

2016 RE 010 CEQA SOW

Southern Coho Salmon Captive Broodstock Program (UCSC-NOAA)

Introduction:

The University of California at Santa Cruz/NOAA Southwest Fisheries Science Center (SWFSC) will implement the 2016 Coho Salmon Captive Broodstock Program by continuing the captive rearing of approx. 380 annually to maturity for the three years 2017-2020. The project will help to preserve the remaining genetic and phenotypic characteristics of Scott Creek Coho Salmon, thereby reducing the risk of extirpation of this population of endangered Coho Salmon.

The Grantee shall not proceed with implementation of the project until all necessary permits and the Notice to Proceed are secured.

Objective(s):

The objective of the project is to maintain a breeding population of endangered Coho Salmon in captivity to ensure that adequate numbers of mature spawning Coho Salmon will be available each year (winters of 2017/18, 2018/19, 2019/20) to spawn at the Monterey Bay Salmon and Trout Project (MBSTP). Natural production of Coho Salmon in Scott Creek (Santa Cruz Co.) has been extremely low in almost all of the last several years, with only a few (<10) adult Coho Salmon returning to Scott Creek each winter.

Project Description:

Location:

The SWFSC is located at 36.95166700 NL, 122.06500000 WL. It is a stand-alone saltwater hatchery facility on the University of California at Santa Cruz Marine Science Campus at 110 Shaffer Road, Santa Cruz. The MBSTP is located at 37.08972200 NL, 122.23055600 WL. The Kingfisher Flat Conservation Hatchery of the MBSTP is situated on Big Creek, tributary to Scott Creek, approx. 1.5 river-km upstream of the confluence of Big Creek and the mainstem of Scott Creek, and approx. 4.8 river-km from the Pacific Ocean.

Project Set Up:

All fish husbandry and other associated hatchery work, as well as project management, will be carried out by NOAA Fisheries staff. Project coordination, planning, administration and reporting will be done by a staff research associate. In addition, two UCSC contract employees and one UCSC undergraduate assistant will assist with husbandry, sampling and tagging of Coho Salmon, as well as genetic sample preparation, processing and analysis.

Materials:

Equipment and materials needed for this project are as follows:

- Fish feed, including bulk pellet food, fresh/frozen krill and various nutritional supplements such as vitamins and cod liver oil.
- Expendable tagging and marking supplies, including external floy tags, PIT tags, coded wire tags (CWT) and the rental of two CWT tagging units for two months annually
- Miscellaneous fish husbandry supplies as needed, including nets, netting, belt feeders, air stones, batteries, thermometers, waders, boots and a portable waterproof PIT tag reader
- Reagents and consumable laboratory supplies for genetic analysis of broodstock fish and preparation of the annual genetic breeding matrix.

Tasks:

Task 1: Daily Husbandry of Coho Salmon Captive Broodstock

Daily husbandry and feeding of Coho Salmon throughout the funding period will be managed by the same NOAA SWFSC Research Fishery Biologist who has overseen the captive broodstock program for the past 15 years. This task will include feeding of fish, maintenance of water and air systems, cleaning of tanks and equipment, fish health maintenance and periodic travel to the MBSTP and Warm Springs Hatchery satellite rearing facilities.

Task 2: Tagging and Release of Captive Broodstock Program Fish

During January/February of each grant year, NOAA SWFSC staff will implant a CWT in each program fish, and a PIT tag in a sub-sample of the program fish (up to 20,000 annually, depending on production levels). For tagging, fish are anesthetized, the CWT and PIT tags are inserted, and fish are then allowed to recover in a holding tank until release (March-May).

Task 3: Development of a Genetic Spawning Matrix

To create a spawning matrix, permanent NOAA SWFSC staff each year collect a small tissue sample (usually from the caudal fin) from each captive broodstock Coho Salmon and any natural-origin Coho Salmon captured in Scott Creek. Tissue samples are then processed in the laboratory for DNA extraction and analysis. Results of the analysis are used to create a matrix that prioritizes potential mating partners according to their level of relatedness.

Task 4: Reporting

NOAA SWFSC permanent staff will produce annual and final project reports.

Deliverables:

1. For each year throughout the grant period, delivery of a cohort of up to 380 mature Coho Salmon of the highest possible physical and genetic quality to the MBSTP for spawning.
2. Implantation of a coded wire tag (CWT) into each program Coho Salmon, and implantation of a passive integrated transponder (PIT) tag into a subset of program Coho Salmon (up to 20,000) before release of these fish into the natural environment.
3. Genotypic analysis of each broodstock Coho Salmon and creation of an annual spawning matrix based on relatedness.
4. Periodic progress reports, annual reports and final report (hard copy and Compact Disc). The Final Report shall include the following:
 - Demonstrated fish survival at each of the three rearing facility (NOAA SWFSC, MBSTP and WSH).
 - rates of adult return
 - broodyear-specific data on all fish in the captive broodstock program
 - key metrics of performance at each facility (e.g., size, fecundity, survival)
 - numbers of fish tagged annually
 - data on the date, number, life stage and release location of program fish released in regional Coho Salmon recovery watersheds
 - any pertinent Geographic Information System (GIS) data

Timelines:

Task 1: Year-round, 365 days per year, throughout the grant period.

Task 2: Each year of the grant period. October: Order CWTs and rent CWT injector unit. December – March: Execute batch tagging of program fish. March – May: Assist MBSTP with release of MBSTP program Coho Salmon.

Task 3: Each year of the grant period. November – March: Production and regular update of the spawning matrix. March: PIT tagging and tissue sampling of candidate broodstock Coho Salmon for potential inclusion in the spawning matrix. March – August: Genotyping and sex determination of each potential broodstock fish for potential inclusion in the spawning matrix.

Additional Requirements:

There are no additional requirements for this project.



Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Query Criteria: Quad (Davenport (3712212) OR (Felton (3712211) OR (Laurel (3712118) OR (Santa Cruz (3612281) OR (Soquel (3612188))

Possible species within the Santa Cruz Quad and surrounding quads for 725239 Southern Coho Salmon Captive Broodstock Program (UCSC-NOAA), T11S R02W S22, Santa Cruz County

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
American badger <i>Taxidea taxus</i>	AMAJF04010	None	None	G5	S3	SSC
Anderson's manzanita <i>Arctostaphylos andersonii</i>	PDERI04030	None	None	G2	S2	1B.2
Antioch specid wasp <i>Philanthus nasalis</i>	IIHYM20010	None	None	G1	S1	
arcuate bush-mallow <i>Malacothamnus arcuatus</i>	PDMAL0Q0E0	None	None	G2Q	S2	1B.2
bank swallow <i>Riparia riparia</i>	ABPAU08010	None	Threatened	G5	S2	
Ben Lomond buckwheat <i>Eriogonum nudum var. decurrens</i>	PDPGN08492	None	None	G5T1	S1	1B.1
Ben Lomond spineflower <i>Chorizanthe pungens var. hartwegiana</i>	PDPGN040M1	Endangered	None	G2T1	S1	1B.1
bent-flowered fiddleneck <i>Amsinckia lunaris</i>	PDBOR01070	None	None	G2G3	S2S3	1B.2
black swift <i>Cypseloides niger</i>	ABNUA01010	None	None	G4	S2	SSC
Blasdale's bent grass <i>Agrostis blasdalei</i>	PMPOA04060	None	None	G2	S2	1B.2
Bonny Doon manzanita <i>Arctostaphylos silvicola</i>	PDERI041F0	None	None	G1	S1	1B.2
bristly sedge <i>Carex comosa</i>	PMCYP032Y0	None	None	G5	S2	2B.1
burrowing owl <i>Athene cunicularia</i>	ABNSB10010	None	None	G4	S3	SSC
California giant salamander <i>Dicamptodon ensatus</i>	AAAAH01020	None	None	G3	S2S3	SSC
California linderiella <i>Linderiella occidentalis</i>	ICBRA06010	None	None	G2G3	S2S3	
California red-legged frog <i>Rana draytonii</i>	AAABH01022	Threatened	None	G2G3	S2S3	SSC
chaparral ragwort <i>Senecio aphanactis</i>	PDAST8H060	None	None	G3	S2	2B.2
Choris' popcornflower <i>Plagiobothrys chorisianus var. chorisianus</i>	PDBOR0V061	None	None	G3T2Q	S2	1B.2
coho salmon - central California coast ESU <i>Oncorhynchus kisutch</i>	AFCHA02034	Endangered	Endangered	G4	S2?	



Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Cooper's hawk <i>Accipiter cooperii</i>	ABNKC12040	None	None	G5	S4	WL
deceiving sedge <i>Carex saliniformis</i>	PMCYP03BY0	None	None	G2	S2	1B.2
Dolloff Cave spider <i>Meta dolloff</i>	ILARA17010	None	None	G1	S1	
Dudley's lousewort <i>Pedicularis dudleyi</i>	PDSCR1K0D0	None	Rare	G2	S2	1B.2
elongate copper moss <i>Mielichhoferia elongata</i>	NBMUS4Q022	None	None	G5	S4	4.3
Empire Cave pseudoscorpion <i>Fissilicreagris imperialis</i>	ILARAE5010	None	None	G1	S1	
Empire Cave pseudoscorpion <i>Neochthonius imperialis</i>	ILARAD1010	None	None	G1	S1	
eulachon <i>Thaleichthys pacificus</i>	AFCHB04010	Threatened	None	G5	S3	
foothill yellow-legged frog <i>Rana boylei</i>	AAABH01050	None	None	G3	S3	SSC
globose dune beetle <i>Coelus globosus</i>	IICOL4A010	None	None	G1G2	S1S2	
great blue heron <i>Ardea herodias</i>	ABNGA04010	None	None	G5	S4	
hoary bat <i>Lasiurus cinereus</i>	AMACC05030	None	None	G5	S4	
Kellogg's horkelia <i>Horkelia cuneata var. sericea</i>	PDROS0W043	None	None	G4T1?	S1?	1B.1
Mackenzie's Cave amphipod <i>Stygobromus mackenziei</i>	ICMAL05530	None	None	G1	S1	
maple-leaved checkerbloom <i>Sidalcea malachroides</i>	PDMAL110E0	None	None	G3	S3	4.2
marbled murrelet <i>Brachyramphus marmoratus</i>	ABNNN06010	Threatened	Endangered	G3G4	S1	
Maritime Coast Range Ponderosa Pine Forest <i>Maritime Coast Range Ponderosa Pine Forest</i>	CTT84132CA	None	None	G1	S1.1	
marsh microseris <i>Microseris paludosa</i>	PDAST6E0D0	None	None	G2	S2	1B.2
marsh sandwort <i>Arenaria paludicola</i>	PDCAR040L0	Endangered	Endangered	G1	S1	1B.1
mimic tryonia (=California brackishwater snail) <i>Tryonia imitator</i>	IMGASJ7040	None	None	G2	S2	
minute pocket moss <i>Fissidens pauperculus</i>	NBMUS2W0U0	None	None	G3?	S2	1B.2



Selected Elements by Common Name
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California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
moestan blister beetle <i>Lytta moesta</i>	IICOL4C020	None	None	G2	S2	
monarch - California overwintering population <i>Danaus plexippus pop. 1</i>	IILEPP2012	None	None	G4T2T3	S2S3	
Monterey pine <i>Pinus radiata</i>	PGPIN040V0	None	None	G1	S1	1B.1
Monterey Pine Forest <i>Monterey Pine Forest</i>	CTT83130CA	None	None	G1	S1.1	
Mount Hermon (=barbate) June beetle <i>Polyphylla barbata</i>	IICOL68030	Endangered	None	G1	S1	
North Central Coast Drainage Sacramento Sucker/Roach River <i>North Central Coast Drainage Sacramento Sucker/Roach River</i>	CARA2623CA	None	None	GNR	SNR	
North Central Coast Short-Run Coho Stream <i>North Central Coast Short-Run Coho Stream</i>	CARA2632CA	None	None	GNR	SNR	
Northern Coastal Salt Marsh <i>Northern Coastal Salt Marsh</i>	CTT52110CA	None	None	G3	S3.2	
northern curly-leaved monardella <i>Monardella sinuata ssp. nigrescens</i>	PDLAM18162	None	None	G3T2	S2	1B.2
Northern Interior Cypress Forest <i>Northern Interior Cypress Forest</i>	CTT83220CA	None	None	G2	S2.2	
Northern Maritime Chaparral <i>Northern Maritime Chaparral</i>	CTT37C10CA	None	None	G1	S1.2	
obscure bumble bee <i>Bombus caliginosus</i>	IHYM24380	None	None	G4?	S1S2	
Ohlone manzanita <i>Arctostaphylos ohloneana</i>	PDERI042Y0	None	None	G1	S1	1B.1
Ohlone tiger beetle <i>Cicindela ohlone</i>	IICOL026L0	Endangered	None	G1	S1	
Opler's longhorn moth <i>Adela oplerella</i>	IILEE0G040	None	None	G2	S2	
osprey <i>Pandion haliaetus</i>	ABNKC01010	None	None	G5	S4	WL
pallid bat <i>Antrozous pallidus</i>	AMACC10010	None	None	G5	S3	SSC
perennial goldfields <i>Lasthenia californica ssp. macrantha</i>	PDAST5L0C5	None	None	G3T2	S2	1B.2
Point Reyes horkelia <i>Horkelia marinensis</i>	PDROS0W0B0	None	None	G2	S2	1B.2
robust spineflower <i>Chorizanthe robusta var. robusta</i>	PDPGN040Q2	Endangered	None	G2T1	S1	1B.1
saltmarsh common yellowthroat <i>Geothlypis trichas sinuosa</i>	ABPBX1201A	None	None	G5T3	S3	SSC



Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
San Francisco collinsia <i>Collinsia multicolor</i>	PDSCR0H0B0	None	None	G2	S2	1B.2
San Francisco dusky-footed woodrat <i>Neotoma fuscipes annectens</i>	AMAFF08082	None	None	G5T2T3	S2S3	SSC
San Francisco popcornflower <i>Plagiobothrys diffusus</i>	PDBOR0V080	None	Endangered	G1Q	S1	1B.1
sandy beach tiger beetle <i>Cicindela hirticollis gravida</i>	IICOL02101	None	None	G5T2	S2	
Santa Cruz black salamander <i>Aneides niger</i>	AAAAD01070	None	None	G3	S3	SSC
Santa Cruz clover <i>Trifolium buckwestiorum</i>	PDFAB402W0	None	None	G2	S2	1B.1
Santa Cruz cypress <i>Hesperocyparis abramsiana</i> var. <i>abramsiana</i>	PGCUP04081	Threatened	Endangered	G1T1	S1	1B.2
Santa Cruz kangaroo rat <i>Dipodomys venustus venustus</i>	AMAFD03042	None	None	G4T1	S1	
Santa Cruz long-toed salamander <i>Ambystoma macrodactylum croceum</i>	AAAAA01082	Endangered	Endangered	G5T1T2	S1S2	FP
Santa Cruz microseris <i>Stebbinsoseris decipiens</i>	PDAST6E050	None	None	G2	S2	1B.2
Santa Cruz Mountains beardtongue <i>Penstemon rattanii</i> var. <i>kleei</i>	PDSCR1L5B1	None	None	G4T2	S2	1B.2
Santa Cruz Mountains pussypaws <i>Calyptridium parryi</i> var. <i>hesseae</i>	PDPOR09052	None	None	G3G4T2	S2	1B.1
Santa Cruz tarplant <i>Holocarpha macradenia</i>	PDAST4X020	Threatened	Endangered	G1	S1	1B.1
Santa Cruz wallflower <i>Erysimum teretifolium</i>	PDBRA160N0	Endangered	Endangered	G1	S1	1B.1
Schreiber's manzanita <i>Arctostaphylos glutinosa</i>	PDERI040G0	None	None	G1	S1	1B.2
Scotts Valley polygonum <i>Polygonum hickmanii</i>	PDPGN0L310	Endangered	Endangered	G1	S1	1B.1
Scotts Valley spineflower <i>Chorizanthe robusta</i> var. <i>hartwegii</i>	PDPGN040Q1	Endangered	None	G2T1	S1	1B.1
slender silver moss <i>Anomobryum julaceum</i>	NBMUS80010	None	None	G5?	S2	4.2
Smith's blue butterfly <i>Euphilotes enoptes smithi</i>	IILEPG2026	Endangered	None	G5T1T2	S1S2	
steelhead - central California coast DPS <i>Oncorhynchus mykiss irideus</i>	AFCHA0209G	Threatened	None	G5T2T3Q	S2S3	
swamp harebell <i>Campanula californica</i>	PDCAM02060	None	None	G3	S3	1B.2



Selected Elements by Common Name
California Department of Fish and Wildlife
California Natural Diversity Database



Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
tear drop moss <i>Dacryophyllum falcifolium</i>	NBMUS8Z010	None	None	G2	S2	1B.3
tidewater goby <i>Eucyclogobius newberryi</i>	AFCQN04010	Endangered	None	G3	S3	SSC
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	AMACC08010	None	Candidate Threatened	G3G4	S2	SSC
tricolored blackbird <i>Agelaius tricolor</i>	ABPBXB0020	None	None	G2G3	S1S2	SSC
western bumble bee <i>Bombus occidentalis</i>	IIHYM24250	None	None	G2G3	S1	
western pearlshell <i>Margaritifera falcata</i>	IMBIV27020	None	None	G4G5	S1S2	
western pond turtle <i>Emys marmorata</i>	ARAAD02030	None	None	G3G4	S3	SSC
western snowy plover <i>Charadrius alexandrinus nivosus</i>	ABNNB03031	Threatened	None	G3T3	S2S3	SSC
white-flowered rein orchid <i>Piperia candida</i>	PMORC1X050	None	None	G3	S3	1B.2
white-rayed pentachaeta <i>Pentachaeta bellidiflora</i>	PDAST6X030	Endangered	Endangered	G1	S1	1B.1
white-tailed kite <i>Elanus leucurus</i>	ABNKC06010	None	None	G5	S3S4	FP
woodland woollythreads <i>Monolopia gracilens</i>	PDAST6G010	None	None	G3	S3	1B.2
Zayante band-winged grasshopper <i>Trimerotropis infantilis</i>	IIORT36030	Endangered	None	G1	S1	

Record Count: 95

Southern Coho Salmon Captive Broodstock Program (UCSC-NOAA)
Project Location Map
T11S R02W S22, Santa Cruz Quad, Santa Cruz County



2016 RE 041 CEQA SOW

MBSTP Coho Captive Broodstock and Recovery Program

Introduction:

The Monterey Bay Salmon & Trout Project (MBSTP) will implement the 2016 MBSTP Coho Salmon Broodstock and Recovery Program. The program is the continued operation of the Kingfisher Flat Conservation Hatchery (KFH) and consists of the spawning, rearing and release of Coho Salmon in Scott Creek and possibly other regional streams. The MBSTP has been instrumental in preserving the Scott Creek (Santa Cruz Co.) Coho Salmon population for several decades. Without the MBSTP Coho Salmon program at KFH, it is likely that Coho Salmon would have become completely extirpated from Santa Cruz County streams, and the continued operation of the program will reduce the risk of extirpation of endangered Coho Salmon in Santa Cruz County.

The Grantee shall not proceed with implementation of the project until all necessary permits and the Notice to Proceed are secured.

Objective(s):

The objective of the project is to preserve and augment the Scott Creek (Santa Cruz Co.) Coho Salmon population through artificial spawning of mature Coho Salmon, captive rearing of progeny at KFH, and release of juvenile Coho Salmon in Scott Creek and possibly other regional streams, thereby reducing the risk of population extirpation. Natural production of Coho Salmon in Scott Creek has been extremely low in almost all of the last several years, with only a few (<10) adult Coho Salmon returning to Scott Creek each winter. This project will be implemented in coordination with the Southern Coho Salmon Captive Broodstock Program at the NOAA Southwest Fisheries Science Center (SWFSC) in Santa Cruz.

Project Description:

Location:

The MBSTP is located at 37.08972200 NL, 122.23055600 WL. The Kingfisher Flat Conservation Hatchery of the MBSTP is situated on Big Creek, tributary to Scott Creek, approx. 1.5 river-km upstream of the confluence of Big Creek and the mainstem of Scott Creek, and approx. 4.8 river-km from the Pacific Ocean. The SWFSC is located at 36.95166700 NL, 122.06500000 WL on the University of California at Santa Cruz Marine Science Campus at 110 Shaffer Road, Santa Cruz.

Project Set Up:

All fish husbandry work at the MBSTP KFH will be performed by the MBSTP Hatchery Manager and Fish Culturist, including spawning of broodstock, egg incubation, fish rearing through the smolt (age 1+) stage, and fish health

maintenance and treatment. Hatchery maintenance, repair and improvements will be implemented and overseen by the MBSTP Facility Manager. The MBSTP Executive Director will oversee all operations and administer grants.

Materials:

Equipment and materials needed for this project are as follows:

- Fish feed, including various pellets and crumble, fresh/frozen krill and various nutritional supplements such as vitamins and cod liver oil.
- Fish culture supplies, including various chemicals, therapeutics such as iodine, hydrogen peroxide, erythromycin, vibrio vaccine and ovaplant, and other materials such as pipettes, water filters, photoperiod light bulbs, oxygen, and basic laboratory supplies.
- Miscellaneous fish husbandry supplies as needed, including nets, netting, air stones, batteries and thermometers.

Tasks:

Task 1: Maintenance, repair and updating of the Kingfisher Flat Conservation Hatchery

This task includes hatchery building maintenance, equipment and systems maintenance, and grounds and vegetation maintenance. This task will be implemented by permanent MBSTP staff year-round, subcontractors and volunteers as appropriate.

Task 2: Inventory of captive broodstock to be spawned during spawning season.

This task will be implemented by permanent MBSTP staff, in coordination with staff at the SWFSC and Warm Springs Hatchery where part of the Coho Salmon Broodstock are reared for the MBSTP.

Task 3: Spawning of broodstock.

This task will be implemented by permanent MBSTP staff with assistance from contractors and volunteers as appropriate. Broodstock are spawned each year in January/February.

Task 4: Chemotherapeutic treatment of broodstock.

Each winter, MBSTP staff will treat broodstock Coho Salmon with hydrogen peroxide as prophylaxis against fungal infection as prescribed by CDFW Pathology staff.

Task 5: Rearing of young-of-the-year program Coho Salmon.

Following spawning each year, MBSTP staff, with help from subcontractors and volunteers as appropriate, will rear newly spawned Coho Salmon in a Moist Air Incubator, vertical tray incubators, troughs, and circular rearing tanks to the smolt stage.

Task 6: Release of program Coho Salmon.

Each year during spring (March-May) MBSTP staff, with help from subcontractors and volunteers as appropriate, will release program Coho Salmon smolts in Scott Creek and possibly other regional streams as advised by the program's Technical Advisory Committee whose members include NOAA and CDFW staff. In years where sufficient numbers of juvenile program Coho Salmon are available and loading densities in the rearing vessels exceed desirable levels, juvenile (age 0+) Coho Salmon will be released in Scott Creek in late fall.

Task 6: Reporting

MBSTP permanent staff will produce annual and final project reports.

Deliverables:

1. Throughout the grant period, maintenance of a fully operational Coho Salmon conservation hatchery facility.
2. Rearing of approx.. 120 adult broodstock Coho Salmon for spawning annually.
3. Each year of the grant period, production of a cohort of juvenile Coho Salmon from mature adult broodstock under the guidance of a genetic spawning matrix supplied by SWFSC Genetics Laboratory.
4. Each year, production of a cohort of Coho Salmon smolts of the highest possible physical quality for release in Scott Creek.
5. Periodic progress reports, annual reports and final report (hard copy and Compact Disc). The Final Report shall include the following:
 - o Demonstrated fish survival at the KFH conservation hatchery facility.
 - o broodyear-specific data on all fish in the program
 - o key metrics of performance during and following annual spawning (e.g., size, fecundity, survival)
 - o numbers of fish produced annually
 - o data on the date, number, life stage and release location of program fish released in regional Coho Salmon recovery watersheds
 - o any pertinent Geographic Information System (GIS) data

Timelines:

Task 1: Year-round, 365 days per year, throughout the grant period.

Task 2: Each year of the grant period, November – December.

Task 3: Each year of the grant period, December-March.

Task 4: Each year of the grant period, primarily December – May, but as needed and as prescribed by CDFW Pathology staff.

Task 5: Year-round throughout the grant period. Each new Coho Salmon cohort is reared for approx. 15 months, from spawning in winter through spring of the following year.

Task 6: Each year of the grant period, March – June.

Additional Requirements:

There are no additional requirements for this project.



Selected Elements by Common Name

California Department of Fish and Wildlife

California Natural Diversity Database



Query Criteria: Quad (Ano Nuevo (3712213) OR Big Basin (3712222) OR Castle Rock Ridge (3712221) OR Davenport (3712212) OR Felton (3712211) OR Franklin Point (3712223) OR Santa Cruz (3612281))

Possible species within the Davenport Quad and surrounding quads for 725240 MBSTP Coho Captive Broodstock and Recovery Program, T10S R03W S8, Santa Cruz and San Mateo Counties

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
American badger <i>Taxidea taxus</i>	AMAJF04010	None	None	G5	S3	SSC
American peregrine falcon <i>Falco peregrinus anatum</i>	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
An isopod <i>Calasellus californicus</i>	ICMAL34010	None	None	G2	S2	
Anderson's manzanita <i>Arctostaphylos andersonii</i>	PDERI04030	None	None	G2	S2	1B.2
Antioch specid wasp <i>Philanthus nasalis</i>	IIHYM20010	None	None	G1	S1	
arcuate bush-mallow <i>Malacothamnus arcuatus</i>	PDMAL0Q0E0	None	None	G2Q	S2	1B.2
bank swallow <i>Riparia riparia</i>	ABPAU08010	None	Threatened	G5	S2	
Ben Lomond buckwheat <i>Eriogonum nudum var. decurrens</i>	PDPGN08492	None	None	G5T1	S1	1B.1
Ben Lomond spineflower <i>Chorizanthe pungens var. hartwegiana</i>	PDPGN040M1	Endangered	None	G2T1	S1	1B.1
bent-flowered fiddleneck <i>Amsinckia lunaris</i>	PDBOR01070	None	None	G2G3	S2S3	1B.2
black swift <i>Cypseloides niger</i>	ABNUA01010	None	None	G4	S2	SSC
Blasdale's bent grass <i>Agrostis blasdalei</i>	PMPOA04060	None	None	G2	S2	1B.2
Bonny Doon manzanita <i>Arctostaphylos silvicola</i>	PDERI041F0	None	None	G1	S1	1B.2
burrowing owl <i>Athene cunicularia</i>	ABNSB10010	None	None	G4	S3	SSC
Butano Ridge cypress <i>Hesperocyparis abramsiana var. butanoensis</i>	PGCUP04082	Threatened	Endangered	G1T1	S1	1B.2
California black rail <i>Laterallus jamaicensis coturniculus</i>	ABNME03041	None	Threatened	G3G4T1	S1	FP
California giant salamander <i>Dicamptodon ensatus</i>	AAAAH01020	None	None	G3	S2S3	SSC
California red-legged frog <i>Rana draytonii</i>	AAABH01022	Threatened	None	G2G3	S2S3	SSC



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chaparral ragwort <i>Senecio aphanactis</i>	PDAST8H060	None	None	G3	S2	2B.2
Choris' popcornflower <i>Plagiobothrys chorisianus</i> var. <i>chorisianus</i>	PDBOR0V061	None	None	G3T2Q	S2	1B.2
Coastal Brackish Marsh <i>Coastal Brackish Marsh</i>	CTT52200CA	None	None	G2	S2.1	
coho salmon - central California coast ESU <i>Oncorhynchus kisutch</i>	AFCHA02034	Endangered	Endangered	G4	S2?	
Cooper's hawk <i>Accipiter cooperii</i>	ABNKC12040	None	None	G5	S4	WL
deceiving sedge <i>Carex saliniformis</i>	PMCYP03BY0	None	None	G2	S2	1B.2
Dolloff Cave spider <i>Meta dolloff</i>	ILARA17010	None	None	G1	S1	
Dudley's lousewort <i>Pedicularis dudleyi</i>	PDSCR1K0D0	None	Rare	G2	S2	1B.2
elongate copper moss <i>Mielichhoferia elongata</i>	NBMUS4Q022	None	None	G5	S4	4.3
Empire Cave pseudoscorpion <i>Fissilicreagris imperialis</i>	ILARAE5010	None	None	G1	S1	
Empire Cave pseudoscorpion <i>Neochthonius imperialis</i>	ILARAD1010	None	None	G1	S1	
fragrant fritillary <i>Fritillaria liliacea</i>	PMLIL0V0C0	None	None	G2	S2	1B.2
Franciscan thistle <i>Cirsium andrewsii</i>	PDAST2E050	None	None	G3	S3	1B.2
globose dune beetle <i>Coelus globosus</i>	IICOL4A010	None	None	G1G2	S1S2	
great blue heron <i>Ardea herodias</i>	ABNGA04010	None	None	G5	S4	
hoary bat <i>Lasiurus cinereus</i>	AMACC05030	None	None	G5	S4	
Kellman's bristle moss <i>Orthotrichum kellmanii</i>	NBMUS56190	None	None	G2	S2	1B.2
Kellogg's horkelia <i>Horkelia cuneata</i> var. <i>sericea</i>	PDROS0W043	None	None	G4T1?	S1?	1B.1
Kings Mountain manzanita <i>Arctostaphylos regismontana</i>	PDERI041C0	None	None	G2	S2	1B.2
Loma Prieta hoita <i>Hoita strobilina</i>	PDFAB5Z030	None	None	G2	S2	1B.1
longfin smelt <i>Spirinchus thaleichthys</i>	AFCHB03010	Candidate	Threatened	G5	S1	SSC



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Mackenzie's Cave amphipod <i>Stygobromus mackenziei</i>	ICMAL05530	None	None	G1	S1	
maple-leaved checkerbloom <i>Sidalcea malachroides</i>	PDMAL110E0	None	None	G3	S3	4.2
marbled murrelet <i>Brachyramphus marmoratus</i>	ABNNN06010	Threatened	Endangered	G3G4	S1	
Maritime Coast Range Ponderosa Pine Forest <i>Maritime Coast Range Ponderosa Pine Forest</i>	CTT84132CA	None	None	G1	S1.1	
marsh microseris <i>Microseris paludosa</i>	PDAST6E0D0	None	None	G2	S2	1B.2
marsh sandwort <i>Arenaria paludicola</i>	PDCAR040L0	Endangered	Endangered	G1	S1	1B.1
Methuselah's beard lichen <i>Usnea longissima</i>	NLLEC5P420	None	None	G4	S4	4.2
mimic tryonia (=California brackishwater snail) <i>Tryonia imitator</i>	IMGASJ7040	None	None	G2	S2	
minute pocket moss <i>Fissidens pauperculus</i>	NBMUS2W0U0	None	None	G3?	S2	1B.2
moestan blister beetle <i>Lytta moesta</i>	IICOL4C020	None	None	G2	S2	
monarch - California overwintering population <i>Danaus plexippus pop. 1</i>	IILEPP2012	None	None	G4T2T3	S2S3	
Monterey pine <i>Pinus radiata</i>	PGPIN040V0	None	None	G1	S1	1B.1
Monterey Pine Forest <i>Monterey Pine Forest</i>	CTT83130CA	None	None	G1	S1.1	
Mount Hermon (=barbate) June beetle <i>Polyphylla barbata</i>	IICOL68030	Endangered	None	G1	S1	
Myrtle's silverspot butterfly <i>Speyeria zerene myrtleae</i>	IILEPJ608C	Endangered	None	G5T1	S1	
N. Central Coast Calif. Roach/Stickleback/Steelhead Stream <i>N. Central Coast Calif. Roach/Stickleback/Steelhead Stream</i>	CARA2633CA	None	None	GNR	SNR	
North Central Coast Drainage Sacramento Sucker/Roach River <i>North Central Coast Drainage Sacramento Sucker/Roach River</i>	CARA2623CA	None	None	GNR	SNR	
North Central Coast Short-Run Coho Stream <i>North Central Coast Short-Run Coho Stream</i>	CARA2632CA	None	None	GNR	SNR	
Northern Coastal Salt Marsh <i>Northern Coastal Salt Marsh</i>	CTT52110CA	None	None	G3	S3.2	
northern curly-leaved monardella <i>Monardella sinuata ssp. nigrescens</i>	PDLAM18162	None	None	G3T2	S2	1B.2



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Northern Interior Cypress Forest <i>Northern Interior Cypress Forest</i>	CTT83220CA	None	None	G2	S2.2	
Northern Maritime Chaparral <i>Northern Maritime Chaparral</i>	CTT37C10CA	None	None	G1	S1.2	
obscure bumble bee <i>Bombus caliginosus</i>	IIHYM24380	None	None	G4?	S1S2	
Ohlone manzanita <i>Arctostaphylos ohloneana</i>	PDERI042Y0	None	None	G1	S1	1B.1
Ohlone tiger beetle <i>Cicindela ohlone</i>	IICOL026L0	Endangered	None	G1	S1	
osprey <i>Pandion haliaetus</i>	ABNKC01010	None	None	G5	S4	WL
pallid bat <i>Antrozous pallidus</i>	AMACC10010	None	None	G5	S3	SSC
pine rose <i>Rosa pinetorum</i>	PDROS1J0W0	None	None	G2	S2	1B.2
Point Reyes horkelia <i>Horkelia marinensis</i>	PDROS0W0B0	None	None	G2	S2	1B.2
Point Reyes meadowfoam <i>Limnanthes douglasii ssp. sulphurea</i>	PDLIM02038	None	Endangered	G4T1	S1	1B.2
robust spineflower <i>Chorizanthe robusta var. robusta</i>	PDPGN040Q2	Endangered	None	G2T1	S1	1B.1
round-leaved filaree <i>California macrophylla</i>	PDGER01070	None	None	G3?	S3?	1B.2
saltmarsh common yellowthroat <i>Geothlypis trichas sinuosa</i>	ABPBX1201A	None	None	G5T3	S3	SSC
San Francisco campion <i>Silene verecunda ssp. verecunda</i>	PDCAR0U213	None	None	G5T2	S2	1B.2
San Francisco collinsia <i>Collinsia multicolor</i>	PDSCR0H0B0	None	None	G2	S2	1B.2
San Francisco dusky-footed woodrat <i>Neotoma fuscipes annectens</i>	AMAFF08082	None	None	G5T2T3	S2S3	SSC
San Francisco gartersnake <i>Thamnophis sirtalis tetrataenia</i>	ARADB3613B	Endangered	Endangered	G5T2Q	S2	FP
San Francisco popcornflower <i>Plagiobothrys diffusus</i>	PDBOR0V080	None	Endangered	G1Q	S1	1B.1
sand-loving wallflower <i>Erysimum ammophilum</i>	PDBRA16010	None	None	G2	S2	1B.2
sandy beach tiger beetle <i>Cicindela hirticollis gravida</i>	IICOL02101	None	None	G5T2	S2	
Santa Clara red ribbons <i>Clarkia concinna ssp. automixa</i>	PDONA050A1	None	None	G5?T3	S3	4.3



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Santa Cruz black salamander <i>Aneides niger</i>	AAAAD01070	None	None	G3	S3	SSC
Santa Cruz clover <i>Trifolium buckwestiorum</i>	PDFAB402W0	None	None	G2	S2	1B.1
Santa Cruz cypress <i>Hesperocyparis abramsiana</i> var. <i>abramsiana</i>	PGCUP04081	Threatened	Endangered	G1T1	S1	1B.2
Santa Cruz kangaroo rat <i>Dipodomys venustus venustus</i>	AMAFD03042	None	None	G4T1	S1	
Santa Cruz microseris <i>Stebbinsoseris decipiens</i>	PDAST6E050	None	None	G2	S2	1B.2
Santa Cruz Mountains beardtongue <i>Penstemon rattanii</i> var. <i>kleei</i>	PDSCR1L5B1	None	None	G4T2	S2	1B.2
Santa Cruz Mountains pussypaws <i>Calyptridium parryi</i> var. <i>hesseae</i>	PDPOR09052	None	None	G3G4T2	S2	1B.1
Santa Cruz tarplant <i>Holocarpha macradenia</i>	PDAST4X020	Threatened	Endangered	G1	S1	1B.1
Santa Cruz wallflower <i>Erysimum teretifolium</i>	PDBRA160N0	Endangered	Endangered	G1	S1	1B.1
Schreiber's manzanita <i>Arctostaphylos glutinosa</i>	PDERI040G0	None	None	G1	S1	1B.2
Scotts Valley polygonum <i>Polygonum hickmanii</i>	PDPGN0L310	Endangered	Endangered	G1	S1	1B.1
Scotts Valley spineflower <i>Chorizanthe robusta</i> var. <i>hartwegii</i>	PDPGN040Q1	Endangered	None	G2T1	S1	1B.1
short-leaved evax <i>Hesperevax sparsiflora</i> var. <i>brevifolia</i>	PDASTE5011	None	None	G4T3	S2	1B.2
slender silver moss <i>Anomobryum julaceum</i>	NBMUS80010	None	None	G5?	S2	4.2
slender-leaved pondweed <i>Stuckenia filiformis</i> ssp. <i>alpina</i>	PM POT03091	None	None	G5T5	S3	2B.2
Smith's blue butterfly <i>Euphilotes enoptes smithi</i>	IILEPG2026	Endangered	None	G5T1T2	S1S2	
steelhead - central California coast DPS <i>Oncorhynchus mykiss irideus</i>	AFCHA0209G	Threatened	None	G5T2T3Q	S2S3	
Steller (=northern) sea-lion <i>Eumetopias jubatus</i>	AMAJC03010	Delisted	None	G3	S2	
stinkbells <i>Fritillaria agrestis</i>	PMLIL0V010	None	None	G3	S3	4.2
swamp harebell <i>Campanula californica</i>	PDCAM02060	None	None	G3	S3	1B.2
tear drop moss <i>Dacryophyllum falcifolium</i>	NBMUS8Z010	None	None	G2	S2	1B.3



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tidewater goby <i>Eucyclogobius newberryi</i>	AFCQN04010	Endangered	None	G3	S3	SSC
Toren's grimmia <i>Grimmia torenii</i>	NBMUS32330	None	None	G2	S2	1B.3
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	AMACC08010	None	Candidate Threatened	G3G4	S2	SSC
tricolored blackbird <i>Agelaius tricolor</i>	ABPBXB0020	None	None	G2G3	S1S2	SSC
unsilvered fritillary <i>Speyeria adiastra adiastra</i>	IILEPJ6143	None	None	G1G2T1	S1	
vaginulate grimmia <i>Grimmia vaginulata</i>	NBMUS32340	None	None	G2G3	S1	1B.1
western bumble bee <i>Bombus occidentalis</i>	IIHYM24250	None	None	G2G3	S1	
western pearlshell <i>Margaritifera falcata</i>	IMBIV27020	None	None	G4G5	S1S2	
western pond turtle <i>Emys marmorata</i>	ARAAD02030	None	None	G3G4	S3	SSC
western snowy plover <i>Charadrius alexandrinus nivosus</i>	ABNNB03031	Threatened	None	G3T3	S2S3	SSC
white-flowered rein orchid <i>Piperia candida</i>	PMORC1X050	None	None	G3	S3	1B.2
white-rayed pentachaeta <i>Pentachaeta bellidiflora</i>	PDAST6X030	Endangered	Endangered	G1	S1	1B.1
white-tailed kite <i>Elanus leucurus</i>	ABNKC06010	None	None	G5	S3S4	FP
woodland woollythreads <i>Monolopia gracilens</i>	PDAST6G010	None	None	G3	S3	1B.2
Zayante band-winged grasshopper <i>Trimerotropis infantilis</i>	IIORT36030	Endangered	None	G1	S1	

Record Count: 116

MBSTP Coho Captive Broodstock and Recovery Program
Project Location Map
T10S R03W S8, Davenport Quad, Santa Cruz County

