

Biological Monitoring Report for Cotoni-Coast Dairies Biological Monitoring Plan

Prepared in 4th Quarter by BLM Central Coast Field Office:

Mike Powers. Natural Resource Specialist (Wildlife)

Ryan O'Dell. Natural Resource Specialist (Botany/Soils)

Mike Westphal. Ecologist (Wildlife)

October 20, 2022

Introduction

Presidential Proclamation 9563 added Cotoni-Coast Dairies to the California Coastal National Monument in 2017. The most frequently used term in the Cotoni-Coast Dairies (C-CD) section of the Presidential Proclamation is “diversity,” used to highlight the importance of the native biological diversity of species utilizing these lands. The Proclamation discusses the diversity of habitat types, species listed under the Endangered Species Act, and some of the unlisted native species onsite. The BLM will work towards conserving, protecting and restoring all species noted in the Proclamation, as well as the diversity of native species not noted. For many of the common wildlife and plant species noted in the Proclamation, the BLM can meet this goal by managing their habitats effectively. For example, working towards protection and enhancement of riparian areas accounts for many of the common species noted in the Proclamation, such as red alder. Therefore, specific restoration goals or formal monitoring protocols for each species discussed in the Proclamation is not recommended or proposed.

The BLM released its Cotoni-Coast Dairies Proposed Resource Management Plan Amendment (RMPA) and Environmental Assessment in September 2020. The RMPA was developed to allow for public access and enjoyment of C-CD, while ensuring the conservation, protection and restoration. A key component of the approach described above is effective monitoring. BLM will use a biological monitoring approach that is adaptive to incorporate changes in policy and updates in biological information over time, such as the listing or discovery of any species utilizing these Monument lands, and improved understanding of threats to species related to BLM's land management practices. See **Figures 1, 2 and 3** for current monitoring locations at C-CD.

The monitoring approaches identified here provide a broad suite of monitoring tools. The BLM's ability to complete monitoring components is subject to the availability of funds and staff. The BLM envisions the monitoring plan as a living document that will evolve over time as monitoring capacity and needs change.

This Biological Monitoring Report provides an update for 2022 for programs discussed in each section of BLM's 2021 Biological Monitoring Plan, which is the document that provides the background information for the monitoring approaches presented in this update.

Document Outline:

I. Weather and Climate
II. Water Quality
III. Soil, Vegetation, and Rangelands
IV. Wildlife
V. Special Status Species
VI. Recreation
VII. Emerging Technologies
VIII. Research and Education

Biological Monitoring Report for Cotoni-Coast Dairies (October 2022).

Biological Monitoring Plan Indicators, Methods, Timing, Frequency Summary Table:

Resources	Indicators	Methods	Timing	Frequency	Status
Weather and Climate	Air temperature, wind speed and direction, relative humidity, precipitation, and soil moisture. Quantitative.	Automated, instrumental – Remote Automated Weather Station (RAWS)	Constant, continuous	Continuous, hourly	Initiated (Sept 2021) and ongoing.
Water Quantity – Springs	Flow rate. Quantitative.	Manual for springs.	Year-round	Monthly for springs for 1 st two years, then quarterly.	Initiated (Jan 2021) and ongoing.
Water Quantity - Streams	Flow rate. Quantitative.	Automated gauging station	Year-round	Continuous, hourly	Automated gauging station not funded or initiated. Other water quantity information collected by City of Santa Cruz Water Resources.
Water Quantity - Ponds	Water depth. Quantitative.	Manual – Visual read. Staff gauges.	Year-round	Quarterly	Not yet initiated.
Water Quality - Streams	See BLM National Aquatic AIM program reference.	Manual, instrumental	Year-round	Annually	Information collected by BLM National Aquatic AIM program for 4 streams in summer

Biological Monitoring Report for Cotoni-Coast Dairies (October 2022).

					season in 2021 and 2022.
Water Quality – Streams and Ponds	Invertebrate diversity and abundance. Quantitative.	Manual – Collection and identification.	Summer/Fall	At least every 5 years. Annually	Information collected by BLM National AIM program for four streams in summer season in 2021 and 2022.
Soil Integrity	See Vegetation	See Vegetation	See Vegetation	See Vegetation	
Vegetation - Plant Species	Diversity. Quantitative.	Manual - Casual surveys. Crowdsourcing/ Citizen Science	Year-round	Incidental, all year	Initiated (2018) and ongoing. Plant species observations by BLM staff are uploaded to Calflora. Species observations by the public are uploaded to iNaturalist and Calflora.
Vegetation – All Types	Vegetation cover and structure. Weeds presence and abundance. Pathogen (SOD) presence and abundance. Evidence of soil erosion. Qualitative.	Manual – Photomonitoring. Landscape level photopoints. Digital camera, T-post marker.	Year-round	Quarterly	Initiated and ongoing. Photomonitoring within the CZU August Lightning area was initiated Feb 2021 and is ongoing. Photos are collected quarterly. Chronolog photomonitoring stations CCD-102 and CCD-103 were installed along Agua Puerca trail in October 2022. Additional Chronolog photomonitoring stations will be installed

Biological Monitoring Report for Cotoni-Coast Dairies (October 2022).

					as trail construction progresses.
Vegetation (upland) – Grasslands, Rangelands	Cover and abundance, by species. Residual Dry Matter (RDM). Quantitative	Manual - Photo-based monitoring of randomized study plots (quadrat grid) with quantitative data extraction. Cover type (plant or bare soil) and abundance by species. RDM collected and weighed and subset of sites.	Spring/Summer	Annually	Initiated (Oct 2022) and ongoing. Eight range study plots were installed within the grasslands of RMZ1 in October 2022.
Wildlife – All Species	Diversity. Quantitative.	Manual - Casual surveys. Crowdsourcing/ Citizen Science	All year	Incidental, all year	Not yet initiated. Pending public access.
Wildlife – Non-Native Species	Presence/absence	Incidental observations	All year	Incidental, all year	Initiated and ongoing.
Wildlife – Terrestrial Invertebrates	Diversity, distribution.	Manual - Collection and identification.	Spring/Summer	Two or more year cycle.	Not yet initiated. Subject to availability of funding. Not yet funded.
Wildlife - Monarchs	Population census. Quantitative.	Manual – Survey, Counts.	Winter (over-wintering)	Annually	Initiated and ongoing. Led by partner organizations (Groundswell, Xerces)
Wildlife – Reptiles and Amphibians	Diversity, distribution, and abundance. Quantitative.	Manual –Coverboards for counts.	All year	Incidental, all year	Initiated and ongoing. Coverboard project initiated.

Biological Monitoring Report for Cotoni-Coast Dairies (October 2022).

Wildlife - Birds	Diversity, distribution, and abundance. Quantitative.	Manual - Surveys. Visual, auditory. Counts.	-Breeding season (March-May), -Spring migration (Feb-April) -Fall migration (Sept. – Nov.)	Specific season surveys on three-year cycle. Incidental, all year.	Not yet initiated. Subject to availability of funding. Not yet funded.
Wildlife - Mammals	Diversity, distribution, and abundance.	Camera trap array	Dry season	Continuous	Not yet initiated. Subject to availability of funding in partnership with San Vicente Redwoods. Not yet funded.
Wildlife - Badgers	Diversity, distribution, and abundance. Quantitative.	Scent detection dogs	Summer	Two or more year cycle. Determine best frequency to maximize detection	Not yet initiated. Subject to availability of funding. Not yet funded.
Wildlife – Puma	Distribution and abundance. Quantitative.	Manual - Identification. Visual documentation, trapping,	All year	Dependent on research needs.	Initiated and ongoing. Led by partner organization (UCSC)
Special Status Species – California Red Legged Frog	Population census, species distribution, habitat condition. Quantitative.	Manual – California Red legged frog monitoring protocol. Night driving surveys, stream surveys, pond surveys. Counts of breeding adults. Counts of tadpoles.	Winter, Spring. October-March following rain events ----- During breeding season	Annually	Initiated and ongoing.

Biological Monitoring Report for Cotoni-Coast Dairies (October 2022).

Special Status Species – Steelhead trout and Coho salmon	Species distribution. Quantitative.	Manual – Steelhead trout and Coho salmon monitoring protocols.	Spring to Fall	Determined by organizations conducting specific surveys.	Initiated and ongoing. Led by partner organizations (City of Santa Cruz, NOAA-NMFS)
Recreation - Parking	Parking availability	Incidental documentation of parking availability/issues at BLM parking lots	Year-round	Monthly monitoring, quarterly documentation	Not yet initiated. Pending completion of the parking lot and public access.
Recreation – Trail Condition	Identification of trail maintenance issues and erosional features	Monthly trail monitoring	Year-round	Monthly monitoring, quarterly documentation	Not yet initiated. Pending public access.
Recreation – Social Trails	Identification of social/unauthorized trails	Monthly trail monitoring	Year-round	Monthly monitoring, quarterly documentation	Not yet initiated. Pending public access.
Recreation – Sensitive Habitats	Documentation of unauthorized entry into sensitive habitat areas in RMZ 2 and 4	Monitoring using trail cameras	Year-round	Monthly data collection, quarterly documentation	Not yet initiated. Pending public access.

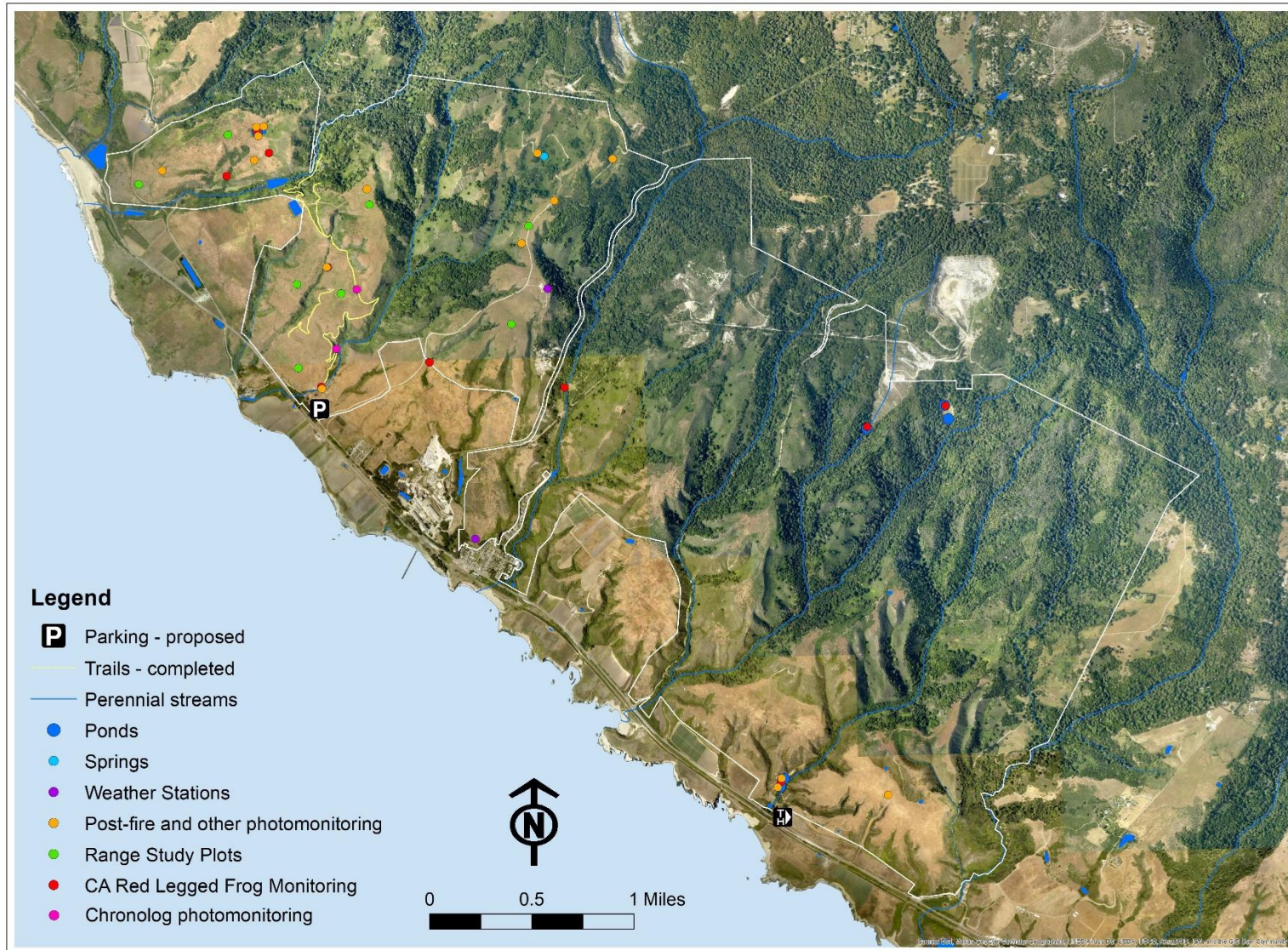


Figure 1. Monitoring overview of C-CD - Entire. Monitoring data collection locations.

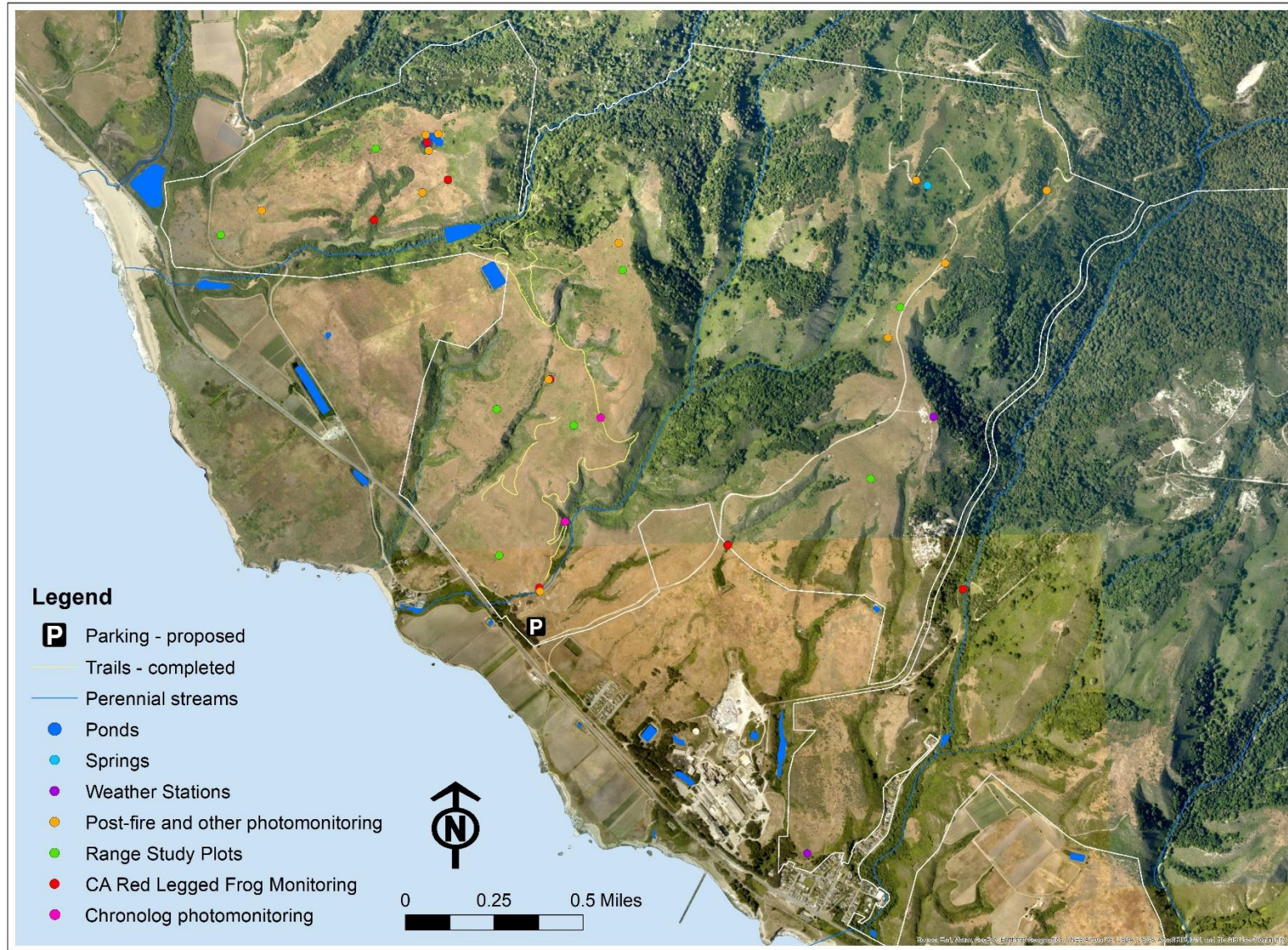


Figure 2. Monitoring overview of C-CD – North (RMZ 1 & 2). Monitoring data collection locations.

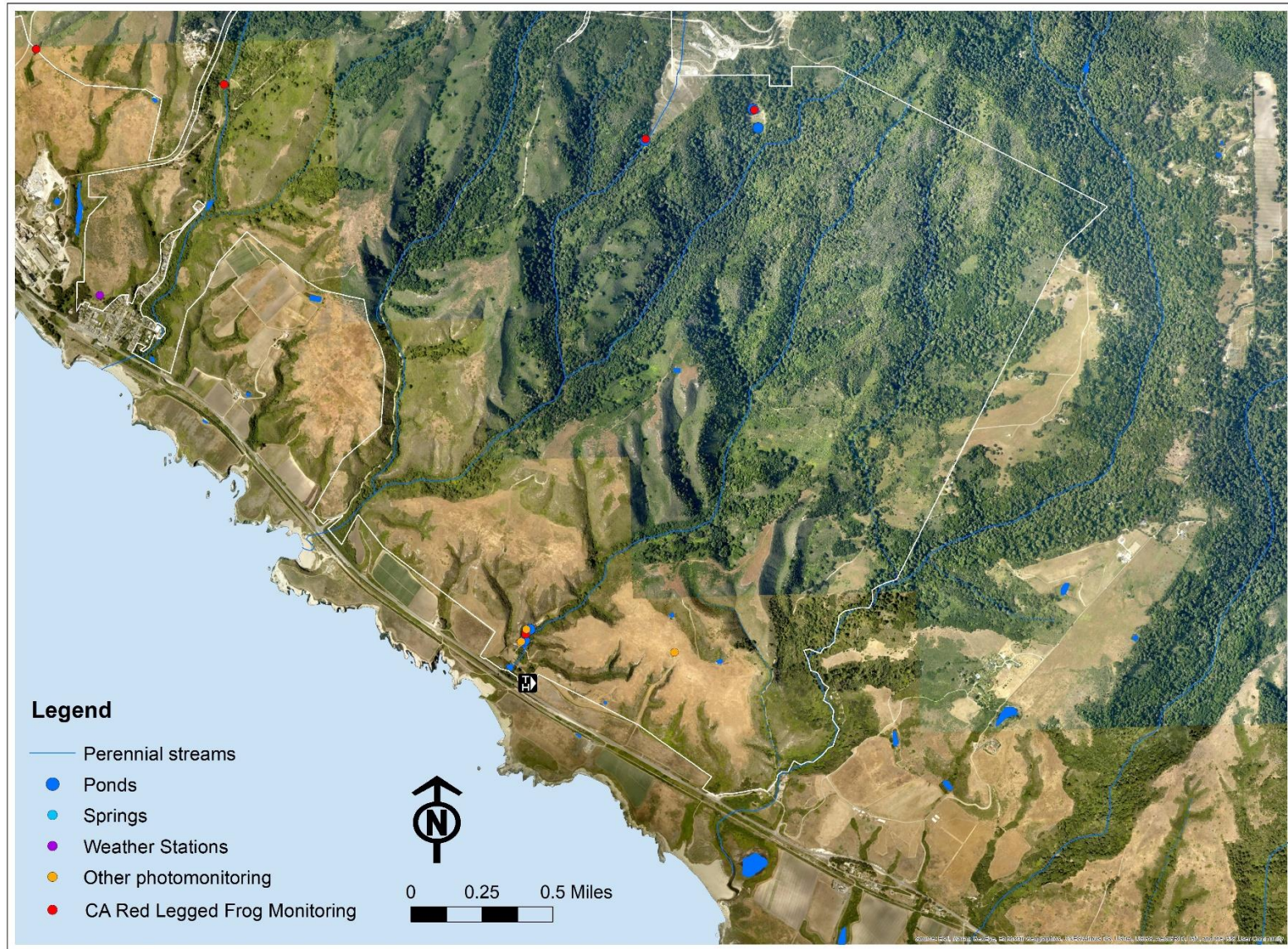


Figure 3. Monitoring overview of C-CD – South (RMZ 3 & 4). Monitoring data collection locations.

I. Weather and Climate

Indicators Monitored: Weather

The Coast Dairies Remote Automatic Weather Station (RAWS) was installed on September 13, 2021. The RAWS continuously measures air temperature, wind speed and direction, relative humidity, precipitation, and soil moisture at three depths (2, 4, and 8 inches). Data collection is automatic. Coast Dairies RAWS data is available at:

<https://wrcc.dri.edu/cgi-bin/rawMAIN.pl?caCCDA>

Average annual precipitation where the Coast Dairies RAWS is installed is 26 inches. The total precipitation for water year 2022 was approximately average, despite most of the rest of the South Coast Ranges region being in extreme drought (**Figure 4**). Continuation of the drought is forecast for water year 2023.

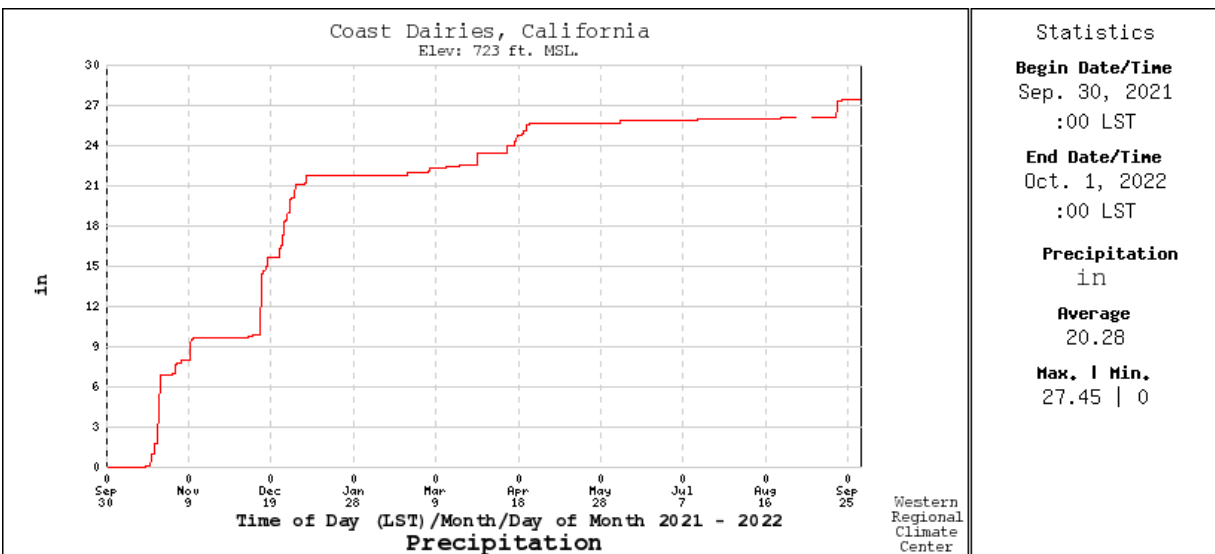


Figure 4. Cotoni-Coast Dairies precipitation total for water year 2022 (September 2021 – October 2022). Precipitation data from the Coast Dairies RAWS.

II. Water

Indicators Monitored: Water Quantity - Spring flow

Surface water flow rate is measured monthly at four springs in RMZ1. The monitored springs include Molino Pasture, Agua Puerca, Middle Warrenella, and Upper Warrenella (**Figures 5 – 7**). The spring surface flow is diverted into a container for a few minutes. The surface flow rate is a simple calculation of the volume of water collected divided by the total time of collection

**Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).**

(gallons per minute). Note: while the “Middle Warrenella Spring” at Lat. 37.0259, Lon. - 122.1981 was evaluated with the same methodology, no Figures will be included for this location below because no water was present on any date and this was discontinued in March 2022.

Biological Monitoring Report for Cotoni-Coast Dairies (October 2022).

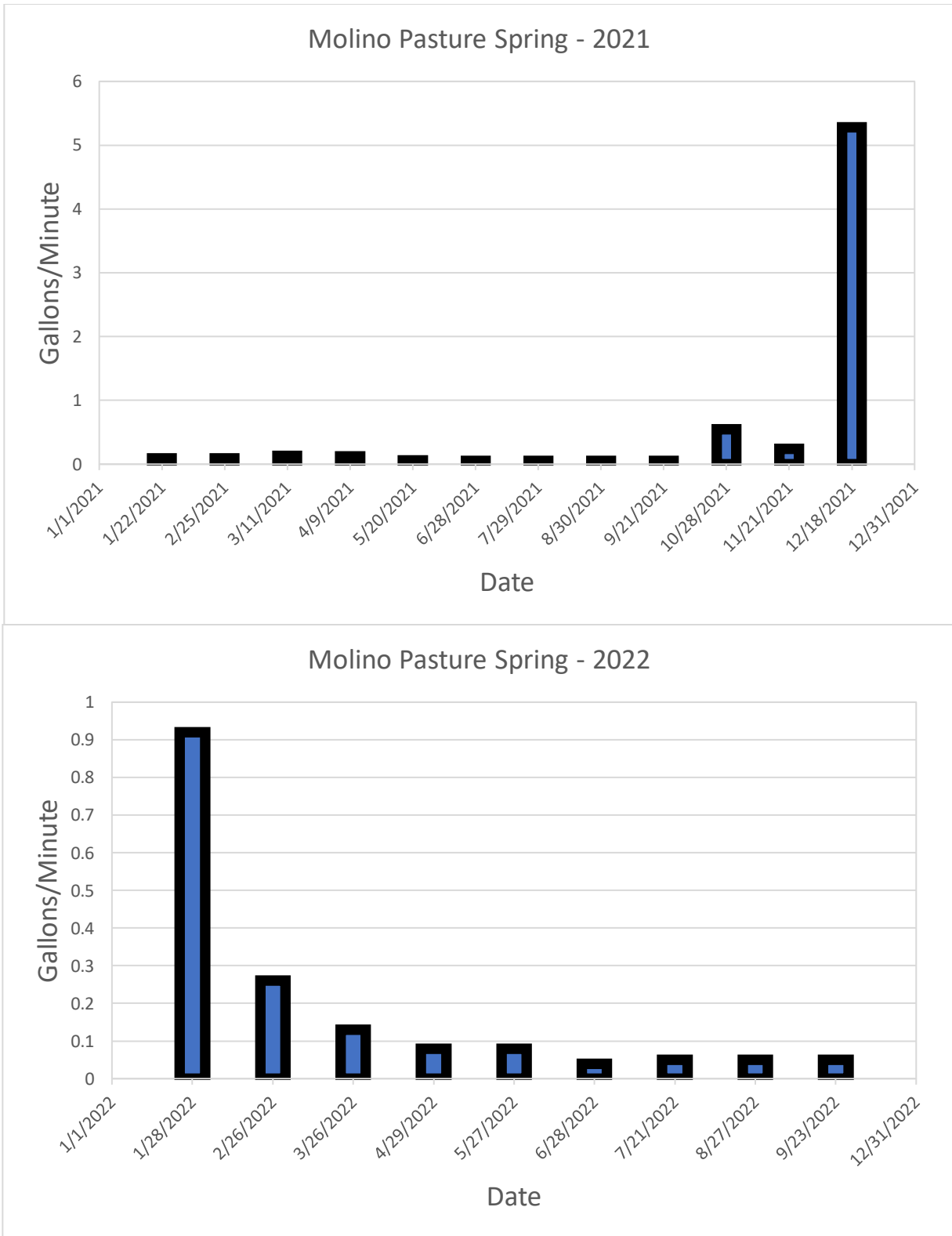


Figure 5. Surface water flow rate at Molino Pasture Springs for 2021, and 2022. Lat. 37.0408, Lon. -122.2120

Biological Monitoring Report for Cotoni-Coast Dairies (October 2022).

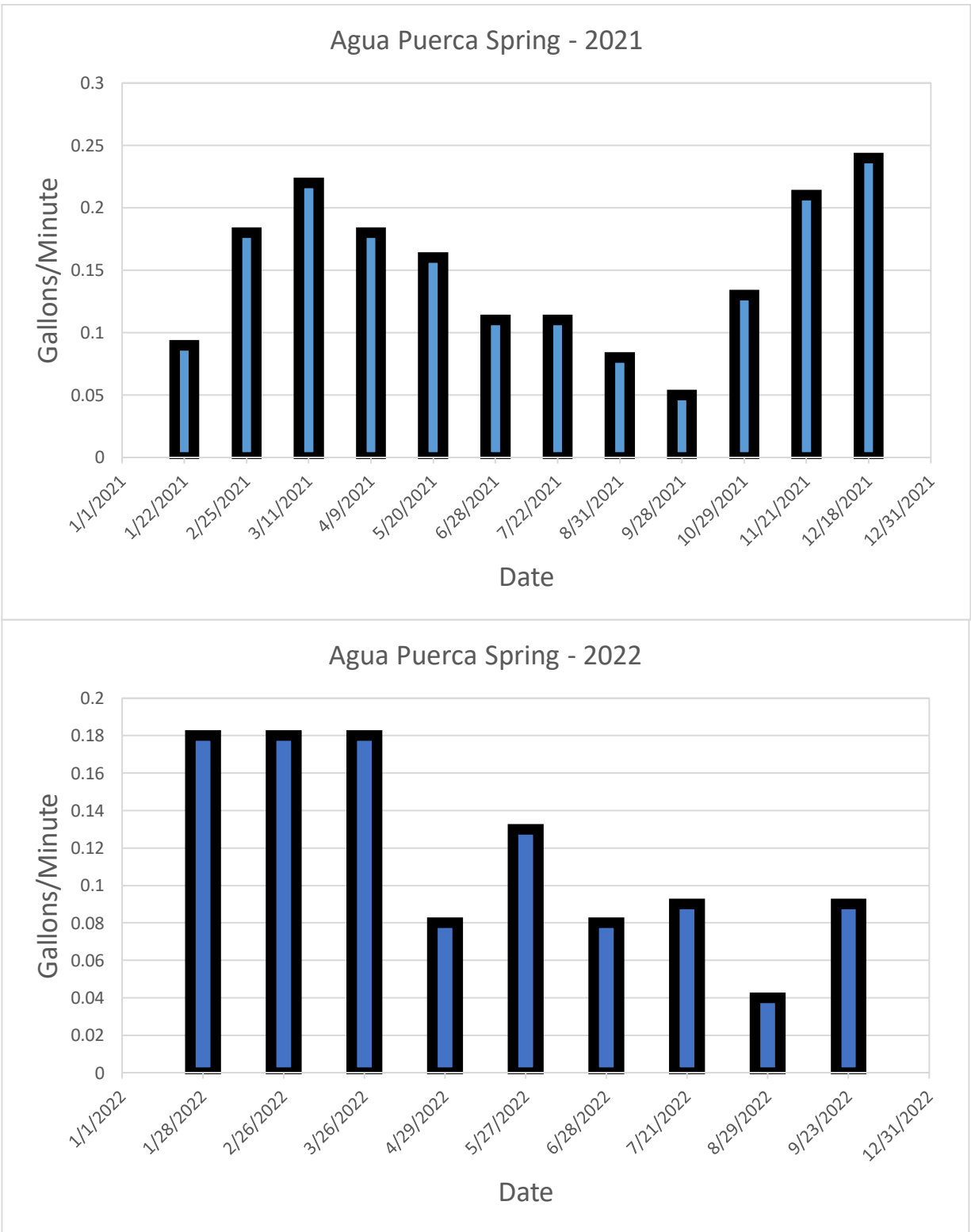


Figure 6. Surface water flow rate at Agua Puerca Spring for 2021 and 2022. Lat. 37.0326, Lon. -122.2072

Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).

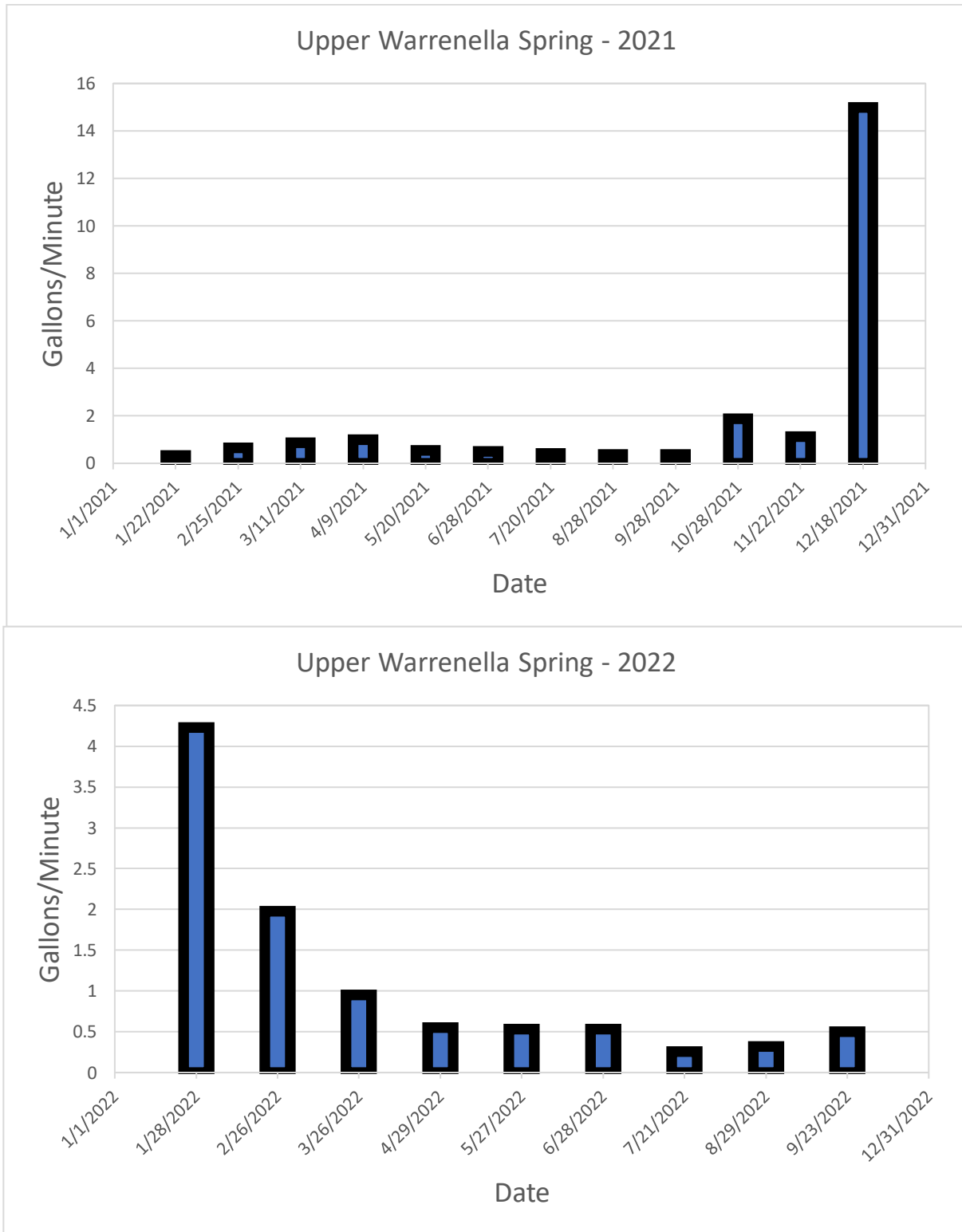


Figure 7. Surface water flow rate at Upper Warrenella Spring for 2021 and 2022. Lat. 37.0395, Lon. -122.1872

Indicators Monitored: Water Quantity and Quality

BLM's National Assessment, Inventory, and Monitoring (AIM) program collected water quality and quantity data for four stream sites in the summer seasons of 2021 and 2022. See attachment for data collected in 2021. The 2022 data will be shared in a future update as this is pending further processing by the BLM AIM program.

Water quantity flow information collected by City of Santa Cruz Water Resources for Laguna and Liddell Creeks (see Salmonid Report attachment).

Automated gauging station concept subject to availability of funding and was not initiated.

Indicators Monitored: Water Quantity - Ponds

Pond water depth staff gauges are planned to be placed in multiple ponds onsite. This information will be included in a subsequent update.

III. Soil, Vegetation, and Rangelands

Indicators Monitored: Plant Species Diversity

Plant species diversity is measured and monitored through casual surveys conducted by BLM staff. Plant species observations are uploaded to Calflora. Crowdsourcing and Citizen Science observations are uploaded to iNaturalist and Calflora. A current plant species list for C-CD is available here on Calflora: https://www.calflora.org/app/ipl/idx?loc_id=gpi225. It includes all current plant species observations for C-CD. In addition to casual surveys at C-CD, a formal botanical survey and report for the Warrenella Road Gate Parking Area and Trailhead was completed on June 29, 2022.

Indicators Monitored: Vegetative Cover and Composition; Soil Integrity.

Vegetative cover and soil integrity (health) are interrelated. Soil supports vegetation by providing a substrate to root into and a supply of water and nutrients. Vegetative cover protects soil from erosion and contributes to soil formation through mineral weathering and addition of organic matter. Measures of vegetative cover and composition provide indicators of vegetation and soil health. Vegetative cover and composition at C-CD is monitored through a combination of photomonitoring (qualitative) and measures of % cover by species (quantitative).

The CZU August Lightning fire of 2020 burned most of RMZ1. The fire was contained in late September 2020. A total of eight photomonitoring stations (T-post) were established within the burned area at C-CD in October 2020, in order to monitor vegetation recovery. Starting in

Biological Monitoring Report for Cotoni-Coast Dairies (October 2022).

February 2021, a photo was collected from each of these photomonitoring points monthly. In 2022 and beyond, a photo will be collected from each monitoring station at three-month intervals (quarterly). **Figures 8 - 18** shows photomonitoring from these eight photomonitoring stations. Grassland vegetative cover recovered entirely within the first year (2021) of growth and there was almost no visible evidence remaining that a fire had occurred within that vegetation type. Woody vegetation types including coastal scrub and conifer forest have been slower to recover and will likely take at least several years to achieve the level of vegetative cover before the fire. There has been no evidence of soil erosion within the grasslands and little to no evidence of soil erosion on the steeper slopes of the coastal scrub and conifer forest vegetation types.

Following the 2020 CZU August Lightning fire, invasive French broom (*Genista monspessulana*) greatly increased in abundance at the Warrenella East monitoring station, the site of an old quarry (**Figure 19**). The species is broadly distributed across large areas of very steep (80%+) slopes where ground access for manual removal or to treat it with herbicide is almost impossible. The only areas of French broom that are accessible for treatment are along roads. Only a small proportion (<5%) of the total area of French broom was treated with foliar applications of glyphosate herbicide in September 2021. A BLM-owned UTV and spray rig were used to apply the herbicide (**Figure 20**). The foliar herbicide application is effective to kill French broom, but the application method using a ground-based vehicle, greatly limits herbicide application in this steep terrain. Aerial herbicide application method (e.g. drone) was originally proposed in the C-CD Weed Management Plan, but that method was not included in the final plan, due to public opposition. There are no feasible options remaining to control French broom on such steep slopes.

Photomonitoring is being conducted along completed segments of recreation trails. Two Chronolog photomonitoring stations (CCD-102; CCD-103) were installed along completed segments of the Agua Puerca trail in October 2022 (**Figures 21 – 25**). The Chronolog photomonitoring stations are designed to allow anyone, including public visitors, to collect photos and upload them to the Chronolog website. Once there is public access on the recreation trails, visitors will be able to participate in citizen science by collecting and uploading monitoring photos. Until there is public access, BLM staff will collect and upload monitoring photos to the Chronolog website at three-month intervals (quarterly). The BLM purchased ten Chronolog stations total. Two have been installed and the remaining eight stations will be installed as additional segments of the trails are completed. Chronolog station CCD-101 will be installed on the foot bridge currently being constructed across Agua Puerca Creek. Bridge construction should be completed within the next few months.

In addition to photomonitoring (qualitative) for vegetation and soil condition, eight range study plots were established within the grasslands of RMZ1. The range study plots were established in October 2022 to measure % plant cover by species and Residual Dry Matter (RDM=thatch; **Figures 26 – 33**). Each study plot measures 3 x 3 ft. Rebar stakes were anchored into the ground to mark two diagonal corners of each study plot. Plant cover (%) by species data and RDM measurements from each study plot will be collected annually in late Summer, at the end of the grazing season. The % cover by species will be visually estimated while in the field, or from a high-resolution photo of the study plot. RDM biomass will be collected from within a 1 x 1 ft square randomly placed within the study plot. The RDM biomass will be collected into a paper

**Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).**

bag, air dried, and then weighed. This allows for a calculation of mass (lb) per unit area (acre) of RDM.

The % cover by species and RDM for the range study plots for 2022 is presented in **Table 1**. Most of the study plots had 100% vegetative cover. The RDM in the grasslands is relatively high with 2497 to 9428 lb/acre. Most of the plant species cover on the study plots of 2, 3, 4, 6, 7, and 8 (all on Terrace 2) consists of non-native annual grasses and forbs. Study plots 1 and 5 on Terrace 3 have significant cover of the native purple needlegrass (*Stipa pulchra*). The difference in cover of native purple needlegrass between Terrace 2 and Terrace 3 likely reflects historic land use differences between these two areas. The lower elevation Terrace 2 was likely subject to cultivation and more intensive levels of livestock grazing, as compared to the higher elevation Terrace 3.

Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).



Figure 8. Lower Agua Puerca. Lat. 37.030490, Lon. -122.203898. This photo series shows the seasonal change of grassland growth (green) and senescence (brown). Grassland growth is dependent upon soil moisture availability. The highest soil moisture availability is in Winter.

**Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).**



July 2021



July 2022

Figure 9. Lower Agua Puerca. Lat. 37.030490, Lon. -122.203898. Looking southeast. CZU August Lightning fire vegetation recovery monitoring.

:



July 2021



July 2022

Figure 10. Upper Agua Puerca. Lat. 37.038094, Lon. -122.203670. Looking southeast. CZU August Lightning fire vegetation recovery monitoring.

:

**Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).**



July 2021



July 2022

Figure 11. Lower Molino. Lat. 37.039536, Lon. -122.221832. Looking west. CZU August Lightning fire vegetation recovery monitoring.

:



July 2021



July 2022

Figure 12. Molino Pond. Lat. 37.042607, Lon. -122.212794. Looking east. CZU August Lightning fire vegetation recovery monitoring.

:

Biological Monitoring Report for Cotoni-Coast Dairies (October 2022).



July 2021



July 2022

Figure 13. Warrenella East. Lat. 37.039567, Lon. -122.182078 Looking south. CZU August Lightning fire vegetation recovery monitoring.

:



July 2021



July 2022

Figure 14. Warrenella Fork. Lat. 37.037154, Lon. -122.187052. Looking northeast. CZU August Lightning fire vegetation recovery monitoring.

:

**Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).**



October 2020. After the wildfire.

Figure 15. Warrenella Middle. CZU August Lightning fire vegetation recovery monitoring.

:



July 2021



July 2022

Figure 16. Warrenella Middle. Lat. 37.034144, Lon. -122.189988. Looking west. CZU August Lightning fire vegetation recovery monitoring.

:

**Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).**



October 2020. After the wildfire.
Figure 17. Warrenella West. CZU August
Lightning fire vegetation recovery
monitoring.

:



July 2021



July 2022

Figure 18. Warrenella West. Lat. 37.040555, Lon. -122.188487. Looking southeast. CZU
August Lightning fire vegetation recovery monitoring.

:

**Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).**



Figure 19. French broom (bright green) invasion near the Warrenella East photomonitoring station. Most of the French broom is growing on long, steep slopes (80%+) that can't be accessed from the ground to control it with physical or chemical methods.



Figure 20. BLM UTV with a spray rig was used to foliar apply glyphosate herbicide to French broom in September 2021. Due to the very steep slopes, only a small proportion (<5%) of the French broom could be accessed from the ground to treat it.

:

Biological Monitoring Report for Cotoni-Coast Dairies (October 2022).



Figure 21. Chronolog photomonitoring station CCD-102 (Agua Puerca Creek Overlook) along the Agua Puerca trail. Lat. 37.02678, Lon. -122.03048. This photomonitoring station will be used to monitor vegetation of Agua Puerca Creek riparian vegetation and coastal scrub vegetation on the hillslopes.

:



Figure 22. Chronolog photomonitoring station CCD-102 (Agua Puerca Creek Overlook). Instruction sign that shows visitors how to collect a photo and upload it to the Chronolog website.
<https://www.chronolog.io/site/CCD102>

Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).



Figure 23. Chronolog photomonitoring station CCD-103 (Agua Puerca Terrace 2) along the Agua Puerca trail. Lat. 37.03048, Lon. -122.20440. This photomonitoring station will be used to monitor vegetation of Agua Puerca Terrace 2 grassland vegetation.

:



Figure 24. Chronolog photomonitoring station CCD-103 (Agua Puerca Terrace 2) along the Agua Puerca trail.



Figure 25. The CCD-103 photomonitoring photo frame of view. Uploaded to the Chronolog website.

<https://www.chronolog.io/site/CCD103>

:

**Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).**



Figure 26. Range Study Plot 1. Lat. 37.03537, Lon. -122.18934. October 2022.



Figure 27. Range Study Plot 2. Lat. 37.02840, Lon. -122.19095. October 2022.



Figure 28. Range Study Plot 3. Lat. 37.02526, Lon. -122.21012. October 2022.

**Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).**



Figure 29. Range Study Plot 4. Lat. 37.03068, Lon. -122.20604. October 2022.



Figure 30. Range Study Plot 5. Lat. 37.03697, Lon. -122.20344. October 2022.



Figure 31. Range Study Plot 6. Lat. 37.03135, Lon. -122.20999. October 2022.

Biological Monitoring Report for Cotoni-Coast Dairies (October 2022).



Figure 32. Range Study Plot 7. Lat. 37.03852, Lon. -122.22382. October 2022.



Figure 33. Range Study Plot 8. Lat. 37.04203, Lon. -122.21600. October 2022.

Table 1. Range Study Plot % cover by species and RDM.

Study plot	Latitude	Longitude	Bare soil	Grasses			Thistles			Mustards		Clovers			Other non-natives			RDM lb/acre											
				Hordeum murinum	Briza maxima	Bromus diandrus	Avena barbata	Festuca perennis	Stipa pulchra	Carduus pycnocephalus	Centaurea melitensis	Centaurea calcitrapa	Cirsium vulgare	Silybum marianum	Helminthotheca echioides	Hirschfeldia incana	Brassica rapa		Sisymbrium officinale	Raphanus sativus	Trifolium angustifolium	Trifolium fragiferum	Trifolium campestre	Trifolium repens	Conium maculatum	Rumex acetosella	Plantago lanceolata	Geranium dissectum	Erodium moschatum	Hypochoeris glauca	Bellardia trixago
1	37.03537	-122.18934	.	.	.	10	80	5	5	9428
2	37.02840	-122.19095	.	5	.	90	4	1	.	.	7779
3	37.02526	-122.21012	.	60	.	.	2	.	.	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	1	.	.	2689
4	37.03068	-122.20604	.	75	.	.	.	.	15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.	5	3457
5	37.03697	-122.20344	.	.	.	65	20	.	.	.	.	.	.	.	.	5	.	.	.	.	.	.	.	10	.	.	.	4610
6	37.03135	-122.20999	.	75	.	5	.	.	.	.	5	.	.	.	.	5	.	.	.	.	.	.	.	.	10	.	.	4706
7	37.03852	-122.22382	.	.	.	60	.	.	25	.	.	.	.	.	10	.	.	.	.	.	.	.	.	.	5	.	.	3745
8	37.04203	-122.21600	15	10	.	15	10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	25	.	.	2497

IV. Wildlife

Indicators Monitored: Native Wildlife Species Diversity and Abundance

This Crowdsourcing and Citizen Science program is pending public access.

Indicator Monitored: Non-Native Wildlife Species Distribution and Abundance

No additional aquatic invasive species or new locations were observed or reported to BLM onsite. BLM will contact Coastal Commission when any additional invasive species locations are noted onsite in the effort to share communications regarding invasive species and help limit their spread in the region.

Indicators monitored: Monarch Butterfly Distribution and Abundance

Please see Monarch Grove Restoration Plan and related datasheet prepared by Groundswell. Note: Groundswell voiced concerns regarding sharing the location information with the public at this point as this may create unwanted attraction to this area, which is not authorized for public access.

Indicators Monitored: Reptile and Amphibian Diversity & Abundance

A total of 100 coverboards were obtained by BLM Biologists in Fall 2022. A total of 10 coverboards have been distributed throughout RMZ1 BLM will notify Coastal Commission if any invasive species such as bullfrogs, or new locations for T&E species (red-legged frog) are observed. Relevant Noteworthy findings will be included in a subsequent report.

Indicators monitored: Bird Diversity and Abundance

Not yet initiated. Subject to availability of funding. Not yet funded.

Indicators monitored: Bird Diversity and Abundance

Not yet initiated. Subject to availability of funding. Not yet funded.

Indicators monitored: Mammal Distribution and Abundance

Not yet initiated. Subject to availability of funding. Not yet funded.

Indicators monitored: Badger Distribution and Abundance

Not yet initiated. Subject to availability of funding. Not yet funded.

Indicators monitored: Puma Distribution and Abundance

BLM supported the UCSC Puma Lab’s ecological research at Cotoni-Coast Dairies by providing coordination and access for fieldwork during the development of publications and distribution tracking, though these studies were not specific or limited to lands managed by BLM.

The UCSC Puma lab website includes a list of their regionally focused publications:

<https://wildlife.ucsc.edu/publications/>

UCSC Puma lab maintains a website depicting puma distribution throughout the Santa Cruz Mountains region reflecting the UCSC Puma lab tracking:

<http://www.santacruzpumas.org/puma-tracker/>

V. Special Status Species

Federally Listed Species:
California Red-legged frog (<i>Rana draytonii</i>). Threatened.
Steelhead trout (<i>Oncorhynchus mykiss</i>); South - Central Coast DPS. Threatened.
Coho salmon (<i>Oncorhynchus kisutch</i>); Central Coast DPS. Endangered.

California Red-legged Frog Monitoring

BLM will share the annual report regarding red-legged frogs that is submitted to the US Fish and Wildlife Service with the Coastal Commission. This is generally submitted at the end of the calendar year.

**Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).**

Red-legged Frog surveys can include any or all of the following methodologies:
Night driving surveys
Stream surveys = mapping out microhabitat (i.e. plunge pools) and counting frogs encountered
Pond surveys during breeding season = dipping for tadpoles/adults and night surveys for adults

Night driving surveys

Highway 1 borders the west side of C-CD and provides a convenient transect for recording the presence of CRLF as they move around on the landscape on rainy nights. Surveys will be conducted on rainy nights by one to three people along a prescribed route starting at Swift Street at the north end of Mission Street in Santa Cruz, to the intersection of Hwy 1 and Hwy 92 in the town of Half Moon Bay. The route includes lands beyond C-CD’s boundaries to provide a necessary comparison of observed patterns and abundances at C-CD vs the coastal habitat overall. Roadkilled CRLF will be collected and transferred to USGS. All frogs will be geolocated and an annual map of the pattern of CRLF presence will be created. Unusual changes in distribution will be noted. The timing of these surveys is the rainy season (October – March). It requires one vehicle and one to two people (surveyors). The time required for each survey is 10 hrs a night for 10 nights.

Table 2. Night driving survey monitoring data for CRLF.

Year	Number of Nights	Number of Frogs	Frogs per night	Frogs per mile	Notes
2012-13	4	20	5.00	0.053763441	
2013-14	2	20	10.00	0.107526882	
2014-15	13	100	7.69	0.082712986	
2015-16	4	23	5.75	0.061827957	
2016-17	10	94	9.40	0.101075269	
2017-18	5	35	7.00	0.075268817	
2018-19	12	125	10.42	0.112007168	
2019-20	6	27	4.50	0.048387097	
2020-21	0	0	0.00	0	COVID shutdown
2021-22	2	7	3.50	0.037634409	

Stream Surveys

Not yet initiated. Subject to availability of funding. Not yet funded.

**Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).**

Larval Amphibian Monitoring

Ponds will be sampled with D-hoop nets or 12 foot kick seine. Number of sweeps and number of amphibians by species will be recorded.

Selected results:

Date	<i>T. torosa</i> ¹	<i>T. granulosa</i> ²	<i>P. sierrae</i> ³	<i>R. draytonii</i> ⁴	Notes
7-Jul-17	92	165	0	0	larvae
19-Jun-18	56	9	0	0	larvae
26-May-19	5	39	2	0	larvae
4-Sep-20	0	86	0	0	larvae
24-Feb-21	5	69	0	0	adults, sampled with net
9-Jun-22	143	55	3	0	larvae

¹ *Taricha torosa*, California newt

² *Taricha granulosa*, roughskinned newt

³ *Pseudacris sierrae*, Sierra chorus frog

⁴ *Rana draytonii*, California red-legged frog

Adult California red-legged frogs were observed annually in Upper Molino Pond. However, intensive larval sampling never revealed larval or juvenile CRLF during the time when they would be expected to be present. At present we believe the presence of large population of newts, which have been documented to forage on California red-legged frog eggs, may be causing adult frogs to avoid laying eggs in the pond. The near total absence of the otherwise ubiquitous Sierra chorus frog also indicates heavy predation occurs at this site.

Habitat Photomonitoring

Photomonitoring has included locations of interest for monitoring, research, and restoration of red-legged frog habitat. Representative photos are included below (Figures 34 - 43).

**Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).**



October 2020. After the wildfire -burned tule.
Figure 34. Molino Pond North



March 2022



July 2022

Figure 35. Molino Pond North. Lat. 37.042577, Lon. -122.213442. Looking south.



September 2022. After pond basin scraping.
Figure 36. Molino Pond North

**Biological Monitoring Report for Cotoni-Coast
Dairies (October 2022).**



March 2022



July 2022

Figure 37. Molino Pond South. Lat. 37.041936, Lon. -122.213294. Looking north.



March 2022



July 2022

Figure 38. Agua Puerca Spring. Lat. 37.032546, Lon. -122.207285. Looking northeast.

Biological Monitoring Report for Cotoni-Coast Dairies (October 2022).



March 2022



July 2022

Figure 39. Agua Puerca Creek. Lat. 37.023903, Lon. -122.207804. Looking southwest.



March 2022



July 2022

Figure 40. Yellow Bank Pond North. Lat. 36.995867, Lon. -122.167306. Looking south.



March 2022



July 2022

Figure 41. Yellow Bank Pond South. Lat. 36.995234, Lon -122.167646. Looking northeast.



Figure 42. Constructed red legged frog study pond basin array on Molino Terrace 2.



Figure 43. Constructed red legged frog study pond basin on Molino Terrace 2.

Steelhead trout and Coho Salmon Monitoring

Indicators monitored: Salmonid Species Distribution and Abundance

BLM supported the City of Santa Cruz Water Department's salmonid studies at Cotoni-Coast Dairies by providing coordination and access for fieldwork, though these studies were not specific or limited to lands managed by BLM.

The City of Santa Cruz Water Department prepares annual reports regarding their regionally focused salmonid studies which are undertaken throughout the year. The most annual recent report is attached.

VI. Recreation

Indicators of Recreation described in the Biological Monitoring Plan will be measured once public access becomes available onsite.

VII. Emerging Technologies

This section includes concepts and approaches that are of interest to be undertaken when relevant opportunities develop, potentially in partnership with other agencies or organizations.

VIII. Research and Education

BLM's Central Coast Field Office supported research onsite for small projects by University of California (bat acoustic monitoring, seed collection, and herpetological surveys) which will be discussed further in a subsequent update, in addition to the UCSC Puma lab research, and collection of water and salmonid information onsite by the City of Santa Cruz Water Resources.
