



Foster Park Aquatic Habitat Area Aquatic Groundwater Dependent Ecosystem Monitoring Workplan

Upper Ventura River Groundwater Basin

prepared for

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1 Introduction

The Upper Ventura River Groundwater Agency (UVRGA) Groundwater Sustainability Plan (GSP) identified the Foster Park Aquatic Habitat Area as an aquatic groundwater dependent ecosystem (GDE)¹. This GDE occurs in the southernmost portion of the Upper Ventura River Groundwater Basin (Basin) (Figure 1 and 2) and provides important aquatic habitat for a variety of special-status species, including the southern California Distinct Population Segment (DPS) of steelhead (*Oncorhynchus mykiss*)² and the California red-legged frog (CRLF, *Rana draytonii*) (NOAA 2022, USFWS 2022). The Foster Park Aquatic Habitat Area is reliant on interconnected surface water (ISW) and provides important pools and other rearing habitat features for all life stages of steelhead and CRLF, as well as other special-status aquatic species, especially during the dry period of the year when other reaches of the river typically run dry. Appendix A presents aerial photographs of the northern and southern portions of the GDE.

Instream habitat around Foster Park has been studied by various investigators over the years, including consultants, federal and state resource agencies, local water agencies, and municipal government agencies. The GSP identified the need for additional data collection to assess performance of the ISW depletion sustainable management criteria (SMC) included in the GSP for the Foster Park Aquatic Habitat Area. It is anticipated that a monitoring program will eventually be developed and implemented as part of a physical solution for the Ventura River Watershed Adjudication. However, there is currently no definitive timeline for either a judgment and or implementation of a physical solution. Similarly, there are no publicly available details concerning what the scope of the physical solution monitoring program would be. Therefore, UVRGA has prepared this workplan with the understanding that monitoring may transition to or be shared with other entities in the future.

Following guidance provided in Section 5.8 of the GSP, this workplan outlines a three-year monitoring program to assess performance of the ISW depletion SMC included in the GSP for the Foster Park Aquatic Habitat Area. This workplan provides detailed protocols and field methods for each of the monitoring components that will be implemented; establishes a monitoring schedule for each of these components; and describes methodologies that will be used to interpret and analyze monitoring data.

The monitoring program is designed to provide data to facilitate UVRGA's ongoing evaluation of SMC developed in the GSP for the *Depletion of Interconnected Surface Waters* sustainability indicator in the Foster Park Aquatic Habitat Area, as required by the Sustainable Groundwater Management Act (SGMA). To address this need, the monitoring program will seek to answer the following questions:

¹ Aquatic GDEs were assessed and identified separately from riparian GDEs within the Basin. Riparian GDEs are comprised of riparian vegetation communities with rooting depths that reach directly to groundwater, while aquatic GDEs are comprised of instream habitat that is dependent on interconnected surface water. This monitoring workplan pertains to instream aquatic habitat, while existing efforts are in place to monitor vegetation communities identified within the Foster Park Riparian GDE Unit. More details regarding riparian GDE monitoring are provided in Table 2.

² Steelhead are the anadromous (ocean-going) form of *O. mykiss*, while rainbow trout are the resident (solely freshwater) form of the species. All *O. mykiss* in waterbodies with connectivity to the ocean have the potential to become anadromous and are therefore treated as steelhead from a regulatory standpoint.

- What is the current distribution of aquatic mesohabitats³ in the Foster Park Aquatic Habitat Area Aquatic GDE?
- What are the current aquatic habitat suitability conditions within this GDE?
- How do aquatic habitat suitability conditions within this GDE change in response to seasonal variation?
- How and when does ISW depletion affect habitat suitability conditions within this GDE?
- How might groundwater pumping in the Basin affect habitat suitability conditions within this GDE?

Answering these questions will provide the necessary information to perform ongoing evaluation of the ISW depletion SMC for the Foster Park Aquatic Habitat Area and to establish a long-term monitoring plan for the area.

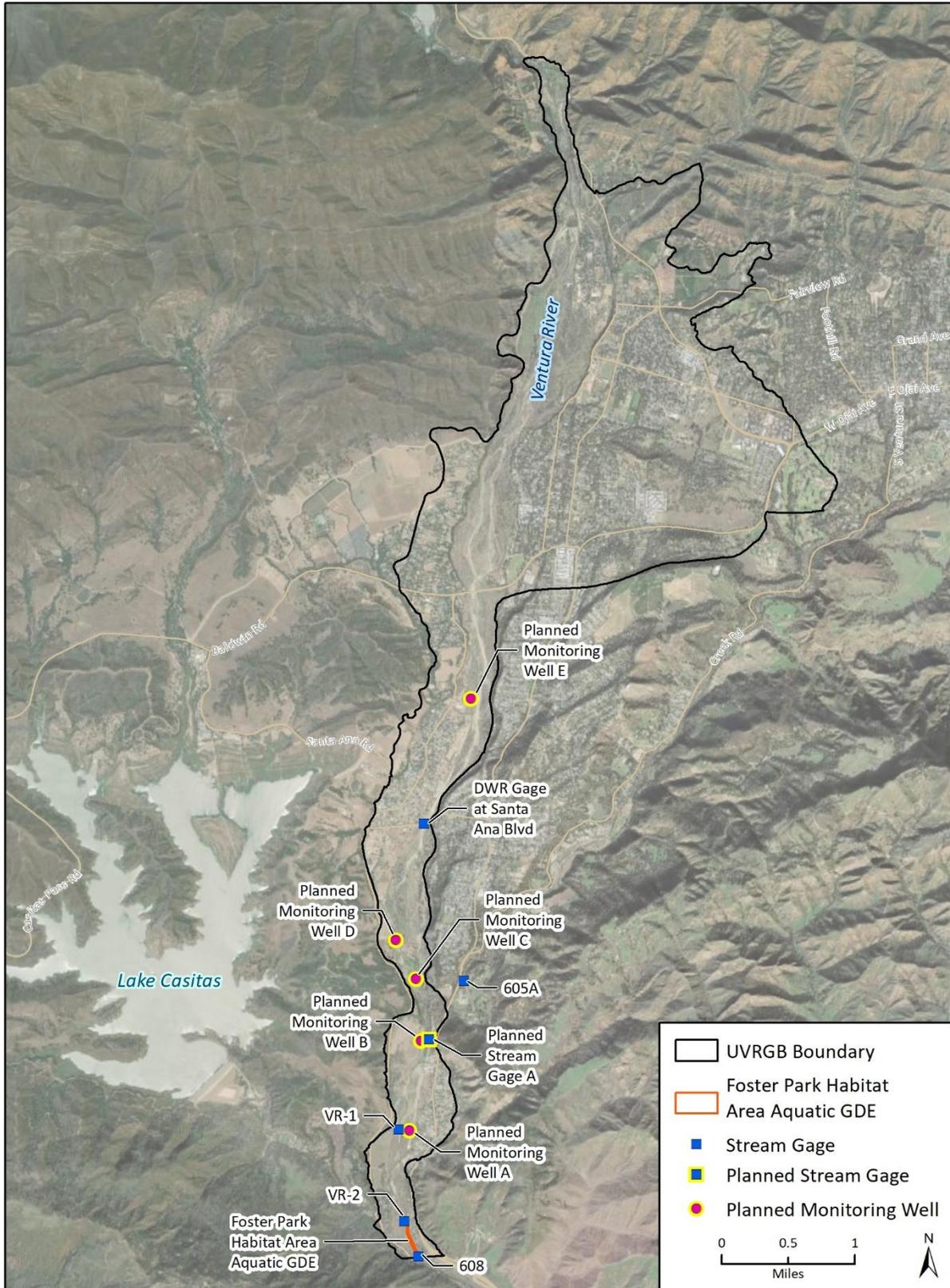
1.1 Existing Monitoring Efforts and Previous Studies within the Basin

UVRGA is committed to working with various stakeholders within the Basin and will seek input from other entities in the Basin during the process of finalizing and implementing this workplan. The monitoring program will consider current and ongoing monitoring efforts being undertaken by other stakeholders in the Basin and will include information on the collaborative and data-sharing approach UVRGA will take with its monitoring efforts. This collaboration will aid in establishing a comprehensive monitoring program that can prevent duplication of efforts and provide a broader data set, which will ultimately increase confidence in the results and conclusions drawn from monitoring data.

Table 1 provides a summary of relevant existing monitoring programs and previous studies conducted in the Basin. These existing monitoring efforts and previous studies were referenced during the development of the monitoring program methods, and data from these efforts conducted by other stakeholders will be incorporated into this program's data analysis and evaluation, as appropriate and feasible.

³ Aquatic mesohabitats are visually and functionally distinct areas of instream habitat (e.g., pools, riffles, and runs).

Figure 1 Foster Park Aquatic Habitat Area Location



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Fig 1 Foster Park Habitat Area Location

Figure 2 Foster Park Aquatic Habitat Area Aquatic GDE



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Fig. X Foster Area Habitat Area Aquatic GDE

Table 1 Relevant Existing Monitoring Programs and Previous Studies within the UVRGB

Program Name	Responsible Party	Description of Data Collection/ Study	Recurrence Interval/Study Date	Availability/ Applicability Notes
Matilija Dam Removal	County ¹	Habitat mapping and sediment/hydrologic modeling completed by Stillwater and AECOM. Habitat suitability and <i>O. mykiss</i> population studies completed by Normandeau Associates throughout the Basin, including within the Foster Park Aquatic Habitat Area.	Annually/Completed (Normandeau Associates, Inc. 2015)	Data are publicly available or provided upon request. May offer watershed-scale context to changing habitat conditions over time.
County-wide Bioassessment Monitoring	County	Long-term benthic macroinvertebrate and physical habitat monitoring.	Annually	Data are publicly available or provided upon request. On-going studies provide long-term data for instream aquatic habitat conditions. The latest five-year study began in 2021. Previous studies were conducted from 2009-2014 and 2015-2020. This program may reveal trends related to macroinvertebrate abundance, composition, and diversity, as well as physical conditions including substrate, sinuosity, flow, and habitat type (e.g., pool, riffle, glide).
Ventura River Streamflow Monitoring	County DWR ² USGS ³	Continuous water level and streamflow data collection.	Continuous	Data are publicly available in online databases. Provides real time and historic instream flow data just downstream of the Foster Park Aquatic Habitat Area.
Stream Team Water Quality Monitoring	Santa Barbara Channel Keeper	Water quality and instantaneous streamflow monitoring.	Monthly	Data are publicly available or provided upon request. Community-based monitoring with a consistent monitoring schedule within the Foster Park Aquatic Habitat Area. Data are currently available online from 2007 to 2018.
Robles Diversion Fish Passage Monitoring	CMWD ⁴	Long term monitoring program consisting of streamflow, fish passage, fish spawning, fish presence and distribution, and aquatic habitat assessment.	Annually	Data are publicly available on CMWD's website, but not regularly updated. The most recent annual report is from 2018. Monitoring efforts include the Foster Park Aquatic Habitat Area. These data provide information pertaining to habitat suitability trends, fish population dynamics, and hydrologic conditions throughout the river system. Data are not available until published by CMWD, which may not occur on a schedule that would inform this effort.
Ventura River Algae TMDL Monitoring	County	Long term monitoring consisting of monthly instantaneous water quality and streamflow, quarterly	Monthly	Data are publicly available or provided upon request. Monitoring occurs upstream and downstream of the Foster Park

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Program Name	Responsible Party	Description of Data Collection/ Study	Recurrence Interval/Study Date	Availability/ Applicability Notes
		continuous pH and dissolved oxygen (DO), and summertime algal biomass.		Aquatic Habitat Area. This program provides a long-term dataset for specific habitat suitability parameters.
CDFW Instream Flow Studies	CDFW ⁵	Habitat suitability and habitat mapping, fish habitat use, critical riffle analysis, streamflow measurements	2017 to present	Publicly available (CDFW 2017a and 2017b). Data are collected at multiple sites throughout the watershed. Also includes data from previous studies. Draft instream flow recommendations for Reach 4 (which includes the Foster Park Aquatic Habitat Area) were released in 2021. These recommendations are still preliminary, and while they can inform the UVRGA in their development and evaluation of SMC, they were not developed with the intent of meeting SGMA requirements and are not prescriptive for establishing minimum thresholds in the GSP.
California Coastal Salmonid Monitoring Plan (CMP)	CDFW NMFS ⁶	Steelhead abundance, spawning behavior and habitat availability. Conducted biological surveys and use of Dual-Frequency Identification Sonar (DIDSON) and Adaptive Resolution Imaging Sonar (ARIS) cameras.	2006-2011	Publicly available (Adams et al. 2011). Data were collected at multiple sites throughout the watershed. Also includes data from previous studies. The CMP describes the overall strategy, design and methods used in monitoring salmonid populations. While the scope of this program is beyond that of this monitoring work plan, these data and monitoring protocol may be referenced to inform the use of the aquatic GDE habitat for different life stages.
Integration of Coastal Salmonid Monitoring Plan	CDFW NMFS	An updated and expanded monitoring program of the original version CMP (Adam et al. 2011) and focuses on a more detailed strategy, design and methodology for the Southern California Area.	2013-2022	Publicly available (Boughton et al. 2022). Data was collected at multiple sites throughout the watershed. Also includes data from previous studies. This updated and expanded CMP provides important information pertaining to steelhead recovery. While the scope of this program is beyond that of this monitoring work plan, these data and monitoring protocol may be referenced to inform the use of the aquatic GDE habitat for different life stages.

1. County of Ventura
2. Department of Water Resources
3. United States Geological Survey

4. Casitas Municipal Water District
5. California Department of Fish and Wildlife
6. National Marine Fisheries Service

1.1.1 Existing and Planned UVRGA Monitoring Efforts

In addition to the programs and studies listed in Table 1, the UVRGA currently implements a suite of monitoring efforts and the GSP identifies additional future monitoring efforts to satisfy SGMA requirements. Table 2 provides a summary of these existing and planned monitoring efforts.

Table 2 Existing and Planned UVRGA Monitoring Efforts

Program Name	Description of Data Collection/ Study	Schedule	Notes
Groundwater Level Monitoring	Continuous groundwater level data logging currently in 5 wells and compilation of data collected by others in 3 additional wells	Continuous data collection, data are downloaded and archived on a semi-annual basis in May/June and September/October	The GSP proposes five additional wells into the network. These additional wells will provide data for areas upstream of the Foster Park Aquatic Habitat Area.
Streamflow Monitoring	Continuous streamflow monitoring at two proposed locations within the Basin.	Continuous data collection, data will be downloaded periodically. Gages will be maintained seasonally during baseflow recession period and dry season.	The GSP proposes two UVRGA-maintained baseflow gages, at the Camino Cielo Road crossing and within the Confluence Aquatic Habitat Area (Planned Stream Gage A, Figure 1).
Visual Stream Monitoring	Monitor the extent of surface water flows, map wet and dry reaches	Monthly for winter months and increased during late spring-to-Fall period	Informs analysis of how seasonal conditions influence streamflow and when various reaches within the Basin (and the Foster Park Area) are typically dry.
Riparian GDE Monitoring	Desktop assessment of NDVI/NDMI values for riparian vegetation within GDEs, and assessment of relationship between these indices and groundwater levels	Annual desktop assessment	Assessment follows protocols outlined by The Nature Conservancy for evaluating riparian vegetative health within GDEs (The Nature Conservancy 2018).

2 Monitoring Program Components

The Foster Park Aquatic Habitat Area monitoring program includes a suite of monitoring components to inform ongoing evaluation of the ISW depletion SMC for the Foster Park Aquatic Habitat Area by answering the specific questions presented in the introduction. The monitoring program will follow established survey protocols and methods when appropriate, which may be slightly modified, as necessary, to assess site conditions most accurately. These established protocols include the following:

- The California Department of Fish and Wildlife (CDFW) California Salmonid Stream Habitat Restoration Manual (Flosi et al. 2010);
- The U.S. Fish and Wildlife Service (USFWS) Habitat Suitability Information (HSI) Model for Rainbow Trout (Raleigh et al. 1984);
- The Southern Steelhead Habitat Suitability Index (SS HSI) Model (Normandeau Associates, Inc. 2015); and
- The USFWS Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog (USFWS 2005).
- UVRGA Monitoring and Data Collection Protocols (UVRGA 2018)
- Integration of Steelhead Viability Monitoring, Recovery Plans and Fisheries Management in the Southern Coastal Area (Boughton et al. 2022)

Biological monitoring methods will be primarily focused on steelhead habitat suitability, because all of the mainstem of the Ventura River and most of the major tributaries (including Coyote Creek, Santa Antonio Creek, Matilija Creek and North Fork Matilija Creek) are designated as critical habitat for the federally endangered southern California DPS of steelhead. The Foster Park Aquatic Habitat Area specifically includes habitat components (e.g., pools and riffles) that are known to be important for steelhead spawning, migration, and rearing (National Marine Fisheries Service 2007, Normandeau Associates, Inc. 2015). Furthermore, instream areas that provide suitable habitat for steelhead can also provide important habitat for other special-status aquatic and amphibious species, including CRLF, two-striped gartersnake (*Thamnophis hammondi*), Pacific lamprey (*Entosphenus tridentatus*), and southwestern pond turtle (*Actinemys pallida*). Steelhead habitat preferences are well studied and defined, and typically represent the most extensive and demanding habitat requirements of any aquatic species in southern California instream habitats. Therefore, steelhead habitat suitability requirements can be viewed as the limiting conditions when analyzing instream habitat. Habitat conditions for other aquatic species, including CRLF, will also be evaluated through this program.

An initial habitat mapping survey of the entire GDE will be conducted at the beginning of this program. During this initial habitat mapping effort, specific monitoring locations throughout the GDE will be established for subsequent routine surveys. Electronic data tablets with ArcGIS Collector software and high accuracy GPS units will be used to collect field data, which will then be synced with an online server. Descriptions of each of the monitoring program components are provided below. Table 3 provides an overview of each of these components, including the anticipated schedule, data to be collected, and protocols that will be implemented.

It is not anticipated that any permits will be required for implementation of the monitoring program components. Public access points will be used for entry into the Foster Park Aquatic Habitat Area and monitoring activities will avoid modifying the active channel. Should access to any privately-owned areas be required, monitoring personnel will coordinate with landowners as necessary. Finally, while not anticipated, an encroachment permit to access County rights-of-way would be required to access stream gaging locations that fall within County jurisdiction.

Table 3 Monitoring Program Overview

Monitoring Component	Data Collected	Purpose	Schedule	Locations	References/Protocols
Initial Habitat Mapping	Map aquatic mesohabitats in the Foster Park Aquatic Habitat Area Aquatic GDE	Will provide in-depth information on existing habitats within the GDE and allow for identification of specific mesohabitats to monitor	Once at the beginning of the program (likely during Fall 2022)	Entire Foster Park Aquatic Habitat Area Aquatic GDE (approximately 1,590 linear feet)	California Salmonid Stream Habitat Restoration Manual (Flosi et al. 2010)
Routine Habitat Suitability and Snorkel Surveys	Survey HSI parameters, including sediment type, riparian vegetation/cover, water depth, and various in-stream structure, as well as all species observed, within predetermined pools, riffles, and glides. Steelhead presence/ absence will be documented during snorkel surveys. Fish stranding/mortality will also be documented.	Will provide in-depth information on existing conditions and allow for assessment of habitat suitability for steelhead, CRLF, and other aquatic organisms. Conditions can be quantified and compared with streamflow, as well as climatic data and modeled ISW depletion.	At least four times per year (once during winter and at least three times during summer/fall)	Designated monitoring locations (e.g., pools, riffles, glides) within the Foster Park Aquatic Habitat Area Aquatic GDE	SS HSI (Normandeau Associates, Inc. 2015, Padre Associates, Inc. 2013) California Salmonid Stream Habitat Restoration Manual (Flosi et al. 2010) Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog (USFWS 2005) NWFS and CDFW Integration of Steelhead Viability Monitoring, Recovery Plans and Fisheries Management in the Southern Coastal Area (Boughton et al. 2022)
Water Quality and Flow Monitoring	Water level, DO, pH, temperature	Will provide continuous flow and water quality data that can then be correlated with streamflow, as well as climatic data and modeled ISW depletion.	Continuous data collection, data downloaded during each field visit	One designated location within the Foster Park Aquatic Habitat Area Aquatic GDE.	LA RWQCB ¹ Basin Plan (2014), USGS ² standards for stream gauge installation, UVRGA Monitoring and Data Collection Protocols (2018)

Monitoring Component	Data Collected	Purpose	Schedule	Locations	References/Protocols
Aerial Photography	Aerial images	Will provide a visual time series of overall conditions within the GDE and allow for comparison of conditions over time and during different hydrologic and climatic conditions	At least four times per year, concurrent with habitat suitability surveys	Aerial photographs of the upper, middle, and lower portions of the Foster Park Aquatic Habitat Area Aquatic GDE	General photography and FAA rules
Repeat Ground Photography	Photographs of instream and riparian habitat from fixed locations	Will provide a visual time series for each monitoring location that will allow for comparison of habitat conditions over time and during different hydrologic and climatic conditions	At least four times per year, concurrent with habitat suitability surveys	Photographs will be taken from fixed locations at each mesohabitat that is monitored during the habitat suitability surveys	General photography

¹ Los Angeles Regional Water Quality Control Board

² U.S. Geological Survey

Initial Habitat Mapping

The Foster Park Aquatic Habitat Area Aquatic GDE will be mapped using CDFW methods (Flosi et al. 2010), most likely at Level II or Level III habitat⁴ types. This survey will occur once at the beginning of the monitoring program, likely in the Fall of 2022. Surveyors will document all mesohabitats within the GDE, including pools, riffles, and glides.

Purpose of monitoring component

This initial survey effort will provide data on the aquatic habitat present within the GDE, as well as a map of all aquatic mesohabitats in the GDE. These mesohabitats can then be randomly or systematically chosen as monitoring locations for the subsequent routine habitat suitability and mapping surveys.

Note that habitat conditions are likely to change during and following large storm events, and the monitoring locations will inherently require adjustment if mesohabitat characteristics are substantially changed. This assessment would be made through the subsequent biological surveys, and if a large storm event occurred that substantially "reset" the channel morphology, an additional mapping event may be needed to account for the new habitat structure.

Routine Habitat Suitability and Snorkel Surveys

Routine habitat suitability surveys will be conducted once during the rainy season (between December and April) and at least three times during the dry season (between July and October) and will focus on a subset of mesohabitats (e.g., pools, riffles, glides) either randomly or systematically selected following the initial habitat mapping effort. These surveys will provide data on habitat suitability for special-status species, including steelhead and CRLF, as well as other aquatic organisms.

Surveyors will collect data for a suite of variables within these predetermined mesohabitats, including, but not limited to, substrate size, canopy cover, instream cover, gradient, elevation, and thalweg depth. Water quality data, including water temperature, DO, and pH, will also be collected at each monitoring location using a handheld probe. Macroalgae presence/absence will be documented, and photos will be collected to show areal extent. Habitat suitability surveys will follow protocols outlined by Flosi et al. (2010), Normandeau Associates, Inc (2015), Padre Associates, Inc. (2013), and the USFWS (2005).

When sufficient water is present, underwater snorkel surveys will also be performed as part of these routine surveys to document the presence of steelhead, CRLF tadpoles, and other aquatic species. Performing underwater surveys is a cost-effective and non-invasive method to determine fish distribution and aquatic species composition. Snorkel surveys will follow the appropriate protocols outlined by Flosi et al. (2010) and Boughton et al. (2022). Any observed fish stranding and/or mortality will also be documented during each survey.

In addition, nighttime surveys will also be conducted at designated locations throughout the Foster Park Aquatic Habitat Area Aquatic GDE to provide more accurate documentation of the presence or

⁴ There are four levels of classification used to describe physical fish habitat. Each higher level in the sequence includes more descriptive categories of habitat types. Level I categorizes habitat into riffles or pools. Level II categorizes riffles into riffle or flatwater habitat types, for a total of three types (riffle, pool, and flatwater). Level III further differentiates riffle types on the basis of water surface gradient (riffle or cascade), and pool types according to their location in the stream channel (main channel, lateral scour, or backwater).

absence of CRLF, invasive amphibian species (such as bullfrogs), and other nocturnal aquatic species. Night surveys will follow protocols outlined by the USFWS (2005).

Purpose of monitoring component

Conducting routine habitat suitability surveys will allow for the quantification of habitat suitability and species abundance within the Foster Park Aquatic Habitat Area Aquatic GDE, which will build on the findings of previous studies (e.g., Normandeau Associates, Inc. 2015, Padre 2013) to provide an understanding of existing habitat conditions within the GDE and allow for comparison of SS HSI scores and water quality parameters under varying flow conditions.

Continuous Surface Water Quality and Flow Monitoring

Two continuous surface water quality monitoring stations will be installed within the Foster Park Aquatic Habitat Area. These stations will likely be collocated with City of Ventura continuous surface water flow gage VR-2 and USGS Site ID 11118500 (Figure 1). These existing stream gages are located at the upstream and downstream extent of the aquatic habitat area and will provide accurate and reliable long-term continuous flow data. Continuous instream water quality monitoring will be conducted with multi-parameter water quality sondes, which will provide data on important habitat suitability parameters, including water temperature, dissolved oxygen (DO), and pH.

Data from the surface water monitoring stations will be downloaded during each routine habitat suitability survey. Additional downloads may occur if the water quality sondes require more frequent maintenance. Water quality data can then be correlated with flow and water level data taken from the existing County and USGS gages. Methods will align with those outlined in the UVRGA Monitoring and Data Collection Protocols (UVRGA 2018).

Purpose of monitoring component

Continuous surface water quality monitoring will provide data that show how streamflow correlates with water quality parameters within the GDE. The water quality parameters measured (e.g., DO, pH, and temperature) are important habitat suitability components for special-status aquatic species and continuous water quality data will therefore allow for analysis of habitat suitability under varying flow conditions. Additionally, continuous water quality data can allow for daily comparisons, as temperature and DO in particular can fluctuate greatly between daytime and nighttime. Water quality and water level data will also be compared with climatic data and ISW depletion modeling (conducted by UVRGA) to better understand how annual and seasonal variation, natural baseflow recession, and groundwater extraction, affect conditions within the Foster Park Aquatic Habitat Area Aquatic GDE.

Aerial Photography

Aerial photography of the Foster Park Aquatic Habitat Area Aquatic GDE will be conducted with an unmanned aerial vehicle (UAV) by a licensed UAV pilot. Aerial photographs will be taken of the upper, lower, and middle portions of the GDE at predetermined sites, most likely from a height of 50 to 100 feet, with both upstream and downstream views captured, at a minimum. Aerial photography will be conducted at least four times annually, simultaneous with the routine habitat suitability surveys.

Purpose of monitoring component

Conducting aerial photography will provide a visual time series of the overall conditions within the GDE and allow for comparison of the aquatic habitat during and following different hydrologic and climatic conditions.

Repeat Ground Photography

Repeat ground photography will be conducted during each monitoring effort, at the designated monitoring locations established by the initial habitat mapping event for the routine habitat suitability surveys. Photographs will be taken at the same locations and from the same vantage points with the same orientation (upstream and downstream) at least four times annually, during each habitat suitability survey. Photographs will be taken in ArcGIS Collector using an electronic data tablet.

Purpose of monitoring component

Conducting repeat photography will provide a visual time series for each monitoring location of both instream and riparian habitat. These photographs will allow for comparison of habitat conditions over time and during differing hydrologic and climatic conditions.

3 Data Interpretation and Evaluation Methodology

Monitoring data will be collected in the field using ArcGIS Collector software (as described in Section 2), synced with an online server, and compiled into a digital database for organization, interpretation, and evaluation.

Habitat Suitability Conditions and Relationship to ISW Depletion

It is known that steelhead occur throughout the Ventura River, and the entire river (up to the Ordinary High Water Mark) within the Basin is designated as critical habitat for steelhead. Established methodologies will be used to evaluate habitat suitability for steelhead within the Foster Park Aquatic Habitat Area, which will also provide data on the overall existing ecological conditions within the GDE. Understanding existing ecological conditions within the GDE and tracking how conditions change in comparison with modeled ISW depletion estimates will be used to determine the effects of ISW depletion on this aquatic GDE and to evaluate the SMC put forth in the GSP.

The SS HSI model developed by Normandeau Associates, Inc. (2015) and utilized by Padre Associates, Inc. (2013) will be used to analyze data collected during the habitat suitability surveys, as well as continuously collected water level and water quality data. The SS HSI model will be used to calculate HSI scores at each monitoring location within the Foster Park Aquatic Habitat Area Aquatic GDE. These SS HSI scores can then be compared with streamflow data and numerical modeling of ISW depletion to gain a better understanding of the nature and frequency of significant and unreasonable effects that might occur as a result of ISW depletion. This quantitative evaluation can be used to inform ongoing evaluation of the ISW depletion SMC for the Foster Park Aquatic Habitat Area.

Steelhead presence/absence and overall species abundance data within the GDE will also be considered when assessing if and when significant and unreasonable effects are occurring. Additionally, aerial and repeat photography will allow for visual comparisons of conditions within the GDE, as well as at specific mesohabitats within the GDE. Qualitative assessments of vegetative health, presence or absence of water, and water quality may be made using these time series images.

The results of the monitoring program will be evaluated to assess undesirable results for depletions of ISW. Specifically, the SS HSI scores, species presence/absence and overall species abundance data, will be evaluated together with the model derived estimates of ISW depletion to draw conclusions about the effects of the depletion on the aquatic GDE. This evaluation will occur in the 5-year GSP assessment and update..

Consideration of Other Monitoring Programs

In addition to the data collected through this monitoring program, data collected by other regional stakeholders (as described in Section 1.1) will be incorporated into the analysis. Data collected in other areas of the Basin could also serve as a basis of comparison for the GDE and may help in understanding how habitat conditions change within the river both seasonally and/or due to groundwater pumping.

3.1 Annual Progress Reports

Following completion of each full year of monitoring, a written memo will be provided to the UVRGA with a summary of the monitoring efforts completed, the data collected, and a preliminary analysis of the findings for that year. Links to the online server with the data and Collector maps will also be provided. Annual progress reports will be submitted in December 2023 and December 2024 covering the preceding water year.

3.2 Final Assessment Report

The monitoring program data will be compiled and analyzed in a final assessment report that will be submitted to the UVRGA following completion of the third year of monitoring. This report will include the following components:

- Detailed maps and figures of all monitoring locations and habitat mapped within the GDE;
- Quantitative and qualitative descriptions of overall habitat conditions within the GDE, habitat suitability conditions at various flows and groundwater conditions, and modeled depletion of ISW;
- Calculated HSI scores for each monitoring location within the GDE during each site visit;
- Statistical analyses of the relationship between streamflow, groundwater levels, modeled ISW depletion, and habitat conditions within the GDE;
- Evaluation of whether the existing SMC for ISW depletion in the Foster Park Aquatic Habitat Area prevent significant and unreasonable effects; and
- Recommendations for a streamlined monitoring program for the remainder of the GSP implementation period.

4 Monitoring Program Schedule and Budget

4.1 Monitoring Program Schedule

Table 4 provides an overview of the approximate schedule for implementation of this workplan.

Table 4 Three-year Monitoring Program Schedule Overview

Monitoring Program Milestones	Timeline
Submittal of Draft Workplan	May 2022
Public Comment Period	June 2022
Approval of Final Workplan and Contracting	August 2022
Implementation of the Monitoring Program	October 2022 – October 2025
1. Initial Habitat Mapping	1. Fall 2022
2. Routine Habitat Suitability Surveys	2. At least four times annually (once during winter, at least three times during dry season)
3. Aerial Photography	3. At least four times annually, during each field visit
4. Repeat Ground Photography	4. At least four times annually, during each field visit
5. Water Quality and Water Level Monitoring	5. Continuous monitoring, data downloads during each field visit
Installation of Water Quality and Water Level Monitoring Stations	Fall 2022
Annual Progress Reports	December 2023 and 2024
Final Three-Year Findings Report	December 2025

4.2 Budget

Rincon anticipates that implementation of the monitoring program over three years (2022 through 2025), as described in this workplan, will not exceed the Foster Park monitoring budget estimated in the GSP. Specifically, this amount is expected to be sufficient to cover monitoring efforts, as well as data management, analysis, and reporting. The budget included in the GSP was as follows:

- Fiscal Year 2022/2023: \$30,252
- Fiscal Year 2023/2024: \$21,294
- Fiscal Year 2024/2025: \$18,800

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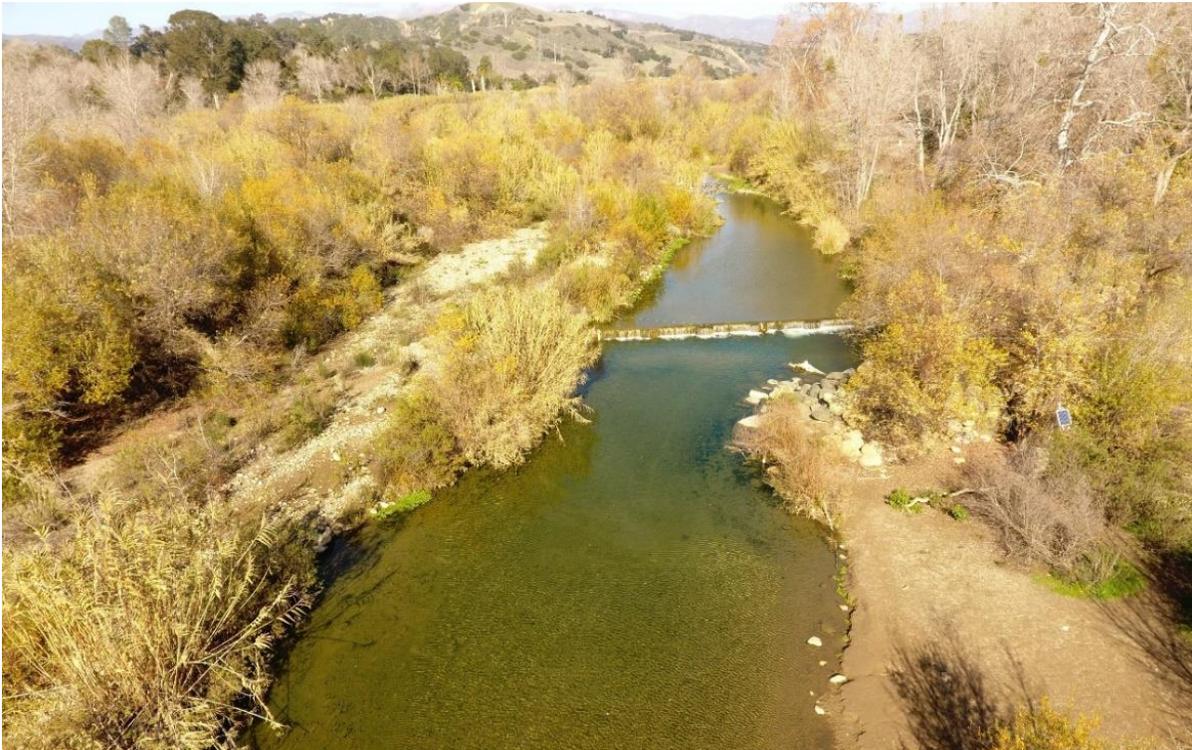
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Appendix A

Foster Park Aquatic Habitat Area Photographs



Photograph 1. Northern portion of Foster Park Aquatic Habitat Area (facing north).



Photograph 2. Southern portion of Foster Park Aquatic Habitat Area (facing north).

Photographs by S. Howard, January 22, 2020 and April 19, 2021