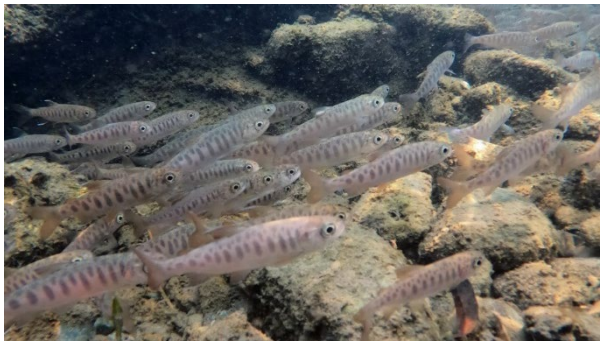
Monitoring and Evaluation of Russian River Coho Salmon

Detailed Research Plan for Contract W912P721C0002



Prepared by:

California Sea Grant, August 2021, Windsor, California

Contents

Suggested reference: California Sea Grant. 2021. Monitoring and evaluation of Russian River coho salmon: Detailed research plan for contract W912P721C0002. Windsor, California.

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1. Background

Coho salmon and steelhead are spawned and raised at US Army Corps of Engineers (Army Corps) fish facilities and released into the Russian River watershed as mitigation for the loss of spawning and rearing habitat caused by construction of the Coyote Valley and Warm Springs dams. Central California Coast coho salmon populations (including the Russian River population) are listed as endangered under the Federal Endangered Species Act. In 2001, the Russian River Coho Salmon Captive Broodstock Program (RRCSCBP) was established to supplement the very low natural reproduction in the watershed. Annual monitoring of juvenile survival and adults returning to spawn in the watershed is necessary to evaluate the success of the program and to provide data useful to adaptively manage the program.

In order to ensure that monitoring is consistently incorporated into the coho recovery program, NOAA's National Marine Fisheries Service (NMFS) Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation Improvement District in the Russian River Watershed (RRBiOp) (NMFS 2008), dated September 24, 2008, includes in its Reasonable and Prudent Alternative (RPA) that the "[Army] Corps will strengthen the Russian River Coho Salmon Captive Broodstock Program (RRCSCBP) by conducting needed 1) annual genetics analysis and 2) annual monitoring of the distribution and survival of stocked juvenile salmon and the subsequent return of adult coho to the Russian River." Specifically, section 4.1 of the RPA states that "… monitoring and evaluation of the RRCSCBP will be conducted to evaluate the effectiveness and performance of the program. This will include monitoring of juvenile and adult coho salmon in multiple release streams to assess survival of the juveniles released, adult returns, spawning success, and to determine if there is an increase in abundance of natural production of coho salmon in these streams." On June 6, 2014, NMFS received a proposed monitoring plan from the Army Corps (Appendix A) outlining monitoring activities that would meet the monitoring obligations identified in RRBiOp section 4.1 of the RPA, and the Army Corps' proposed plan was accepted by NMFS on September 22, 2014 (Appendix B).

This research and monitoring plan is based on the Army Corps monitoring plan (Appendix A), and is intended to satisfy the RRCSCBP monitoring requirements specified in the RRBiOp. The proposed work will be conducted by California Sea Grant (CSG) under Army Corps contract W912P721C0002.

2. Location

Four RRCSCBP index streams were selected by the RRCSCBP technical advisory committee (TAC) for long term monitoring, including Willow, Dutch Bill, Green Valley, and Mill creeks (Figure 1 - Figure 4). Hereafter, the four index streams will be referred to as life cycle monitoring (LCM) streams for consistency with the California Coastal Monitoring Program (CMP) terminology. In the event that the RRCSCBP decides to suspend stocking in one of the LCM streams in order to evaluate the effectiveness of the program in establishing sustainable populations, monitoring will continue in the un-stocked stream in the same manner described for the stocked LCM streams.

In each stream, trap and antenna locations were selected based on feasibility and landowner access. Snorkeling and spawner survey reaches were selected based on the CMP sample frame for the Russian River. Any changes to the streams monitored must be approved by the RRCSCBP TAC as well as the contract representatives.

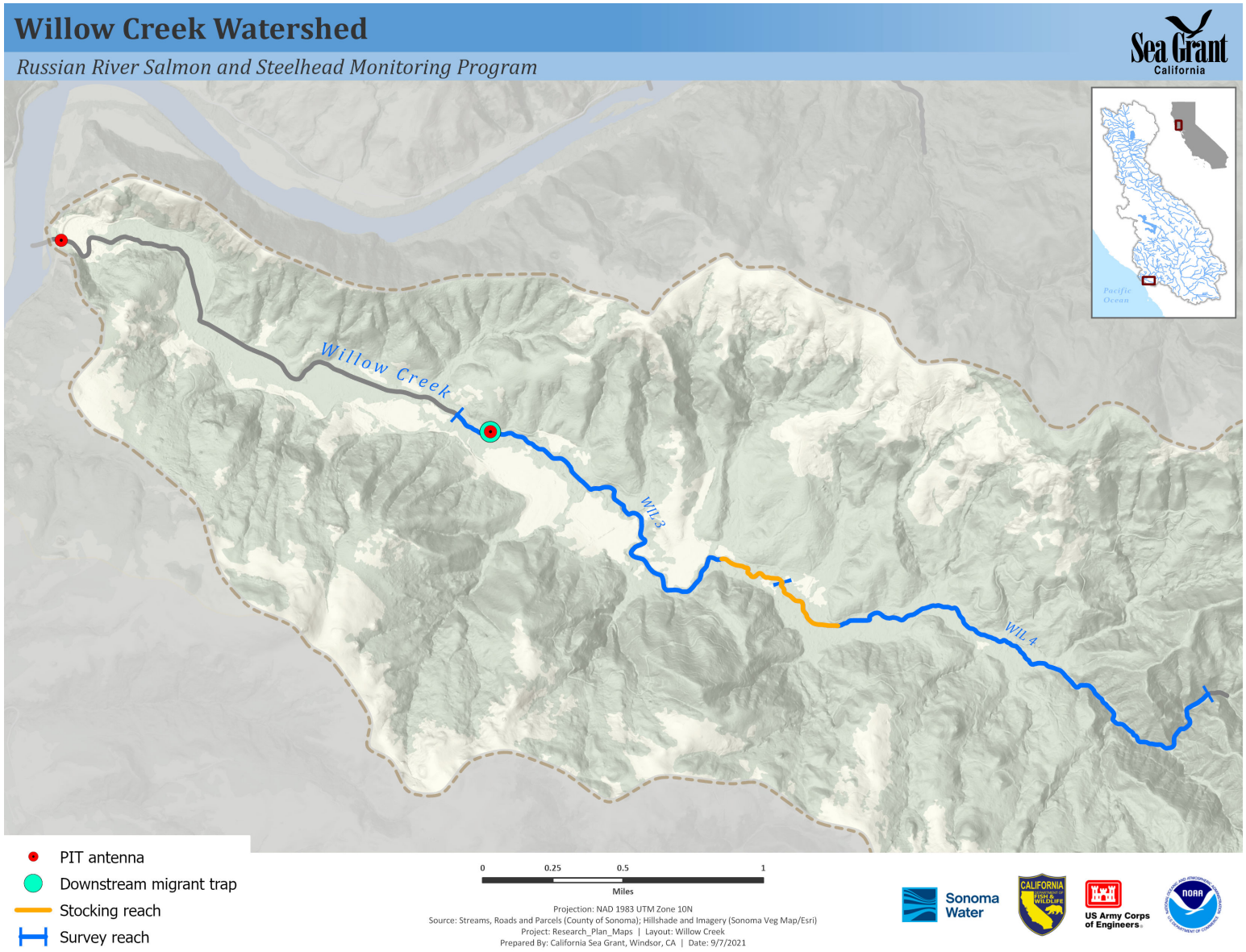

Figure 1. Map of Willow Creek stocking locations, monitoring sites and survey reaches.

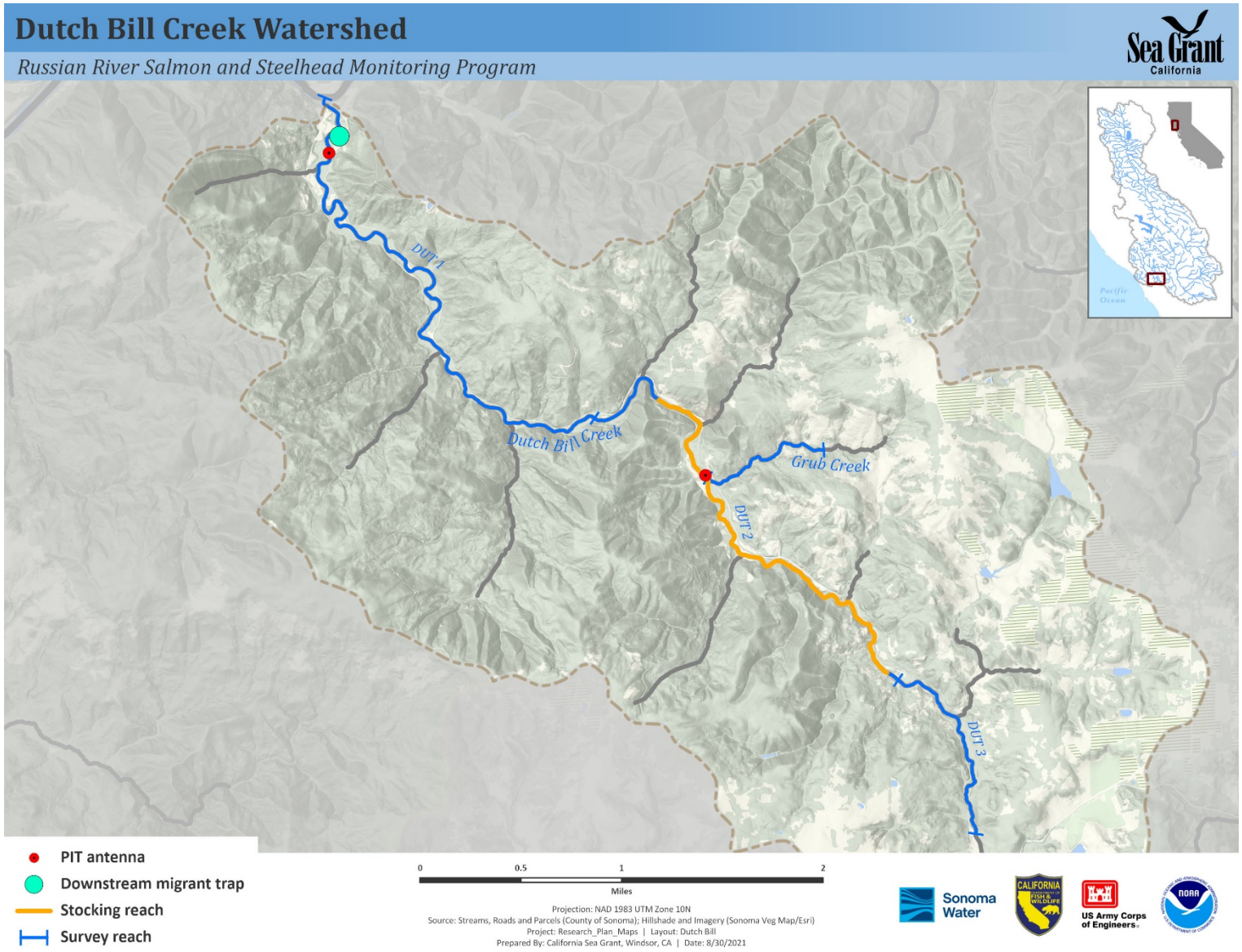

Figure 2. Map of Dutch Bill Creek stocking locations, monitoring sites and survey reaches.

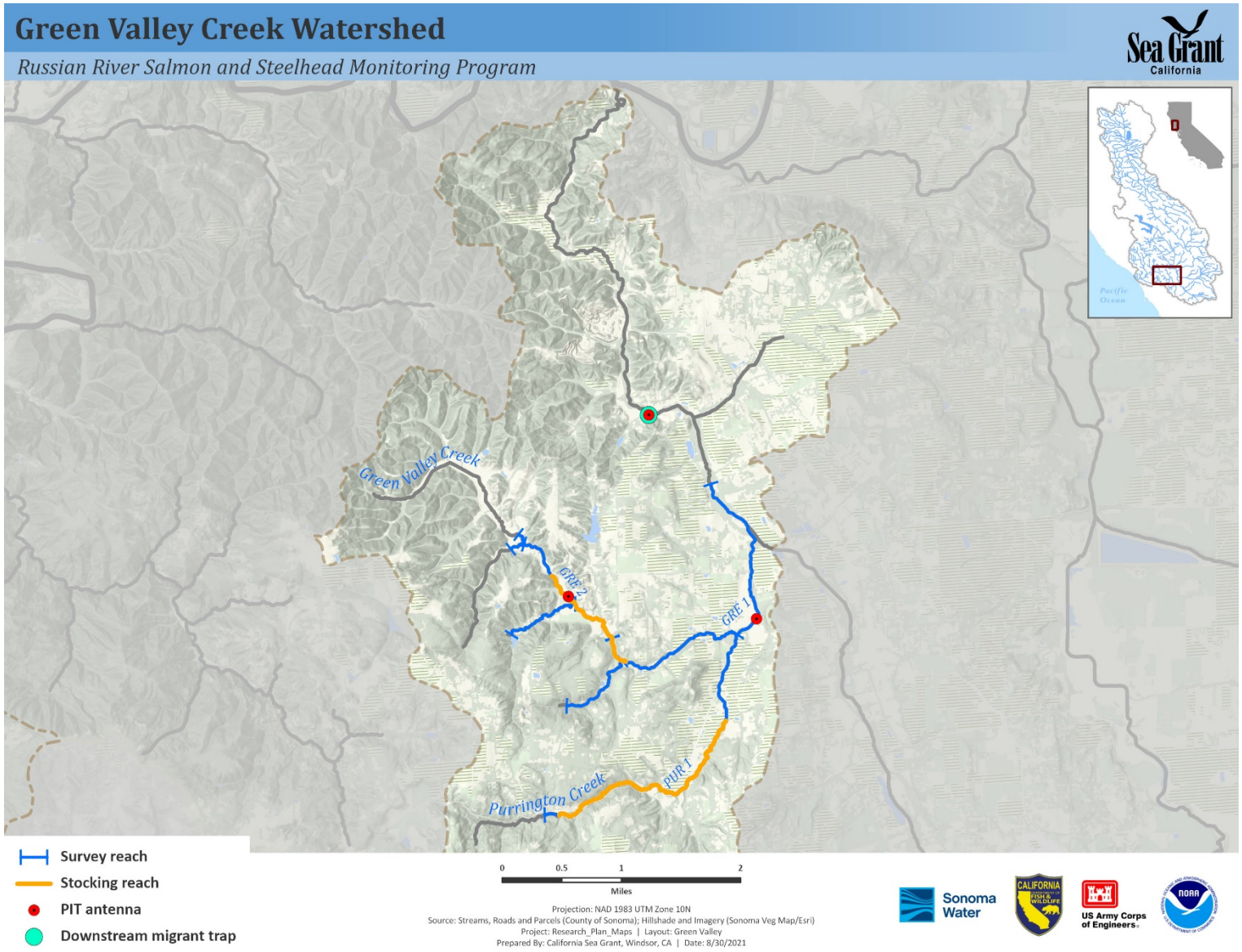

Figure 3. Map of Green Valley Creek stocking locations, monitoring sites and survey reaches.

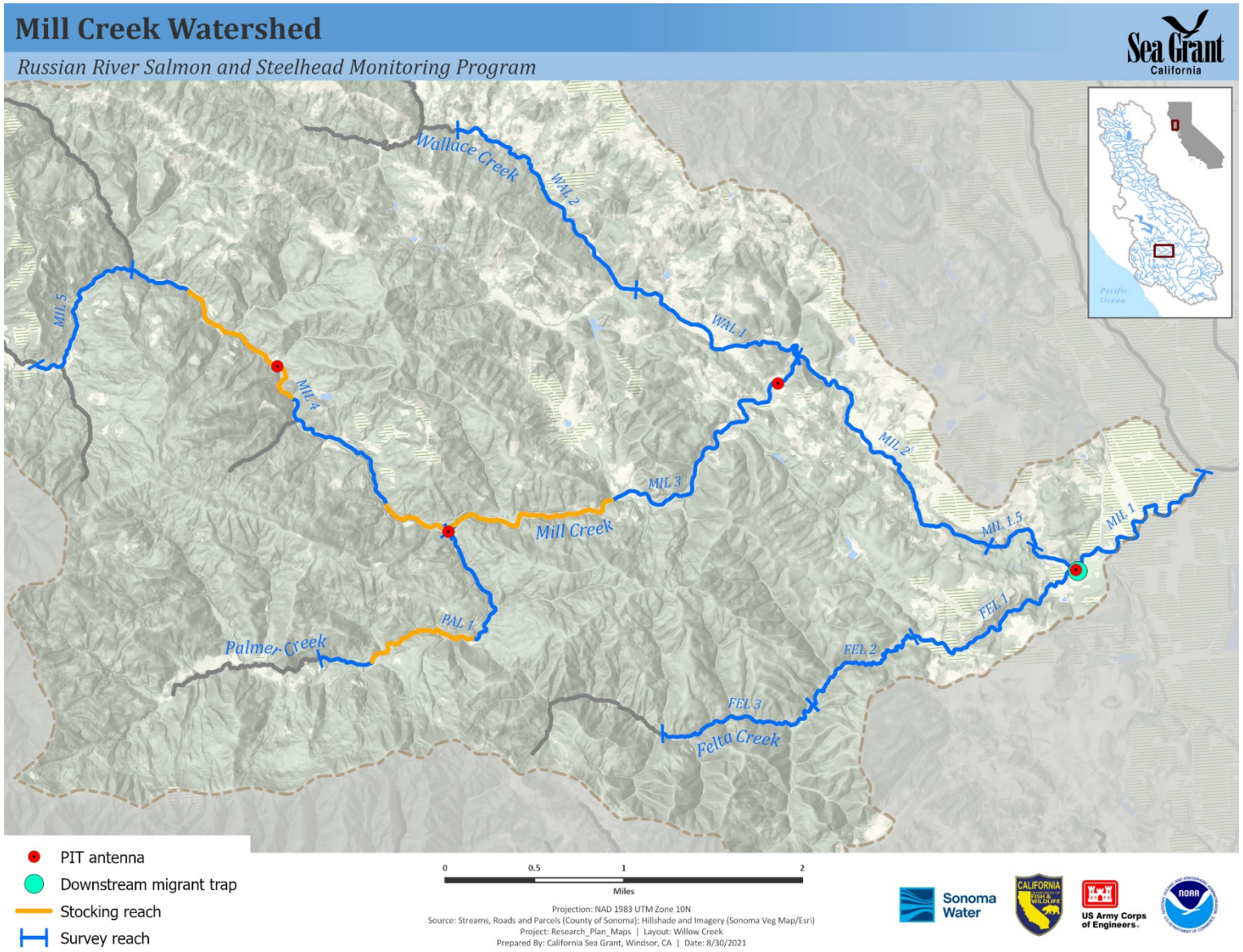

Figure 4. Map of Mill Creek stocking locations, monitoring sites and survey reaches.

3. Proposed work

Three studies will be completed each year in order to document the metrics listed in the RRBiOp (survival of hatchery-released juveniles, number of returning adults, spawning success, and natural production). Descriptions of each study are as follows:

3.1. Smolt abundance and freshwater survival study

Downstream migrant trapping in combination with operation of passive integrated transponder (PIT) detection systems will be used to estimate smolt abundance, natural production, freshwater growth, and freshwater survival in the four LCM streams.

3.1.1. Field methods

Downstream migrant (funnel and/or pipe) traps will be operated by CSG on Willow, Green Valley, and Mill creeks between March and June of each year. The Sonoma County Water Agency (Sonoma Water) will operate a trap on Dutch Bill Creek each spring and coho salmon data from this effort will be provided to CSG. All coho salmon captured in the traps will be scanned for PIT and coded wire tag (CWT)s, and a portion will be measured for fork length (mm) and weight (g). Fin tissue will be collected on a portion of captured smolts for subsequent genetics analysis by NMFS' Southwest Fisheries Science Center. Data will be entered into field computers, downloaded and error-checked upon return to the office, and uploaded into a SQL database.

Approximately fifteen percent of juvenile coho are implanted with a PIT tag prior to release from Don Clausen Warm Springs Hatchery. In order to track the PIT-tagged fish following their release, paired PIT antenna arrays will be operated year-round on the four LCM streams. PIT transceivers and antenna arrays will be visited biweekly to download data, check and/or change batteries, and troubleshoot any issues that arise. Text files downloaded onto field computers will be transferred into Excel, reformatted, error checked, and uploaded into a SQL database.

3.1.2. Data analysis

3.1.2.1. Smolt abundance

A two-trap mark recapture design (Bjorkstedt 2010; Bjorkstedt et al. 2005) will be used to estimate the total number of smolts leaving each creek during the time that each trap is in operation. PIT-tagged fish passing over the antenna array will serve as the marking event, and fish captured in the trap will serve as the recapture event. PIT-tagged fish detected at both the antenna and captured in the trap will be counted as recaptures, and the sum of non-PIT-tagged fish and PIT-tagged fish only detected in the trap (but not the antenna) will be counted as unmarked fish.

3.1.2.2. Freshwater survival

PIT tag detections at multiple antenna and trap sites will be used to estimate stock-to-smolt (freshwater) survival in the four LCM streams. A multistate emigration model (Horton et al. 2011) as implemented in Program MARK (White and Burnham 1999) will be used to compare survival among different release groups (i.e. spring, fall, presmolt, and smolt) in the four LCM streams.

3.1.2.3. Freshwater growth

Measurements of PIT-tagged fish captured in the downstream migrant traps will be used along with size data collected in the hatchery at the time of tagging to calculate growth rates for individual fish. Individual data will then be used to estimate averages for each release group in the four LCM streams.

3.1.2.4. Natural production

Fish origin (natural or hatchery) will be determined for each coho salmon captured in the smolt traps based on the presence of a CWT. These data will be used to develop ratios of natural-origin to hatchery-origin smolts in each of the four LCM streams so that trends can be tracked over time.

3.1.3. Reporting

Summary tables and figures will be incorporated into a report that will be completed and submitted to the Army Corps on November 1 each year.

3.2. Summer abundance and spatial distribution study

Summer snorkeling surveys document the relative abundance and spatial distribution of naturally-spawned juvenile coho salmon and will be conducted in each of four LCM streams. Surveys will be completed between June and October of each year, which is prior to the typical fall hatchery release timing.

3.2.1. Field methods

Snorkeling surveys will be coordinated with the Russian River CMP effort, using standardized methods in reaches of Willow, Dutch Bill, Green Valley, and Mill creeks that are defined as juvenile coho salmon habitat (SCWA and UC 2014). In each reach, a crew of two divers will snorkel and count the number of juvenile salmonids in every other pool on the first day of the survey (pass 1). On the second day, divers will count the number of juvenile salmonids in every other pool that was snorkeled on the first day (pass 2). Fish counts in each pool will be categorized by salmonid species (coho, steelhead, Chinook, unknown) and life stage (yoy (young-of-year) or parr (≥ age 1)). GPS points will be collected at survey pools so that juvenile distribution can be mapped. Data will be entered into field computers, downloaded and error-checked upon return to the office, and uploaded into a SQL database.

3.2.2. Data analysis

3.2.2.1. Relative abundance

First-pass counts will be used to document the minimum number of coho yoy observed in each reach. Because only half of the pools will be snorkeled, minimum counts will be doubled for an expanded minimum count.

3.2.2.2. Spatial distribution

Multiscale occupancy models (Nichols et al. 2008) will be used to estimate the probability of juvenile coho occupancy at the sample reach scale and conditional occupancy at the sample pool scale, given presence in the reach (Garwood and Larson 2014). Detection probability at the pool scale will be accounted for using the repeated dive pass data. The proportion of area occupied (PAO) will then be estimated by multiplying the reach and pool scale occupancy parameters. PAO will be used as a metric

for tracking trends in spatial distribution of naturally-produced juveniles over time in the four LCM streams.

3.2.3. Reporting

Summary tables and maps displaying the spatial distribution of coho yoy in each of the four LCM streams will be incorporated into a report that will be completed and submitted to the Army Corps on March 1 each year.

3.3. Escapement study

Winter spawner surveys and PIT detection systems will be used to estimate the number of coho adults returning and the distribution of redds in the four LCM streams each year.

3.3.1. Field methods

Spawner surveys will be conducted in coordination with the Russian River CMP efforts in reaches of Willow, Dutch Bill, Green Valley, and Mill creeks that are defined as adult coho spawning habitat by the CMP effort (Adams et al. 2011; Gallagher and Gallagher 2005; Gallagher et al. 2010; SCWA and UC 2014). Surveys will begin after the first significant rainfall of the winter (typically early December) and continue through the end of February, with surveys occurring approximately biweekly (when storms permit) throughout the season. During spawning surveys, redds, live fish, and carcasses will be counted. Carcasses will be measured, scanned for CWT and PIT tags and when possible, tissue samples for genetic analysis will be collected. GPS points will be collected at redd locations in order to map spatial distribution of spawning adults. Field data will be entered into field computers, downloaded and error-checked upon return to the office, and uploaded into a SQL database.

As described in Study 1, paired PIT antenna arrays will be operated year-round on the four LCM streams. PIT transceivers and antenna arrays will be checked biweekly to download data, check and/or change batteries, and troubleshoot any issues that arise. More frequent checks will occur during winter storm events to ensure that solar powered stations are fully charging the battery banks and to repair any damage that resulted from storm debris. Text files downloaded onto field computers will be transferred into Excel, reformatted, error checked, and uploaded into a SQL database.

3.3.2. Data analysis

3.3.2.1. Adult escapement

PIT tag detections on paired, year-round antenna arrays, ratios of PIT-tagged to non-PIT-tagged hatchery releases, and average ratios of hatchery to naturally-spawned returns from spawner surveys will be used to estimate the total number of coho returning to each of the four LCM streams each year.

3.3.2.2. Marine survival

For each cohort of coho salmon, adult estimates will be compared to the number of smolts that previously emigrated from each stream to generate estimates of “marine” survival. Although riverine and estuarine survival cannot be disentangled from marine survival, tributary survival can be separated from survival in the combined riverine, estuarine and marine environments.

3.3.2.3. Spawning success

Redd counts from spawner survey data will be used to estimate the total number of redds produced each year in the four LCM streams (Adams et al. 2011; Gallagher and Gallagher 2005; Gallagher et al. 2010; SCWA and UC 2014).

3.3.2.4. Spatial distribution

Maps displaying redd locations will be produced for each of the four LCM streams.

3.3.2.5. Natural production

Origin of coho salmon carcasses encountered on surveys will be determined by presence of a CWT in the snout (indicating hatchery-origin). These data will be used to develop ratios of natural to hatchery-origin adults in each of the four LCM streams so that trends can be tracked over time.

3.3.3. Reporting

Summary tables, figures and maps will be incorporated into a report that will be completed and submitted to the Army Corps on July 1 each year.

4. Landowner access

In May of 2020, requests to access coho release streams were sent to over 2,000 landowners that own property adjacent to streams within the lower Russian River watershed. The agreements are held by California Department of Fish and Wildlife (CDFW) with individual landowners, and allow access for four RRCSCBP partners (CDFW, CSG, Sonoma Water, and Army Corps). CSG currently manages SQL and GIS databases used to track and map landowner responses to our requests as well as document communications with landowners. This database will be used to contact landowners prior to all of our monitoring activities, follow-up with specific requests landowners have made, and record communications. CSG will provide landowners with an annual update of monitoring survey results from the previous year.

5. Schedule

Downstream migrant trapping will occur from March through June, depending on stream flows. Snorkeling surveys will occur between June and October. Spawner surveys will occur following the first significant rain event that reconnects the streams in the winter (typically early December) through the end of February. PIT antennas will be operated year-round. Landowner access, data management and analysis, and reporting will occur year-round.

Schedule of monitoring activities

Activity	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Project coordination, permits, landowner communications	■	■	■	■	■	■	■	■	■	■	■	■
Downstream migrant trapping	■	■	■									■
Snorkeling surveys			■	■	■	■	■					
Spawner surveys									■	■	■	
Operation of PIT antennas	■	■	■	■	■	■	■	■	■	■	■	■
Data management and analysis	■	■	■	■	■	■	■	■	■	■	■	■
Reporting				■				■				■

6. Permits

The monitoring activities outlined in this plan will be covered under the permits below. Any permits that will expire prior to March 31, 2026 will be renewed before the end of the contract.

1. Section 10(a)(1)(A) Endangered Species Act permit 10837: Russian River salmonid recovery monitoring, 1/07/16 – 12/31/20, renewed through 12/31/25 (10837-3R).
2. CESA MOU: Obedzinski_Coho_12-31-2025: Memorandum of understanding by and between Mariska Obedzinski California Sea Grant Extension Program and California Department of Fish and Wildlife, 3/8/18 – 12/31/20, in process of renewal through 12/31/25.
3. California Department of Fish and Wildlife Scientific Collecting Permit (specific use): Russian River Salmon and Steelhead Monitoring Program Entity Permit, S-210270002-21027-001, 6/10/21 – 6/9/24.
4. UCSD Institutional Animal Care and Use Committee permit (Protocol # S12020), current permit 9/16/20 – 9/16/23.
5. California Department of Parks and Recreation permit to conduct biological investigations/collections, 4/27/12 – 4/27/22.
6. U.S. Army Corps of Engineers consultation with U.S. Fish and Wildlife Service, 08ESMF00-2019-F-2285, 6/5/2019 – present (provides incidental take coverage for California freshwater shrimp and California Red-legged frog)

7. Contingency plans

Potential factors that may affect our ability to carry out each study include extreme weather conditions, environmental and/or health hazards such as wildfires and pandemics, changes in landowner access, and incidental take of other federally listed species (e.g., California freshwater shrimp and California red-legged frog). In the case of extreme weather (high flows that prevent trap or antenna installation, or drought that negates the need to conduct surveys since migration corridors are cut off) we will adjust our schedule accordingly (e.g. if the tributaries are not connected to the mainstem of the river until February, we will begin our spawner surveys in February instead of early December). If we are unable to conduct our field work due to shelter-in-place orders, we will consult with the contracting officer representative (COR) and the technical point of contact (POC) to determine whether there is alternative work that can be completed. If we lose access to a monitoring site due to changes in landowner access, we will attempt to find a suitable replacement site. If the loss of access is extreme enough that we do not think we can sufficiently address the monitoring objectives outlined in this plan, we will consult with the RRCSCBP TAC to find a replacement stream. If a particular monitoring activity incurs incidental take that is unacceptable to permitting agencies, we will discontinue that activity and consult the RRCSCBP TAC to determine the best alternative course of action.

8. Adaptive management

The goal of this monitoring effort is to best serve the monitoring needs of the RRCSCBP. As new questions arise, different streams and/or methods may be necessary to better meet the needs of the

program. Such changes can be proposed to the RRCSCBP TAC and if accepted by the TAC they will be forwarded to the COR and POC for review.

9. References

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Bjorkstedt, E. P. 2010. DARR 2.02: DARR for R. Addendum to NOAA-TM-NMFS-SWFSC-368. National Marine Fisheries Service, Santa Cruz, CA.

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Garwood, J. M., and M. D. Larson. 2014. Reconnaissance of salmonid redd abundance and juvenile spatial structure in the Smith River with emphasis on coho salmon (*Oncorhynchus kisutch*). California Department of Fish and Wildlife, Arcata, California.

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Nichols, J. D., and coauthors. 2008. Multi-scale occupancy estimation and modelling using multiple detection methods. Journal of Applied Ecology 45:1321-1329.

NMFS. 2008. Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation District in the Russian River Watershed, Santa Rosa.

SCWA, and UC. 2014. Implementation of the California Coastal Salmonid Monitoring Plan in the Russian River. Pages 19 *in*. Sonoma County Water Agency and University of California Cooperative Extension/California Sea Grant, Santa Rosa, CA.

White, G. C., and K. P. Burnham. 1999. Program MARK: survival estimation from populations of marked animals. Bird Study 46:120-139.

APPENDIX A

Monitoring Activities Required under the Russian River Biological Opinion:

p. 274 of the Russian River Biological Opinion states that,

"*3. Monitoring and evaluation of the RRCSCBP will be conducted to evaluate the effectiveness and performance of program. This will include monitoring of juvenile and adult coho salmon in multiple release streams to assess survival of the juveniles released, adult returns, spawning success, and to determine if there is an increase in abundance of natural production of coho salmon in these streams."*

The monitoring activities described below are designed to address these requirements:

Survival of juveniles released

Freshwater and marine survival of released juvenile coho will be estimated through use of PIT tags and PIT tag detection systems. Fifteen percent of juvenile coho will be implanted with a PIT tag prior to release from Don Clausen Warm Springs Hatchery, and fish will be tagged according to release tributary and release season. Paired PIT tag antenna arrays will be operated year-round on a minimum of four index release streams (currently Willow, Dutch Bill, Green Valley, and Mill Creeks) to track PIT-tagged fish following their release. Detections of PIT-tagged fish will be used to generate estimates of survival from release to the smolt stage (freshwater survival) and from the smolt stage to the adult stage (marine survival).

Adult returns

Estimates of the number of returning PIT-tagged coho adults will be generated for the four index release streams (currently Willow, Dutch Bill, Green Valley, and Mill Creeks) with paired PIT tag detection systems. Antenna efficiency information from the paired arrays, the ratio of PIT-tagged to nonPIT-tagged hatchery releases, and the average ratio of hatchery to naturally-spawned returns from spawner surveys will be used to estimate the total number of coho returning to each of the four index release streams.

Spawning success

Winter spawner surveys will be conducted on a minimum of four release streams (currently Willow, Dutch Bill, Green Valley, and Mill Creeks) to document the return of adult coho to spawning habitat and to estimate the total number of redds produced in each stream. Coho carcasses encountered will be scanned with a coded wire tag (CWT) wand to determine whether the fish was of hatchery-origin (CWT present) or natural-origin (no CWT). Summer snorkeling surveys to document the presence and minimum number of naturally-spawned juvenile coho will be conducted in each of the four index release streams in which hatchery adult returns were anticipated the previous winter. Surveys will be conducted prior to the release of hatchery fish each year.

Natural production

Increases in natural production will be documented through use of downstream migrant traps operated seasonally on two to four index release streams. Each juvenile coho captured will be scanned with a CWT wand to determine origin, and estimates of hatchery and naturally-spawned coho smolts will be generated each year. Fin tissue will be collected on a portion of captured smolts for subsequent genetics analysis. Coho carcass data and minimum count data from snorkeling surveys will also be used to document increases in abundance and spatial distribution of naturally-produced coho salmon.

APPENDIX B

UNITED STATE DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404-4731

September 22, 2014

In response, refer to:
SWR-2006-07316

Peter LaCivita
U.S. Army Corps of Engineers
1455 Market Street
San Francisco, California 94103

Dear Mr. LaCivita:

This letter is in regards to your email of June 10, 2014, requesting confirmation regarding the sufficiency of the U.S. Army Corps of Engineers (Corps) proposed plan for monitoring and evaluation of the Russian River Coho Salmon Captive Broodstock Program (RRCSCBP) as identified within NOAA's National Marine Fisheries Service (NMFS) Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation Improvement District in the Russian River watershed (RRBiOp) dated September 24, 2008. NMFS has received the Corps' (June 6, 2014) proposed monitoring plan which is intended to meet the monitoring obligations identified in the Reasonable and Prudent Alternative (RPA) in the RRBiOp relative to operations and management of the Don Clausen Fish Hatchery. The Don Clausen Fish Hatchery is located on Dry Creek, tributary to the Russian River, Sonoma County, California.

As you are aware, to avoid the likelihood of jeopardy to Central California Coast coho salmon and adverse modification of their critical habitat, NMFS collaborated with the Corps and Sonoma County Water Agency in developing eight modifications and additional actions to the Russian River Water Supply and Flood Control Project (project). These modification and additional actions were to be implemented as part of one RPA. As described in RPA 4.1, the Corps agreed to "*...strengthen the Russian River Coho Salmon Captive Broodstock Program (RRCSCBP) by conducting needed 1) annual genetics analysis and 2) annual monitoring of the distribution and survival of stocked juvenile salmon and the subsequent return of adult coho to the Russian River.*"

Due to the importance of the monitoring program in evaluating the effectiveness of the RRCSCBP, NMFS emphasized concerns regarding the sufficiency of available funds to ensure the program continued into the future. To address this concern the RPA stated "*... the Corps will conduct annual genetics analysis and the monitoring and evaluation components of the*

RRCSCBP at levels consistent with recent historic (al) funding levels for these activities, with adjustments for inflation. Recent NOAA and DFG (California Department of Fish and Wildlife) *funding for these activities has been approximately $250,000 for annual monitoring and evaluation and $50,000 for annual genetics analysis of the coho broodstock program"* (Section X.4.1.1). Specifically, the Corps agreed that "*...monitoring and evaluation of the RRCSCBP will be conducted to evaluate the effectiveness and performance of the program. This will include monitoring of juvenile and adult coho salmon in multiple release streams to assess survival of the juveniles released, adult returns, spawning success, and to determine if there is an increase in abundance of natural production of coho salmon in these streams*" (Section X.4.1.3).

NMFS' staff has reviewed the Corps' plan, which describes monitoring for elements of juvenile survival, adult returns, spawning success and natural production in multiple release streams in the Russian River watershed (specifically Green Valley, Dutch Bill, Mill and Willow Creeks). The plan proposes a variety of assessment methods including use of PIT tags and antennae arrays, winter spawning surveys, summer snorkeling surveys and downstream migrant trapping. We agree the plan is consistent with the RPA's description and are supportive of the various proposed monitoring elements.[1] We are also pleased to learn that despite shortfalls in recent fiscal year budgets, that the Corps has met funding obligations for 2014, and has identified funding for fiscal year 2015 and beyond.

Trend and abundance monitoring efforts indicate CCC Evolutionarily Significant Unit coho salmon still face a high risk of extinction, as evidenced by the low population abundance across their range. However, it is likely that the likelihood of imminent extirpation in the Russian River watershed has been avoided, in large part due to the success of the RRCSCBP, which the Corps also funds and operates. The Corps' monitoring efforts have documented increasing numbers of returning adult coho salmon to the Russian River which is a significant achievement toward the recovery of CCC coho salmon, and a demonstration of the RRCSCBP's success. We acknowledge and are grateful to the Corps' staff for their ongoing commitment and leadership in this critical recovery effort, and are in support of efforts to enlist other partners and funding for the monitoring program.

[1] We are aware of the various other monitoring efforts conducted by the Corps through their contractor, University of California Cooperative Extension Sea Grant in addition to the requirements of the RPA. These include monitoring basin-wide population trends via a flat-plate antennae across the Russian River near Duncan's Mills, and habitat and low flow monitoring through a variety of funding sources in support of other management objectives which also complement and benefit management of the RRCSCBP.

We look forward to our joint ongoing efforts towards salmon and steelhead recovery in the Russian River watershed. If you have questions or comments about this letter, please contact Mr. Bob Coey at (707) 575-6090, or via e-mail at Bob.Coey@noaa.gov

Sincerely,

Irma Lagomarsino
Assistant Regional Administrator
California Coastal Area Office

cc: B. Coey, NMFS, Santa Rosa
P. Rutten, J. Pecharich, NOAA RC, Santa Rosa
E. Larson, S. Wilson, CDFW, Yountville
Kevin Shaffer, CDFW, Sacramento
M. Dillabough, USACE, San Francisco