure to prepare and file Emergency Action Plan with California Dam Safety - SB 92, 2017. Failure to file and submit inundation map with California Dam Safety - SB 92, 2017. Failure to file annual progress report with RWQ on TMDL actions aimed at improving water quality behind Dwinnell dam, since 2011, coupled with failure to follow up on commitments made between 2008 and 2011. Failure to cease capturing water once their 35,000/14,000af limits have been reached. Capture of all river, springs and Carrick Creek flows reaching the reservoir through summer without a summer water right.</p>	<p>These questions fall under the jurisdiction of the State Water Resources Control Board and are outside NMFS's purview. However, a significant difference between SHAs and enforcement under 5937 is that an SHA is a voluntary process. Moreover, enforcement of 5937 requires local or state action. As a result, in issuing the Agreement, we focus on the SHA issuance criteria and whether they are met. Here, we have determined that the commitments articulated in the Agreement and site plan agreements meet the criteria for entering into the agreements and issuing section 10(a)(1)(A) permits, as documented in our NCB Finding Memorandum. The best available information was used to formulate an approach to improving habitat for the Covered Species, including water quality.</p>
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171	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Seldom Seen Ranch SHA</u> Key Conclusions: Not enough improvements proposed to justify take coverage. The only tangible on-the-ground change provided for in the Seldom Seen Ranch Plan is to enhance spawning gravel in 11 locations. The rest are the “agree to work, agree to plan, agree to cooperate” types of statements listed under other beneficial activities. [p.39]</p>	<p>Commitments in the Seldom Seen site plan agreement include riparian, instream habitat, and gravel improvements, as well as working with neighbors on projects that will provide habitat potential, but that also may decrease pasture productivity and increase management costs. Conservation efforts on non-federal properties are essential to the survival and recovery of the Covered Species. SHAs provide an ESA mechanism and incentive to encourage proactive species conservation efforts by private and other non-federal property owners. The ESA mechanism and incentive is described in NMFS and the U.S. Fish and Wildlife Service Safe Harbor Policy (Policy) (64 FR 32717, June 17, 1999). The Policy states that NMFS will provide participating property owners with technical assistance to develop SHAs that manage habitat for listed species and provide assurances that additional ESA restrictions will not be imposed as a result of the property owner’s voluntary conservation actions to benefit listed species. SHAs are collaborative stewardship partnerships between NMFS, non-federal property owners, and other collaborators to promote conservation efforts on non-federal properties and help achieve ESA goals to recover listed species. We expect that the Agreement will provide benefits to each life stage of the Covered Species. The Agreement will increase instream flows at key times of year and reduce water temperatures. The Agreement was designed to meet the interim minimum instream flow targets articulated by McBain & Trush and the Parks Creek Critical Riffle Analysis and will contribute to the recovery of the species by working toward the NMFS (2014) recovery goals. The riparian area on Seldom Seen Ranch is mostly excluded from livestock access, with additional management changes proposed. The pastures are irrigated with an existing well and sprinklers, i.e., no surface water diversion and little potential for warm water inputs. The actions in the site plan agreement will improve in-channel and riparian habitat.</p>
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172	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	The plan mentions addressing some of the factors limiting Coho survival, but it is short on any tangible projects. When there is an actual project, the timeline is unreasonable. For example, “Will remove passage barrier within five years of permit issuance”. Why five years? While the property has the potential to give positive results to all seven of our Key Criteria there is nothing certain that we see in the plan.	Time estimates for project improvements are based on feasibility. The set time limits serve as an outer limit to accomplish implementation and are not necessarily the time it will take to implement. The timelines were estimated to allow for grant funding application cycles and contracts for design, permitting, and implementation.
173	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<u>Seldom Seen Ranch SHA</u> 1) Will the SHA create or improve rearing or spawning habitat that is accessible to juveniles and adults? Yes, if spawning gravel is brought in regularly and if adult fish passage is provided and adequate flows are released by MWCD to clean and distribute gravel regularly, and releases from MWCD are not periodically lethal to Coho due to low DO and high ammonia, and if there is no intermittent failure of Flying A pumps to provide adequate mixing water, etc. to offset all Dwinnell water quality problems.	Comment noted.
174	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<u>Seldom Seen Ranch SHA</u> 2) Will the SHA cool stream temperatures or reduce warming? Not as described	Commitments in the Seldom Seen site plan agreement include riparian, instream habitat, and gravel improvements, as well as working with neighbors on projects that will provide habitat potential, but that also may decrease pasture productivity and increase management costs. Conservation efforts on non-federal properties are essential to the survival and recovery of the Covered Species. SHAs provide an ESA mechanism and incentive to encourage proactive species conservation efforts by private and other non-federal property owners. The Policy states that NMFS will provide participating property owners with technical assistance to develop SHAs that manage habitat for listed species and provide assurances that additional ESA restrictions will not be imposed as a result of the property owner’s voluntary conservation actions to benefit listed species. SHAs are collaborative stewardship partnerships between NMFS, non-federal property owners, and other collaborators to promote conservation efforts on non-federal Properties and help achieve ESA goals to recover listed species.

175	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<u>Seldom Seen Ranch SHA</u> 3) Will the SHA produce significantly more instream flow of clean water? No.	The Flow Management Strategy shows the added instream flows that will result from the actions taken at Seldom Seen Ranch.
176	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<u>Seldom Seen Ranch SHA</u> 4) To what extent will the SHA mitigate for the impacts of the operation? Unclear.	Project in the Seldom Seen site plan agreement include riparian, instream habitat, and gravel improvements, as well as working with neighbors on projects that will provide habitat potential, but that also may decrease pasture productivity and increase management costs. We weighed the benefit of each site plan agreement in our NCB Finding Memorandum.
177	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<u>Seldom Seen Ranch SHA</u> 5) Will the SHA improve fish passage for juveniles and adults? Unclear.	The Agreement will increase instream flows at key times of year and reduce water temperatures in this reach of the river. The Agreement was designed to meet the interim minimum instream flow targets articulated by McBain & Trush and the Parks Creek Critical Riffle Analysis and improve fish passage.
178	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<u>Seldom Seen Ranch SHA</u> 6) How soon will this project be implemented? Gravel in 10 years 15 years for riparian work.	Comment noted. Spawning gravel within 10 years. Gravel has already been placed in locations on Seldom Seen Ranch and areas where there was no riparian have been planted. Other actions and timelines are identified in their site plan agreement.
179	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<u>Seldom Seen Ranch SHA</u> 7) Will these projects provide improvements in survival and the production of Coho to the extent that species can make progress towards recovery? Unlikely.	NMFS conducted a net conservation benefit assessment for each site plan agreement and determined that each will meet the NCB standard and make a contribution to recovery.
180	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<u>Seldom Seen Ranch SHA</u> In addition to the above, it should be noted that the Seldom Seen Ranch now irrigates with groundwater, and transfers its prior [appropriation] rights water from Lake Shastina to the Hole in the Ground Ranch. Groundwater extracted here will likely diminish natural stream accretions somewhere downstream, accretions that would have been cold inputs that Coho might otherwise have relied on, and that are hence being lost in exchange for some of the proffered gains from cold water releases from Dwinell/Flying A, meaning likely less net gain to the system in terms of cold water.	Water usage was a factor considered in the negotiations to establish this site plan agreement. Modeling conducted by Water Course Engineering suggested that more water that stays instream will increase thermal mass of any cold water released to the river resulting in maintaining a cooler temperature signal further downstream. The connection of the groundwater wells on Seldom Seen and stream flow in this reach has not been established. The Siskiyou County Groundwater Sustainability Plan is also addressing the effects of groundwater pumping on surface water.

181	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>Seldom Seen Ranch SHA</u> [It is unclear just what kind of water right exists for the Seldom Seen Ranch, in that they formally relinquished any riparian or pre-1914 claim in exchange for Dwinnell Water (documentation available on request), which is a post-1914 right, subject to SWRCB control as to place of use. By substituting ground water for surface water on Seldom Seen, and transferring the surface water to consumptive use elsewhere on Hole in the Ground, they appear to have increased their overall consumptive use, thereby likely harming other more junior users downstream. The legality of this transfer needs to be confirmed by the SWRCB. [p.42]</p>	<p>Emerson Investments has valid water rights to use Seldom Seen Ranch (see, e.g., water rights license ID 011609; 004151 on file with the California SWRCB). Emerson Investments has adequately described its water usage for the Agreement, stating that it is using none of its rights to divert water from the Shasta River. Emerson Investment is permitted to use its prior rights water from the MWCD on adjacent property that it also owns.</p>
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<p>182</p>	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>Hidden Valley Ranch</u> Key Conclusions Not enough improvements proposed to justify take coverage. Release of Hidden Valley Ranch (HVR) spring water to the river is contingent on water exchange with MWCD, which cannot happen unless MWCD receives a 1707 instream flow dedication for canal lining which is not legal because there is no reduction in consumptive use. Rather than relying on an illegal water exchange, it would be better to relocate the points of diversion from Upslope Spring and two Pond Springs (160, 161) downstream to the Shasta River, so Coho salmon juveniles can have access to the full flow of the springs. This SHA offers some benefits similar to the other SHAs including goodwill, allowing habitat restoration, providing access for monitoring, and fence maintenance. However the Coho population is so depleted and its habitat so degraded that considerable improvement over baseline conditions is necessary to result in a net conservation benefit. This Ranch Plan fails to provide such considerable improvements. [p.43]</p>	<p>MWCD is agreeing to bypass water via the Forbearance Agreement. We are not aware of any information suggesting that the water exchange contemplated here is illegal. We have considered this comment and concluded that we will not require relocation of the diversion points indicated in this comment. Hidden Valley Ranch is unwilling to move the points of diversions for the upper springs or 160/161 for the following reasons. (1) The upper springs have been modified to flow both to the ranch irrigation system as well as to the river via a pipeline into an alcove in the stream bed which in itself was designed to provide refuge for fish at all life stages. Without this infrastructure, the springs were flowing directly into the ranch gravity fed ditch irrigation system and, without control of the excess, would enter the river as tailwater. Under the old methodology, this tailwater would not be as desirable for fish as the current method delivers. (2) Diversions 160 and 161 are adjudicated diversions and are located within 15 to 30 feet of the river, slightly above the stream bed gradient. During the irrigation season, water is utilized directly from these ponds to irrigate adjacent pastures. Additionally, both exist to provide stock water availability by keeping stock away from the riparian area of the stream itself with all excess returning to the river in a desirable condition for fish. The ranch has demonstrated this commitment over the past 6-7 years. (3) The current design of the outflow of the spring complex prevents fish from entering the ranch gravity flow irrigation system. Allowing full access to the springs puts the fish in unnecessary jeopardy if they enter the ditch system and ultimately end up on pasture as a result of flood irrigation practices. NMFS conducted a net conservation benefit analysis for each site plan agreement, including weighing the benefits against any off-setting adverse effects of management actions.</p>
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183	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hidden Valley Ranch</u> This reach of the river has two off-channel spring sources that appear to have been free flowing in early 1990s as shown on the 1986 USGS topo insert (Figure 5). Since this time, the springs have been impounded. Some alcove habitat has been constructed recently on the upstream end of the property for the purpose of providing rearing habitat. It would be far better to have the off-channel spring fed habitat which previously existed so that rearing Coho could be protected from high temperature prior rights water that is released from Dwinnell into the mainstem. [p.43]</p>	<p>Comment noted. Hidden Valley Ranch is committed to releasing spring flow when possible per the Diversion Reduction Schedule. However, Hidden Valley Ranch is unwilling to alter the spring impoundments to allow fish access for the following reasons. (1) The impoundments provide the necessary head pressure to deliver adjudicated and riparian rights water to the gravity fed irrigation system. Without this head pressure, pumping of this water would in all probability be required at costs that are unsustainable. (2) Fish would potentially enter the gravity fed irrigation system, potentially resulting in direct take. (3) Stock water capability at these locations is removed. (4) An alcove below the upper spring/161 diversion was designed and implemented to provide additional refuge for warmer river water. This feature benefits the fish as if located in the spring itself. (5) Removal of the ponds does nothing for fish as it would only put the spring flow at the surface of the ground and not at sufficient depths to provide fish habitat. The landowners have observed this when the ponds are drained on a seasonal to allow for head gate maintenance and other actions.</p>
184	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hidden Valley Ranch</u> A good deal of manure was observed on the pasture adjacent to the Shasta River during the field trip in December 2019. We asked Asil Donna if any nutrients were entering the stream and she said that there was no runoff from the pasture. Elevated levels of bacteria were measured at the lower end of the HIG ranch in 2017. We recommend that bacterial testing be done during the 2020 irrigation season to learn the source of the bacteria in the Shasta River (Shasta River Bacterial Sampling 2017). [p.43]</p>	<p>Comment noted. Bacteria contamination through pasture runoff is addressed under the TMDL waivers by the SWCRB and is beyond the scope of the Agreement.</p>

185	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hidden Valley Ranch</u> HVR uses prior rights water that is delivered via the Shasta River channel. It is unclear from temperature experiments is that even when well water is mixed with reservoir water the result is sub optimal temperatures for rearing Coho in the mainstem. This being the case, reservoir water should be delivered in a pipe in order to protect juveniles rearing in small spring outlets throughout the reach below the dam. [p.43]</p>	<p>The suggestion of piping prior rights water to Hidden Valley Ranch and Emmerson properties was first considered and rejected during project scoping in 2011 due in part to costs, required access easements across neighboring properties, maintenance responsibilities and the associated costs. Of greatest concern is the danger of a potential pipeline failure, which would result in a complete loss of adjudicated water availability until repairs are accomplished. This would be devastating given the time it takes for funding resources and work to be accomplished. Further, removal of Hidden Valley Ranch’s prior rights to a pipeline would remove 2-3 cfs of water from the river from the dam to HVR’s point of diversion. This could be detrimental to fish regardless of the water quality conditions as this amount would not be otherwise available from other sources such as ground water. See response to comment 161. On the surface, this suggestion seems like a viable alternative, but adopting it would cause great expense for the landowner, not only to implement the piping as suggested, but to abandon an already expensive and partially installed infrastructure to accomplish the same outcome. Hidden Valley Ranch indicates that it would consider the concept only upon demonstration of the ability to fund, construct, and hold harmless Hidden Valley Ranch against any liability from maintenance or other associated costs.</p>
186	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hidden Valley Ranch</u> 1) Will the SHA create or improve rearing or spawning habitat that is accessible to juveniles and adults? Yes, it’s likely that some additional rearing habitat will be created with the constant release of spring water to the river. If all the spring water is to be released to the river, restoration of the spring creek would be the best option for Coho. [p.45]</p>	<p>Comment noted.</p>

187	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hidden Valley Ranch</u> 2) Will the SHA cool stream temperatures or reduce warming? Yes 3) Will the SHA produce significantly more instream flow of clean water? Yes, if we understand correctly that all the spring water is now going to the river.</p>	Comment noted.
188	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hidden Valley Ranch</u> 4) To what extent will the SHA mitigate for the impacts of the operation? Somewhat. The off-channel spring creek that existed pre 1991 likely provided better rearing habitat than the small alcove constructed in the main stem Shasta. Using the channel to convey prior rights water from Dwinnell remains a problem.</p>	Comment noted.
189	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hidden Valley Ranch</u> 5) Will the SHA improve fish passage for juveniles and adults? NA 6) How soon will this project be implemented? Unclear. 7) Will these projects improve survival and the production of Coho to the extent that species can make progress towards recovery? Possibly.</p>	The Hidden Valley Ranch site plan agreement includes the following BMAs, most of which are scheduled for implementation in 2020: continue release of spring water into the river at the end of the irrigation season (November 1- March 1); implement more water use efficiency projects from point of diversion to place of use; release 0.5 cfs of spring water to the river continuously for the term of the Agreement; construct and maintain tailwater infiltration berms to prevent warm water inputs; provide a maximum of 3 cfs spring water for instream contribution from June 1 – September 15; file permissive instream flow dedication through a Water Code section 1707 of this riparian right for increased assurances; collect tailwater in open ditches and reuse for irrigation; participate in a reach-wide diversion management strategy; implement soil moisture monitoring; voluntarily release additional spring water over the 3cfs committed when irrigation needs are met; construct an on channel new fish screen. These actions will improve conditions for the Covered Species.

190	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hidden Valley Ranch</u> p.16: the following is listed as Elevated Baseline Condition “Implement efficiency projects from point of diversion to place of use and commit to releasing 0.5 cfs of spring water to the river continuously for the term of this agreement as described in Section E.2.a.” This is confusing. The phrase “for the term of this agreement” appears to be a contradiction because it is our understanding that Elevated Baseline Conditions are permanent, even if the SHA is terminated? Please clarify (i.e., delete “for the term of this agreement”). [p.46]</p>	<p>An elevated baseline, if specified, becomes the baseline conditions that will exist at the end of the Agreement. During the Agreement, the Permittees will implement management activities that can improve the existing baseline conditions on the property, and some properties will achieve elevated baseline conditions. For site plan agreements that include elevated baseline conditions, those conditions must be maintained after the Agreement and permit have expired. After permit expiration, the landowner has no ESA take authorization for listed species on their property.</p>
191	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hidden Valley Ranch</u> p. 24: “The current prior rights conveyance has approximately 2,500-feet of open ditch, resulting in ditch loss and an increased non-consumptive diversion amount. The Permittee commits to pipe the entire prior rights conveyance ditch, from the newly constructed fish screen to the existing prior rights pipeline at the place of use.” This excerpt above describes converting 2,500 feet of open ditch to pipe, while later on page 24 (see below) it is stated that 4000 feet of additional pipeline will be installed. Comparing Figure 2 (baseline) and 4 (proposed), it looks like there are only 4,000 feet proposed pipeline to be added. Where is the 2,500 feet? Is that some subset of the 4,000 feet? Please clarify. Also explain how these efforts benefit Coho? [p.46]</p>	<p>These are referring to two separate pipelines. The reference on page 24 is referring to the 2,500-feet of open ditch that currently delivers the prior right to the ranch. The reference of installing an additional 4000 feet of piping is referring to the exchange pipeline that is the new conveyance and is needed to fulfill the cold water exchange. The figures are not depicting the separate pipeline alignments effectively as the exchange pipeline runs adjacent to the prior rights pipeline for its entire length. In exchange for the prior rights pipeline, the conserved volume (0.5cfs) will be provided for instream benefit from the spring source they currently use for irrigation. The exchange pipeline will result in warm water diverted at HVR POD in exchange for equal portions of cold spring water released to the river from the spring. The conserved volume of water supports a stream reach flow and water quality strategy for the upper Shasta. Flow targets are supported by McBain and Trush flow investigations.</p>

<p>192</p>	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>Hidden Valley Ranch</u> p. 24: “A water exchange of 1.5 cfs with MWCD has been negotiated under this Agreement to facilitate improvement to water quality by releasing additional spring water to the channel. Once the terms with MWCD are settled and a 1707 has been completed, the exchange would be exercised for the term of the agreement. In order to exercise the exchange, the installation of an additional pipeline (approximately 4000-feet) to deliver up to 1.5 cfs of MWCD water (in addition to current prior rights deliveries) in exchange for bypassing available cold spring water directly to the Shasta River from June 1 through September 15th is needed.” While we enthusiastically support the general concept of using warm river water for irrigation in place of cool spring water, this particular 1.5 cfs transfer between MWCD and Hidden Valley Ranch is predicated on MWCD obtaining a 1707 instream flow dedication as credit for lining the MWCD main canal. This is problematic because the canal lining project will not reduce consumptive use and therefore SWRCB will be unable to grant a 1707 instream flow dedication. MWCD has already committed to transferring this water to instream flow as a result of the 2013 agreement and Army Corps 404 permit that settled their lawsuit with Klamath RiverKeeper and the Karuk Tribe. It should be characterized as baseline rather than allowing MWCD to “double dip” by trying to make it an enhancement to qualify for a SHA... Instead, we recommend a more realistic option which would be to move the points of diversion from the springs (the two Pond Springs and the Upslope Spring) downstream to the Shasta River, so that Coho salmon juveniles would have access to the cold springs. This would likely require less length of pipe than the 4,000 feet needed for the 1.5 cfs MWCD exchange, but would take additional pumping.</p>	<p>MWCD has submitted a change petition (section 1707) to the SWRCB and is successfully working with the SWRCB to add fish and wildlife as an additional beneficial use of water. Consumption occurs on open canals. Numerous methods can be used to determine the volume of water provided for instream benefit. The terms of MWCDs commitment are based on canal lining and attaining instream dedication. MWCD’s instream commitment to the SHA is in excess of the CHERP. Exchanging water from Dwinnell with spring source water is not a condition of the settlement but an additional commitment under the Agreement. While the implementation time step is concurrent, commitments of MWCD’s site plan agreement are in addition to the settlement and CHERP and exceed those actions. Piping would still be beneficial to reduce delivery loss and reduce diversion volume.</p>
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<p>193</p>	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>Hidden Valley Ranch</u> p. 27: “The Permittee will voluntarily bypass excess spring water over the 3 cfs of spring water committed to under Elevated Baseline. These riparian rights will be protected via a permissive 1707 dedication or some other arrangement such as a forbearance agreement acceptable to the parties. The agreement will be applied for within 3 years after the execution of the SHA.” Is there existing precedent for a using 1707 dedication for riparian rights, or would this be the first time this has been done in California? What are the chances that this process will be successful, and how far downstream will this water go before it is used by downstream users? This action is listed as Other Beneficial Land and Water Management Activities. We do not see any clear information presented in the SHA as to how often it is anticipated that this action (release of “excess” spring water) will occur. Is that known? How far downstream is it envisioned that the permissive 1707 dedication forbearance agreement would be able to protect the water from diversion? [p.47-48]</p>	<p>A 1707 dedication of riparian rights has occurred prior to this project and the process of how best to protect the spring water is currently being established. The Permittees are also entering into a Forbearance Agreement that can accomplish the same action items regardless of the type of water right. The bypassed water is intended to be protected to the downstream extent of the Covered Area and will be monitored at the bypass and also at the end of the stream reaches identified in the Adaptive Management Program.</p>
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194	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hole In the Ground Ranch</u> Key conclusions: Not enough improvements proposed to justify Take coverage. There are significant opportunities to improve water quality and habitat in Hole-in-the-Ground Creek, but the proposed assessments contemplated in the SHA may not result in benefits unless actually implemented (which is not required by the SHA). The SHA’s proposed increase in riparian fencing along Parks Creek and Hole-in-the-Ground Creek would likely improve habitat, but the SHA does not propose fencing the Parks Creek overflow. This SHA proposed a Diversion Combining Project which seems like it might offer some benefits but is difficult to understand. The SHA also proposes a water exchange with MCWD along with a 1707 instream flow dedication, but since there is no reduction in consumptive use it is unlikely that SWRCB would actually grant a 1707. This SHA offers some benefits similar to the other SHAs including goodwill, allowing habitat restoration, providing access for monitoring, and fence maintenance. However; Coho populations in the Shasta are so depleted and its habitat so degraded that considerable improvement over baseline conditions is necessary to result in a net conservation benefit. The actions proposed here do not provide such considerable improvements. [p.49]</p>	<p>Hole in the Ground Creek does not appear to be accessible to salmonids. The stream was evaluated for fish presence at a season and year when fish would likely have been observable. The creek may have potential to contribute additional cold water to the river, and coho utilize the mouth of Hole in the Ground Creek (on SBSR), but additional evaluations are needed to determine if the rest of the creek could be accessible (evaluations are proposed in the Big Springs Ranch site plan agreement). There are no diversions from HIG creek on the ranch. Portions of the pasture are sub-irrigated by the creek as it flows through the ranch, and the landowner accepts responsibility to reduce impacts from ranch activities, which currently consist of road use and cattle management. Furthermore, the landowner will improve and maintain riparian vegetation and will cooperate to reduce inputs of warm surface water, the source of which is not on this land, comingling with cold Hole in the Ground Creek water near the north property line. The hydrology of the pastures at HIG Ranch will change after the Cardoza diversion is relocated, and Emerson Investments will continue to operate in the vicinity as riparian pastures, adding, as appropriate, measures for cattle management to safeguard water quality including fencing the Parks overflow channel.</p>
195	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hole In the Ground Ranch</u> The first example of an elevated baseline condition project is: to agree to cooperate in project to rebuild Cardoza Diversion”. Followed by “agree to seek matching funds to install riparian fencing on Hole in the Ground Creek.” These are good ideas but minimal, considering the potential this Ranch has for making improvements to Coho production, particularly if the expected completion is 7 years from the date of permit issuance. There is no sense of urgency to any of these proposed projects despite the fact that SONCC Coho teeter on the brink of extinction.</p>	<p>NMFS assessed the net conservation benefit of this site plan agreement, including the timing of project implementation. The timing of actions considered if projects were likely feasible given funding, permitting and implementation.</p>

196	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hole In the Ground Ranch</u></p> <p>1) Will the SHA create or improve rearing or spawning habitat that is accessible to juveniles and adults? No.</p> <p>2) Will the SHA cool stream temperatures or reduce warming? Not directly.</p> <p>3) Will the SHA produce significantly more instream flow of clean water? No.</p> <p>4) To what extent will the SHA mitigate for the impacts of the operation? None.</p> <p>5) Will the SHA improve fish passage for juveniles and adults? Indirectly yes, by allowing a neighboring ranch to modify a water diversion that has no fish passage.</p> <p>6) How soon will this project be implemented? Within 7 years.</p>	<p>NMFS assessed the net conservation benefit for each site plan agreement individually. HIG Ranch will implement BMAs including installing additional riparian fencing, cooperating on instream habitat enhancement and spawning gravel placement, and diversion combining to allow water exchanges to increased spring water contributions.</p>
197	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hole In the Ground Ranch</u></p> <p>7) Will these projects result in improvements in survival and the production of Coho to the extent that species can make progress towards recovery? Yes, improved fish passage at Cardoza's diversion will help increase survival if meaningful improvements are made to the habitat on the Shasta Springs Ranch. At this point those necessary improvements at Shasta Springs Ranch are not included in the plan. Restoration of the Bridge Field and Black Meadow Springs is needed to provide rearing habitat of Coho produced in Parks Creek. Access to the springs and channel restoration downstream of the springs is also necessary.</p>	<p>Comment noted. Restoration feasibility and implementation of Black Meadow and Bridgefield Springs is a project that included in the Shasta Springs site plan agreement. The specific elements of the restoration project could not be described in the Agreement because surveying and design must occur first to develop a list of alternatives that are feasible.</p>

198	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hole In the Ground Ranch</u> p. 9: “Agree to seek matching funds to and install riparian fencing along Hole in the Ground Creek” & p. 13: “Agree to install balance of riparian fencing along Parks Creek (±40%) as riparian pasture borders...” Both of these are good, but shouldn’t the Parks Creek overflow channel within the HIG Ranch should also be fenced? The Cardoza SHA calls for fencing the riparian pastures within the Cardoza Ranch downstream on the Parks Creek overflow channel. The Parks Creek overflow channel looks like it has lower elevation, lower gradient, more sinuosity, and better floodplain connectivity than the main Parks Creek channel.</p>	Comment noted and this suggestion was taken into consideration. The hydrology of the pastures at HIG Ranch will change after moving the Cardoza diversion, and Emerson Investments will continue to operate in the vicinity as riparian pastures, adding, as appropriate, measures for cattle management to minimize impacts.
199	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hole In the Ground Ranch</u> p. 11: “Will work cooperatively to solve issue of warm surface water, from source not on Permittee, entering Hole in the Ground Creek near north property line.” and p.31: “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 permit issuance” What is the current management of the upstream (southwest) portion of Hole in the Ground Creek watershed? Is that area irrigated, or is it wet enough that it is naturally sub-irrigated by the spring at the upstream (southeast) end of the Hole in the Ground Creek Valley? The HIG Ranch SHA and Template SHA provide very little information about the upstream portion of the Hole in the Ground Creek. Are Coho salmon juveniles currently rearing in at the springs at the head of the valley? With its low gradient, high water table, springs at upper and lower ends, Hole in the Ground Creek seems like it might offer significant potential for summer and winter rearing for Coho salmon if fish had access and the habitat was enhanced.</p>	Currently there is no irrigation in the Hole in the Ground Creek area. Tailwater from another landowner up gradient (east of Big springs road and outside the agreement area) of Hole in the Ground Ranch enters Hole in the Ground Ranch and the BSRWA from upstream, and into Hole in the Ground Creek. Currently, CDFW redirects Hole in the Ground Creek away from natural cold water springs near the confluence to maintain better cold water refugia in the Shasta River. There is a barrier to juvenile upstream migration into upper Hole in the Ground Creek, so coho are not currently present. Fish passage is a potential project on lower Hole in the Ground Creek. Upstream of Hole in the Ground Creek is on Hole in the Ground Ranch, managed by Emmerson.

200	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hole In the Ground Ranch</u> p. 32: “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” As currently worded (in this excerpt as well as other parts of p. 29–33), it is somewhat difficult to understand all the various components of the Diversion Combining Project. We recommend that at some place in the SHA, the end result of all of the components of the Diversion Combining Project be explained together including maximum instantaneous rates and annual volumes.</p>	<p>The Diversion Combining Project, introduced in the site plan agreement “Increased delivery and irrigation efficiencies,” consists of the following components: Increase capacity of POD #165 on the Shasta River, with screens and measurement capability, to allow the diversion of full irrigation right for the Hole in the Ground at that POD. Pipeline to replace the current Gravity Ditch that is currently mostly earthen ditch, up to a point across the river from the POD #166. Add control box and an intertie pipeline to divert the irrigation water intended for pastures on the west side, across the river to the pump station at POD #166. The above irrigation infrastructure improvements will allow implementation of the Hole in the Ground Ranch contribution part of the Upper Shasta River Flow Management Strategy, which is described in the HIG site plan agreement under water exchanges.</p>
201	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hole In the Ground Ranch</u> p. 33 “Annually, when 18C 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 delivered at which time...” In the template SHA, data access for station “HVR-DS” (which we presume is the same as the “HVR DS PL” listed on p. 33 of the HIG SHA), is listed as private. This is unacceptable. As noted in the excerpt above, the temperatures at this station will be used by the HIG ranch to make real-time decisions on diversion management. For Coho juveniles to be able to survive the entire summer, they must have continuous access to cold water. The data from the station must be available to the agencies and public in real-time, to provide real-time accountability.</p>	<p>Information in the possession of a federal agency is subject to FOIA and is presumptively available upon request unless commercially sensitive or otherwise exempt from disclosure. Private landowner data and information are not subject to FOIA. All materials and information agreed to be provided have been the result of multi-party negotiations. There will be a temperature monitoring station in the river near the boundary between the HVR and Hole in the Ground Ranch. A similar station was used as part of the flow studies to develop the Flow Management Strategy that is now part of the Agreement. The data will be collected and recorded in real time with notification to participants when a change in delivery is imminent and required, per an unambiguous and measurable temperature threshold agreed upon with the agencies and Permittees. The temperature data and delivery changes will be recorded and reported as part of the annual monitoring report.</p>

202	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hole In the Ground Ranch</u> In addition, somewhere in the HIG SHA, the abbreviation “MWAM” should be spelled out and a definition of how it is calculated should be provided (currently neither are provided). We recommend using an instantaneous maximum of 18C rather than a smoothed metric.</p>	Comment noted. We have revised accordingly.
203	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Hole In the Ground Ranch</u> p. 39: “ 1707 Dedications” “Agree to evaluate 1707 dedication for Clear Spring offset for Exchanges and Efficiency Savings” The meaning of this is unclear. What specific reaches and quantities of water are proposed to be included in this hypothetical 1707 in steam flow dedication? SWRCB cannot issue a 1707 instream flow dedication if there is no reduction in consumptive use. What is there to evaluate? Given that there are only a few landowners in this reach of the Shasta River, it may be more feasible to use binding forbearance agreements instead.</p>	As described in the Diversion Reduction Table, Hole in the Ground Ranch (HIG) will commit 0.7 to 1.2 cfs of the Clear Springs flow from March 1-June 15 and June 16-September 30. This commitment will replace the need for a 1707 dedication.
204	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Shasta Springs Ranch</u> Key Conclusions Not enough improvements proposed to justify take coverage. This ranch has huge potential for Coho salmon habitat restoration, yet the SHA proposed very few improvements. Several evaluations and plans are proposed, to be implemented “if feasible.” These evaluations and plans need to be completed prior to issuance of SHA. Coho juveniles need access to the cold springs. Rather than diverting the springs (Bridge Field, Black Meadow, and Kettle) at their sources, diversions should be moved downstream into Parks Creek (or even further down to Shasta River) so that there is as much length cool stream reach length as possible. The combined current length of channels flowing from the three springs (Bridge Field, Black Meadow, and Kettle Springs) to Parks Creek is 2.5–3 miles. See figure below for an example (modified from Figure 3).</p>	The parties to the Agreement concur that there is potential to improve habitat for the Covered Species while continuing productivity of the pastures. The Permittee has agreed to participate in the Mid-Parks Creek, East Side Pastures, and Spring Channels Renovation Evaluation Project (Mid-Parks Creek Project). As a show of commitment to the positive outcome of this project, immediately, the Permittee will provide an additional 1 cfs of flow from the springs used for irrigation and will be conducting water quality assessments to better quantify water quality parameters that may be compounding water temperature issues in the spring channels. It is expected that within five years of permit issuance, a more comprehensive plan will be formulated for achieving the goals itemized in the site plan agreement, and the project will proceed to

		<p>Once the water has warmed up it becomes much less valuable for fish and could then be used for irrigation. Fish access to cold water can be greatly improved without changing the total volume of water consumed for irrigation.</p> <p>Habitat improvements are also necessary in the creeks flowing from the springs; currently their channels appear to be straightened ditches rather than meandering streams.</p> <p>Electrical infrastructure may need to be improved since there does not appear to be grid power in the vicinity of the Parks Creek/Kettle Springs Creek confluence. Off-grid solar may be the most cost-effective solution given the distance to the electrical grid. Fencing is needed on the “Wheat Field” portion of Parks Creek in the middle of Shasta Springs Ranch. We see little concrete benefit in this SHA other than goodwill. [p.54]</p>	<p>design and implementation phases. Emmerson will consider the idea of moving the POD downstream if it is consistent with one of the stated goals of the project: “...increase the volume of self-sustaining, complex instream habitat for salmonids in Mid-Parks Creek reach and/or unnamed spring channels.” Which will be evaluated as part of the feasibility study.” Permittee is entering into a Forbearance Agreements to bypass water in Parks Creek, to which Permittee, holding a water right inferior to upstream water rights holders, would otherwise legally be entitled. Improving Parks #4 POD (to be able to divert irrigation water on both sides of Parks Creek, proximate the place of use) and enable the option of leaving instream the irrigation demand, currently diverted further upstream by necessity, will provide better access to habitat in Upper Parks Creek, dictated by objectives prescribed in the annual implementation of their site plan agreement. Permittee is providing, and will continue to provide, access for equipment, laborers, and material for projects to eliminate potential salmon migration barriers on upstream landowner (Parks Creek under I-5), which will benefit salmon with improved adult and restored juvenile access to Upper Parks Creek. Shasta Springs Ranch owner will fence the wheat field pasture if necessary to achieve the stated management goals that include reducing bare streambank, enhancing Salix, other native trees and shrubs, Juncus, and Carex spp. cover and vigor at the stream’s greenline, in the short-term, and enhanced streambank stability, reduced stream channel width to depth ratio, and improved instream habitat conditions in the long-term.</p>
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205	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Shasta Springs Ranch</u> Emergent Coho have been observed rearing in Parks Creek by the first week of May. CDFW staff have tagged Coho in Parks Creek on multiple occasions and detected them at Kettle Springs (area circled in the upper part of photo X below). They have also been detected in other nearby spring locations at a later date (Adams 2012, 2013). When Kettle Springs was allowed to flow into the channel below the impoundment, Coho would rear there all summer. Chris Adams Master's Thesis describes in detail the movement and survival of juvenile Coho throughout the upper Shasta watershed and identified the importance of Parks Creek and its tributaries. Winter stockwater diversions on this ranch and upstream properties in November limit the use of spawning habitat in Parks Creek. If redds are successfully constructed, fry will typically emerge from the gravel after the start of the irrigation season. If spring weather is clear and sunny, fry will be quickly displaced by high stream temperatures due to the tail water from multiple upstream diversions on this and upstream ranches. [p.58]</p>	<p>Comment noted. Parks Creek and its tributaries are undoubtedly important to coho. This has not changed since the first coho was confirmed utilizing Parks Creek when the landowner allowed access for fisheries studies by CDFW. Many of the practices since that discovery have changed in order to improve conditions for anadromous salmonids and more are proposed to fulfill commitments under the Agreement.</p>
206	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Shasta Springs Ranch</u> Wetlands are known to be used by juvenile Coho for extended freshwater rearing and can play an important role in over-summer survival and juvenile growth. The proposed SHA projects for the Shasta Springs Ranch don't reflect the large potential for Coho production on this property. Springs are abundant and the Parks Creek wetlands are in need of restoration. Fish passage to Bridge Field Springs needs to be improved. Current practices set culverts too high and create slack water or block culvert in order to divert water. We know that salmon will utilize this channel if they have the chance as we have observed Chinook spawning below the spring in 1995. [p.58]</p>	<p>Comment noted and can be considered in the Mid Parks Creek Feasibility Study.</p>

207	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Shasta Springs Ranch</u> Elevated water temperatures and nutrient and bacterial contamination from the irrigation practices described are detrimental to Parks Creek. We have observed hundreds of cattle on this pasture at one time with no effort to contain the runoff.</p>	<p>Comment noted. Bacteria contamination through pasture runoff is addressed under the TMDL waivers by the SWRCB and is beyond the scope of this Agreement. However, additional fencing proposed in the site plan agreement is expected to minimize impacts.</p>
208	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Shasta Springs Ranch</u> The proposed SHA 3.2 cfs summer flow at Kettle Spring is inadequate, as it is the only functioning spring source accessible to juveniles produced in upper Parks Creek.</p>	<p>The flow exhibited at Kettle Springs in summer is generally at the high end of the range of flows, i.e. 6.5-7 cfs, from which up to 1.15 cfs may periodically be diverted, consistent with the adjudicated water right for irrigation. Due to the spring source management structure, a relatively constant flow of >5 cfs continues into Kettle Springs Creek during the summer months.</p>
209	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Shasta Springs Ranch</u> “Will the SHA create or improve rearing or spawning habitat that is accessible to juveniles and adults? No. Will the SHA cool stream temperatures or reduce warming? No. Will the SHA produce significantly more instream flow of clean water? 1 cfs. To what extent will the SHA mitigate for the impacts of the operation? Very little. Will the SHA improve fish passage for juveniles and adults? No. How soon will this project be implemented? We believe the mechanism to release 1cfs from the spring is operational. Will these projects provide improvements in survival and the production of Coho to the extent that species can make progress towards recovery? No.” [p.64]</p>	<p>Comment noted. Implementation timelines are given in the site plan agreement. The Agreement is expected to increase instream flows at key times of the year and reduce water temperature in this reach of the river. All of this will benefit the Covered Species. The Agreement and site plan agreement contributions reflect our consideration of the interim minimum instream flow targets articulated by McBain & Trush and the Parks Creek Critical Riffle Analysis and are expected to contribute to the recovery of the species.</p>

210	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Shasta Springs Ranch</u> p. 45: “Parks Creek Reach 2 (see Figure 6) is contained with the “Wheat Field” pasture. This is a pasture that has been planted in the past to an upland perennial wheatgrass variety. This reach is open to grazing by livestock during grazing bouts in this pasture. Parks Creek is moderately entrenched throughout this reach with a riparian vegetation component occurring just at the stream edge (greenline). Due to relatively steep banks and deep water cattle only cross and enter the reach in a few locations. This reach provides overwintering, early- spring rearing, out- migration, and emigration habitat for salmonids. Noxious weeds are of limited extent in this reach. ... Parks Creek Reach 3 is a short, unfenced reach similar to Reach 2 but outside of the Wheat Field.” We are skeptical that the riparian area in this reach would not benefit from fencing to control cattle access.</p>	Shasta Springs Ranch will fence the wheat field pasture if necessary to achieve the stated management goals that include reducing bare streambank, enhancing Salix, other native trees and shrubs, Juncus, and Carex spp. cover and vigor at the stream’s greenline, in the short-term, and enhanced streambank stability, reduced stream channel width to depth ratio, and improved instream habitat conditions in the long-term.
211	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Cardoza Ranch</u> Key Conclusions: Changing point of diversion from the spring-fed flashboard impoundment downstream to the Shasta River will provide major improvements to water temperatures and fish passage. In addition, this SHA offers some benefits similar to the other SHAs including goodwill, allowing habitat restoration, providing access for monitoring, and fence maintenance. This may be the best Ranch Plan in the whole proposal; however, we are concerned that the volume and rate of the proposed Shasta River diversion is not defined in the SHA. We would support the Cardoza SHA is the following changes were made: 1) Due to replacing an unlined canal with a pipe, the new diversion will be more efficient (less tailwater and seepage to groundwater). The water right for the diversion must therefore be reduced accordingly so that the pipe will deliver the same amount of water as the old canal, not deliver additional water. 2) Similarly, to avoid increasing consumptive use, tailwater collection and re-use should be applied to reduce the diversion amount not to irrigate new areas. [p.65]</p>	The volume of water diverted from the Shasta River will be 2.98 cfs, which is Cardoza’s adjudicated water right. Historically, Cardoza diverted up to 9 cfs at the POD to get 3 cfs at the point of use. The proposed pump and pipe is designed to deliver the full water right. However, the pump station allows the landowner to reduce the diversion amount. Having the capacity to deliver the entire right will allow the diversion to be turned off more frequently. Cardoza’s irrigated pastures will be equipped with soil moisture sensors to manage pasture needs and allow the landowner to shut off the POD and leave the water instream for the benefit of fish and wildlife. The new project will also provide risers, which will irrigate much more efficiently and significantly reduce the diversion needed and tailwater produced on this ranch. Any tailwater created will be collected along the south end of the main pasture and delivered to ground that is currently irrigated with diverted water. There is very little ground on the ranch that is not already irrigated.

212	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Cardoza Ranch</u> The only SHA that we can come close to supporting is Cardoza Ranch, and even there we would need to see additional details clarified first (i.e., due to the increased efficiency, the diversion rate of the new pipe should be lower than the rate of the old canal diversion). [p.65]</p>	Comment noted.
213	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Cardoza Ranch</u> The Cardoza Ranch's proposed relocation of their point of diversion from cold springs downstream to the warm Shasta River is a commendable action that we would like to see replicated for all the other diversions of cold springs in the Shasta River watershed. We do not support any of the other SHAs because they do not do enough to alleviate the key limiting factors for Coho salmon.</p>	Comment noted. The Agreement is expected to increase instream flows at key times of year and reduce water temperature in this reach of the river. The Agreement and site plan agreement contributions reflect our consideration of the interim minimum instream flow targets articulated by McBain & Trush and the Parks Creek Critical Riffle Analysis and would contribute to the recovery of the Covered Species.
214	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>We recognize that the voluntary SHA process is unlikely to be a fruitful venue for implementing actions that would have significant negative economic effects on agricultural operations, such as reducing consumptive use of water during spring and summer (i.e., reduce the area irrigated). However, it appears to us that two key limiting factors could be substantially ameliorated without having negative economic effects on agriculture, assuming public funds were available to implement them: 1) relocate points of diversions from cold springs downstream to use warm Shasta River water instead (as is proposed in the Cardoza Ranch SHA) to provide juvenile Coho salmon with dependable high-quality summer rearing habitat; 2) the volume of the Edson Foulke (9.9 cfs) and Parks Creek Ranch's (5.65 cfs) winter stockwater diversions from Parks Creek could be dramatically reduced (by a factor of 10-100x) and still provide ample water for livestock using either shallow wells or a piped diversion to feed stockwater tanks, providing adult Coho salmon the water they need to dependably access spawning grounds. We feel strongly that these actions are feasible and should be included as key components of the SHAs. [p.65]</p>	With respect to Edson Foulke Ditch Company, there does not appear to be any cold springs near the current Edson Foulke point of diversion such that relocation would provide a benefit to water quality. The volume of Edson Foulke's winter diversions from Parks Creek include not only a stockwater right but also a storage right. The 9.9 cfs identified for stock water has been required to create head and deliver water the full distance of the ditch and laterals. Because it is an earthen ditch in its current and historical condition, seepage occurs throughout the length of the approximately 14 mile ditch. The objective of the project is to reduce seepage through lining or piping which will result in a commitment to reduce diversion. The storage right is used to fill storage ponds that are later used for irrigation. This storage right is not always fully met, and reduction in diversion would have economic consequences for Edson Foulke. Edson-Foulke cannot move it's point(s) of diversion substantially downstream. Instead, Edson-Foulke is reducing diversion maximum by over 30% as a result of delivery efficiency. Further, Edson-Foulke, in addition to Parks Creek Ranch and MWCD, are committing to meet the upper Parks Creek Flow Strategy upon implementation of its conservation projects. Parks Creek Ranch cannot move it point(s) of diversion substantially downstream. Instead, Parks Creek Ranch is combining points of diversion and reducing diversion amounts as a result of delivery efficiency. Further, Parks Creek Ranch, in addition to Edson-Foulke and MWCD, are committing to meet the upper Parks Creek Flow Strategy upon implementation of their conservation projects.

215	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Cardoza Ranch</u></p> <p>1. Will the SHA create or improve rearing or spawning habitat that is accessible to juveniles and adults? By reducing tailwater it is likely to improve water temperatures and extend the time period that juvenile salmonids are able to rear in this part of the watershed.</p> <p>2. Will the SHA cool stream temperatures or reduce warming? Warming will be reduced by a reduction in tailwater and removal of the impoundment</p> <p>3. Will the SHA produce significantly more instream flow of clean water? This project will reduce the warming that now occurs in the impoundment.</p> <p>4. To what extent will the SHA mitigate for the impacts of the operation? See number 2</p> <p>5) Will the SHA improve fish passage for juveniles and adults? Yes</p> <p>6) How soon will this project be implemented? Unclear as to the date of implementation. [p.66]</p>	<p>Timelines are given in the site plan agreement. In addition to the reduced tailwater, moving the POD downstream will result in the entire water right remaining instream for 2.8 miles before it is diverted for use. There is rearing and spawning habitat upstream of the Cardoza current POD. The diversion impoundment that will be eliminated as committed to in the site plan agreement provides many improvements to rearing and spawning habitat. The design for this project has already been funded and is currently at a 100% design level. The grant applications that have been submitted for funding the implementation elements have been awarded, and the project is being implemented now,</p>
216	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Cardoza Ranch</u></p> <p>7) Will these projects result in improvements in survival and the production of coho to the extent that species can make progress towards recovery? This project has the potential to improve water temperatures and fish passage in lower Parks Creek. Improvements in the production of coho will largely depend whether there will be improvements made to fish passage and spawning and rearing habitat upstream on the Shasta Springs. These necessary changes on the Shasta Springs Ranch are not part of the Safe Harbor Agreement at this time. [p.66]</p>	<p>The most important rearing habitat immediately upstream of the Cardoza impoundment is Kettle Springs Creek. Improvements to maintain consistent summer rearing habitat at Kettle Springs have already been implemented, and tailwater input at Kettle Springs will also be investigated and reduced as part of the HIG site plan agreement. The Mid Parks Creek Project to evaluate improvement to the Bridgefield and Black Meadow spring complex has also been included in the Shasta Springs site plan agreement.</p>

217	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Cardoza Ranch</u> p. 5: “There are also two ponds on the Cardoza Ranch that fluctuate in volume, with a maximum area of 45 acres. One pond is completely spring fed...” Are there any estimates of how much water the spring produces? Could the irrigation water from the spring water be replaced with additional Shasta River water as part of the irrigation upgrades project? Then perhaps the spring could be piped into the Parks Creek bypass channel so it can provide fish habitat? Or is there a way to provide fish passage to the spring source? [p.66]</p>	<p>Comment noted. It would not be worthwhile to pipe the pond to Parks Creek. The landowners refer to the ponds on the ranch as “lava lakes,” and although the water may come from springs, there is not enough to be usable. The landowner is not aware of any estimates of how much water the spring produces. The ponds themselves are very shallow, and the water would be bad for fish; it is very alkaline pungent. At times, both ponds dry up. They fluctuate with the water table and will not support even bass, which were planted in the 1960s. In light of this, piping water from these springs would not be a sensible BMA.</p>
218	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Cardoza Ranch</u> p. 18: This page discusses the proposed relocation of the Cardoza diversion from the flashboard impoundment on Parks Creek to the Shasta River downstream. As a conceptual level, this proposed diversion relocation seems like a great idea; however, we are concerned that the Cardoza SHA does not provide any quantification of the amount of water diverted after project implementation, nor any estimates of how consumptive water use, groundwater recharge, or tailwater return flows would (or would not) change. Such information is necessary to know what the effects of the proposed project would be at reach and basin scales. Most of the other point-of-diversion swaps or canal-to-pipeline conversion projects proposed in the Ranch Plans include a substantial (e.g., 50%) reduction in the maximum amount diverted. If the Cardoza point-of-diversion does not also include a similar reduction in maximum amount diverted, consumptive use could increase which would worsen basin-scale water shortages. [p.67]</p>	<p>The new POD has been designed to divert the legal water right of 2.98 cfs. A ditch loss study was conducted and an insignificant amount of water was lost thru the bottom of the ditch (less than 1 cfs), most loss was from overtopping which was irrigating ground that was not considered a legal place of use. The landowner is participating in The Nature Conservancy’s 1707 Batch Petition project. Through the petition preparation, a consumptive use analysis was prepared for the ranch POU, the 7000 feet of open ditch, and the impoundment. Petitions are in the process of being drafted and will be submitted to the SWRCB prior to the construction of this project. The project will allow the Cardoza Ranch to turn the diversion off more frequently, allowing the dedication of the consumed portion of the right when the diversion is not in operation, approximately 4-5 weeks a season or more due to increased management with the assistance of the soil moisture sensors.</p>

219	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>Cardoza Ranch p. 19: The following is listed in the Other Beneficial Land and Water Management Activities (BMA) section: “Permittee agrees to maintain pickup ditch and will collect tailwater wherever possible and put to beneficial use.”</p> <p>If that collected tailwater were distributed to areas that are not currently fully irrigated (rather than used to offset diversions in areas that are already irrigated), consumptive use could increase. Our brief review of aerial photos in Google Earth’s “time slider” indicates substantial year-to-year variation in the greenness of some pastures in the Cardoza Ranch (i.e., see area inside dashed oval in the example photos below from 7/7/2012 and 7/11/2014 of the northern portion of Cardoza Ranch), indicating that irrigation upgrades could increase both agricultural productivity and consumptive use. Therefore, this tailwater BMA should be revised to “Permittee agrees to maintain pickup ditch and will collect tailwater wherever possible and put to beneficial use in such a way that re-use of tailwater will not increase consumptive use.”</p>	Comment noted. We have revised accordingly.
220	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p>Cardoza Ranch p. 18: “Permittee agrees to construct, operate, and maintain a pipeline infrastructure throughout the ranch for better irrigation efficiency and reduce tailwater in accordance with the pipeline’s Operations and Maintenance Manual for the term of the agreement and as stipulated by grantor. A 1707 will be filed to permissively dedicate the consumed portion of the water right for instream benefit, when the diversion is not in operation.”</p> <p>There is no discussion presented in the Cardoza Ranch Plan of when the diversion will not be in operation. How frequently is it envisioned that the diversion would not be in operation, and for what reasons would it not be in operation? Perhaps we are misunderstanding some key point, but as currently worded the discussion of a 1707 in stream flow dedication for Cardoza Ranch does not appear to have much meaning or value. [p.68]</p>	Under the historical irrigation practices, the impoundment was in place for the duration of the irrigation season, and the ranch was allowed to rotate the diversion, taking more water for shorter time periods, which is allowed under the Decree. The management action could be averaged out to equate to their water right for any 30 day period of use. For the 1707 petition, we considered this management as continuous consumptive use in the impoundment, the ditch and the legal POU. Once the POD is moved, there will no longer be same rate of consumptive use at the 25 acre impoundment area or along the 7000 feet of open ditch, and the ranch will shut off the diversion completely for 4-5 weeks for haying, which is generally in June and September. It is also anticipated that the diversion will be turned down significantly at times or completely off after rotations, as irrigation will occur more quickly and efficiently than it currently does. These times are not predicted currently, and while there is a solar off set, the solar system will not completely support continuous pumping, creating an incentive for the landowner to turn off the diversion to avoid excessive power bills. When the diversion is off or certain pastures are not being irrigated, then the consumptive portion of the water right will be left instream to the downstream boundary of the Covered Area.

221	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>NB Ranches</u> Key Conclusions: Not enough improvements proposed to justify Take coverage. This SHA offers some benefits similar to the other SHAs including goodwill, allowing habitat restoration, providing access for monitoring, fence maintenance, and seasonal flow improvements (particularly in early April and late September) by implementing the Mid-Shasta Flow strategy. Given that the two springs (Rivers Edge Spring and Driveway Spring) are not frequently used for irrigation due to abundant water available in the Huseman Ditch, there would be no reduction in consumptive use and therefore a 1707 instream flow dedication is not likely to be successful. Given the relative proximity of the Huseman Ditch to the Shasta River (base of the hillslope), water that seeps into the ground likely returns to the river relatively rapidly and therefore it is unclear what is to be gained by the proposed conversion of the ditch to a pipe. [p.69]</p>	<p>NB Ranches has committed to bypass flows per the Flow Management Strategy. Regarding the Huseman Ditch, implementing irrigation efficiencies have demonstrated reductions in diversion volumes at the point of diversion, which will result in several other benefits including improved water temperatures. Piping large open ditches can result in some reductions in evaporation and transpiration losses along the length of the open conveyance and reduce ditch loss. These actions will result in a certain amount of conserved water, which is site-specific.</p>
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<p>222</p>	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>NB Ranches</u> p. 59: “In exchange for piping the from current POD to end of existing ditch, Huseman Ditch, including NB Ranches, will permanently reduce the maximum diversion volume from 11.9 cfs to 10.0 cfs for irrigation purposes. “ ... “Current NB Ranches use: 1,477 afy” ... “NB Ranches maximum use after piping project 1,209 afy” ... “Volume conserved for instream benefit 268 afy” ... “Permittee will work with SWCG to add instream beneficial use as secondary benefit for water conserved by the proposed projects for Huseman Ditch through a Section 1707 or equivalent process.” How would the canal-to-pipe conversion affect the basin-wide water balance, and what is the basis for those calculations? The only water truly “saved” by converting from a canal to a pipe is the evaporation from the canal surface (assuming the pipe will not be buried with water-consuming pasture on top, which pipes often are). Since the irrigated pasture area will not change, it is likely that consumptive use will not change. The amount of water seeping from the canal into the ground (i.e., groundwater recharge) would decline, but that does not increase instream flow because groundwater and surface water are interconnected. When SWRCB processes 1707 instream flow dedications, only changes in consumptive use are credited. Since converting the canal to a pipeline will not change consumptive use, there will not be any water that can be used for a 1707 instream flow dedication. [p.69]</p>	<p>Pipeline projects reduce water usage in numerous ways. Consumption occurs in open canals, and permissive dedications can also be used to provide instream flow. Instream dedications via consumptive use is not the only method to determine the volume of water provided for instream benefit. In many cases, change in flow at the POD and reach of stream is the critical objective. Similarly, timing and availability of water is equally important for coho salmon. The proposed project improves flow based on immediate diversion reduction benefitting the stream reach from the POD downstream. The Huseman Ditch diverts water that is suitable in temperature and would otherwise be available for instream benefit and utilization if conserved.</p>
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<p>223</p>	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>NB Ranches</u> p. 59: “Spring Sources Contribution: In addition, NB Ranches will permanently cease diversion of two cold water springs (Rivers Edge Spring and Driveway Spring) and provide the spring water for instream benefit as a commitment for the pipeline. The combined spring water volume is estimated to be 0.3 cfs resulting in an additional 109 af provided for instream benefit as a condition of providing a pipeline for houseman ditch.” p. 61: “Permittee will commit spring water through a 1707 petition or equivalent once the Huseman Ditch piping is implemented, estimated at 2023.” These cold water springs may provide important localized summer habitat even under current conditions, given that these springs “are used infrequently for irrigation” (p. 7). Creating alcoves would enhance localized habitat, and permanently dedicating them to instream flow might provide a small amount of additional flow downstream unless used by downstream users. According to p. 7, the ranch applies approximately 7.95 acre-feet of water per acre (2-3x that of consumptive use) to its irrigated pastures from the Huseman ditch, and thus appears to already have an adequate supply of water without using these springs. Thus, the non-diversion of these springs might be better characterized as Baseline Conditions rather than Beneficial Management Activities. In addition, the pipeline would be a permanent improvement and therefore the non-diversion of these springs should be designated as permanent Elevated Baseline Conditions (continues even if SHA is terminated) rather than a temporary Beneficial Management Activity. If these springs are not currently used for irrigation, it seems unlikely that SWRCB will grant a 1707 instream flow dedication because there would be no change in consumptive use.</p>	<p>Ceasing the diversion of the springs is a proactive measure taken by the landowner and was initiated as part of the safe harbor agreement discussions. Actions taken after the first SHA meeting can be counted as Beneficial Management Activities under the Agreement including those implemented prior to development of the site plan agreements. The landowner has defined this BMA to be categorized as an “other beneficial management activity”.</p>
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224	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>NB Ranches</u> p. 60: if the Huseman Ditch is convert to pipe, then: “If using livestock water between October 1 and April 1, the Permittee and Rice Livestock Company, Inc. will reduce maximum diversion from 5.0 cfs to 4.0 cfs or less and limit days of operation to a maximum of 20 days or partial days per year. Maximum cumulative diversion for stock water during winter period will be 200 acre feet per year.” 200 acre-feet per year is likely (somewhat, though much less dramatically than some other ranches applying for SHAs) more than is necessary. Converting 200 acre-feet to gallons and dividing by the 183 day winter season equates to: 200 acre-feet x 325,851 gals/acre-foot/ 183 days = 35,612 gals/day. Divided 35,612 gals/day by a high estimate of 20 gals/day per cow indicates this amount of water would support 1,780 cattle which is more than twice the combined number of cattle (750) that the SHAs say are actually present on NB Ranches (450) and Rice Livestock (300) properties. In addition, cycling the 4 cfs diversion on and off would cause fluctuations in Shasta River flow. Would it be possible to continuously divert at a lower rate rather than a pulsed 4 cfs? [p.70]</p>	<p>Huseman Ditch has a right to 5.0 cfs continuous diversion throughout the non-irrigation season (10/1-3/31) or nearly 1,800 af. They propose to reduce their non-irrigation season diversion volume to a maximum of 4.0 cfs and reduce the total diversion volume from 1,800 afy to 200 afy. This volume is necessary to deliver water to all the fields served by Huseman on a rotation where the diversion operates for one or two days (10 af) and fill ditches and ponds. The commitment is separate from the pipeline commitment. Under operation with the pipeline, it is possible the annual volume could be reduced and be adjusted with NOAA and CDFW. As explained above, the volume retained is necessary to deliver water. Commenter’s calculation-based estimates of “reasonable” water use fail to take into account the numerous factors which affect the determination of whether or not use is reasonable, including but not limited to inevitable transportation losses.</p>
225	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Rice Livestock</u> Not enough improvements proposed to justify Take coverage. This SHA offers some benefits similar to the other SHAs including goodwill, allowing habitat restoration, providing access for monitoring, fence maintenance, and seasonal flow improvements (particularly in early April and late September) by implementing the Mid-Shasta Flow strategy. The SHA also calls for the conversion of the flashboard dam on the Shasta River at the Novy-Rice-Zenkus diversion to be replaced with a new structure that meets modern fish passage and screen specifications; however, this diversion upgrade project could be implemented without the SHA and may already be in progress. We would like to know if funding has already been made available (i.e, see CDFW 2019a). Given the relative proximity of the Huseman Ditch to the Shasta River (base of the hillslope), water that seeps into the ground likely returns to the river relatively rapidly and therefore it is unclear what is to be gained by the proposed conversion of the ditch to a pipe. [p.71]</p>	<p>Several of the projects identified in the Agreement have been in development concurrent with the SHA process and can be considered BMAs. The flashboard dam removal project has already completed 100% design, has been submitted to grant programs for implementation funding, and is conditionally awarded. It is possible the ditch loss from Huseman does return to the river either as tailwater or subsurface. The benefit of piping Huseman would be ensure the water stays instream at the POD, and increased efficiency would result in further reduction in diversion and reduced production of tailwater.</p>

226	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Rice Livestock</u> p. 64: “This proposal includes NB Ranches dedicating two cold water springs (approximately 0.5 cfs) to instream benefit in addition to the 1.9 cfs reduction (the Permittee and NB Ranches) in maximum diversion. Therefore, the cumulative enhancement to the river will be 2.4 cfs.” The cold spring flow quantity presented here (in Rice Livestock SHA) as 0.5 cfs conflicts with the 0.3 cfs stated in the NB Ranch SHA. [p.71]</p>	Comment noted. Upon additional measurement, the correct value is .3 cfs.
227	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Rice Livestock</u> p. 63 to 65 discusses converting the Huseman Ditch and Novy-Rice-Zenkus Riparian Diversion to pipelines, accompanied by a reduction in the maximum diversion rate, and that “Conserved water will be provided for instream benefit either through forbearance or through a SWRCB Change Petition adding Fish and Wildlife as a secondary beneficial use, potentially protected through water code 1707.” Our comments above regarding the NB Ranches SHA apply to this Rice Livestock SHA. Since converting the canals to pipelines will only reduce tailwater return flow to the river and seepage (i.e., groundwater recharge), neither of which are consumptive uses, SWRCB is unlikely to allow this to be used a 1707 instream dedication. This is a classic example of “rob Peter to pay Paul”. These canal-to-pipeline projects would increase flow locally (from the point of diversion downstream to where tailwater and groundwater re-enters the river), but at the basin scale they will have no effect. In contrast, other elements of the Mid-Shasta Flow Strategy such as the voluntary reductions in diversion in early April and late September would increase flow at specific times of year.</p>	We disagree with this characterization. Implementation of bypass flows for diversion will yield immediate benefits to the instream flow, as tailwater returns often have poor water quality and delay flow contributions to the stream channel. <i>See</i> Hampton, M., NMFS Fishery Biologist, “Shasta Safe Harbor Agreement Flow Management Strategy Summary,” June 24, 2019 at 2. Further, the Agreement includes an effectiveness monitoring commitment that provides for several water quality monitoring stations to document stream flow and water temperatures at critical locations within the Covered Area. <i>Id.</i> The effectiveness monitoring allows for adaptively managing the bypasses if needed.

228	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Rice Livestock</u> p. 66: “ Huseman Ditch: If diverting for stock water from 10/1-3/31, Rice livestock will reduce maximum diversion volume to 4.0 cfs and limit days of operation to a maximum of 25 days a year as opposed to continuous right of 5.00 cfs during non-irrigation season. Maximum cumulative diversion for stock water during winter period will be 200 acre feet per year.” 200 acre-feet per year is likely (somewhat) more stockwater than is necessary, although is a lot closer to reasonable than the stockwater diversions proposed in some of the other SHAs. Converting this 200 acre-feet to gallons and dividing by the 183 day winter season equates to: 200 acre-feet x 325,851 gals/acre-foot / 183 days = 35,612 gals/day. Divided 35,612 gals/day by a high estimate of 20 gals/day per cow indicates this amount of water would support 1,780 cattle which is more than twice the combined number of cattle (750) that the SHAs say are actually present on NB Ranches (450) and Rice Livestock (300) properties. In addition, cycling the 4 2 cfs diversion on and off would cause fluctuations in Shasta River flow. Would it be possible to continuously divert at a lower rate rather than a pulsed 4 cfs? [p.72]</p>	<p>Huseman Ditch has a right to 5.0 cfs of continuous diversion throughout the non-irrigation season (10/1-3/31) or nearly 1,800 af. They propose to reduce their non-irrigation season diversion volume to a maximum of 4.0 cfs and reduce the total diversion volume from 1,800 afy to 200 afy. This volume is necessary to deliver water to all the fields served by Huseman on a rotation where the diversion operates for one or two days (10 af) and fills ditches and ponds. As explained above, the volume retained is necessary to deliver water to all the fields served by Huseman on a rotation where the diversion operates for one or two days (10 af) and fill ditches and ponds. Commenter’s calculation-based estimates of “reasonable” water use fail to take into account the numerous factors which affect the determination of whether or not use is reasonable, including but not limited to inevitable transportation losses.</p>
229	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Rice Livestock</u> p. 72: “Diversion monitoring station will be maintained and operated as designed. Provide yearly data.” It is unclear of the phrase “Provide yearly data” in the SHA means provide one data point per year (total annual volume), or to once a year provide detailed data. We recommend that this be clarified to state that data should have a daily (or monthly?) temporal resolution. According to the SWRCB website SWRCB requires that direct diversion of ≥ 1,000 AF/year be reported hourly. [p.72]</p>	<p>Comment noted. We have revised accordingly. Diversion data will be obtained by installing head gates and measuring devices that meet NMFS and CDFW standards and is in compliance with Senate Bill 88. 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 annual reports, if required in the individual site plan agreements. Diversion data will be reported hourly or as stipulated under SB88.</p>

230	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>Grenada Novy Ranches</u> Not enough improvements proposed to justify Take coverage. Air photos indicate that Grenada Novy Ranches does not appear to be following their grazing plan, which is a bad sign for the likelihood of the SHA being implemented as designed. Ranch also appears to be using riparian diversions to irrigate lands in non-riparian parcels, which if true would not be legal. It also lacks the pre-1914 right that it claims. We cannot support any SHA that legitimizes illegal water diversions. No significant springs are identified within the Ranch, so potential for enhancing cold water is limited. The proposal to add instream beneficial use as a secondary benefit for the water conserved by proposed projects for Novy-Rice-Zenkus diversion are unlikely to be successful because these projects do not reduce consumptive use of water. This SHA offers some benefits similar to the other SHAs including goodwill, allowing habitat restoration, providing access for monitoring, fence maintenance, and seasonal flow improvements (particularly in early April and late September) by implementing the Mid-Shasta Flow strategy. The SHA also calls for the conversion of the flashboard dam on Shasta River at the Novy-Rice-Zenkus diversion to be replaced with a new structure that meets modern fish passage and screening specifications; however, this diversion upgrade project could be implemented without the SHA and may already be in progress (i.e., see CDFW 2019a). [p.73]</p>	<p>Grazing plans will be developed and implemented in conjunction with the UC Cooperative Extension. Neither the agencies nor the landowners have received any legal notices that the riparian rights are invalid. The issue that is raised here relates to less than 10% of the property irrigated by the diversion. Nevertheless, the landowners are conducting due diligence regarding the legality of these rights.</p>
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<p>231</p>	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>Grenada Novy Ranches</u> p. 3 to p. 8: these pages describe the Grenada-Novy Ranches’ water rights and irrigation practices, including mention of the “Novy, Rice, Zenkus Pre-1914 Riparian Diversion” and “Novy Pump Pre-1914 Riparian Diversion”. This is confusing because our understating is that Pre-1914 Riparian Diversion is not an actual category of water rights in California. A water right can either be claimed as “pre-1914” or “riparian”, but not both. Our review of available information indicates that the Grenada-Novy Ranches not only lacks a valid pre-1914 water right, but also only has a valid riparian right to irrigate a relatively small portion of the current irrigated area. The direction of canal flow is not totally clear without additional research, but Figure 1 and 2 strongly suggest that water from Riparian Diversions are being delivered to adjacent parcels that do not touch the source waterbody. While there are rare exceptions and we may be mistaken, our understanding is that riparian water rights can only be used on parcels that touched the stream when the land was originally patented (i.e., first passed into private hands). Furthermore, if an original parcel is subdivided into two separate parcels, only the parcel touching the stream retains riparian water rights (Sawyers 2005). Have NMFS and CDFW conducted a water rights review to confirm that all the public money that is being recommended for water infrastructure upgrades will be used to irrigate lands for which there is a valid water right? Please see page 14 for our section on Documenting the Validity of Riparian Rights. [p.73]</p>	<p>Neither the agencies nor the landowners have received any legal notices that the riparian rights for this property are invalid. The issue that is raised here relates to less than 10% of the property irrigated by this diversion, and a very small portion of the overall project. Nevertheless, the landowner is reviewing and confirming historical land use and related riparian water use.</p>
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232	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Grenada Novy Ranches</u> p. 9 “As developed within the 2016 Riparian Grazing Plan (Appendix G), produced by UC Cooperative Extension plan, grazing is currently allowed within the riparian area during periods that minimize the potential for impacts to fish and their habitat.” ... “Currently the Grenada Novy Ranches riparian grazing occurs twice per year on the following schedule:” ... “# 1 After July 15th ... Grazing allowed to an approximate 6” stubble height for herbaceous vegetation” ... “#2: Non-irrigation Season – herbaceous riparian growth grazed to an approximate 6”” “A 7/8/2017 photo from Google Earth shows actual conditions on that day that deviate substantially from the grazing plan. The grazing plan says that the pasture should not be grazed to less than 6-inch stubble height and should have been rested for the first several months of the irrigation season...” [p.74]</p>	<p>We are not aware of past grazing methodologies, however, once the Agreement is signed, grazing will be conducted according to a plan developed in conjunction with the UC Cooperative Extension. Under the Agreement, NMFS and CDFW may initiate periodic inspection of grazed riparian pastures to ensure the riparian grazing management plan is effective. In addition, there will be photo monitoring and a log book submitted annually regarding riparian grazing on the enrolled properties.</p>
233	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Grenada Novy Ranches</u> p. 52 to 57: In Table 2, the column header for “Present Day Baseline (Complete & Maintain)” is not the correct position (it should be in second column not first column). This could lead to ambiguity and should therefore be corrected.</p>	<p>Comment noted.</p>
234	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Grenada Novy Ranches</u> p. 64 “In-stream Beneficial Use- Grenada Novy Ranches will work with SWCG to add instream beneficial use as a secondary benefit for the water conserved by proposed projects for Novy-Rice-Zenkus diversion. The estimated timeframe for seeking funding is 2019 and 2020. The timeframe for implementation is 2022.” It is far from clear that the conversion of the Novy-Rice-Zenkus canal to a pipe projects will result in any reduction in consumptive use; therefore, there is unlikely to be any water available to designate as an instream beneficial use. In general, we strongly support instream flow dedications for the Shasta River watershed, but do think this particular effort will be successful so should not be provided much weight when determining the overall benefits of the Grenada-Novy Ranches SHA.</p>	<p>This is a riparian right, and the landowners have acknowledged that the delivery efficiency will benefit their ranches. In return, they are willing to reduce their usage from 10 cfs to 6 cfs. The question of consumptive use is not necessarily relevant in the context of a riparian right.</p>

235	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Belcampo-North Annex</u> Key Conclusions: This SHA offers some benefits similar to the other SHAs including goodwill, allowing habitat restoration, and providing access for monitoring. There is no permanent fencing delineating Belcamp’s Shasta River riparian zone. Instead, ranch uses an intensively managed grazing schedule with electric fences where livestock are frequently rotated through pastures. Air photos indicate more woody vegetation on this property than many other Shasta Rive reaches outside the property; however, this vegetation established decades ago (perhaps because the area was protected from cattle grazing for many decades by having the old Huseman Ditch [now inactive] on its western edge and Shasta River on its eastern edge) so predates Belcampo’s management. The SHA does not identify any significant springs within the Ranch, so potential for enhancing cold water is limited. The ranch irrigates a large area (1,503 acres) with a combination of groundwater and Grenada Irrigation Ditch water, so is a substantial contributor to basin-wide water demand. It is not clear why the landowner wants or needs an SHA, nor that there would be major effects (either positive or negative) to implementing the SHA.</p>	Instream habitat improvements such as reconnection of old oxbows, riparian planting, and installation of LWD will provide benefits in this reach.
236	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Belcampo-North Annex</u> p. 42: “Diversion monitoring station will be maintained and operated as designed. Provide yearly data.” The meaning of the phrase “Provide yearly data” is unclear. See similar comment regarding p. 77 of the Rice Livestock SHA. [p.76]</p>	Comment noted. We have revised accordingly.

<p>237</p>	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>Big Springs Ranch Wildlife Area</u> Key Conclusions: Safe Harbor inappropriate strategy to provide Take coverage and not enough offered in this proposal besides. Given the large public investment in the acquiring the land and water rights, which was specifically intended to protect endangered species like Coho salmon, the Big Springs Ranch Wildlife Area should be held to a much higher standard than private ranches. The SHA does not require removal of the impoundment at the headwaters of Little Springs Creek which blocks fish passage and heats the water. This is unacceptable to us. We cannot support an SHA that does not require removal of this impoundment. The use of herbicides in the absence of a holistic vegetation management plan is also unacceptable. Given that this is public land that presumably is to be managed for the benefit of wildlife resources, it is a poor candidate for a SHA and instead should be covered for take by more traditional means. [p.77]</p>	<p>CDFW has already removed the two culverts downstream of the impoundment in Little Springs Creek. CDFW will investigate (and implement if feasible) modification/replacement of the impoundment structure to provide fish passage and the ability to control water surface elevation to meet multiple beneficial uses while providing coho habitat and maintaining the ability to divert water at this location. CDFW will continue monitoring water temperature in the impoundment and Little Springs Creek to guide management for coho habitat. Herbicide use is one of several tools to eradicate invasive species and to maintain and increase native riparian species cover. Herbicide treatments of non-native vegetation would only be considered when other treatments such as mechanical, grazing, or burning would not be viable or effective. Avoidance and Minimization Measures (AMMs) per the Agreement will be implemented to prevent toxins from entering surface waters. Routine agricultural activities may result in taking of the Covered Species; such take would be minimized and avoided through the implementation of AMMs included in the Agreement. The net conservation benefit assessment requires NMFS to assess the benefits that accrue to the species while the Agreement and site plan agreement are in place, and the off-setting adverse effects attributable to the incidental taking allowed by the enhancement of survival permit. The resulting net conservation benefit must be sufficient to contribute, either directly or indirectly, to the recovery of the Covered Species.</p>
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238	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Big Springs Ranch Wildlife Area</u> We do not understand why a State-owned property that was specifically purchased with public funds to increase the survival and production of Coho is trying to enroll in a program designed to protect the owner (the State) from the accidental take of Coho. [p.77]</p>	<p>CDFW is seeking federal take authorization for activities on Big Springs Ranch Wildlife area, including instream restoration, water diversion, and screen maintenance.</p>
239	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Big Springs Ranch Wildlife Area</u> What are the management practices of this property that are likely to result in take? When will the management plan be available for review? [p.77]</p>	<p>The management plan is currently being drafted and may be out for review in late 2020.</p>
240	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Big Springs Ranch Wildlife Area</u> The focus of the plan seems to be on ranching, even the new name of the property puts the word ranch before wildlife. [p.77]</p>	<p>The primary management objective for Big Springs Ranch Wildlife Area is providing habitat for fish and wildlife resources, including coho salmon.</p>
241	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Big Springs Ranch Wildlife Area</u> At certain flows, the box culverts located on Big Springs Creek at the site of the old water wheel are barriers to upstream migrating juveniles in search of cold-water rearing habitat. This structure is on the upstream property but it can be modified to allow fish passage under the easement. [p.77]</p>	<p>The water wheel passage barrier is not located on Big Springs Ranch Wildlife Area, but on an upstream property owned by another entity. CDFW does not own an easement on this upstream property.</p>
242	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Big Springs Ranch Wildlife Area</u> CA Department of Fish and Wildlife published a report, Little Springs Creek Monitoring Results in 2015 (CDFW 2015). One of the principal findings of these studies was that the impoundment of spring sources resulted in rapid warming of the 13 degree C spring degree water. Water temperatures at the outfall of the impoundment reached 19 degrees before it passed through Culvert 4. There is no mention in the proposed SHA site plan of removing, modifying, or providing fish passage for Coho at Culvert 4. This action is necessary for rearing Coho to reach the source of cold water located at T8 and T7 (Figure 1 of the report). [p.77]</p>	<p>CDFW has already removed the two culverts downstream of the impoundment in Little Springs Creek. CDFW will investigate (and implement if feasible) modification/replacement of the impoundment structure to provide fish passage and the ability to control water surface elevation to meet multiple beneficial uses while providing coho habitat and maintaining the ability to divert water at this location. CDFW will continue monitoring water temperature in the impoundment and Little Springs Creek to guide management for coho habitat.</p>

243	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Big Springs Ranch Wildlife Area</u> 1) Will the SHA create or improve rearing or spawning habitat that is accessible to juveniles and adults? If improvements to fish passage are made at all 4 culverts on Little Springs Creek and the waterwheel is modified and if instream habitat enhancement projects are implemented as described in the plan, then yes. 2) Will the SHA cool stream temperatures or reduce warming? Yes 3) Will the SHA produce significantly more instream flow of clean water? Yes 4) To what extent will the SHA mitigate for the impacts of the operation? The question should be irrelevant. On a State-owned wildlife area purchased for the production of Coho and [protection] of cold water sources there should be no impacts from operation. 5) Will the SHA improve fish passage for juveniles and adults? Not adequately as submitted. Culvert 4 on Little Springs needs to be removed as does the waterwheel. 6) How soon will this project be implemented? Uncertain 7) Will these projects result in improvements in survival and the production of Coho to the extent that species can make progress towards recovery? Possibly [p.78]</p>	Comments noted.
244	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Big Springs Ranch Wildlife Area</u> p. 9: “The riparian corridor on BSRWA has been excluded from cattle from the eight miles of riparian area on the ranch, including approximately five miles of the Shasta River. If the Permittee decides to graze the riparian area, a grazing management plan will be necessary to minimize impacts. Riparian grazing recommendations are included in Appendix D”. Riparian grazing should not be allowed. [p.79]</p>	Large scale stream bed operations are not authorized in any of the site plan agreements. Per the site plan agreements, the Permittees that currently allow for riparian grazing agree to develop riparian grazing management plans with University of California Cooperative Extension, and those management plans are to be reviewed by NMFS and CDFW. All site plan agreements require fish passage at road crossings of streams and adherence to the 2010 4th edition of the Department’s California Salmonid Stream Habitat Restoration Manual for any instream crossings.

245	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Big Springs Ranch Wildlife Area</u> p. 10: “To control large stands of invasive weeds the Permittee may contract a third party to spray appropriate herbicides such as Roundup or Transline as needed...” CDFW needs a feasible plan to address invasive species like star thistle, but rather than just focusing on what they want to kill, they should develop a holistic plan for what they want to grow which could compete with the invasive species. CDFW should have implemented a structured multi-year transition to dryland pasture rather than suddenly stop irrigating and let all the grass die without a plan for what they wanted to replace the irrigated pasture grass. We recommend that CDFW attempt to implement a dryland pasture program similar to what was developed in the Upper Klamath Basin in Oregon. The Klamath Soil and Water Conservation District (KSWCD) and Natural Resources Conservation Service (NRCS) designed and implemented a soil health program in the Sprague River valley (Quick 2014). [p.79]</p>	Comments noted. CDFW will be drafting a ranch management plan that address upslope habitat and other issues in more detail.
246	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Big Springs Ranch Wildlife Area</u> p. 14 “If redds are determined to be present, livestock may graze within the riparian pasture between November 1 and April 30 if a temporary electric exclusion fence or wire is installed between the riparian pasture and the stream bank, and provisions are made to supply off-channel stockwater. The electric fence must be checked and maintained daily.” A temporary electric fence is not an adequate protection to keep cattle off of redds. Riparian grazing is not an appropriate tool for riparian management, especially during egg incubation periods.</p>	Large scale stream bed operations are not authorized in any of the site plan agreements. Per the site plan agreements, the Permittees that currently allow for riparian grazing agree to develop riparian grazing management plans with University of California Cooperative Extension, and those management plans are to be reviewed by NMFS and CDFW. All site plan agreements require fish passage at road crossings of streams and adherence to the 2010 4th edition of the Department’s California Salmonid Stream Habitat Restoration Manual for any instream crossings.

<p>247</p>	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>Big Springs Ranch Wildlife Area</u> p. 26: “Little Springs Creek may be diverted from the spring if both of the following are met: 1) water temperature in Little Springs Creek is 16 degrees Celsius or less at the confluence with Big Springs Creek; and 2) culverts are removed.” We have not attempted any data analyses or modeling on the topic, but it seems plausible that there could be conditions under which water from Little Springs Creek provides important cooling benefits downstream in Big Springs Creek (and possibly the Shasta River?); therefore, it seems insufficient to base decisions on when to divert Little Springs Creek water solely on conditions at the mouth of Little Springs Creek (unless temperatures at Little Springs Creek and Big Springs Creek are highly correlated?). We recommend changing item #1 to “1) water temperature in Little Springs Creek is 16 degrees Celsius or less at the confluence with Big Springs Creek, and diversion of Little Springs Creek would not result in detectable warming of water temperatures downstream in Big Springs Creek and the Shasta River.” p. 28: “Natural woody debris from existing trees along the banks throughout the property will be left in place for refugia.” This language should be included in all the SH agreements. It is conspicuously absent in many of the other SH agreements. It does not make sense to spend public money to install large wood structures while at the same time allowing landowners to remove naturally recruited large wood.</p>	<p>Comment noted.</p>
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248	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Big Springs Ranch Wildlife Area</u> p. 29: “Permittee plans to remove the two culverts and provide unimpeded fish passage at the third upstream of the County road on Little Springs Creek for fish passage and water quality benefits within 3 years of signing this agreement.” There is also a dam/impoundment near the source of Little Springs Creek. This impoundment is a barrier to fish passage. This impoundment also increases residence time and surface area which increases daily maximum water temperatures in summer (Deas et al. 2015). Given the direct impacts to water quality and fish passage, the SH agreement should be revised to require removal of this impoundment. The people of California paid a lot of money for the Big Springs Ranch Wildlife Area, first for a conservation easement (\$10.3 million) and then fee title acquisition (\$2.4 million). The State’s website rightly states the reason for these projects as “Threatened or Endangered Species Recovery.” Given the public investment and public ownership, the SHA for this property should have much higher expectations than the private entities in the Shasta River watershed. [p.80]</p>	<p>Comment noted. Regarding Little Springs Creek – CDFW has already removed the two culverts downstream of the impoundment in Little Springs Creek. CDFW will investigate (and implement if feasible) modification/replacement of the impoundment structure to provide fish passage and the ability to control water surface elevation to meet multiple beneficial uses while providing coho habitat and maintaining the ability to divert water at this location. CDFW will continue monitoring water temperature in the impoundment and Little Springs Creek to guide management for coho habitat. The BSRWA is managed differently from most private ranches in the area. The primary management objective is providing habitat for fish and wildlife resources, including coho salmon.</p>
249	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Big Springs Ranch Wildlife Area</u> p. 31 : “Permittee will prepare a feasibility analysis to identify enhancement and restoration opportunities in coordination with the adjacent landowner on HIG Creek. These opportunities may include enhancement of channel form and riparian vegetation, channel relocation, riparian fencing, reducing water temperatures, eliminating fish passage barriers, and comprehensive restoration of the entire reach of HIG Creek.” Judging from air photos and maps, HIG Creek looks like it has amazing restoration potential with very low gradient and large areas of wetlands. [p.80]</p>	<p>Comment noted. The feasibility analysis will provide the extent of benefits that could result from improvements.</p>

250	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Big Springs Ranch Wildlife Area</u> E.3.g Assessments/Studies: “-Permittee commits to continue to allow research entities such as UC Davis, SVRCD, USFWS, NMFS and others to conduct studies to describe salmonid habitat conditions, life history requirements, and productivity to help inform efforts to improve survival and productivity of Coho Salmon in the future, as long as they have the appropriate permits and follow the existing protocols for obtaining approval to conduct studies on State property. “ CDFW should be listed as a research entity to work on the property. CDFW staff have conducted multiple studies since 2007 and additional follow-up studies are needed to improve management of the property for Coho production.</p>	Comment noted.
251	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Parks Creek Ranch</u> Key Conclusions: There are some improvements proposed, but they are not enough to justify take coverage. Winter stockwater diversions are proposed to be reduced from 5.65 cfs down to 1.2 cfs, but this is still far more water than is actually necessary for the intended purpose (1.2 cfs is enough stockwater to support nearly 40,000 cattle). The alcove below Spring Creek would provide summer rearing habitat for juvenile Coho salmon. The use of collected tailwater in lieu of diversion #6 would improve water quality. This SHA offers some benefits similar to other SHAs including goodwill, diversion coordination, riparian fencing, allowing habitat restoration, and providing access for monitoring.</p>	Parks Creek Ranch believes use of 1.2 cfs for winter stockwater is a reasonable and beneficial use of its water rights. The water will be used in connection with Parks Creek Ranch’s management objective of expanding livestock access to all reaches of the ranch to encourage consumption of available dry feed. Parks Creek Ranch is voluntarily offering to reduce its stockwater consumption in connection with the installation of an efficient alternative livestock water system that will aid adult salmonid migration and spawning. Parks Creek Ranch requires 1.2 cfs of stockwater to support its program of expanding livestock access to all reaches of the ranch. Commenter’s calculation-based estimates of reasonable water use fail to take into account the numerous factors which affect the determination of whether or not use is reasonable, including but not limited to inevitable transportation losses. The Shasta Valley Watermaster District is tasked with ensuring water is allocated according to established water rights. Permittees state that they are in compliance with all requirements imposed by the SWRCB on their water use and will continue to comply with all use limitations imposed by the SWRCB and the Shasta Valley Watermaster District.

252	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Parks Creek Ranch</u> p. 1: “The Parks Creek Ranch properties within the Agreement are riparian to Parks Creek and/or irrigated by Parks Creek water rights.” The discussion of water rights on pages 4 through 7 does not clearly identify which diversions and places of use are riparian and which are included under the Shasta River Adjudication. Please clarify which diversions and places of uses are riparian.</p>	<p>Comment noted. This information will be provided where it is feasible to do so.</p>
253	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Parks Creek Ranch</u> p. 9: “Stockwater/Winter Rights: Parks Creek Ranch has a winter right to divert 5.65 cfs from Parks Creek to water livestock between November 1 and February 28.” and p. 63: “E.3.a.5 Efficient Alternative Livestock Watering System. Permittee will assess, design and implement an efficient alternative livestock watering system to aid adult migration and spawning. In exchange for design and installation of efficient livestock water facilities, Permittee [sic] will limit livestock diversion volume to 1.2 cfs rather than the 5.6 cfs stock water right.” 5.6 cfs is an excessive amount of water for stockwater, so a system redesign is an excellent idea. What is the basis for the 1.2 cfs amount? That is still a lot of water (646,317 gals/day/cfs x 1.2 cfs = 775,580 gals/day). Using a high estimate of 20 gallons per day per cow, 775,580 gals/day would support 38,779 cattle which is likely far more than are present on the Parks Creek Ranch. We recommend that the SHA agreement be revised to limit stockwater diversion to a more reasonable amount of water (1.2 cfs is too high). In the 1971 Erickson v. Queen Valley Ranch Company decision, the California Court of Appeals ruled that a particular diversion where five-sixths of the water diverted into an earthen canal was lost en route to the point of use for agricultural irrigation was an unreasonable use of water (Kibel 2014). Given the Parks Creek Ranch proposes to divert perhaps 20 times more water than they are beneficially using (i.e., if they have 2000 cattle [that is just a guess] but are diverting enough water to support 38,779 cattle), a similar argument can be made that Parks Creek Ranch’s winter stockwater diversion is not a reasonable use of water. [p.81-82]</p>	<p>Livestock practices are at the discretion of the landowners. The site plan agreements were negotiated and agreed upon by the agencies overseeing the Agreement and the Permittees. 1.2 cfs is still required. The proposed alternative livestock watering systems will not eliminate delivery of stock water via an open ditch. Parks Creek Ranch requires 1.2 cfs of stockwater to support its program of expanding livestock access to all reaches of the ranch. Commenter’s calculation-based estimates of reasonable water use fail to take into account the numerous factors which affect the determination of whether or not use is reasonable, including but not limited to inevitable transportation losses. The Shasta Valley Watermaster District is tasked with ensuring water is allocated according to established water rights. The Permittees state that they are in compliance with all requirements imposed by the SWRCB on their water use and will continue to comply with all use limitations imposed by the SWRCB and the Shasta Valley Watermaster District.</p>

254	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Grenada Irrigation District</u> Key Conclusions: Implementation of the projects proposed in the Grenada Irrigation District’s SHA are actually likely to result in increased diversions and reduced instream flows in the Shasta River; therefore we strongly oppose this SHA and the canal-to-pipeline conversion, especially if funded by public money that is supposed to be used for fisheries restoration. If GID wants a pipeline they should buy it themselves or use federal farm bill funding that is intended to support agriculture (not fisheries restoration).</p>	The diversion schedule developed with GID results in a reduction in diversion over historical use that benefits coho life stages, specifically spring emigration and spring redistribution.
255	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Grenada Irrigation District</u> p. 3: Table 1 lists “4,144 acres” for “Acreage Irrigated with Diversion” This number in the table is contradicted by other text on page 3 which states “GID provides water to over 60 users who irrigate up to 1,477 acres within the 4,144 acre district boundary.” Which number is correct?</p>	4,144 acres are identified within the district, of which a maximum of 1,477 is irrigable.
256	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Grenada Irrigation District</u> p. 3: Table 1 lists “ Total Ac-ft. per season diverted ” as “ 14,599 ac-ft. ”. The context for this number is at best incompletely described, at worst it is misleading. It is not the amount actually diverted per season. It is the theoretical maximum amount that can be diverted. It should be labelled as the “Maximum Total Ac-ft. per season diverted”. 40 cfs x 165 days x 1.983 acre-feet/day per cfs = 14516 acre-feet. The text above the table says “During wetter than average years, GID diverts throughout the irrigation season, irrigating approximately 165 days a year.” The SHA does not provide any actual records of the amount of water diverted. Davids Engineering (2006) shows diversion records for May–September 2006 indicating that in that year GID diverted 6,406 acre-feet, and also states “The District's water rights are relatively junior, and diversions are sometimes curtailed by a State watermaster to ensure that senior rights are protected. GID diverts about 6,000 to 7,000 acre-feet of water annually under</p>	As a result of GID's proposed water conservation project, a maximum diversion schedule is proposed which reduces GID’s historical diversion volumes. GID’s specific diversion volume schedule is based on life stage needs in the stream reach from the POD to the downstream boundary of the Covered Area (and at times beyond). The diversions downstream of GID within the Covered Area are always fully met. Any water conserved or bypassed by GID will flow through the Covered Area. During the summer months, GID diversions are often curtailed during normal and drier years. GID is not proposing to conserve water during this period due to curtailment, priority, and diversion variability. GID recognizes water rights of higher priority provided for instream benefit will be bypassed. Equally, water of higher priority rights within the Covered Area

		<p>existing conditions. Historical diversions may have been more than this.”... An important fact to realize is that due to GID’s junior water right which is often not completely fulfilled particularly during low summer/fall falls, water conservation anywhere on the Shasta River downstream of the GID diversion can actually be counter-productive to Shasta River flows, because reduced water demand downstream allows the GID to divert additional water. Does the SHA flow strategy take this into account? For example, if the diversions for the Huseman Ditch, Novy-Rice-Zenkus Riparian Diversion, and Novy Pump Riparian Diversion downstream were reduced as called for in the various SHAs, would GID be able to increase its diversion and negate any flow benefits? Have NMFS and CDFW analyzed whether efficiency improvements upstream (and downstream) will not make more water available for diversion for GID’s relatively low-priority was right? [p.83-84]</p>	<p>downstream of GID will be bypassed for instream benefit to downstream of the Covered Area. The Flow Management Strategy demonstrates the volume of water made available per reach and cumulatively.</p>
257	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>Edson-Foulke</u> Key Conclusions: Not enough improvements proposed to justify take coverage. The proposed 6.9 cfs winter diversion for stockwater is far greater than what is “reasonable” by any standard. While lower than the current stockwater diversion of 9.9 cfs, the 6.9 cfs diversion is enough to support more than 222,979 cattle (three times the number in all of Siskiyou County), which is obviously far more than are actually present on the properties that the Edson Foulke ditch serves. The diversion could and should be dramatically reduced to a reasonable amount (less than 1 cfs) without affecting the intended end use of this water (providing stockwater for a number of cattle which could reasonably be expected to be present on the destination properties), which would have major ecological benefits downstream in Parks Creek including reliable access for Coho salmon migration, spawning, and incubation. Instead, the Edson Foulke SHA proposes to only decrease this winter diversion to 6.9 cfs (a reduction of only 3 cfs). We see little concrete benefit in the Edson Foulke SHA other than goodwill. [p.84-85]</p>	<p>The SWRCB has authority to prevent the waste or unreasonable use of water, regardless of the basis of the water right. The Shasta Valley Watermaster District ensures that water is allocated according to established water rights. The Permittees state that they are in compliance with all requirements imposed by the SWRCB on their water use and will continue to comply with all use limitations imposed by the SWRCB and the Shasta Valley Watermaster District. The Upper Parks Creek Flow Strategy first requires that instream targets be met prior to diversion, effectively giving instream benefit a first priority right. This commitment by Edson-Foulke and other Permittees is that 10 cfs must be instream at the downstream verification gage for migration and spawning prior to diverting any flow for stockwater.</p>

258	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Edson-Foulke</u> p. 9: “Irrigation Management: Edson Foulke can typically divert full adjudicated volume during the spring until mid-June on an average year. Transmission losses can occur in the main canal. Losses are proportional to the volume of water diverted. Losses are proportionally higher when diverting near maximum volumes. Conversely, the efficiency of the ditch is higher when diverting smaller volumes of water. The ditch is an unlined earthen ditch excavated from native materials (consolidated and unconsolidated serpentine soils and rock). Transmission loss occurs through the fill side of the ditch when maximum capacity is approached.”</p> <p>Have there been any studies quantifying transmission losses from the ditch? This information is needed to inform how much the diversion should be reduced if the canal is replaced with a pipeline. [p.85]</p>	As described in their Site Plan Agreement, Edson-Foulke will conduct an assessment to determine methods and alternatives to conserve water. The assessment will inform the target reach, design, and size of project to conserve 3.0 cfs.
259	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Edson-Foulke</u> p. 46: For consistency, Table 2 should mention (currently it does not) the E3a4 Forbearance Agreement that is described on page 55. [p.85]</p>	Comment noted. We have revised accordingly.
260	Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR	<p><u>Edson-Foulke</u> p. 53–55: “ E.3.a2: Enhance Edson-Foulke's Parks Creek Point of Diversion (POD)”, “E3a3: Water Conservation”, and “E3a4: Forbearance Agreement”</p> <p>These projects are listed as “Other Beneficial Management Activities” rather than “Elevated Baseline”, and therefore may be temporary rather than permanent. The permittee seeks public funding for a new diversion structure and canal upgrade (presumably to a pipeline or lined ditch) to “improve ditch conveyance efficiencies where conserved water would be used to provide by-pass flows in Parks Creek” such that the “water conservation project” will “conserve at least 3.0 cfs when the ditch is operating at 60% capacity.” “The permittee will not be financially responsible for any replacing new</p>	We have taken this comment into consideration and concluded that these activities are properly classified as “Other Beneficial Management Activities.”

		<p>diversion facility, automated headgate and flow monitoring gages if destroyed by a flood event. Permittee agrees to a maximum annual cost of \$1500.00 to cover maintenance.” In our opinion, it seems highly likely that at some point in the next few decades there will be a large storm that will damage the new infrastructure enough to require more than \$1500 in maintenance. What will happen then? As written, it appears as though if the SHA is terminated or is not renewed, the permittee will be able to keep their high-efficiency lower-maintenance pipeline (or lined ditch) but not have to abide by the bypass flow requirements, allowing delivery of more irrigation water to the detriment of instream flows (same amount of water diverted as current conditions but not seepage which can return to the river or recharge groundwater). This is not acceptable. If the conveyance system is upgraded, the Forbearance Agreement specifying bypass flows should be permanent (i.e., “Elevated Baseline” not “Other Beneficial Management Activities”). [p.85-86]</p>	
261	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p><u>Edson-Foulke</u> p. 54: “ Edson Foulke Ditch has a right to divert 9.9 cfs from Parks Creek throughout the year. During the period from 3/1-10/31 water is diverted for irrigation. During the period from 11/1-2/28, water is diverted for livestock watering.” And p. 55: “Permittee commits to jointly seek funding with agencies to complete construction of project.” ... “Upon completion of project, Permittee will deliver 3.0 cfs of its 9.9 cfs rights for instream benefit.” A very strong argument can be made that diverting 6.9 cfs and conveying it 15.45 miles to deliver stockwater use is not a “reasonable” use of water because the amount of water diverted vastly exceeds the stockwater needs. Multiplying 6.9 cfs by 646317 gals/day/cfs equates to 4,459,587 gal/day. Using a high estimate of 20 gallons per day per cow , 4,459,587 gals/day would support 222,979 cattle which is likely far more than are present</p>	<p>The Edson-Foulke association serves multiple users located at different points along Edson-Foulke’s 15.45 mile-long canal. It is inaccurate to state that Edson-Foulke transports all of its water 15.45 miles from the point of diversion to the point of use. Much of the water is used at the halfway point along the canal. Edson-Foulke states that they do not believe these losses rise to the level of unreasonable use. The permittees state that they are in compliance with all requirements imposed by the SWRCB on their water use and will continue to comply with all use limitations imposed by the SWRCB and the Shasta Valley Watermaster District. The Upper Parks Creek Flow Strategy first requires that instream targets are met prior to diversion, effectively giving instream benefit a first priority</p>

		<p>on the destination properties because that nearly three times the entire number (approximately 75,000) of livestock and poultry in all of Siskiyou County (Smith 2018). The permittee does not deserve a SHA condoning its diversion of an amount of water (6.9 cfs) similar to the proposed Upper Parks Creek bypass flows (6-10 cfs) and that is far more than is actually beneficially used. In the 1971 Erickson v. Queen Valley Ranch Company decision, the California Court of Appeals ruled that a particular diversion where five-sixths of the water diverted into an earthen canal was lost en route to the point of use for agricultural irrigation was an unreasonable use of water (Kibel 2014). Given the Edson Foulke proposes to divert perhaps 100 times more water than they are beneficially using (i.e., if they have 2000 cattle [that is just a guess] but are diverting enough water to support 222,979 cattle), a similar argument can be made that Edson Foulke’s winter stockwater diversion is not a reasonable use of water.</p>	<p>right. This commitment by Edson-Foulke and other participants is that 10 cfs must be instream at the downstream verification gage for migration and spawning prior to diverting any flow for stock water.</p>
262	<p>Karuk Tribe, Quartz Valley Indian Rancheria, Yurok Tribe, PCFFA, IFR</p>	<p>Edson-Foulke p. 66: Why is Appendix A (Edson-Foulke- Proof of Water Right from Shasta River Decree) blank? Please provide this information.</p>	<p>This is provided in the site plan agreement.</p>
263	<p>Water Climate Trust</p>	<p>“While there are numerous beneficial projects and activities, we are concerned that the cumulative water savings and instream dedications will not result in flow levels that provide for the recovery of endangered Coho salmon. We are also concerned that bypass flow agreements proposed for larger diverters may preclude actions necessary to achieve recovery flow levels.”</p>	<p>The Agreement includes Beneficial Management Activities (BMAs) that the Permittees will voluntarily undertake or forgo to provide a net conservation benefit for the Covered Species. BMAs include actions to enhance, restore, or maintain habitat (e.g., restoring hydrological conditions, or restoring fish passage). The NMFS (2014) recovery plan as well as information on existing conditions in the Covered Area were used to guide BMAs.</p>

264	Water Climate Trust	<p>“As you know, the California Water Action Plan requires the State Water Resources Control Board and the Department of Fish and Wildlife to enhance flows in the Shasta River, and in the process, to “consider their public trust responsibility and existing statutory authorities such as maintaining fish in good condition” pursuant to Fish & Game § 5937. At the same time, the federal Endangered Species Act requires flow levels and other actions necessary for the recovery of Coho.</p> <p>To ensure that Safe Harbor Agreements are consistent with existing state and federal law, we encourage you to establish enforceable instream flow requirements on the Shasta River that provide a high probability of Coho recovery according to the best available science. Bypass flows of individual diverters should be consistent with said flow requirements, and adjustable if necessary to achieve biological outcomes.”</p>	<p>Comment noted. It would be inappropriate for us to impose generally enforceable instream flow requirements through this Agreement. However, in many instances, landowners, have voluntarily taken on similar obligations in order to ensure a tangible, realized conservation benefit based on their actions.</p>
265	Water Climate Trust	<p>“We urge you to conduct a more comprehensive accounting of water diversion and consumption pursuant to appropriative and claimed riparian rights. In the process, please take steps to ensure that diversion quantities of individual landowners comply with the California Reasonable Use Doctrine.”</p>	<p>Whether or not a diversion complies with California state law is beyond the scope of NMFS’s authority. The Permittees state that they are in compliance with all requirements imposed by the SWRCB on their water use and will continue to comply with all use limitations imposed by the SWRCB and the Shasta Valley Watermaster District.</p>
266	Water Climate Trust	<p>“We also request that you take steps to ensure that water conservation and efficiency projects translate into additional instream flows rather than additional water consumption.”</p>	<p>Comment noted. We intend this result through the site plan agreements. Many of the site plan agreements contain mechanisms for ensuring that additional instream flows result from Permittee actions. The Forbearance Agreement will ensure that water savings will be delivered to the downstream extent of the Covered Area.</p>

267	Pacific PEER	<p>1. Twenty-Year Duration Too Long The inordinate length of the Safe Harbor arrangement is compounded by the fact that NOAA has only one recourse should things go wrong and that is complete cancellation of the agreement. There is no provision for penalties or any sanctions short of cancellation. That is a recipe for continued agreement violations without meaningful enforcement. Moreover, it is unclear that NOAA will be able to provide sufficient staff time over a 20 period to “ride herd” on a diverse group of applicants, all running different ranch operations, all with differing financial abilities, and business structures, and all with little or no track record in protecting trust resources.</p> <p>PEER suggests that this arrangement be limited to a five-year duration. A five-year duration would also allow an assessment of impacts on the Coho and provide a basis for reviewing necessary alteration of terms for any renewal.</p>	<p>We have concluded that 20 years is a sensible term that will allow for the conservation benefits of the Agreement to accrue but still provide flexibility for necessary conservation actions that may be required in the future. There are advantages and disadvantages to a shorter term, and we believe the advantages of a twenty year term surpass the disadvantages. The investments of time and money for project design, permitting, and implementation, the nature of grant cycles, and the variability of the natural processes tied to the full realization of the proposed habitat improvements all dictate a longer commitment by all parties. Each Permittee will submit an annual report to help verify that they are complying with the terms of the Agreement. A 5 year check-in process, per the Adaptive Management Program, will evaluate if set performance objectives and success criteria have been met and provides a process to re-evaluate the efficacy of BMAs. There is also a five-year check-in process in the Forbearance Agreement.</p>
268	Pacific PEER	<p>2. Lack of Measurable Outcomes Th arrangement lacks any firm deliverables. The permits are replete with terms such as "will try to" and "will consider". A Safe Harbor agreement needs to be based on measurable efforts whose efficacy can be meaningfully evaluated. This should be especially the case in any arrangement based upon an adaptive management approach. Adaptive management requires specific desired results, otherwise it is a sham.</p>	<p>Some of the projects identified in the site plan agreements have yet to go through a feasibility process where constraints and benefits will be identified. Once a valid project has been identified, funding will be secured for design and implementation and the benefits will be realized. We built in time lines to ensure that these benefits will be actively pursued in an efficient manner. NOAA Fisheries determined that a net conservation benefit will result from each site plan agreement based on ESA § 10(a)(1)(A) standards. The Permittees will install monitoring systems that will allow for more data and more certainty going forward. This data can be used, along with the adaptive management process, to make necessary changes throughout the life of the Agreement to ensure that landowners are maximizing the benefit they can provide to Shasta River coho. There is an annual report requirement to determine if participants are adhering to the terms of the agreement, and a 5-year check in process has been added to the Adaptive Management Program.</p>

269	Pacific PEER	<p>3. No Water Quality Protections Nothing in the Safe Harbor agreements addresses the likely low levels of dissolved oxygen, high levels of phosphorus, likely methane and other BOD stimulating organics. This lack is compounded by the absence of any real time monitoring to assure that lethal pulses of deep-origin lake water will not kill Coho residing below the dam. Nor is there anything in these arrangements to reduce the negative impacts of irrigation tailwater that returns to the Shasta Riviera downstream. Similarly, there is nothing to address the – Permanent prevention of riparian tree recruitment as a result of the severely altered hydrograph; The need for cleaning fine organics from gravels in stream; or The need for routinely adding gravel that is now blocked by the dam. Until conditions are such that Coho can be reliably expected to survive a return to enhanced baseline, the minimum legal requirements for issuance of a Safe Harbor agreement cannot be met.</p>	<p>Comment noted. Water quality data varies considerably between reaches. The overall strategy of the Agreement is to implement BMAs and AMMs to improve the habitat and water quality parameters that are currently believed to impede recovery of coho salmon, such as fencing of several reaches of Parks Creek and the Shasta River, adding additional spring water, and irrigating using soil moisture sensors to reduce tailwater and therefore reduce nutrients and improve water quality. Fencing will also allow riparian vegetation to grow. Cleaning fine organics from the gravel will be accomplished by flushing flows from Dwinnell. Gravel will be added in the upper Shasta from the dam down to the confluence with Parks Creek, as described in the site plan agreements. Generally, when basic freshwater habitat of coho salmon is suitable (e.g., adequate availability of deep complex habitat, adequate quantities of water, cool water temperatures, unimpeded passage to spawning grounds and back to the ocean, adequate quantities of clean spawning gravels, and access to low velocity habitat during high flow events), water quality requirements, such as dissolved oxygen are met. Temperature and flow monitoring is required as part of the Agreement. There is currently very little data available on diversions in this watershed. As a result of this Agreement, numerous diversion monitoring stations will be installed, which will provide significant new data about water usage. This data will allow for adjustments to the Agreement through the adaptive management process. This increased monitoring will benefit the Covered Species. Use of water rights for stock ponds</p>
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270	Pacific PEER	<p>4. No Incentive for Water Efficiency Several of the applicants do not offer to rely on soil moisture sensors to minimize excessive water application and consequent tailwater return. Overall, the arrangement appears to lack any incentive for efficient water use. Irrigation efficiency measures should be a precondition for any permit. Otherwise, the Safe Harbor will be a basis for supporting outmoded and wasteful practices. Further, the agreement should redress the excessive amount of water diverted for purported stockwater use. The amounts already diverted collectively greatly exceeds what is required for all the cows in Siskiyou county. Finally, the arrangement makes no reduction in consumptive use anywhere, regardless of how excessive or unreasonable.</p>	<p>The efficiency of landowners' irrigation is regulated by the state law and is beyond the scope of this process. Depending on site characteristics, soil moisture sensors are not appropriate for every site. The Permittees state that they are in compliance with all requirements imposed by the SWRCB on their water use and will continue to comply with all use limitations imposed by the SWRCB and the Shasta Valley Watermaster District.</p>

271	Pacific PEER	<p>5. Questionable Water Rights Some applicants are relying on claims of riparian rights. Yet, these riparian rights need to be documented, as the current ownership has overlapping claims from originally patented parcels.</p> <p>The existing water claims outstanding in the Shasta Valley allocate far more water than actually exists. The agreement should address the likelihood that substantial cutbacks in areas irrigated are needed to make the applicants otherwise legal.</p>	<p>Adjudicating riparian water rights in California is beyond the scope of NMFS's authority. Many of the rights at issue were clarified in the Shasta River Adjudication. Documentation of these rights has occurred through the SWRCB.</p>
272	Pacific PEER	<p>6. No Groundwater Protections While the Safe Harbor agreements focus on surface diversion, it leaves open the door for exchanging water left instream with increased use of groundwater. Groundwater usage in the Shasta Valley is already very apparently impacting surface flows, resulting in higher water temperatures, and less water for both irrigators and fish.</p> <p>Safe Harbor applicants should be required to formally forgo the drilling of any additional wells as part of enhanced baseline. Although efforts to develop ground water management plans are underway, they are unlikely to adequately address any relevant issues in time to provide useful guidance here.</p>	<p>Comment noted. Landowners are required to comply with California's Sustainable Groundwater Management Act (SGMA). Beyond complying with the SGMA, the Permittees have indicated that they are not willing to forego future groundwater development as part of this process. Surface water is coordinated in a conjunctive use strategy with groundwater. As the commenter notes, the Groundwater Sustainability Agency (GSA) for Shasta Valley will develop a framework for managing groundwater withdrawals and complying with the SGMA. The Permittees state that they do not want to preclude opportunities for groundwater-surface water exchanges for the benefit of other stakeholders, such as the Tribes, or to improve instream conditions. The SGMA is the appropriate vehicle for imposing new groundwater restrictions, if warranted, not this process. The GSA has requested a change to the current groundwater boundaries to include the Pluto Caves Basalt zone, which includes many of the lands within the Covered Area. Implementation of SGMA may have a direct bearing on groundwater use independent of the SHA process. If through the SGMA process groundwater withdrawals within the Covered Area are found to adversely impact surface water contributions, the agencies and the Permittees should discuss solutions that would reduce or eliminate impacts to surface water flows. No significant groundwater development is anticipated in the near future. In many cases, there is no opportunity for groundwater development. Any future groundwater or riparian use not described in the site plan agreements are not covered under the Agreement.</p>

273	Pacific PEER	<p>7. NOAA Lacks Coherent Recovery Plan The Shasta River was once a tremendous producer of Fall Chinook and steelhead, and a significant number of Coho. Conditions are now so degraded that it only has Coho by virtue of regular infusions from Iron Gate hatchery. Steelhead are barely hanging on now, in contrast to pre-dam times when the Shasta, according to California Department of Fish & Game reports, was once "the most heavily fished stream for (steelhead) trout in Siskiyou County, with DFG estimating 6,000 outmigrants caught per mile. Today, those stocks have virtually disappeared.</p> <p>While the Safe Harbor purports only to benefit Coho, the dire condition of all salmonids is indicative of just how conditions have deteriorated and how much needs to be done before Coho populations can be considered life supporting. However, it is not clear how much, if any, progress this Safe Harbor will create.</p> <p>Nor is this arrangement integrated into a larger recovery strategy. Absent a coherent strategy, this arrangement may make no meaningful contribution toward meeting its purported goals.</p>	<p>The Agreement serves as an additional effort that will contribute to the recovery of the Covered Species along with other established conservation efforts including Klamath River Restoration Conservation Measure (KRRCM) and the SONCC Coho recovery plan. These efforts strive to further the recovery of protected anadromous fish in the Klamath and Shasta river basins. KRRCM and the SONCC recovery plan employ joint operations combining the efforts of NMFS, USFWS, CDFW, and NFWF. There is no requirement that the net conservation benefit be "significant" or for an SHA to serve as a comprehensive recovery plan. The purpose of an SHA is to allow and encourage management activities that are beneficial to a listed species. An SHA must provide a net conservation benefit that helps the recovery of the species. SHAs are only part of the overall recovery plan for SONCC coho. <i>See</i> National Marine Fisheries Service, Final Recovery Plan for the Southern Oregon/Northern California Coast Evolutionary Significant Unit of Coho Salmon (2014). NMFS evaluated each site plan agreement individually and determined that each would provide a net conservation benefit for SONCC coho. According to USFWS and NMFS's Safe Harbor Policy, "[t]he Services will not rely solely on these benefits as the basis to delist any species. A Safe Harbor Agreement does not have to provide permanent conservation for enrolled property." 64 Fed. Reg. 32717 (June 17, 1999). The SONCC Coho recovery plan provides a comprehensive roadmap for the recovery of coho salmon, which requires implementation of</p>
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274	CalTrout	<p>“CalTrout is both encouraged and discouraged by the proposed applications. Several landowners have stepped forward and are proposing (and in some cases already implementing) progressive measures for the benefit of coho salmon; we look forward to working with these landowners. Conversely, other applicants appear to be hiding behind thin commitments rather than proposing meaningful actions. CalTrout finds this minimal approach disappointing given the large amount of resources and opportunities presented to these landowners to take action and improve conditions for coho salmon.” [p.2]</p>	<p>Comment noted. We determined that the commitments made by each Permittee will provide a net conservation benefit.</p>

275	CalTrout	<p>“NOAA can only grant an ESP based on a SHA if the agreement will result in a Net Conservation Benefit that is “sufficient to contribute ... to the recovery of the Covered Species.”⁴ Therefore, an applicant may not receive an ESP unless their Safe Harbor Agreement, comprising the Template Agreement and their individual Site Plan, demonstrates the achievability of such Net “Conservation Benefit. For this reason, CalTrout supports the following projects that we believe meet this exacting standard by improving fish passage, restoring instream habitat, or enhancing cold water flows: Cardoza Ranch point of diversion relocation and irrigation efficiency improvements, which will enable the removal of a fish passage barrier and 25-acre impoundment, as well as provide flow enhancement for 2.8 miles, included in Cardoza (23278); Hole in the Ground commitment to remove fish passage barrier at Cardoza’s existing diversion, included in Hole in the Ground Ranch (23286); Cold water exchanges and efficiency improvements on Hidden Valley Ranch and Hole in the Ground Ranch to support juvenile rearing, included in Hidden Valley Ranch (23285) and Hole in the Ground Ranch (23286); MWCD Flow Strategy in Upper Shasta to help outmigration of smolt, included in MWCD (23287); Specific fish screening improvements as committed to on Hidden Valley and Novy-Rice-Zenkus, included in Hidden Valley Ranch (23285), Grenada-Novy (23284), and Rice Livestock (23289); and Removing the fish passage barrier at Novy-Rice-Zenkus, included in Grenada-Novy (23284) and Rice Livestock (23289). We believe that SHAs that call for landowners to implement these projects will contribute to the qualifiable recovery of coho salmon in the Shasta River. As such, we welcome the opportunity to support the above landowners as they undertake voluntary actions to improve conditions for coho salmon through fundraising, design and engineering, permitting, grant administration, legal analysis, construction management, and any other technical capacity needed to implement the projects listed in their respective SHAs.” [p.2]</p>	<p>Comment noted. We have considered the desire of partners to assist in implementation in making our final determinations.</p>
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276	CalTrout	<p>“Further, recognizing the complexity of the proposed SHAs, the varying levels of commitments by the applicants, and the extensive term lengths of the sought-after ESPs, CalTrout believes that the Template Agreement should include a 5-year provisional period during which NMFS could evaluate the effectiveness of the SHAs in achieving Net Conservation Benefit.</p> <p>During this time, NMFS should perform yearly evaluations to determine whether permittees are adhering to all of the minimum requirements set forth under the agreement such as allowing access for monitoring, installing monitoring equipment, annual reporting, and following Avoidance and Minimization Measures.</p> <p>This initial period would give permittees the chance to demonstrate their commitment to implementing Beneficial Management Activities, as well as install the effectiveness monitoring system to collect data and document any improvements to flow and temperature that result from implementing these activities. At the end of the 5-year period, permittees that have been adhering to their SHA terms and can document habitat improvements would be able to continue under those terms for the remainder of the 20-year agreement, while those permittees that do not meet these criteria could have their permits revoked at this time.” [p.2-3]</p>	<p>The Agreement is for 20 years. Adding a clause to upset the stability of such an agreement undercuts one of the purposes of entering into an SHA. Yearly monitoring reports are required to be submitted to CDFW and NMFS under the Agreement. A process for a 5-year check in has been added to the Adaptive Management Program, which will provide the opportunity to perform a site visit for the specific purpose of inspecting the implementation of the Agreement, but also to evaluate how effective are the actions and program at improving habitat conditions. The Forbearance Agreement also has a 5-year interim term built into it so that flows can be adaptively managed based on new and improved data points.</p>
277	CalTrout	<p>“How will the contributions of commitments that contain the phrase “up to” be accounted for in the determination of Net Conservation Benefit, given that the definition of “up to” necessarily includes the possibility that the landowner will take no action? CalTrout does not suggest that NOAA discount these commitments when determining Net Conservation Benefit. However, because this phrase leaves the landowners’ actual commitments ambiguous, CalTrout believes it would be inappropriate for NOAA to use the numbers proposed in the Site Plans as the basis for evaluation because these numbers represent the ideal outcomes of these commitments, not necessarily the actual ones. CalTrout therefore suggests that the Site Plans include a non-zero minimum for commitments using this “up to” language, and that NOAA base the determination of Net Conservation Benefit on this minimum number.” [Appx. A, p.4]</p>	<p>We analyzed each site plan agreement to determine if each one has mechanisms to ensure a net conservation benefit notwithstanding the inclusion this “up to” language.</p>

278	CalTrout	<p>“Relating to commitments that state the applicant “agrees to seek funding”: will NOAA base their evaluation of benefit on the action of seeking funding, or on the implementation of the proposed project for which the applicant is seeking funding? If the latter, then the commitment language regarding funding should be stronger so that implementation of the beneficial project is more than a goal. CalTrout suggest language such as “agrees to seek and secure funding for implementation, carry out implementation as stipulated by the funder, and manage the project as intended for the term of the agreement.”” [Appx. A, p.4]</p>	<p>We have considered this suggested language and concluded that the current language is sufficient. NOAA Fisheries takes the language included in the site plan agreements under consideration relative to net conservation benefits, weighting projects with secured funding higher compared to those with potential funding.</p>
279	CalTrout	<p>“How will NOAA evaluate the benefit contributions of commitments to “allow access” without further committal language related to implementing a beneficial management activity? While CalTrout commends landowners for opening up their private properties, CalTrout does not understand how the act of allowing access, in itself, contributes to Net Conservation Benefit.” [Appx. A, p.4]</p>	<p>Net conservation benefit is defined as “the cumulative benefits of the Beneficial Management Activities on an Enrolled Property, taking into account the term of the Template Safe Harbor and Site Plan Agreement and any off-setting adverse effects attributable to incidental take allowed by the ESP. Such benefit may be an increase in the Covered Species’ population; the enhancement, restoration, or maintaining suitable habitat within the Enrolled Property.” Announcement of Final Safe Harbor Policy, 64 Fed. Reg. 32717, 32722 (Jun. 17, 1999). Involvement of non-federal property owners in the conservation and recovery of SONCC coho salmon is crucial to achieving recovery. By allowing access, Permittees are showing that they are willing partners in efforts to recover the Covered Species. In no case is “allowing access” alone purported to provide a net conservation benefit meeting the standards of ESA § 10. However, allowing access will increase data availability and advance scientific knowlege.</p>

280	CalTrout	<p>“CalTrout is concerned that some of the proposed in-stream flow contributions are the same flow contributions as those currently imposed on applicants under CA Fish and Game Code § 5937.6 While CalTrout acknowledges these contributions by landowners benefit fish, CalTrout believes NOAA should not consider these flow contributions as “voluntary” beneficial management actions because they are already required under the law. Any instream flow contributions above these legally required minimums, however, should factor in favorably in NOAA’s determination of Net Conservation Benefit.” [Appx. A, p.4-5]</p>	<p>We agree that measures already required by law typically comprise baseline conditions. One difference between SHAs and enforcement under 5937 is that an SHA is a voluntary process. Enforcement of 5937 requires state or local action. In issuing an SHA, we focus on the ESA § 10 SHA issuance criteria. Here, the voluntary commitments articulated in the site plan agreements and the Agreement meet the criteria for issuance of an SHA.</p>
281	CalTrout	<p>“In situations where landowners have access to alternative sources of water–i.e. groundwater, surface water available under a riparian right–will NOAA consider the potential adverse effects of utilizing these alternatives when it evaluates the Net Conservation Benefit of proposed flow contributions? Will there be a forbearance agreement or some other clause in the Safe Harbor Agreement that limits the amount of water the permittee can legally use from an alternative source for the term of the agreement?” [Appx. A, p.5]</p>	<p>Future riparian or groundwater withdrawals not described in the Agreement that are conducted by the Permittees are not included in the covered activities. Net conservation benefit is defined as “the cumulative benefits of the Beneficial Management Activities on an Enrolled Property, taking into account the term of the Template Safe Harbor and Site Plan Agreement and any off-setting adverse effects attributable to incidental take allowed by the ESP. Such benefit may be an increase in the Covered Species’ population; the enhancement, restoration, or maintaining suitable habitat within the Enrolled Property.” Announcement of Final Safe Harbor Policy, 64 Fed. Reg. 32717, 32722 (Jun. 17, 1999). The Permittees negotiated a Forbearance Agreement to document their agreed-upon forbearance of diversions.</p>

282	CalTrout	<p>“CalTrout is concerned that the Forbearance Agreement referenced by numerous Site Plans was not in the Shasta SHA package released for public comment.7 As is, it is impossible to determine how commitments to “enter into a Forbearance Agreement with SWCG members for the purpose of improving habitat for covered species in the Shasta River” contribute to Net Conservation Benefit. Moreover, it is disconcerting that a seemingly important provision in these Site Plans (and therefore an important provision of the associated SHAs and ESPs) was not noticed with the rest of the Shasta SHA package.</p> <p>Regardless of this failure to include the Forbearance Agreement for public review, one of the main goals of the Shasta Safe Harbor Program was to improve instream flows at certain times, in certain reaches, for the benefit of coho salmon. Based on the submitted Site Plans, it is unclear how water conserved from applicant commitments will be managed instream. As such, CalTrout recommends that, at a minimum, each applicant that commits to this Forbearance Agreement include it in the Appendix to their Site Plan to clarify what they have actually agreed to do throughout the term of their SHA. Likewise, if an applicant has committed to a CWC § 1707 Change Petition, then their Site Plan should include an explanation of how conserved water will be managed instream (expected downstream place of use, timing, etc.) for both clarity and to support the 1707 process in the future.” [Appx. A, p.5]</p>	<p>The Permittees are entering into a Forbearance Agreement, which was not fully developed at the time the permit applications were submitted. The Diversion Reduction Schedule contains the instream flow dedications and bypass commitments that are enshrined in the Forbearance Agreement and that form the basis for the net conservation benefit provided by this SHA. The Forbearance Agreement will be publicly available and is incorporated by reference in the site plan agreements.</p>
283	CalTrout	<p>“The Final Safe Harbor Policy requires SHAs to “describe any incidental take associated with the management actions during the term of the agreement,” however neither the Template Agreement nor the Site Plans appear to include such descriptions. This is concerning given the fact that NOAA must consider “the off-setting adverse effects attributable to the incidental taking allowed by the enhancement of survival permit” when making a Net Conservation Benefit determination.” [Appx. A, p.5]</p>	<p>We analyzed the effects of the Agreement in an ESA § 7 biological opinion. This opinion discusses the effects of incidental take, as does our NCB Finding Memorandum.</p>

284	CalTrout	<p>“Some Beneficial Management Actions (BMAs) may have unintended consequences for the river; for example, installing a pipeline may reduce ditch loss that would have otherwise returned to the river. Will NOAA be factoring these consequences into its Net Conservation Benefit analysis even if applicants do not specifically identify or acknowledge these consequences in their Site Plans?” [Appx. A, p.5]</p>	<p>Under our Safe Harbor decision framework, we consider “<u>any off-setting adverse effects attributable to incidental take allowed by the ESP.</u>” For BMAs that include piping and will be going through the 1707 process, a harm analysis will be conducted by the applicants and Water Board to determine the consequences of these actions. NMFS does not have the means to calculate all of the potential ditch loss associated with all of the piping projects associated with the Agreement.</p>
285	CalTrout	<p>“The Final Safe Harbor Policy states that SHAs “must [i]dentify a schedule for monitoring and the responsible parties who will monitor maintenance of baseline conditions, implementation of terms and conditions of the Agreement, and any incidental take as authorized in the permit.” However, despite this requirement the terms for such effectiveness monitoring found in the Template Agreement and the Site Plans are vague. When will the monitoring network required to verify that landowners are complying with BMAs and AMMs be in place? Who will be managing and maintaining the effectiveness monitoring network? And what kind of quality assurance plan will be in place to ensure the data collected is valid/accurate?” [Appx. A, p.6]</p>	<p>We have considered this comment to the extent relevant and revised the Adaptive Management Program to include more details about responsibilities and the expectation of schedule of implementation of the effectiveness monitoring network. There is also additional language on QA/QC requirements to ensure the data collected is correct.</p>
286	CalTrout	<p>“In addition to monitoring compliance with SHA commitments, NOAA/CDFW/Permittees should commit to perform validation monitoring to determine whether these Agreements improve the coho population in the Shasta River. A rotary trap at the downstream boundary would be helpful in establishing smolt population changes due to SHA activities.” [Appx. A, p.6]</p>	<p>Comment noted. The monitoring measures in the Agreement were negotiated in the drafting stages of the site plan agreements. Any and all provided measures were established with the consent and approval of all government agencies involved in negotiations. We will not require additional monitoring beyond what is already included in the Agreement. However, data collected in the watershed with respect to smolt population changes will be considered during the 5-year check-in.</p>

287	CalTrout	<p>“CalTrout recognizes that annual reports to NOAA/CDFW are essential in determining if landowners are adhering to the terms of their Agreements and implementing BMA commitments. However, CalTrout also wants to stress the importance of adhering to all identified Avoidance and Minimization Measures (AMMs). Most of the Site Plans incorporate the entire suite of AMMs identified by the Template Agreement as Section C2, yet do not include all of these AMMs in the Section G1 Table that identifies the monitoring commitments for each AMM. To ensure clarity around what applicants are agreeing to implement and monitor, these sections should be consistent, and applicants should only include the AMMs that they are agreeing to implement in their Site Plan. If the applicant decides to include the entire suite of AMMs from the Template Agreement in Section C2, then Section G1 should require them to monitor all of those AMMs.” [Appx. A, p.6]</p>	<p>Although some of the AMMs do not apply to every Permittee, they are all relevant because they encompass the range of actions that may be implemented. Monitoring will occur with respect to AMMs that are relevant to each Permittee.</p>
288	CalTrout	<p>“The Final Safe Harbor Policy states that “Agreement[s] must [d]escribe what activities would be expected to return the enrolled property to baseline conditions and the extent of incidental take that would likely result from such activities.” Neither the Template Agreement nor any of the Site Plans contain such a description.” [Appx. A, p.6]</p>	<p>Incidental take associated with a potential return to baseline conditions is analyzed in the NCB Finding Memorandum and biological opinion. Also the return to baseline procedures are described in section the Agreement and require notification to the agencies.</p>
289	CalTrout	<p>“Section F in the Site Plans for both Edson Foulke (23279) and Parks Creek Ranch (23288) states: The Permit’s take authorization will not be effective until Permittee implements the flow strategy contained in Section E.3 of this Site Plan. Permittee will implement the flow strategy contained in Section E.3 of the Site Plan within two years of permit issuance. Permittee will notify both NMFS and CDFW upon flow strategy implementation. Upon written confirmation by NMFS that the flow strategy is being implemented, the Permit’s take authorization will become effective. If within three years of permit issuance NMFS does not issue confirmation that Permittee is implementing the flow strategy contained in Section E.3 of this Site Plan, then the Permit will automatically expire and its take authorization will never have been effective. (emphasis added). These provisions are confusing for a couple of reasons. First, the second paragraph appears to imply that the Permittee may have had take authorization prior to a written confirmation from NMFS that the Permittee was implementing the flow strategy; this is contradictory to the first paragraph’s requirement that the written confirmation be issued before take coverage becomes effective.” [Appx. A, p.7]</p>	<p>Comment noted. We have revised accordingly.</p>

290	CalTrout	<p>“Second, and largely problematic, is the fact that both sets of Site Plans state that the Permittee cannot implement the flow strategy until after certain infrastructure upgrades have been made, but the implementation timeline for these projects is longer than the deadline set by NMFS for implementing the flow strategy: Edson Foulke– “for Permittee to abide by the Proposed Upper Parks Creek Flow Plan ... a new diversion facility is required.” Permittee commits to “participate with installation of POD enhancement by close of 6th year of permit.” (EF Site Plan Section E.3.a2</p> <p>Parks Creek Ranch– “After water conservation projects are implemented, Permittee will ensure conserved water remains instream prior to diverting.” (PCR Site Plan Section E.3.a1)</p> <p>However, the Site Plan gives no implementation timeline for either proposed water conservation project; instead the Site Plan provides language that speaks to when the landowner will seek funding, as follows:</p> <p>For Combination of Diversions #1, #2, and Edson-Foulke rights: “if a project is mutually agreed upon funding will be sought by close of the 4th year the permit is issued. (PCR Site Plan Section E.3.a2)</p> <p>o For Combination of Diversions #3, #4, #5 and potentially #6: “if a project is mutually agreed upon funding will be sought by close of the third year the permit is issued.” (PCR Site Plan Section E.3.a3)”</p> <p>[Appx. A, p.7]</p>	<p>Edson Foulke and Parks Creek Ranch are on a delayed timeline relative to the other participants. It is not reasonably certain that Edson Foulke and Parks Creek Ranch will be able to meet flow targets within two years. However, the Flow Management Strategy accounts for this: Edson Foulke and Parks Creek Ranch do not have ESA take coverage and are not protected by the Agreement until their BMAs have been performed, instream commitments made, and they provide a net conservation benefit in accordance with the Flow Management Strategy.</p>
291	CalTrout	<p>The abbreviated master flow chart included with the permit package is confusing. The heading of the table suggests that the flows identified in the table are what the applicants are committing to actually “bypass.” However, in some cases the flows listed just summarize the amount of water that each applicant is willing to contribute or reduce their diversion by, as opposed to what is actually going to bypass their diversions. For long term clarity, this table needs to only include the actual bypass amount by each point of diversion. This will help establish/define CDFW bypass amounts, as well as the terms of any future forbearance agreements. As is, the table does not adequately define any accumulated amounts of conserved water that NOAA could expect all downstream PODs to bypass. [Appx. A, p.8]</p>	<p>Comment noted. We have revised accordingly. The Flow Management Strategy produced by Aquaterra and Mark Hampton will be attached to our NCB Finding Memorandum and the Forbearance Agreement to clarify flow strategy commitments.</p>

292	CalTrout	<p>“CalTrout suggests that some commitments defined in the Site Plans as “other BMAs” be moved to the “Elevated Baseline” category to ensure those conditions remain after the Agreements expire/end; specifically those commitments relating to passage, screening, water quality improvements, or providing baseflows that are necessary to keep fish in good condition.” [Appx. A, p.8]</p>	<p>Comment noted. There is no material difference between actions under “other BMAs” vs “Elevated Baseline” relative to what remains after the Agreement expires or voluntarily ends. Both are required to be maintained for a permit to be valid or if the permit period ends, to minimize prohibited take of ESA listed species. We have considered this suggestion and concluded that the “Other BMAs” are properly categorized relative to elevated baseline conditions.</p>
293	CalTrout	<p>“The Site Plan for Shasta Springs Ranch (23291) contains a commitment by the landowner to collaborate with NMFS and CDFW on a feasibility study that will explore options for getting more spring water into Parks Creek from the Bridge Field/Black Meadow springs complex. However, the Site Plan does not specify what will happen if the feasibility study does not result in an alternative that is acceptable to the landowner (beyond the landowner agreeing to meet and confer with the agencies). This lack of specificity is problematic given the importance of the Mid Parks reach to spawning, as well as the amount of cold spring water that is available to support rearing habitat.” [Appx. A, p.8]</p>	<p>The landowner is prepared to work closely with partners to achieve the goals of the Mid-Parks Creek Project and is also prepared to lose their permit if the feasibility study does not result in an alternative that is acceptable to the landowner. All terms of the Agreement and site plan agreements were negotiated among the landowners and agencies. The study itself provides a benefit to the species because increased knowledge can lead to better conservation outcomes and facilitate adaptive management. NOAA Fisheries determined that this site plan agreement meets the net conservation benefit standard, as documented in our NCB Finding Memorandum.</p>

294	North Coast Regional WQCB	<p>“In general, the beneficial management actions described in the SHA Site Plans are in alignment with the requirements of the Waiver, except as noted in this letter. The Regional Water Board strongly supports the following specific actions indicated in the subject Site Plans, some of which will result in actions the permittee is obligated to retain as Elevated Baseline Conditions:</p> <p>Relocation of the Cardoza Diversion to the mainstem of the Shasta River upstream from the confluence of Big Springs Creek and permanent removal of the flashboard dam required under current diversion practices.</p> <p>Removal of the flashboard dam currently in place at the Novy, Rice, Zenkus diversion. The Regional Water Board believes removal of this flashboard dam should be an Elevated Baseline Condition, as it may be in violation of the Action Plan as contained in the Basin Plan, which states:</p> <p>“Irrigation districts, individual irrigators, and others that own, operate, manage, or anticipate construction of instream minor impoundments or other structures capable of blocking, impounding, or otherwise impeding the free flow of water in the Shasta River system shall comply with one or more of the following measures:</p> <p>Permanently remove minor impoundments in the Shasta River mainstem.</p> <p>Re-engineer existing impoundments to decrease surface water of impoundment.</p> <p>Not construct new impoundments unless they can be shown to have positive effects to the beneficial uses of water relative to water quality compliance and support of the beneficial uses, including the salmonid fishery, in the Shasta Valley.”</p> <p>Expanding the use of soil moisture sensors to increase irrigation efficiency and determine if irrigation is applied at agronomic rates.</p> <p>Restoration-focused beaver management.</p> <p>Projects that develop improved geomorphic function in the Shasta River and its tributaries, including beaver dam analogues; projects that increase stream meandering and hyporheic flow; projects that provide additional spawning gravels and large woody debris; projects that improve sediment scouring and sorting; and projects that support increased riparian cover.</p> <p>Instream cold-water dedications, through various means and amounts, that support achieving the Action Plan flow recommendation of an additional 45 cubic feet per second (CFS) of cold water in the Shasta River, as described in the Action Plan and incorporated into the Waiver.</p>	Comments noted.
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295	North Coast Regional WQCB	<p>Comment 2: Riparian Grazing</p> <p>Comment 2a. Multiple Site Plans included plans for riparian grazing prepared by University of California, Davis (UCD) and University of California Cooperative Extension (UCCE). The Waiver allows for riparian grazing when in compliance with the following specific conditions.</p> <p>Condition 5(a) - Riparian areas are managed in a manner that allows for the natural establishment and abundance of native riparian vegetation.</p> <p>Condition 5(b) – Riparian areas are managed in a manner that allows sufficient vegetation to minimize, control and prevent surface erosion.</p> <p>Condition 5(c) – Riparian areas are managed in a manner that maintains their essential functions supporting beneficial uses (e.g. sediment filtering, woody debris requirement, streambank stabilization, nutrient cycling, pollutant filtering, shading).</p> <p>Condition 5(d) – Grazed lands are managed in a manner that minimizes, controls, and prevents pollutant discharges.</p> <p>Condition 5(e) – Periodic grazing in riparian areas is limited to the late winter/early spring period, when impacts to woody species are minimized.</p> <p>Condition 5(f) – Grazing within riparian corridors occurs for short durations and only when forage consisting of non-woody vegetation is available.</p> <p>Condition 5(g) – Livestock are removed from riparian areas when stubble height reaches 4 inches, or livestock shift preference to browsing of woody species, whichever occurs first.</p> <p>Condition 5(h) – Livestock are prevented from disturbing sediment discharge sites and other unstable features adjacent to watercourses.</p> <p>Condition 5(i) - At no time shall grazing in riparian areas cause a discharge of waste to surface waters.</p> <p>[p.3]</p>	Comments noted.
296	North Coast Regional WQCB	<p>While the UCD/UCCE riparian grazing management plans vary, they generally provide the following triggers for cessation of riparian grazing.</p> <p>Forage stubble height, which appears to be site specific and can range from 3 inches to 6 inches depending on plan. Most plans describe a 3 inch stubble height.</p> <p>Browse on recruiting riparian woody species, generally 20% of current years leader growth is allowed before riparian grazing is ceased.</p> <p>Streambank hoof action (i.e., animal induced erosion), generally 20% of each side of a stream bank is allowed before riparian grazing is ceased.</p> <p>[p.4]</p>	Comment noted.

297	North Coast Regional WQCB	<p>These triggers are generally not consistent with the conditions of the Waiver in the following ways.</p> <p>The Waiver specifically describes as a trigger a minimum riparian stubble height of 4 inches. The Waiver specifically requires that riparian grazing be ceased when forage preference shifts to woody riparian species.</p> <p>The Waiver specifically requires that grazing in riparian areas not result in a discharge of waste to surface waters. It is unclear in these plans if 20% hoof action on each side of a streambank will result in a discharge of waste to surface waters, or if the time livestock are present in the riparian area allowed by these triggers will result in a discharge of manure or urine directly to surface waters.</p> <p>The Waiver allows for “management measures developed in consultation with the Regional Water Board staff that provide for equal or better protection.” Neither UCD nor UCCE contacted Regional Water Board staff in the development of these riparian grazing management plans, thus the Regional Water Board at this point can only use the conditions of the Waiver to assess the efficacy of the measures contained in the riparian grazing management plans. Regional Water Board staff welcome the opportunity to coordinate with UCD/UCCE on this important issue. [p.4]</p>	<p>Comment noted. Edits to the site plan agreements were made. The Permittees are responsible for complying with the more stringent of the requirements (as between the waiver and the Agreement) in the case of any conflict because they must comply with both the waiver requirements and the Agreement requirements. We agree that it makes sense for these to be consistent where possible.</p>
298	North Coast Regional WQCB	<p>Comment 2b. The riparian grazing management plans do not address the degree to which emergent aquatic vegetation can be grazed, or if it can be grazed at all. Such emergent aquatic vegetation has been shown to provide important habitat³ and mediate instream temperatures in spring-fed reaches⁴ during the summer months, such as in Big Springs Creek. Much of this vegetation is watercress, which is highly palatable to cattle and may be preferentially browsed. Grazing of this emergent aquatic vegetation by cattle would constitute elevated loading of solar radiation into the water column during the hottest part of the year and would not be consistent with the Waiver. The Regional Water Board believes that if emergent aquatic vegetation is present, specific measures to manage such vegetation should be included in these plans for them to be protective of water quality and satisfy the Waiver. [p.4]</p>	<p>Comment noted. Edits to site plans will be made accordingly. In any case, landowners are responsible for complying with the more stringent of the requirements (as between the Waiver and the SHA) in the case of any conflict because they must comply with both the Waiver requirements and the SHA requirements. We agree that it makes sense for these to be consistent where possible.</p>

299	North Coast Regional WQCB	<p>“Comment 2c. The Riparian Grazing Management Plans include a general statement about utilizing Multiple Indicator Monitoring (MIM) to measure effectiveness. However, the riparian grazing management plans do not describe how these monitoring activities specifically assess riparian health. Photopoint monitoring, as described, will provide some effectiveness monitoring. However, it alone cannot provide the information necessary to assess the impact of riparian grazing on essential riparian functions. For example, photopoint monitoring cannot assess the degree to which riparian grazing impacts sediment filtering, nutrient cycling, or pollutant filtering.” [p.4]</p>	<p>Grazing management plans will be developed (some have been developed) in cooperation with UC Extension to determine the best method for monitoring and the best approach to riparian grazing.</p>
300	North Coast Regional WQCB	<p>Appropriate monitoring measures may include the following, conducted according to an approved Monitoring Plan and Quality Assurance Project Plan.</p> <p>Instream dissolved oxygen and temperature monitoring using an automated data logger with collection intervals no greater than 30 minutes within and downstream of the proposed riparian pasture for the extent of the irrigation season. Collection of instream turbidity measurements before, throughout, and after each discrete riparian grazing event with an automated datalogger with collection intervals not greater than 1 hour.</p> <p>Collection of water quality grab samples for total nitrogen (TN) and total phosphorous (TP) before, during, and after each discrete riparian grazing event.</p> <p>The Regional Water Board is eager to work with individual landowners and with UCD and UCCE to reconsider these elements and welcomes collaboration with UCD and UCCE to understand the scientific justification of the proposed practices. This justification is not currently included in the Riparian Grazing Management Plans.</p>	<p>Comment noted. The Permittees believe that the expense and maintenance associated with the dissolved oxygen sensors, turbidity measurements, and water quality grab samples described here is too high to justify the marginal benefit that would be gained by imposing these requirements. The SHA is designed to provide more cool water in stream, and water temperature will be monitored. The colder the water is, the better the dissolved oxygen will be. The photo monitoring under the Agreement will suffice to monitor the most relevant variables and will provide key information for ensuring the Agreement is on track to achieve conservation benefits.</p>

300	North Coast Regional WQCB	<p>Appropriate monitoring measures may include the following, conducted according to an approved Monitoring Plan and Quality Assurance Project Plan. Instream dissolved oxygen and temperature monitoring using an automated data logger with collection intervals no greater than 30 minutes within and downstream of the proposed riparian pasture for the extent of the irrigation season.</p> <p>Collection of instream turbidity measurements before, throughout, and after each discrete riparian grazing event with an automated datalogger with collection intervals not greater than 1 hour.</p> <p>Collection of water quality grab samples for total nitrogen (TN) and total phosphorous (TP) before, during, and after each discrete riparian grazing event. The Regional Water Board is eager to work with individual landowners and with UCD and UCCE to reconsider these elements and welcomes collaboration with UCD and UCCE to understand the scientific justification of the proposed practices. This justification is not currently included in the Riparian Grazing Management Plans.</p>	<p>Comment noted. The expense and maintenance associated with the dissolved oxygen sensors, turbidity measurements, and water quality grab samples described here may be too high to justify the marginal benefit that would be gained by implementing these requirements. In general, the Agreement is designed to cool the stream water, and that variable will be monitored. The colder the water is, the better the dissolved oxygen will be. The photo monitoring program under the Agreement will suffice to monitor the most relevant variables and will provide key information for ensuring the Agreement is on track to achieve conservation benefits.</p>
301	North Coast Regional WQCB	<p>Comment 3: Irrigation Tailwater</p> <p>Several Site Plans describe the use of tailwater capture berms to time the release of irrigation tailwater in the morning when it is expected to be cooler. The intention of this practice is to allow tailwater to cool overnight and reduce temperature impacts of the receiving water. In general, this practice has the potential to be more protective of water quality as it relates to temperature than allowing tailwater to flow unmitigated into surface flow. However, the discharge of tailwater to surface waters has other potential water quality impacts. The Regional Water Board is concerned that elevated nutrients from the tailwater released to surface water may exacerbate biostimulatory conditions and lead to reductions in dissolved oxygen concentrations. To allow the permittee to implement such a practice, the Regional Water Board may require a targeted effectiveness monitoring program to ensure this practice is not resulting in depressed dissolved oxygen or elevated temperature.</p> <p>If such a system were to be used, water temperature should be utilized as a release trigger rather than time of day, as overnight temperatures can be variable in the Shasta Valley and these overnight temperatures are the driver to tailwater cooling. Such a system has been in place at the Hidden Valley Ranch and while the Regional Water Board supports the project, we have not seen convincing evidence that it has improved water quality conditions downstream of the tailwater input. [p.5]</p>	<p>Comment noted. We encourage landowners considering this type of BMA to work directly with the RWQCB through the TMDL process to ensure appropriate management measures are in place to protect water quality.</p>

302	North Coast Regional WQCB	<p>“The Regional Water Board would prefer tailwater to be impounded in treatment wetlands and allowed to infiltrate through the soil and recharge adjacent surface waters through subsurface flow. Allowing for this water to denitrify as it passes through the anoxic substrate of a treatment wetland will support nutrient assimilation and the travel through subsurface soils will cool the tailwater and allow it to accrete instream, potentially developing stratified refugial areas. This practice also benefits ranchers by allowing them a source of nutrient rich tailwater to pump from and supplement riparian diversions, increasing irrigation efficiency. Ensuring these wetlands are planted with native riparian vegetation and can naturalize to support migratory bird and native terrestrial vertebrate habitat would provide an added ecological benefit.” [p.5]</p>	<p>Comment noted. Several site plan agreements already include measures designed to reduce and eliminate tailwater either through improving efficiency to reduce tailwater collection or developing tailwater berms.</p>
303	North Coast Regional WQCB	<p>Comment 4: Monitoring Monitoring proposed by the SHA applications generally describes the permittee recording activities that may result in incidental take of covered species and photopoint monitoring to assess beneficial management action effectiveness. As all parties to the SHA are also parties covered by the Waiver, these annual monitoring reports could support both the specific responsibilities under the SHA as well as monitoring requirements under the Waiver, to the benefit of both our programs.”</p>	<p>Comment noted.</p>
304	North Coast Regional WQCB	<p>Regional Water Board staff has assessed many of the ranches applying for SHA coverage except for the Nicoletti Ranch and the Cardoza Ranch. Based on the ranch assessments conducted and the sensitive areas within which these ranches lie, the Regional Water Board may require each landowner to monitor for specific water quality conditions regardless of SHA coverage. These conditions may include temperature, dissolved oxygen, and pH using instream continuous data loggers with a logging interval no greater than 30-minutes. Locations of these loggers would be dependent on several considerations indicated below.</p> <ul style="list-style-type: none"> Location of stream inflow and outflow on the property. Locations indicated in the Shasta Stewardship Monitoring Plan (Attachment 1). Location of areas with severely degraded riparian conditions and/or proposed riparian plantings. Location of obvious nutrient source areas, including concentrated animal feeding areas, watering lanes, tailwater inputs, etc. Locations of projects expected to have a positive impact on temperature, dissolved oxygen, and pH. <p>[p.5-6]</p>	<p>Comment noted.</p>

305	North Coast Regional WQCB	<p>“The Regional Water Board is pleased to see proposed temperature logging stations in the Adaptive Management Plan. NOAA’s interest in temperature data as a key indicator of Best Management Practice (BMP) effectiveness is consistent with the Regional Water Board’s interest. However, we also view dissolved oxygen monitoring as extremely valuable for adaptive management purposes and recommend it be included at the same locations. This would be useful when assessing the effectiveness of tailwater management on water quality improvements.” [p.6]</p>	<p>Comment noted. Dissolved oxygen data is collected by the Shasta Valley Resource Conservation District at some effectiveness monitoring locations identified in Table 1 of the Adaptive Management Program.</p>
306	North Coast Regional WQCB	<p>“The Regional Water Board strongly encourages NOAA to make all data accessible to the public in real time, or at least require submission of temperature and dissolved oxygen monitoring data as part of the annual reporting, which should be provided electronically to all the agency recipients at full resolution in either an Excel spreadsheet or comma separated value text files. Including this information in the annual reports would be consistent with requirements under our Waiver and support improved adaptive management response. Regional Water Board staff is eager to contribute to this effort and provide any guidance necessary to expand dissolved oxygen and temperature monitoring in the Shasta River and its tributaries and ensure the SHA annual reports also satisfy the requirements of the Waiver.” [p.6]</p>	<p>Comment noted. Table 1 of the Adaptive Management Program indicates which stations will have real time data available and which ones are private. The Water Board will be one of the recipients, along with the Tribes, of the final annual reports and flow/temp gage data.</p>
307	North Coast Regional WQCB	<p>Comment 5: Instream Coldwater Flow Adequate flows are critical for support of salmonids and attainment of water quality objectives. The Action Plan indicates that water diverters should employ water management practices that result in increasing dedicated cold water instream flow by 45 cubic feet per second (cfs) or an alternative flow regime that achieves the same temperature reductions from May 15 to October 15. The SHA Site Plans include general statements about cold water dedication through use of the California Water Code section 1707 process. As mentioned previously, the Regional Water Board strongly supports the dedication of cold water instream through this mechanism. The Action Plan also calls for water users to report what measures they have taken to increase the dedicated cold water instream flow and contribute to this flow recommendation. Despite this recommendation, flows continue to fall well below 45 cfs towards the end of irrigation season, and outside of a few voluntary flow efforts, the Regional Water Board has not received written reporting from any irrigators describing what actions they have taken to contribute to this flow recommendation. The SHA should include transparent and accurate reporting of instream dedications so the irrigators can receive credit for fulfilling their TMDL Action Plan obligations.” [p.6-7]</p>	<p>Comment noted, and the 45 cfs target mentioned will be kept in mind. The Agreement will increase the availability of transparent and accurate water usage and forbearance data. Please see Exhibit B to the application package (the Abbreviated Shasta Safe Harbor Master Flow Chart), for details regarding instream flow dedications. Additionally, the Permittees developed a Forbearance Agreement that will require reporting on bypassed water. The Flow Management Strategy is attached as an appendix to that agreement.</p>

308	North Coast Regional WQCB	“The Regional Water Board encourages the reporting of the amount of instream flow increases through time resulting from instream dedication in both the permittees’ reports and the Annual Implementation Report.” [p.7]	Comment noted.
309	North Coast Regional WQCB	“The Regional Water Board requests that water rights dedications to instream use in accordance with the 1707 process or other voluntary means should additionally be protected by forbearance agreements or some other legal mechanism to ensure irrigators are not replacing dedicated water sources with other sources, including groundwater or other rights, that result in equivalent instream flow impacts.” [p.7]	Comment noted. The Permittees developed a Forbearance Agreement that will require reporting on bypassed water. The Agreement process does not prevent landowners from developing future water rights, as that action is under the regulatory authority of the SWRCB.
310	North Coast Regional WQCB	“The Regional Water Board encourages NOAA and the parties within the Project Area to coordinate with the Division of Water Rights to ensure these additional cold water dedications are protected to the mouth of the Shasta River, which is necessary to produce water temperatures supportive of cold water aquatic species. Additional or improved infrastructure may be necessary to accomplish this goal.” [p.7]	Comment noted.
311	North Coast Regional WQCB	“The Regional Water Board supports coordination between downstream landowners, the Watermaster, the Division of Water Rights, and other agencies and formalized agreements may be necessary to ensure instream cold water dedications will have maximum beneficial effect. The Regional Water Board is interested in collaborating on such efforts to ensure this water is secured for the full reach of the Shasta River to support water quality. It is also incumbent upon NOAA and the SHA Permittees to ensure the riparian diversions and places of use reported in their SHA permits have been fully vetted through Division of Water Rights and are technically and legally accurate.” [p.7]	Many of the rights at issue were clarified in the Shasta River Adjudication. Documentation of these rights is through the SWRCB. Due to numerous changes of ownership in the time since the Shasta River Adjudication, the records relating to these water rights are complex. Applicants are currently working with counsel to compile necessary documentation of their water rights as well as all necessary reporting related to their water use.
312	SWRCB	“Change Petitions Individual Agreements may require submittal and approval of water right change petitions pursuant to Water Code sections 1701 and 1707 in order to accurately reflect changes in points of diversion, places of use and purpose of use, and to adequately protect dedicated instream flows. The State Water Board is committed to working with parties in advance to help ensure that the petition process is as efficient and effective as possible.” [p.3]	Comment noted. The Water Board and the Scott and Shasta Watermaster will be consulted with during any change petitions.

313	SWRCB	<p>“In its notice, NMFS states that the issuance of an ESA section 10(a)(1)(A) permit constitutes a federal action requiring compliance with the National Environmental Policy Act (NEPA). NMFS states that it will evaluate the application(s) and determine the level of NEPA analysis needed for this action. To the extent possible, the NEPA document should also be developed to accommodate the CEQA documentation necessary for the State Water Board in processing any associated water right change petitions. Ensuring proper CEQA documentation will improve the efficiency of the section 1707 process.” [p.4]</p>	<p>Comment noted. We took this into consideration in making decisions about required NEPA analysis.</p>
314	David Webb	<p>“1. This is absolutely essential--these really need editing. Take whatever comments you get, incorporate what you can, then really clean them up and re-issue them for real, final effective public comment. They are really a mess. Don't cut and paste in some or all of the template language into each plan--it just bulks them up and if you are including the entire template, just [include] it by [reference] and post it entirely separately so [one] can know that it hasn't been changed or had pieces removed. As it stands anyone could argue that it is unreasonable and nearly impossible to do a public review where no one really knows with reasonable certainty what is on offer.” [p.1]</p>	<p>The purpose of incorporating the entire suite of AMMs and similar “template” language is to preserve flexibility for changed land management in the future. During the life of the Agreement, ownership and/or management strategies may change, and if that occurs, landowners should be permitted to continue complying with the Agreement under a new land management strategy or new land use by adhering to any newly applicable AMMs or similar conditions. So although some of the template language does not apply to every participant, they are all relevant because they encompass the range of future actions that can be taken while maintaining compliance with the Agreement. Monitoring will occur with respect to AMMs that are relevant to each Permittee. If other AMMs become relevant later in time, they should be added to the appropriate site plan agreement at that time.</p>

315	David Webb	<p>“2. Most or all of the applicants seem to be trying to use some similar language saying they have a grazing plan, often trying to dress it up by saying it was developed with UC Extension. That doesn't really say anything. I can't imagine anyone successfully making a living on a ranch not having a grazing plan, whether on paper or in their heads. Either can work fine, but one on paper can potentially be understood by others. But the goal of any plan could potentially be to 1.) run the place into the ground because you rent it and don't care, or are going broke and absolutely need short term cash or want to wring every dollar out of it and sell it, 2) could be to leave a lot of grass in place so it looked really nice so as to photograph it to advertise to sell, or 3) could be to maximize forage yield; or 4) other or a combination. Bottom line--just saying [there] is a plan isn't sufficient. I don't think a single general grazing plan for a ranch is feasible for Safe Harbor purposes. There needs to be a [stand-alone] plan/plan component for managing whatever grazing (if any--none would likely be best) will take place within 20-50 feet of the river. It needs to be separately included in the documents for review. And if it is going to pass muster for Safe Harbor it needs to have strong emphasis on goals other than just maximizing forage yield.</p>	<p>Grazing activities beyond those described within the individual grazing and riparian management plans are subject to the BMPs and AMMs. Each landowner is committed to following the terms of the BMAs and AMMs specific to his/her site plan agreement.</p>
316	David Webb	<p>Each site plan needs to have a riparian grazing plan separately included with a map with a scale that will allow seeing what is proposed where and WHY. State the goals, and include a strong adaptive response approach that will be exercised quickly where needed or appropriate. Waiting over a year to analyze and report, then start thinking about modifications means likely 2 years before anything of substance can happen. That's too long.</p>	<p>Since each site plan agreement is reflective of each separate property and the operation thereon, the actions of the Permittees will differ. The Permittees that have agreed to develop riparian grazing plans are identified in the individual site plan agreements.</p>

317	David Webb	<p>3. The proposed 20 year Safe Harbor agreement duration is completely unacceptable. It would make sense if Coho were already on a stable state. But they aren't. The only reason they are in even consistently present in countable numbers now is due to IGH supplementation every year... What this means is that we aren't betting on a sure thing, where 20 years of "what you see" is what you get will be fine. We are instead betting on a bunch mish mash of steps consisting of maybe this is enough, maybe we'll do this, maybe every applicant will be accepted and go the distance and do all the mitigations on time or maybe not, along with way too many "we'll try" statements. Given the huge uncertainty and distance from anything resembling baseline conditions where Coho are surviving, the only responsible approach would be to limit the agreement to at most 5 years. Make core improvements, count fish as you go, especially the adult to smolts ratio, then come back if things are improving and put a new Safe Harbor proposal on the table with a longer duration That is really what the Safe Harbor legislation said-that in some cases, especially for aquatic species, conditions may be so degraded that a return to baseline would mean that the species would not survive. They're not surviving now, and the enhancements to baseline are untried and too limited.</p>	<p>We have concluded that 20 years is a sensible term that will allow for the conservation benefits of the Agreement to occur but still provide flexibility for necessary conservation actions that may be required in the future. There are advantages and disadvantages to a shorter term, and we believe the advantages of a twenty year term surpass the disadvantages. The investments of time and money for project design, permitting, and implementation, the nature of grant cycles, and the variability of the natural processes tied to the full realization of the proposed habitat improvements all dictate a longer commitment by all parties. In addition, the Adaptive Management Program provides a process for modification of BMAs or AMMs. This Program has been revised to add a 5-year check-in process to evaluate the effectiveness of the Agreement. Also, the Forbearance Agreement has a 5-year interim term built into it so that flows can be adaptively managed based on new and improved data points. This will allow for flexibility moving forward. Implementation of BMAs will improve conditions, which may be degraded in some instances. A return to conditions below the agreed upon Baseline Conditions or Elevated Baseline Conditions described in a site plan agreement would constitute a violation of the Agreement.</p>
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318	David Webb	<p>They need to be tested to demonstrate their real world effectiveness, then they can be locked into place for a long time to provide the regulatory certainty the legislation intended. We are too far from that situation to roll the dice. The truth is that at this point, the Coho are functionally gone and we have no incentive (i.e. there is [nothing] left to loose) for settling for a 20 year agreement that will likely assure they stay gone if it doesn't work 100% as planned. Better to keep all options for habitat improvement on the table with no Safe Harbor agreement and the minor improvements it offers and instead hope to get to where Coho can survive via reliance on other measures. At worse if nothing is done over the next 20 years, at least the possibility was not lost entirely.</p>	<p>We are not relying on the Agreement alone to meet recovery goals. The SONCC Recovery Plan is the basis for our conservation strategy, however, implementation of other measures in the Recovery Plan throughout the range of SONCC coho salmon are also important to recovery and we will continue to rely on it going forward. The Adaptive Management Program provides a process for modification of BMAs or AMMs. This Program has been revised to include a 5-year check-in process to evaluate effectiveness. Also, the Forbearance Agreement has a 5-year interim term built into it so that flows can be adaptively managed based on new and improved data points.</p>
319	David Webb	<p>All in all, the basic underlying problem here is that despite applicant claims wanting to help Coho, none of the applicants have done much of anything on their own, or have spent, or are offering to spend, any significant amount of their own money to improve their water management systems, with the result that they are now trying to leverage unapproachable amounts of public money in the near term to make [capital] improvements that could [and] should have been done progressively over the last 50 years as part of the normal cost of doing business. The dollar amounts are so great that they aren't realistically going to happen, and even if the vast amounts of money is found, it should properly be seen as mostly taking money from other systems where benefits to Coho could be achieved at much less cost. That said they are proposing a [win-lose] approach--possible wins for Coho in the Shasta, but larger dollar value losses for Coho somewhere else. The net conservation benefits calculation can therefore only be negative for each measure enacted.</p>	<p>Projects associated with the Agreement will have to compete with projects submitted to grantors for funding opportunities. The decision-makers will evaluate all grant funding requests based upon their criteria to support the request and merits of the project. Some funding may even require land owner contributions as is the practice of NRCS EQIP funding as an example.</p>

320	David Webb	<p>4. The offer of \$1400/yr per applicant is understandable, in that everyone tries to low ball costs wherever [they] can get away with it. But the Safe Harbor legislation that caps costs to [whatever] is initially agreed to [couple] with a 20 year duration makes this again completely unacceptable. The monitoring component needs to be completely overhauled with a detailed budget developed showing actions to be taken, with costs for each by year for the next 20 years if that duration is going to kept to.</p>	<p>\$1,500 is the intended value to maintain the effectiveness monitoring gages. If more is required to maintain the monitoring gage sites, it will be the responsibility of the participants to address those costs. Annual monitoring and reporting requirements are also identified for the Permittees. Flow gauging of diverted volumes is a component of the program where water conservation is occurring, and continuance of that monitoring is the responsibility of the participants. The intent is for the Agreement to serve as a partnership, where the entire burden is not meant to be borne by the landowners. Monitoring costs involved in the Agreement at the time of its development were estimates. The parties negotiated the amount indicated in the documents understanding this financial commitment cannot be borne by the Permittees in total. The information from monitoring devices is not only to help inform compliance with the Agreement, it is also a potential resource to those individuals and organizations who wish it for their own development of science. As such, when the data becomes public, it makes sense for NGO donations and public funds to be part of the complete monitoring funding package. In addition, landowners assert that they cannot fully and solely fund the monitoring effort and stay viable in their business operations. If landowners were to drop out of the Agreement, we would lose the voluntary opportunity to improve habitat for coho.</p>
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321	David Webb	<p>Adjustments for inflation are only sensible. Developing alternative approaches with fewer applicants are an unfortunate necessity. Incorporating public comments might turn out to have fewer applicants willing to go the distance, making budgeting less speculative. Fewer applicants almost certainly will increase the unit cost, but that needs to be determined now, not after the fact.</p>	<p>Comment noted. Although we have not revised the costs due to inflation, the landowners are responsible for the commitments they made in their individual site plan agreements including maintenance of flow and temperature monitoring equipment.</p>
322	David Webb	<p>Additionally, the monitoring proposed is too convoluted and exclusionary to members of the public. Flow and temperature data especially needs to be publicly available in real time. We have to go into this with the perspective that just one bad day--a day of temperature too high or a day when the stream got accidentally dried up-- is the last day in the life of the fish. We have had instances of such "accidents" on at least one participating ranch in the past. One bad day is 1/360 of a year -->than 99.7 % success (not bad!), but means 100% death/failure for the fish, with no possibility of recovery. Not good enough!!!! All interested parties need to be watching [water] flow and temperature trends, weather predications, and indications of mistakes being made real time so they can be turned around in a timely fashion, not finding them in some sort of 12+ months later post mortem. While it is no doubt invasive and will not be welcomed, it is ESSENTIAL. [p.4]</p>	<p>We worked with the landowners and the SSWD to develop more specific language in the forbearance and monitoring agreement that considers the need to monitor at each by-pass. SSWD has agreed to seek funds for planning that will address continuous flow and water quality needs. Monitoring is required in all site plan agreements. There is currently very little data available on diversions in this watershed. As a result of the Agreement, numerous diversion monitoring stations will be installed that will provide significant new data about water usage. This data will allow for real-time adjustments to the Agreement through the adaptive management process. This increased monitoring will improve management for the benefit of the Covered Species. Please see Table 1 of the Adaptive Management Program to reference which gages will be public vs private and if the stations will have real time data. However, any gaging that has been or will be installed or purchased with public funds shall be public.</p>

323	David Webb	<p>5. Another aspect of the monitoring system proposed is the heavy reliance on the Shasta Watershed Con. Group. [It is] important to differentiate this organization from other not-for-profit groups, like 501(c)3 organizations. The Shasta Watershed Con. Group is a 501(c)6 group and as such its purpose is essentially to provide an financial umbrella for collective action by its members in furtherance of their collective self-interest in a likely adversarial environment. By far, most 501(c)6 organizations are unions, where the expectation is that collective action is needed to push back against abuses by "the man". In this case "the man" is NOAA and DFW. This legal structure is a wholly appropriate vehicle for the applicants to form and use to advance their applications. But it is wholly inappropriate for it to have any role in the gathering and interpretation of data. Their role in monitoring should be limited to assessing their members for promised fees or dues for monitoring, then forwarding that money to a public agency who will then contract for the work to be done. If the Shasta Watershed Con Group is in a position to hire and manage the monitoring consultant, any consultant they hire will be under constant pressure (whether explicit or implicit) never to find anything negative, or know they are likely risking future contracts. If instead they are answering to an agency with a stated public trust responsibility, they are much [less] likely not to sweep any problems found problems under the carpet. [p.4]</p>	<p>Comment noted. It is the intent of SWCG to work in collaboration with NOAA and CDFW to identify a third party acceptable to all sides to perform the monitoring tasks, provide its identified funding share, and obtain information in support of its role in carrying out its objectives and responsibilities as indicated in the SHA.</p> <p>Under the Agreement, the parties to the Agreement will choose an independent consultant to report on effectiveness monitoring.</p>
324	David Webb	<p>6. Safe harbor agreements are only allowed to cover [otherwise] legal activities. At least one of the applicants--the Novy-Grenada Ranch, seems to be overstepping state water law. They have long relied on a claim of a riparian right. Now that claim is being confabulated into a "pre-1914 riparian right". That same confabulation was tried in the Sacramento delta prior to 2015, when the WRCB was desperately trying to make sure that all water uses were legal in a severe drought environment. Faced with similar claims and uncertainty to ours, they mandated that all persons claiming either a pre-1914 or riparian rights needed to provide documentation more reliable than a statement of diversion and use. What they demanded (within 30 days) was documentation of what now-irrigated ground had been legally riparian when patented, information readily available from the BLM's General land Office web page showing the original patents of all lands that later were incorporated in whole or part into each ranch's current irrigated ground. There is no reason not to follow the exact same protocol for all applicants here claiming a riparian right as the approach that was found to be reasonable and prudent by the WRCB, and what has been thoroughly tested in practice. See WR 2015-0002-DWR." [p.4]</p>	<p>Neither the agencies nor the landowners have received any notices that the riparian rights for this property are invalid. The issue that is raised here relates to less than 10% of the property irrigated by this diversion, and a very small portion of the overall project. The landowner is reviewing and confirming historical land use and related riparian water use. Finally, the Sacramento Delta area and the Shasta River are two systems distinct in hydrogeology, water demands, jurisdictions, and historical management – the Sacramento Delta information request referred to in the letter involved over 1000 water rights claims in a region severely impacted by the 2013-2015 drought.</p>

325	David Webb	<p>Once that is done on the Novy Ranch, one thing that will become apparent is that a large portion of at least parcel 038-200-010 that is currently being irrigated with riparian water was either severed from the river or was never riparian in the first place. Sadly that irrigation, in place since time after the equally 1950's, probably needs to stop. The documentation of the rest of the Safe Harbor area irrigated under a riparian claim needs to be validated via the same process mandated for the Sacramento Delta in order for NOAA to have done proper due diligence, both on the Novy Ranch and all other applicants making a riparian claim. It is also worth noting that storage of riparian water is also not legal if done for over 30 days The Rice Ranch did note in its application that they fill a pond all winter with the same diversion as is used by the Novy ranch. All of the applicants relying on a riparian right need to produce similar documentation to what the WRCB found essential.</p>	<p>Annual reporting is provided to the SWRCB, which oversees operation and validity of riparian rights. Certain landowners are confirming the validity of riparian water rights through the process of a CA Proposition 1 Grant Funding application.</p>
326	David Webb	<p>Beyond that, those relying on post 1914 or adjudicated rights need to recognize that changes in place of use or point of use can only be done if no harm occurs to other users. Expanding irrigation outside the original footprint (documented in the 199 adjudication maps) almost certainly harms other users since water is short in most years, and the state is no longer even allowing new applications for summer irrigation. That said, Safe Harbor agreements should only be allowed when/if irrigation is restricted to what was documented in 1924 by the dept of Public Works when they tried to sort out irrigation water usage as an essential step in the adjudication. All Pre-1914 water right claimants were required to participate in that adjudication, so if they aren't to be found there, no right yet exists.</p>	<p>Comment noted. Validity of water rights is governed by state law which added water rights after 1924. Riparian rights are not included in the Decree but many were operating prior to 1924 and elected to not participate in the decree.</p>
327	David Webb	<p>7. [Both] the MWCD and the Rice and Nicoletti Ranches seem to be trying to claim a great deal of credit as conservation benefits for actions performed or committed to prior to the Safe harbor agreements exist, including all steps committed to in the MWCD stipulated agreement, and the relocation of the Huseman Ditch diversion. All such actions can only be considered as existing baseline, even if not yet completed.</p>	<p>In general, actions taken after the first meeting of the parties engaging the SHA process in 2013 may be counted towards the net conservation benefit and were done with the intent to improve habitat in advance of permit development and issuance. Such actions were encouraged and done with agency knowledge and support. MWCD's instream commitment to the SHA process is in excess of settlement terms. Exchanging water from Dwinnell with spring source water is not a condition of settlement but an additional commitment of the Agreement. While the implementation time step is concurrent, commitments of MWCD's site plan agreement are in addition to CHERP and exceed those actions.</p>

328	David Webb	<p>8. The duty of water among the applicants varies widely. Studies of the TNC and the Hart Ranch by Davids Engineering found that 100 acres and 115 acres/cfs respectively can meet crop demand at the height of summer, and while certainly there will be carriage losses on top of that, each participant needs to better document the duty of water they have in their covered activities, and explain any excessive use beyond the number above. The Novy Ranch in particular, with a claimed 33 acres per cfs (equivalent to >16 ft./acre each summer) on one portion of the ranch seemingly constitutes prohibited "waste and unreasonable use of water, outlawed by the Calif Constitution since 1924. Many other applicants while, not so egregious, still seem excessive. Such reporting needs to be in a consistent fashion throughout all the Plans proposed so they can be understood and compared.</p>	<p>The Shasta Valley Watermaster District is tasked with ensuring water is allocated according to established water rights. The Permittees state that they are in compliance with all requirements imposed by the SWRCB on their water use and will continue to comply with all use limitations imposed by the SWRCB and the Shasta Valley Watermaster District.</p>
329	David Webb	<p>9. Stock water usage also seems to be something still practiced like Grandpa did in 1860. The relatively huge amounts of water diverted for stockwater relative to what the number of cows need can no longer be justified as anything less than wasteful and unreasonable use of water. Both solar and grid tied systems are in common use. The groundwater is of better for the cows, and the streams will have more flow especially in fall when it is badly needed.</p>	<p>The Shasta Valley Watermaster District is tasked with ensuring water is allocated according to established water rights. The Permittees state that they are in compliance with all requirements imposed by the SWRCB on their water use and will continue to comply with all use limitations imposed by the SWRCB and the Shasta Valley Watermaster District.</p>
330	David Webb	<p>10. Irrigation management also needs to be brought up to modern standards as part of normal costs of doing business. Certainly each ranch has made substantial investments over time to reduce other costs--no one cuts hay by hand, nor stacks it by hand nor does all the management on foot or horseback. Investments have been made on all fronts. The only exception is in the case of water usage, which being free is treated as a no cost item so no investment is made. Treating water as something that can be freely wasted can no longer be tolerated. The hidden costs are being borne by a public that outlawed them back in 1924 as noted above. Some plans do include promises to include use of soil moisture sensors. That needs to be a universal requirement, coupled with record-keeping to document their use and effectiveness in avoiding over irrigating and consequent flow reduction and tailwater creation.</p>	<p>Comment noted. The efficiency of landowners' irrigation is regulated by the state law and is beyond the scope of the Agreement. Depending on site characteristics, soil moisture sensors are not appropriate for every site. The Shasta Valley Watermaster District is tasked with ensuring water is allocated according to established water rights. The Permittees state that they are in compliance with all requirements imposed by the SWRCB on their water use and will continue to comply with all use limitations imposed by the SWRCB and the Shasta Valley Watermaster District.</p>

331	David Webb	<p>11. In the course of trying to examine examples of similar safe harbor agreements, and to get better quality maps than those included in the publicly released documents which had become extremely fuzzy in the course of conversion to PDFs, I contacted the NOAA office via email on numerous occasions. After the first contact or two they simply failed to respond. I can understand staff there have many duties. On the other hand, not even being able to send promised electronic copies of existing documents, nor point me to a source of legible maps strongly suggests that NOAA simply doesn't have the budget nor staff time to oversee anything of this magnitude or complexity, especially if anything goes wrong or unforeseen conditions occur. The Safe Harbor legislation notes that sufficient staff time must be available if such an agreement is signed. Given the above, I don't see how that can be possible unless oversight consists of nothing more than annually checking boxes on a form. Certainly congress doesn't show any sign of increasing resource agency budgets anytime soon.</p>	Comment noted.
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