Salinas River
Stream Maintenance Program
2019 Work Season

Annual Report
To
Central Coast Regional Water Quality Control Board

Water Quality Certification Number 32716WQ02, Dated August 31, 2016

Prepared by

Monterey County Water Resources Agency
P.O. Box 930
Salinas, CA 93902

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Executive Summary

This report summarizes the annual maintenance activities of the Salinas River Stream Maintenance Program (SMP) for the 2019 maintenance season. The SMP incorporates a cooperative planning and design process among technical experts, agencies, municipalities, landowners, and growers to establish a flood risk reduction and habitat enhancement approach for the majority of the Salinas River and three tributaries. This is achieved through vegetation maintenance, sediment management, and non-native vegetation removal primarily in designated secondary or high flow channels outside of the low flow channel. This Annual Report provides regulatory agencies and interested parties with an overview of the work completed during the maintenance season and the program's compliance with the Regional Water Quality Control Board's Water Quality Certification's conditions. It also allows the MCWRA to summarize and analyze the project success and impacts for future planning activities.

Stream maintenance activities were approved for both the early and regular work seasons. Work began on Tuesday, September 3, 2019 and finished by November 15th. Maintenance activities were performed in 5 of the 7 RMUs with treatment occurring in 22 Maintenance Areas and 1 Selective Treatment Area. A total of 120.3 acres of native and non-native vegetation removal occurred within the Maintenance Areas including 19.2 acres of initial treatment and 101.1 acres of retreatment. Sediment was removed from two Maintenance Area including one secondary channel and one tributary. As mitigation for program impacts, arundo was removed via herbicide application and/or mowing on 81.4 acres outside Maintenance Areas in RMUs 3, 4, and 6, including 6.6 acres of initial treatment and 74.8 acres of retreatment. For tree removal mitigation, cottonwood planting occurred at RMU 4. Bar ripping was not conducted as part of this year's maintenance activities. No tree planting projects are required for 2019 impacts, however continued planting and monitoring under previous projects occurred to address impacts from previous years.

Biological surveys for species of concern were conducted prior to work within specified time windows, and protective measures were followed during all project activities. All personnel involved in on-site work were trained in permit conditions, project protocols, and species identification by qualified staff. Confirmed special status wildlife found in or near work sites included fifteen active American badger dens, five coast horned lizards, and 120 active dusky-footed woodrat nests. No state- or federally-threatened or endangered animals or plants were observed. 'No-disturbance' buffers were placed around known and potential habitats like burrows and woodrat houses and buffers were observed during work activities.

1 Introduction

1.1 Program Background

The Salinas River has experienced flooding events in recent years that have damaged agricultural crops along the river corridor. A flood maintenance program is desired by public and private entities to prevent damage from flood events. The Salinas River Stream Maintenance Program (SMP) began in 2014 with Phase 1, a multi-benefit demonstration project involving a cooperative planning and design process among public agencies, stakeholders, landowners and growers. The objective for the SMP is to reduce flood risk to land adjacent to the Salinas River while maintaining or enhancing natural habitat and ecological and hydrological processes. This is achieved through vegetation maintenance, sediment management, and non-native vegetation removal primarily in designated secondary or high flow channels outside of the low flow channel.

Phase 1 of the program occurred in two River Management Units (RMUs) along the Salinas River at river miles 22.7 to 29.2 and river miles 32.7 to 37.7. These are referred to as RMUs 4 and 5 (Gonzales and Chualar areas respectively). Phase 2 of the SMP was developed following the same process as Phase 1 and included five additional RMUs within the SMP Program Area (river miles 2 to 94). The new RMUs are concentrated near Salinas, Soledad, Greenfield, King City and San Ardo. The 2016 work season was the first to include both Phase 1 and Phase 2, using a uniform approach over the entire Program area. The SMP will continue to be implemented under one set of permits.

1.2 Purpose of the Annual Report

The Annual Report provides regulatory agencies, interested parties, and MCWRA an overview of work completed during the previous maintenance season as well as a summary of the program's compliance with the permit conditions. It also allows the MCWRA to summarize and analyze the project results for future planning activities. The Annual Report is due to the Regional Water Quality Control Board (RWQCB) by May 31st of each year. A similar report is prepared for the U.S. Army Corps of Engineers (USACE) by March 31st of each year.

1.3 Authorizations

The Salinas River Stream Maintenance Program was approved by the Monterey County Water Resources Agency Board of Supervisors on July 29, 2014. The authorizations listed below were received to implement both phases of the Program for a period of up to ten years.

1.3.1 U.S. Army Corps of Engineers

The Department of the Army Regional General Permit (RGP) 20 for the Salinas River Stream Maintenance Program, Corps File No. 22309S, was executed on September 28, 2016 by the USACE. The RGP is authorized under Section 404 of the Clean Water Act (33 U.S.C. Section 1344) through November 15, 2021. The National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) concurred with the USACE determination that the project was not likely to adversely affect the federally endangered San Joaquin kit fox (*Vulpes macrotis mutica*) and the federally threatened California tiger salamander (*Ambystoma californiense*), Monterey spineflower (*Chorizanthe pungens var. pungens*) and

its critical habitat, the yellow-billed cuckoo (*Coccyzus americanus*), and the South-Central Coast (S-CCC) steelhead (*Oncorhynchus mykiss*). The USFWS issued a Biological Opinion on August 22, 2016 for the federally endangered least Bell's vireo (*Vireo bellii pusillus*) and tidewater goby (*Eucyclogobius newberryi*) and its critical habitat and the federally threatened California red-legged frog (*Rana draytonii*).

1.3.2 State of California Regional Water Quality Control Board

The Clean Water Act Section 401 Water Quality Certification for Discharge of Dredged and/or Fill Materials, Certification No. 32716WQ02, was approved on August 31, 2016 and is set to expire on November 30, 2025. The Central Coast Water Board staff will assess the implementation and effectiveness of the SMP after five years, and consider modifications to this Certification for the second five years of the permit term.

1.3.3 California Department of Fish & Wildlife

Phase 1 of the SMP was authorized by Operation of Law under Notification of Lake or Streambed Alteration No. 1600-2014-0127-R4, Salinas River Multi-Benefit Demonstration Project, Salinas River – Monterey County, dated October 2, 2014. This was held by an limited liability corporation made up of participating landowners. This authorization expired on November 15, 2018 and has been replaced by a Routine Maintenance Agreement. All impacts and necessary mitigation related to this authorization are tracked separately for the purpose of reporting to the California Department of Fish & Wildlife.

Phase 2 of the SMP was authorized under a Routine Maintenance Agreement (RMA) 1600-2016-0016-R4, approved October 14, 2016 and held by the Resource Conservation District of Monterey County (RCDMC). The RMA was amended and restated on June 16, 2017 and subsequently amended on April 10, 2018. The RMA covers all impacts under the program from the original date of approval through December 31, 2026.

1.4 Annual Work Plan Approvals

Each year, the specific maintenance activities need to be approved prior to commencement of work, by each of the authorizing agencies. Two plans detailing work proposed for the early and regular work seasons were submitted to the USACE and the RWQCB on April 3, 2019 and June 7, 2019 respectively. The National Marine Fisheries Service and U.S. Fish and Wildlife Service were sent a courtesy copy of the Work Plan although their authorization is facilitated through the USACE. In addition, California Department of Fish & Wildlife (CDFW) has a Verification Request Form process in place which is facilitated by the RCDMC.

1.4.1 U.S. Army Corps of Engineers

The early work season plan proposed to conduct herbicide treatment of non-native vegetation in RMUs 3, 4, and 6 in areas that had already been treated in previous seasons and outside of wetland areas. USACE jurisdiction is limited in RMU's 1-6 to the activities involving grading or other fill discharge below the OHWM and in wetlands. Therefore, the early work plan was submitted to the USACE for informational purposed only and authorization for these activities was not required. The proposed regular season activities were authorized by the USACE on August 29, 2019.

1.4.2 State of California Regional Water Quality Control Board

The RWQCB approved the early work plan on April 10, 2019 and the regular season work plan on June 12, 2019. All proposed activities were authorized.

1.4.3 California Department of Fish & Wildlife

Verification Request Forms (VRFs) were approved by CDFW and maintenance activities were completed under the 32 approved VRFs.

2 Pre-Maintenance Activities

Specific Maintenance Areas were defined using modeling and mapping tools during the Program and permit development process. Those Maintenance Areas were further refined prior to implementation of maintenance activities based on current field conditions. Successful implementation of the SMP required a diverse project team which included trained equipment operators, landowners, farm operators, biologists, ecologists, Arundo specialists, hydrologists, engineers, field staff, IT specialists, public relations staff, and legal staff. This team demonstrated a high level of coordination.

2.1 Training

The RCDMC and Monterey County Water Resources Agency (MCWRA) implemented a new approach to program training for the 2019 SMP Work Season. There was an in-person training for both the Spring Work Season (July 8, 2019) and Fall Work Season (August 28, 2019) for project personnel (Biomonitors, Responsible Parties, equipment operators, farm managers). The purpose of these meetings were to train project participants in identification, range, and avoidance and minimization for state- and federally-protected wildlife with the potential to occur on site during project operations. Other topics included both project rules and conditions as stated in the CDFW, RWQCB, and USACE project approvals. All attendees received information regarding how to decontaminate shoes, vehicles, and equipment for both chytrid fungus and New Zealand mud snails both before arriving to the site as well as the importance of decontamination after they leave the site. All pertinent program information was communicated by showing a Stream Maintenance Program video, developed by the RCDMC.

The training video provided a more efficient and effective way to train project personal offsite that were unable to attend the in-person training workshops. Responsible parties opting to watch the training video offsite, were required along with their project personnel to sign a training acknowledgement sheet verifying that they had reviewed all program requirements and guidelines.

A total of 22 people attended the Spring Work Season Workers' Education meeting and 32 attended the Fall Work Season meeting. Additionally, a total of 13 people reviewed the training video offsite and signed the worker training acknowledgement sheet before project activities occurred. See below for copies of the in-person sign-in sheets with attendee's names, organization or business and the training video acknowledgement sheets. Both sheets contain a statement that the attendee understood and agreed to comply with all permit regulations and guidelines covered in the video.

2.2 Site Preparation

Participants with the assistance of the RCDMC, flagged their proposed maintenance areas after the required training and prior to receipt of work authorizations. This flagging is color-coded based on the type of activity in the area. For example, existing access ways are flagged in yellow ribbon so that heavy-equipment operators will use the same site access each time and so biologists and inspectors can survey and access the area. The flagging also marks the boundary for each activity and includes red flagging for avoidance areas.

2.3 Biological Surveys

The California Department of Fish & Wildlife and the U.S. Fish & Wildlife Service identifies the following species of concern for which surveys may be needed before conducting work under the Stream Maintenance Program: : American badger (*Taxidea taxus*), arroyo toad (*Anaxyrus californius*), California legless lizard (*Aniella pulchra*), California red-legged frog (*Rana draytonii*), California tiger salamander (*Ambystoma californienses*), coast horned lizard (*Phrynosoma blainvillii*), foothill yellow-legged frog (*Rana boylii*), Monterey dusky-footed woodrat (*Neotoma fuscipes luciana*), San Joaquin kit fox (*Vulpes macrotis mutica*), steelhead trout (*Oncorhynchus mykiss*), tidewater goby (*Eucyclogobius newberry*), two-stripped garter snake (*Thamnophis hammondii*), western pond turtles *(Emys marorata*), western spadefoot toad (*Spea hammodii*), Salinas pocket mouse (*Perognathis inonatus* psammophilus), burrowing owl (*Athene cunicularia*), yellowbilled cuckoo (*Coccyzus americanus*), least Bell's vireo (*Vireo bellii pusillus*), Monterey spineflower (*Chorizanthe pungens* var. *pungens*), all nesting birds, and roosting bats.

Surveys were conducted for special status species in areas of suitable habitat per Work Plan approval. Nesting bird surveys were conducted for all work taking place before September 1, within two weeks of the start of work. Surveys for yellow-billed cuckoo and least Bell's vireo were avoided by delaying the project until October in areas of concern. Focused California red-legged frog surveys were conducted in several areas of suitable habitat within 48 hours of the start of work.

At all work sites, two types of pre-activity surveys were completed within 30 days of the start of work: habitat assessment surveys and pre-maintenance surveys. Both surveys occurred within permit-specified buffer distances of work areas after the Responsible Party had flagged the work site boundaries. Habitat assessment surveys were conducted by senior biologists from Dawn Reis Ecological Studies, and included conducting transect surveys for special status species and their habitats. Pre-maintenance surveys were conducted by RCD biological monitors and included classifying vegetation types in Maintenance Areas, identifying and flagging wetlands and large native trees for avoidance, and also looking for sensitive wildlife and their habitats. Additionally, RCD biological monitors performed morning walk-throughs of the work areas each day work occurred, and in most cases were present during all work activities.

All surveys for San Joaquin kit fox, California red-legged frogs, and California tiger salamanders were completed by USFWS-approved biologists.

The locations of all special status individuals or habitats identified during any of the above-mentioned surveys were mapped in Collector for ArcGIS and flagged with red or pink flagging tape in the field with the appropriate buffer size.

2.3.1 Biological Survey Results

Woodrat houses were the most common special status species found in or near work sites: 120 active houses were found. All woodrat nests were avoided with at least a 10 foot buffer. Five adult coast horned lizards were observed, and all of which were captured and relocated 100 feet outside of the work area (Map 43 and Map 44). Fifteen American badger dens with sign of recent use was found.

Twenty-two potential bat roosts in dead trees were identified (bat presence not confirmed). Groups of fledging tree swallows, Bewick's wern, and a California Towhee were observed during surveys for work that took place before September 1.

Tables 1 and 2 contain a summary of nesting bird and other special status species (respectively) found in or near work sites. The data will be submitted to the California Natural Diversity Database by the RCDMC with all required fields included.

Table 1: Summary of Nesting Birds Found in or Near Work Sites Before September 1

Maintenance Area ID	Species	Buffer	Date	Notes
4.23	Ca. Towhee	250 ft	July 5	Fledgling
4.23	Tree Swallow	250 ft	July 8	Family of three fledgling
4.26	Bewick's Wren	250 ft	July 9	Fledgling

Table 2: Summary of Species Survey Results

Maintenance Area ID	Western Pond Turtle	Coast Horned Lizard	American Badger	Woodrat Nest in Work Area	Woodrat Nest Outside Work Area	Potential Bat Roost
1.02	0	3 Adults (relocated)	0	7	6	0
1.03	0	0	0	1	2	0
1.06	0	0	0	8	5	0
1.08	0	0	0	17	4	1
1.38	0	0	0	0	1	0
2.05	0	0	3	0	0	0
2.06	0	0	0	0	1	1
3.16b	0	0	0	0	0	9
3.16a & Mitigation	0	1 Adult (relocated)	0	0	0	1
3.18	0	1 Adult (relocated)	0	0	0	0
3.19	0	0	0	1	0	0
4.22	0	0	0	0	0	0
4.23, 4.25, 4.26 & Mitigation	0	0	0	6	0	6

4.24 & Mitigation	**0**	**0**	**0**	**5**	**0**	**0**
6.06	**0**	**0**	**0**	**16**	**10**	**0**
6.07 & Mitigation	**0**	**0**	**0**	**1**	**3**	**3**
6.08	**0**	**0**	**0**	**4**	**0**	**0**
6.09	**0**	**0**	**12**	**6**	**1**	**0**
6.10	**0**	**0**	**0**	**5**	**2**	**0**
6.11 & Mitigation	**0**	**0**	**0**	**2**	**4**	**1**
6.12	**0**	**0**	**0**	**1**	**1**	**0**
Total Found or Indicating Activity	**0**	**4**	**15**	**80**	**40**	**22**

2.3.2 Tidewater Goby Survey Plan

No work was performed in RMU 7 during the 2019 Maintenance Season but some survey data is available that was conducted for other programs. In future years when work is proposed in RMU 7 the following condition will apply: each year before the start of work in RMU 7 and no later than August 1, information on the current status of tidewater goby (e.g., presence, estimated number of individuals) in the Salinas River Lagoon will be submitted to the Service for review.

USFWS has developed a survey protocol to facilitate the determination of presence or absence of the tidewater goby in habitats that have potential to support it. The primary use for this protocol is for project-level surveys in support of requests for consultation under section 7 of the ESA, as amended. Additionally, this protocol may also be used for section 10(a)(1)(B) permit applications, and to determine general presence–absence for other management purposes. Several assessments of the tidewater goby population in various localities have been conducted using these methods.

The USACE and MCWRA in cooperation with a Service-approved biologist will develop and implement a tidewater goby survey plan to document the presence, distribution, and abundance of the species within and adjacent to the Project area, including the Salinas River downstream of the Salinas River Diversion Facility (SRDF) and the Salinas River Lagoon. The survey plan will be developed in coordination with the National Marine Fisheries Service to avoid duplication of effort and excessive disturbance of habitat. The survey plan will be submitted to the Service for review and approval.

2.3.2.1 Tidewater Goby Survey Results

In 2013, a few individuals were found while conducting routine lagoon monitoring, with both individuals observed along the sandbar at the northwestern edge of the lagoon. In 2014, tidewater goby was the second most abundant fish species after threespine stickleback. One of the individuals was captured at the mouth of the lagoon near the usual location of breaching, four of the individuals were captured

along the sandbar at the northwestern edge of the lagoon, and 53 individuals were captured near the Highway 1 Bridge. A doctoral student with the University of California, Los Angeles, conducted multiple surveys in the Salinas River Lagoon and Old Salinas River beginning in 2014, and was able to document and collect tidewater gobies during each visit. However, his collection information does not detail the number or sizes of tidewater gobies that were observed during each survey, but rather provides valuable information on population persistence.

Tidewater goby distribution surveys were conducted in October 2018. Tidewater gobies were found at each sampled location along the sandbar at/near the breach site and along the southwest shoreline of the lagoon until water depth precluded sampling (upstream from the wildlife refuge parking area). This finding contrasts with survey results from most previous years, when the distribution of tidewater goby appeared restricted to the lower lagoon (with exception of the year 2014, when the species was documented as far upstream as the Highway 1 bridge). Contrary to expectations, tidewater gobies were not found in the vicinity of the OSR slidegate. During past surveys, the species was regularly found in this area, and in the OSR in the vicinity of the Monterey Dunes Way road crossing. Although this location was not sampled in October 2018 due to permit restrictions, high tidewater goby densities were also expected in this area.

Numbers of tidewater goby captured with each seine haul during the 2018 survey ranged from 0 (near OSR slidegate, OSR and Hwy 1 Bridge) to 3. At sampling sites where the species was detected, every seine haul captured at least one goby. Due to these low capture numbers, estimation of index densities is not biologically meaningful. However, despite low captured numbers in individual seine hauls, tidewater goby appeared to be widely distributed within the lagoon, suggesting that the species was abundant during this time.

2.3.3 Water Quality Reports

Water quality monitoring of the Salinas River Lagoon typically occurs during the spring, summer, and fall months. The lagoon remained mostly opened to the ocean on January 19, 2019 and remained open until June 29, 2019.

Sampling in the Salinas River is associated with the Salinas Valley Water Project fish monitoring requirements. Seining has not been performed since February 13, 2019 due to a letter dated February 20, 2019 when the National Marine Fisheries Service formally withdrew their 2007 Biologicial Opinion for the Salinas Valley Water Project and associated incidental take statement. No additional fish monitoring was performed during 2019, but water quality monitoring in the Salinas Lagoon continued between April and October. Any future monitoring reports will be forwarded to the U.S. Fish and Wildlife Service.

2.4 Adjustments to Maintenance Area Alignments

Maintenance area locations were estimated through the modeling process using LiDAR-based data. Although this data is extremely useful for modeling and other uses, and was the best available data, it did not capture all of the current field conditions that were encountered. Therefore, during the initial construction of a maintenance area, trained personnel can make made slight modifications to the

location and length of maintenance areas in order to increase their ability to function and decrease impacts to sensitive species. Some maintenance areas were shortened to prohibit the crossing of the low-flow channel at the tie-in locations. Those modifications were based on the resolution of the modeling effort and the depiction of the size and shape of the maintenance area feature and do not constitute an adjustment as described in this section. All adjustments that occurred are identified each year and listed in the table below. There were no alignments performed this maintenance season.

Table 3: Adjustments to Maintenance Areas

Maintenance Area #	Adjustment	Reason for Adjustment
NONE		

2.5 Arundo Surveys

MCWRA shall prevent the establishment of new arundo growth areas within designated maintenance areas. In order to monitor those occurrences, biological monitors will perform visual inspections of maintained areas during the pre-maintenance surveys and map any new arundo growth areas. Retreatment of those areas will then need to be scheduled during the following maintenance season. No new arundo growth areas were observed during the subject maintenance season.

3 Maintenance Activities Conducted in 2019

The Salinas River had significant flows during the previous winter season and conservation releases from the upstream reservoirs continued through the majority of the maintenance season. Therefore, there was water present in the low-flow channel at the beginning of the maintenance season. Some of the RMUs dried out completely before November 15th while other areas stayed wet. Work was not authorized within water or in wetlands.

Maintenance activities were conducted in 5 of the 7 RMUs in a total of 22 Maintenance Areas and 1 Selective Treatment Area. No work was performed in RMU 7. All of the activities were authorized through the Annual Work Plan approvals. The maintenance activities are displayed in map format in Section 6 of this report.

3.1 Work Season Dates

The work season began on September 3rd and was completed by November 15th at which time all equipment and related items were removed from the sites. Typical work hours were daily from 7am to 5 pm during daylight hours. No work was performed at night.

3.1.1 Rainfall Restrictions

There was one rain day during the work season and no work occurred that day. But, no rain event of 0.25 inches or greater in a 24-hour period occurred during the work period.

3.2 Completed Maintenance Activities

Maintenance activities were performed in RMUs 1, 2, 3, 4, and 6 for a total of 1 new Maintenance Area and retreatment of 22 Maintenance Areas. Maintenance activities occurred in one Selective Treatment Area that had previously been treated, but the work was limited in area and types of activities. The specific maintenance activities are further described below.

3.2.1 Native Vegetation Management

Native vegetation was removed within the designated maintenance areas. Disturbance of emergent vegetation did not occur in areas with suitable habitat for California red-legged frogs or for tidewater gobies. All new impacts associated with vegetation removal are quantified in the tables below by vegetation types for each maintenance area, each RMU, and the Program Area. This includes expansion of previously treated areas. Retreatment of native vegetation is included in the total area column but not under the vegetation type columns. Those impacts were addressed in the annual report following the initial removal.

Table 3: Vegetation Impacts by Maintenance Area

Maint. Area #	*Total Area* (acres)*	*Arundo dominant*	*Unvegetated / Sparse herbaceous*	*Early successional perennial riparian*	*Mid-successional willow*	*Early to mid-successional cottonwood forest*	*Low stature herbaceous wetland*
1.02	*10.2*	retreat	retreat	retreat	retreat	retreat	retreat
1.03	*3.2*	retreat	0.20	retreat	retreat	retreat	retreat
1.06	*5.0*	retreat	0.2	retreat	retreat	retreat	retreat
1.08	*4.7*	retreat	retreat	retreat	retreat	retreat	retreat
2.05	*1.85*	retreat	retreat	retreat	retreat	retreat	retreat
2.06	*6.6*	0.1	6.07	0.26	0.27	0	0
3.16a	*5.4*	retreat	retreat	retreat	retreat	retreat	retreat
3.16b	*10.5*	2.1	8.2	1.6	0.7	retreat	retreat
3.18	*4.8*	retreat	retreat	retreat	retreat	retreat	retreat
3.19	*2.4*	retreat	0.15	retreat	retreat	retreat	retreat
4.22	*5.4*	retreat	retreat	retreat	retreat	retreat	retreat
4.23	*6.3*	retreat	retreat	retreat	retreat	retreat	retreat
4.24	*4.6*	retreat	retreat	retreat	retreat	retreat	retreat
4.25	*4.6*	retreat	retreat	retreat	retreat	retreat	retreat
4.26	*4.7*	retreat	retreat	retreat	retreat	retreat	retreat
6.06	*4.5*	retreat	retreat	retreat	retreat	retreat	retreat
6.07	*6.4*	retreat	retreat	retreat	retreat	retreat	retreat
6.08	*7.0*	retreat	1.07	0.06	0.29	retreat	retreat
6.09	*9.4*	retreat	0.20	0.10	retreat	retreat	retreat
6.10	*4.3*	retreat	retreat	retreat	retreat	retreat	retreat
6.11	*8.2*	retreat	retreat	retreat	retreat	retreat	retreat
6.12	*0.5*	retreat	retreat	retreat	retreat	retreat	retreat

Table 4: New Vegetation Impacts by RMU

RMU	*Total Area* (acres)*	*Arundo dominant*	*Sparse herbaceous*	*Early successional perennial riparian*	*Mid-successional willow*	*Early to mid-successional cottonwood forest*	*Low stature herbaceous wetland*
1	*23.1*	retreat	0.22	retreat	retreat	retreat	retreat
2	*8.5*	0.10	6.07	0.26	0.27	0	0
3	*23.0*	2.10	8.35	1.60	0.70	retreat	retreat
4	*25.6*	retreat	retreat	retreat	retreat	retreat	retreat
6	*40.2*	retreat	1.27	0.16	0.29	retreat	retreat
7	*0*	0	0	0	0	0	0

Table 5: Vegetation Impacts for Program Area

RMUs	*Total Area* (acres)*	*Arundo dominant*	*Sparse herbaceous*	*Early successional perennial riparian*	*Mid-successional willow*	*Early to mid-successional cottonwood forest*	*Low stature herbaceous wetland*
1-7	*120.4*	2.2	15.9	2.0	1.3	0	0

Note: * Total Area includes re-treated areas. Total new areas are 21.4. acres. Vegetation categories do not include the retreated areas.

3.2.2 Wetlands Identification and Avoidance

No wetlands were impacted during the maintenance season. Areas where wetland plants were present were marked both by GPS coordinates and red tape during pre-maintenance surveys. Additional monitoring during maintenance activities occurred to ensure avoidance and final locations of wetland plants were confirmed after maintenance activities were completed. Areas that were located within or near where maintenance activities occurred that were previously mapped as wetlands using aerial tools were field verified. If no wetland vegetation was present then these areas were assumed not to be wetlands.

3.2.3 Permanent Fill, Including Grading, Within USACE Jurisdiction

Grading and limited sediment removal occurred during the maintenance season. Two stockpiles locations were established in the approved location outside of jurisdictional area. The grading and excavation activities performed within the maintenance areas are shown in the tables below.

Table 6: Sediment Management Activities by Maintenance Area

Maint. Area #	Total Area Graded (acres)	*Un-vegetated Area Graded (acres)*	*Volume of Sediment Removal (cy)*	*Volume of Sediment Displaced by Grading (cy)*	*Grading Methods Used*
1.06	4.8	0	5,000	0	bulldozing/ excavation
1.38	1.1	0	1,965	0	bulldozing/excavation

Table 7: Sediment Management Activities by RMU

RMU	Total Area Graded (acres)	*Un-vegetated Area Graded (acres)*	*Volume of Sediment Removal (cy)*	*Volume of Sediment Displaced by Grading (cy)*
1	5.9	0	6,965	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	0	0	0

Table 8: Sediment Management Activities for Program Area

RMUs	Total Area Graded (acres)	*Un-vegetated Area Graded (acres)*	*Volume of Sediment Removal (cy)*	*Volume of Sediment Displaced by Grading (cy)*
1-7	5.9	0	6,965	0

3.2.4 New Access

No new ramps were constructed but some vegetation was removed to make 3 new access ways to provide access routes to MAs 1.03, 1.06, and 3.19. All maintenance activities utilized existing access ways.

3.3 Compensatory Mitigation

Impacts to certain native vegetation types require compensatory mitigation. The impacts are tabulated annually and the necessary compensatory mitigation are reported cumulatively after each maintenance season. The following season's work plan must include enough mitigation to compensate for the previous season's impacts. Therefore, compensatory mitigation activities may occur before the related impacts or the season after the impact occurred. The following table outlines which impacts require compensatory mitigation as well as the ratios.

Table 9: Compensatory Mitigation Ratios

Vegetation Type	**Required Mitigation**
Arundo-dominated Removal	none
Sparse Herbaceous with or without Arundo	none
Early Successional Perennial Riparian	1:1 Arundo Removal within secondary channel 0.5:1 Arundo removal outside secondary channel
Mid-Successional Willow (less than 6")	3:1 Arundo Removal outside secondary channel
Early and Mid-Successional Cottonwood (2" or greater of cottonwood, sycamore and alder)	3:1 Planting of cottonwood, sycamore or alder (based on individual trees)
Large Stature Willows (6" or greater)	2:1 Planting of cottonwood, sycamore or alder (based on individual trees)
Low Stature Herbaceous Wetland	1:1 restoration

3.3.1 Summary of Impacts

The initial impacts to specific native vegetation types requires mitigation. Subsequent maintenance activities at the same location do not require additional mitigation. The impacts are documented

annually and cumulatively reported. Therefore, the following tables identify the impacts from the most recent maintenance season and from the entire permit term to date, by vegetation type.

Table 10: New Impacts Requiring Compensatory Mitigation

RMU	*Early successional perennial riparian (acres)*	*Mid-successional willow (acres)*	*Early to mid-successional cottonwood forest (trees)*	*Large Stature Willows (trees)*	*Low stature herbaceous wetland (acres)*
1	0	0	0	0	0
2	0.26	0.27	0	0	0
3	1.6	0.70	0	0	0
4	0	0	0	0	0
6	0.16	0.29	0	0	0
7	0	0	0	0	0
Totals	2.02	1.26	0	0	0

Table 11: Total Impacts for Permit Term Requiring Compensatory Mitigation

RMU	*Early successional perennial riparian (acres)*	*Mid-successional willow (acres)*	*Early to mid-successional cottonwood forest (trees)*	*Large Stature Willows (trees)*	*Low stature herbaceous wetland (acres)*
1	10.5	3.5	0	0	0
2	0.36	0.27	0	0	0
3	3.2	2.2	0	0	0
4	13.0	3.3	7	1	0
5	8.9	1.9	29	18	0
6	15.86	4.59	0	6	0
7	0	0	0	0	0
Totals	51.72	15.66	36	25	0

3.3.2 Arundo Treatment as Compensatory Mitigation

The targeted invasive species for removal is arundo. Herbicide application is the preferred method of treatment for higher eradication rates. Herbicide application is most effective on green leafy plants, before they go dormant. Herbicide application was utilized during this maintenance season primarily in areas that were previously mowed. Any dense stands or browning arundo was treated through mowing and mulching, as necessary.

Mitigation is performed preferentially by RMU or throughout the Program Area as needed. The following tables document the new and retreated arundo areas for the past maintenance season.

Enough arundo areas have been identified and received initial treatment to account for all SMP impacts to date.

Table 12: New Arundo Treatment by RMU

RMU	*New Treatment*				*Retreatment*			
	Mowing		*Herbicide*		*Mowing*		*Herbicide*	
	inside MAs (acres)	*outside MAs (acres)*	*inside MAs (acres)*	*outside MAs (acres)*	*inside MAs (acres)*	*outside MAs (acres)*	*inside MAs (acres)*	*outside MAs (acres)*
1	0	0	0	0	0	0	0	0
2	0.1	0	0	0	<0.1	0	0	0
3	2.1	0	0	0	3.7	2.6	3.3	2.6
4	0	6.6	0	0	3.8	19.9	5.7	48.8
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0.9	1.5	0	3.5
7	0	0	0	0	0	0	0	0
Totals	2.2	6.6	0	0	8.4	24	9.0	54.9

3.3.3 Native Tree Species Plantings

Native trees are typically planted during the rainy season to enhance their rate of success. There had been a delay in tree planting due to the extended drought period, although some trees were planted in RMUs 4 and 5. No trees that would require mitigation were removed during the 2019 work season, and no additional trees are required to be planted for 2019 impacts.

Supplemental planting for previous years' impacts occurred to address low survivorship of planted trees. The success of native tree species plantings continues to be monitored and a replanting report in 2019 recorded the survival and status of trees planted. The report recorded the number of trees surviving and the remedial action needed to address tree cuttings that did not survive from subsequent years'. A total of 40 cottonwood cuttings were planted in December 2019 to address trees that did not survive in RMU 4. All tree planting areas and activities are monitored closely and updates will be provided as necessary.

Table 13: New Tree Plantings by RMU

RMU	*Cottonwoods*	*Willows*	*Other Native Trees*
1	0	0	0
2	0	0	0
3	0	0	0

4	40	0	0
5	0	0	0
6	0	0	0
7	0	0	0
Totals	40	0	0

3.3.4 Status of Compensatory Mitigation

The mitigation activities began in year two of the program and will continue until all success criteria is achieved. The areas are being tracked individually but are reported cumulatively in order to determine programmatic compliance. The tables below document the total treatment areas and compares it to the compensatory mitigation requirement ratios in Table 10. No additional initial arundo removal is required for the impacts to date.

Table 14: Status of Required Arundo as Compensatory Mitigation

RMU	*Total ESPR Impacts (acres)*	*Total Arundo treated inside MAs (acres)**	*Total MSW Impacts (acres)*	*Total Arundo Treatment Required Outside MAs (acres)*	*Total Arundo treated outside MAs (acres)*	*Additional Arundo Removal Required (acres)*
1-7	51.7	31.2	15.7	58.5	82.9	0

*Arundo treatment inside MAs is counted on an acre-for-acre basis for early successional perennial riparian impacts only.

Table 15: Status of Required Tree Planting Mitigation by RMU

RMU	*Number of non-willow trees ≥ 2" dbh removed*	*Number of willows ≥ 6" dbh removed*	*Total Number of Trees Required to Plant*	*Number of Trees Planted, species*	*Trees Required – Trees Planted*
1	0	0	0	0	-
2	0	0	0	0	-
3	0	0	0	0	-
4	7	1	23	90 cottonwoods 700 willows	-
5	29	18	123	275 cottonwoods	-
6	0	6	12	0	-
7	0	0	0	0	-
Totals	**36**	**25**	**158**	**365 cottonwoods 700 willows**	**0**

3.3.5 Success Criteria

Mitigation sites are monitored annually. The success of the invasive plant removal will be reported by area as they reach the targeted percent cover or after five years from initial removal, whichever occurs sooner. Due to extended drought conditions, there are no sites that are nearing the success criteria.

4 Program Review

4.1 Impacts to Listed Species

Maintenance activities were designed to avoid direct and indirect impacts to listed species. There were no observations of any federally-listed species during the required pre-maintenance surveys. Biological Monitors performed all necessary inspections before work began each day and were present during maintenance activities. A Service-approved biologist was on-site as necessary and on-call daily.

4.2 Impacts to Waters of the State

Maintenance activities were designed to avoid impacts to waters of the state by working in dry areas away from the low-flow channel. The Salinas River had significant flows during the previous winter season and conservation releases from the upstream reservoirs continued through the majority of the maintenance season. Therefore, there was water present in the low-flow channel at the beginning of the maintenance season. Inspections of each maintenance site and the adjacent area occurred during the pre-maintenance surveys when flows were reduced enough to show tie-in locations and the adjacent low-flow channel. There was no indication or erosion or other water quality issues at the sites after the maintenance season. Additional inspections will occur during the next maintenance season.

4.3 Project Design Changes

All work was in compliance with the permit applications, permit terms and conditions, and annual authorizations. Less work was performed than proposed in the approved Work Plan.

4.4 Effectiveness Monitoring

Topographic surveys were conducted down the centerline of select secondary channels both pre- and post-maintenance activities. This data is representative of each RMU and will be used over time to determine how the maintenance areas are functioning and to assess the sediment transport characteristics of the maintenance areas. The resultant longitudinal profiles are available in Section 7 of this report.

4.5 Adaptive Management Sites

Adaptive management may be necessary if significant flows (25,450 cfs or greater at the Spreckels stream gage) occur during the previous rainy season. Modifications may need to be made to the location of maintenance areas if flood events cause the designated locations to shift or re-align, or if shifts in the location or alignment of the Salinas River low-flow channel indicate a need to modify a designated maintenance area. These needs should be evaluated near the end of the rainy season in order to be prepared for the following year's maintenance.

During the winter of 2020, none of the Maintenance Areas were activated and the flows were significantly less than the 5-year flow. The peak flows that have occurred at each gaging station by the time of this report are as follows:

- Bradley (USGS 11150500) 647 cfs on 3/22/2020
- Soledad (USGS 11151700) 455 cfs on 4/7/2020

- Chualar (USGS 11152300) 1,020 cfs on 4/6/2020
- Spreckels (USGS 11152500) 437 cfs on 4/8/2020
  (all data is still provisional at this time)

At this time, there are no adaptive management sites identified. Portions of the low-flow channel are still underwater from the current river flows so additional sites may need to be identified in the future.

4.6 River Morphology Monitoring

Monitoring of the Salinas River's morphology is required after all flood events equal to or exceeding 42,800 cfs (10-year event) at the Spreckels stream gage. Specifically, visual inspections must occur of the low-flow channel and all designated maintenance areas to determine if any channel movement due to fluvial processes has occurred. These inspections would occur after flood waters have receded and the low-flow channel and maintenance areas are visible. The past winter did not produce the targeted flow at the Spreckels gage and therefore the inspections were not necessary.

4.7 Long-Term Effectiveness Assessment Reporting

Two Long-Term Effectiveness Reports are due over the permit term in years 2021 and 2025. These reports need to be developed in accordance with a plan that describes the data collection, monitoring, and analysis that will be performed to better understand the effectiveness of the current Program. A draft plan was provided with the 2016 Annual Report for review by the RWQCB. Comments on the plan were received identifying additional clarifications on data analysis and a revised draft was provided with the subsequent Annual Report. Additional comments were received in 2018 and were considered. The most recent revision to the plan was submitted in Appendix B of the 2018 Annual Report for review and approval by the RWQCB. No comments have been received from the RWQCB regarding this revised submittal. Therefore, the revised submittal is provided again in Appendix B of this year's 2019 Annual Report. The data collection efforts have continued annually as the plan is under review.

5 Photos of Typical Work Areas

Pre-maintenance Areas

Vegetation Removal

Arundo Treatment

Selective Treatment Area Pre- and Post-work

Grading & Sediment Removal

6 Maps of Maintenance Activities


1.03
1.02
Access route impassable
Southern alt. route used
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0088
Channel 1.02
Access Routes
Vegetation Removal 2019
Wetlands - restricted
Scale: 1:3,014
0 20 40 80 Meters
Map created February 2020


Access route
not used
1.03
New access route
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0089
Channel 1.03
Access Routes
Vegetation Removal 2019
Scale: 1:1,888
0 12.5 25 50 Meters
Map created February 2020


Access route
not used
New access route
1.06
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0090
Channel 1.06
Salinas River
Longitudinal Profile Centerline
Access Routes
Vegetation Removal 2019
Sediment Removal
Scale: 1:2,556
0 20 40 80 Meters
Map created February 2020


1.08
Access route alignment per VRF (not used)
Actual access route alignment used
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0091
Channel 1.08
Access Routes
Vegetation Removal 2019
Scale: 1:2,716
0 20 40 80 Meters
Map created February 2020


RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0092
Channel 1.38
San Lorenzo Creek
Salinas River
Longitudinal Profile Centerline
Access Routes
Vegetation Removal 2019
Sediment Removal
Scale: 1:2,146
0 15 30 60 Meters
Map created February 2020


0.01 ac Arundo scattered throughout the channel was re-treated by mowing
2.05
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0097
Channel 2.05
Access Routes
Vegetation Removal 2019
Scale: 1:1,703
0 12.5 25 50 Meters
Map created February 2020


2.06
Access to channel using Elm Ave
0.10ac Arundo scattered throughout channel was treated by mowing
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0097
Channel 2.05
Access Routes
Vegetation Removal 2019
Scale: 1:2,006
0 15 30 60 Meters
Map created February 2020


3.17
3.16a
85% arundo cover
sprayed then mowed
1% arundo cover
sprayed then mowed
3.16b
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0081 and 0093
Channel 3.16a
Access Routes
Wetlands - restricted
Vegetation Removal 2019
Scale: 1:2,657
0 20 40 80 Meters
Map created February 2020


3.17
3.16a
Mitigation area
sprayed then mowed
Access to mitigation area
was through 3.16a
3.16b
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0085
Mitigation Area 3.16a
Access Routes
Arundo Mitigation
Wetlands - restricted
Vegetation Removal 2019
Scale: 1:2,657
0 20 40 80 Meters
Map created February 2020


3.16a
Access to channel through 3.16a
3.16b
2.10 ac Arundo scattered throughout channel was treated by mowing
RCDMC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0094
Channel 3.16b
Access Routes
Vegetation Removal 2019
Wetlands - restricted
Parcels
Scale: 1:5,302
0 40 80 160 Meters
Map created February 2020

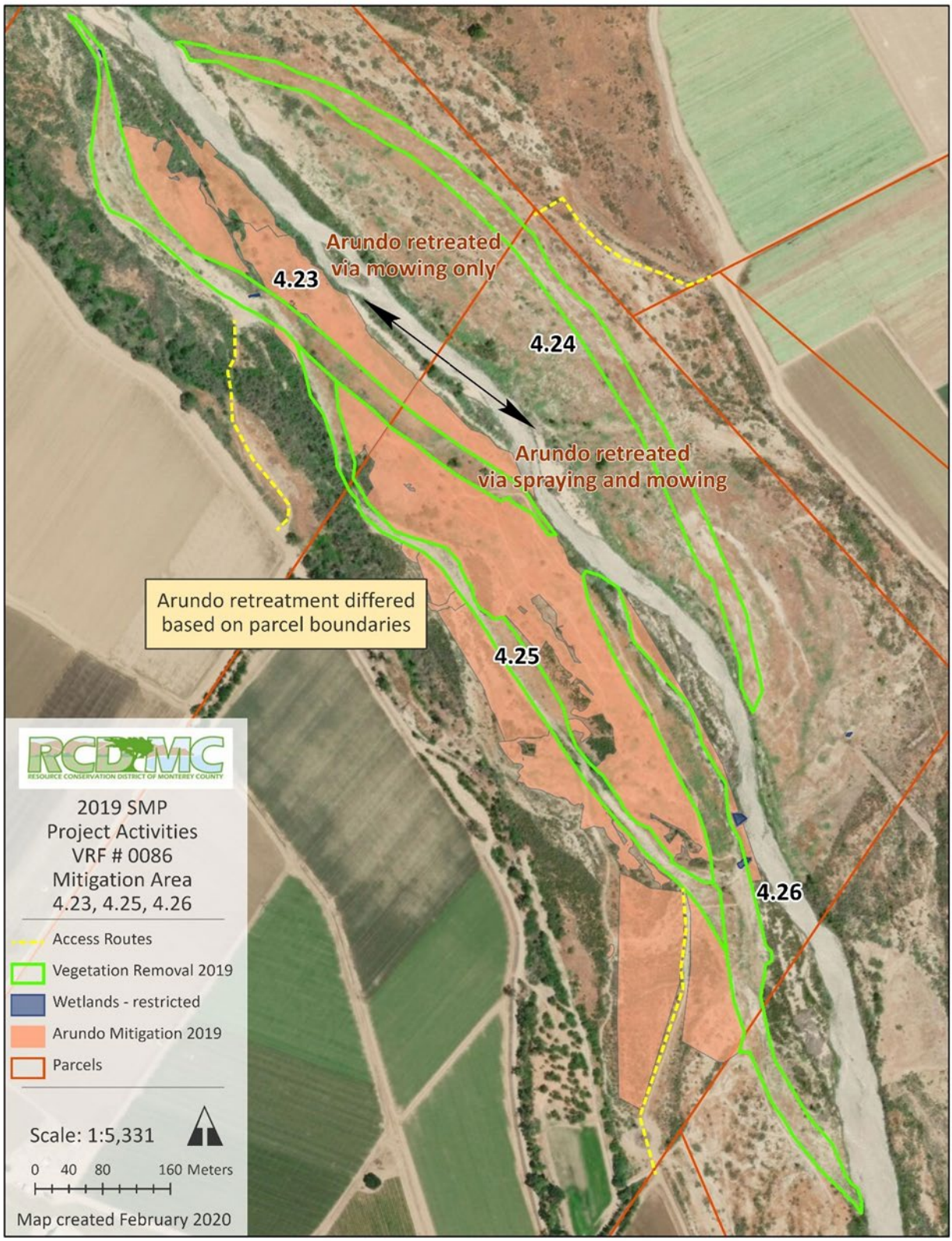

3.18
1.60 ac arundo scattered throughout channel was sprayed and mowed
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0082 and 0095
Channel 3.18
Access Routes
Vegetation Removal 2019
Wetlands - restricted
Scale: 1:3,473
0 25 50 100 Meters
Map created February 2020

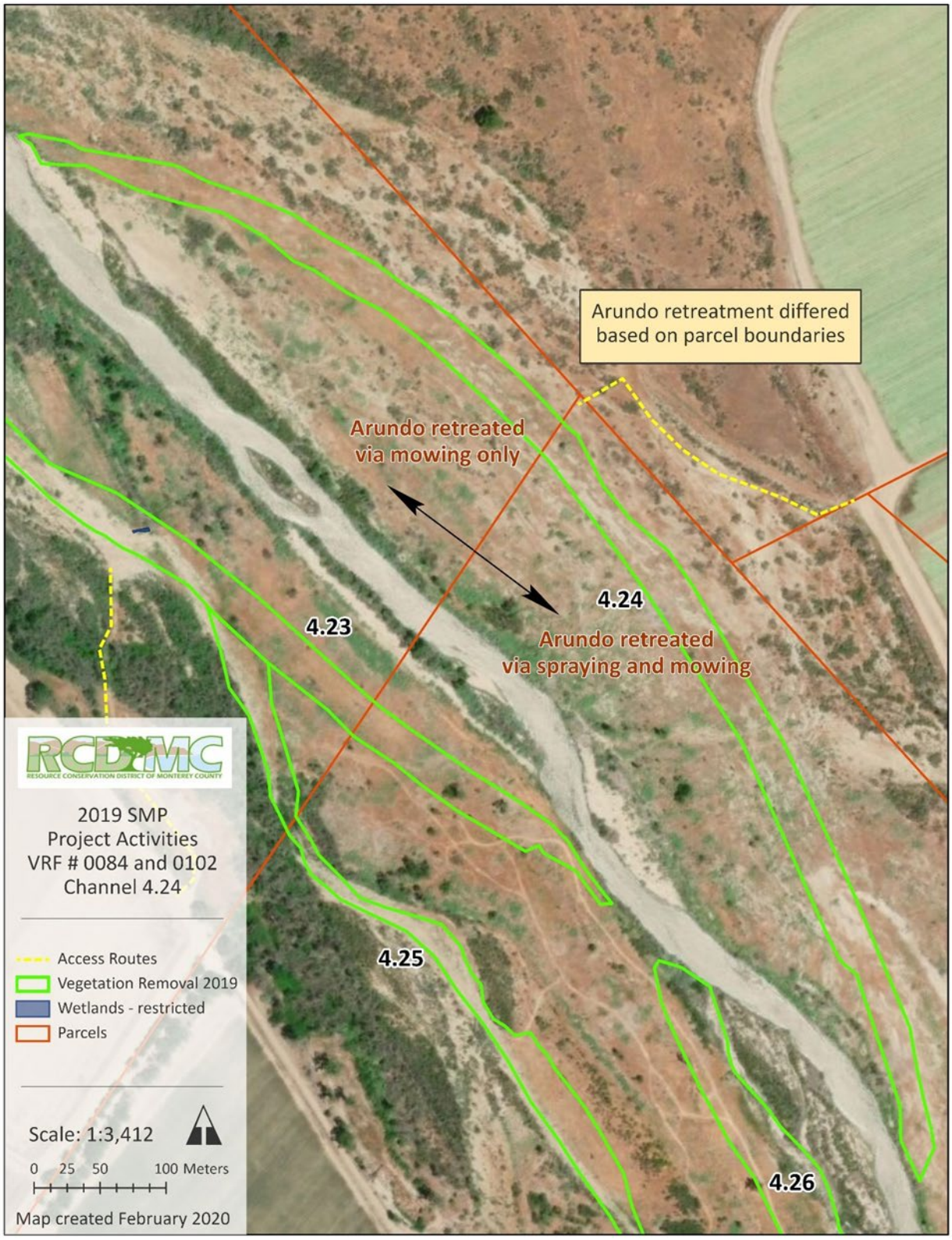

Initial vegetation removal
3.19
0.40 ac arundo scattered throughout channel was mowed
Access to channel from 3.18, across dry riverbed
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0096
Channel 3.19
Access Routes
Vegetation Removal 2019
Wetlands - restricted
Scale: 1:2,091
0 15 30 60 Meters
Map created February 2020

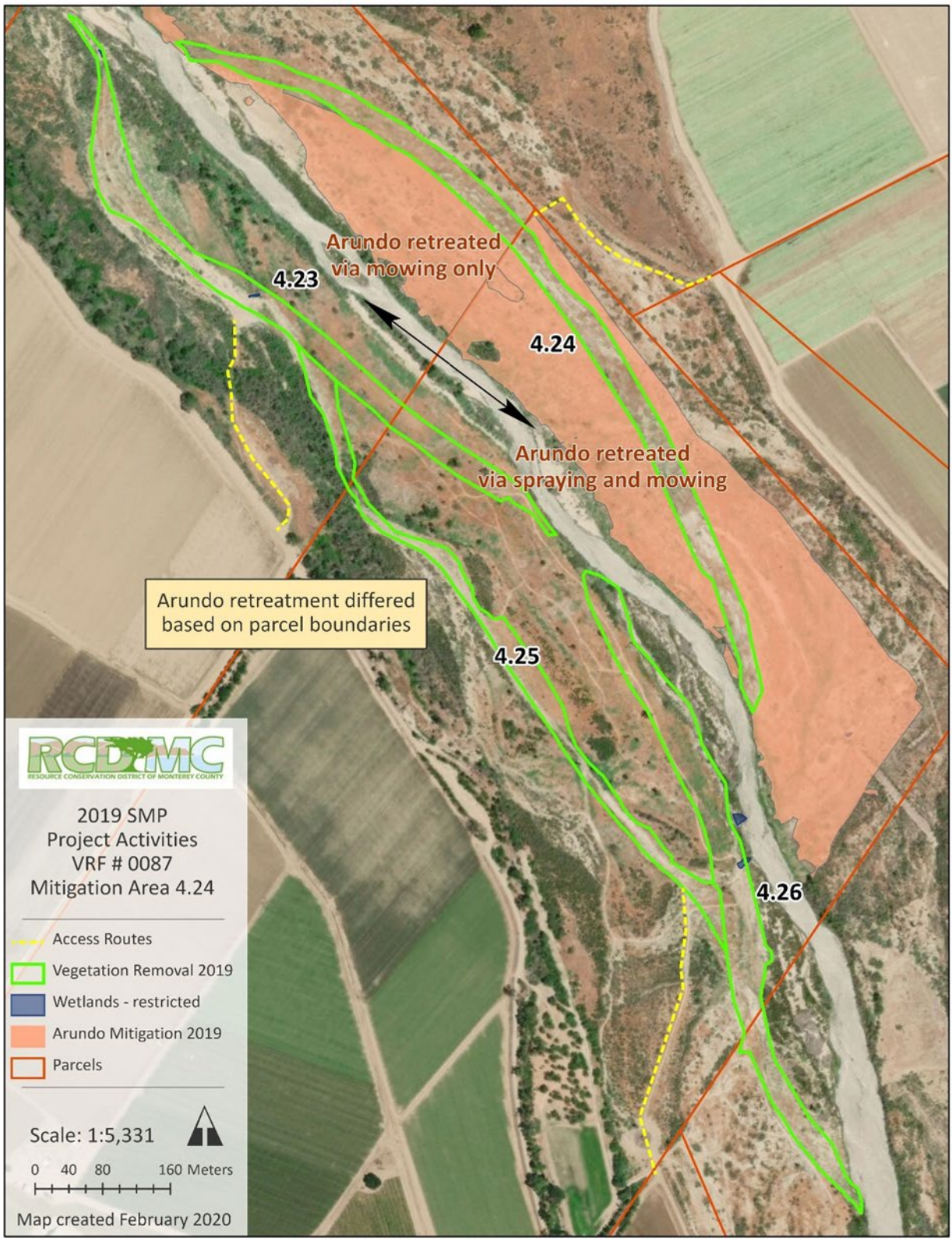

4.22
2.50 ac arundo scattered throughout channel was mowed
RCDMC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0099
Channel 4.22
Access Routes
Vegetation Removal 2019
Arundo Mitigation
Wetlands - restricted
Scale: 1:6,125
0 45 90 180 Meters
Map created February 2020


4.22
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0100
Mitigation Area 4.22
Access Routes
Vegetation Removal 2019
Arundo Mitigation
Wetlands - restricted
Scale: 1:6,002
0 45 90 180 Meters
Map created February 2020


Arundo retreated
via mowing only
4.23
4.24
Arundo retreated
via spraying and mowing
Arundo retreatment differed
based on parcel boundaries
4.25
4.26
RCDMC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0083 and 0103
Channel 4.23, 4.25, 4.26
Access Routes
Vegetation Removal 2019
Wetlands - restricted
Parcels
Scale: 1:5,331
0 40 80 160 Meters
Map created February 2020


Arundo retreated
via mowing only
4.23
4.24
Arundo retreated
via spraying and mowing
Arundo retreatment differed
based on parcel boundaries
4.25
4.26
RCDMC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0086
Mitigation Area
4.23, 4.25, 4.26
Access Routes
Vegetation Removal 2019
Wetlands - restricted
Arundo Mitigation 2019
Parcels
Scale: 1:5,331
0 40 80 160 Meters
Map created February 2020


Arundo retreatment differed based on parcel boundaries
Arundo retreated via mowing only
4.24
4.23
Arundo retreated via spraying and mowing
4.25
4.26
RCDMC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0084 and 0102
Channel 4.24
Access Routes
Vegetation Removal 2019
Wetlands - restricted
Parcels
Scale: 1:3,412
0 25 50 100 Meters
Map created February 2020


Arundo retreated
via mowing only
4.23
4.24
Arundo retreated
via spraying and mowing
Arundo retreatment differed
based on parcel boundaries
4.25
4.26
RCDMC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0087
Mitigation Area 4.24
Access Routes
Vegetation Removal 2019
Wetlands - restricted
Arundo Mitigation 2019
Parcels
Scale: 1:5,331
0 40 80 160 Meters
Map created February 2020


6.06
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0104
Channel 6.06
Access Routes
Vegetation Removal 2019
Wetlands - restricted
Scale: 1:5,568
0 40 80 160 Meters
Map created February 2020


6.07
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0105
Channel 6.07
Access Routes
Vegetation Removal 2019
Wetlands - restricted
Scale: 1:4,112
0 30 60 120 Meters
Map created February 2020


6.07
Access to mitigation area
through channel 6.07
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0106
Mitigation Area 6.07
Access Routes
Vegetation Removal 2019
Arundo Mitigation 2019
Wetlands - restricted
Scale: 1:4,112
0 30 60 120 Meters
Map created February 2020


6.08
Access to channel from 6.09 across dry riverbed
6.09
Initial vegetation removal
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0107
Channel 6.08
Access Routes
Vegetation Removal 2019
Wetlands - restricted
Scale: 1:4,835
0 35 70 140 Meters
Map created February 2020


0.90 ac arundo scattered throughout channel was mowed
6.09
6.08
Initial vegetation removal
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0108
Selective Treatment
Area 6.09
Access Routes
Vegetation Removal 2019
Wetlands - restricted
Scale: 1:4,288
0 30 60 120 Meters
Map created February 2020

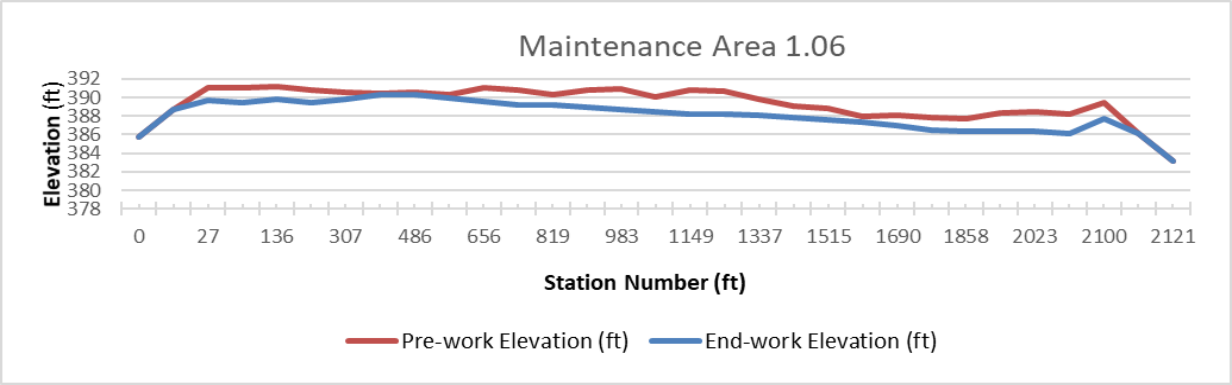

6.10
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0109
Channel 6.10
Access Routes
Vegetation Removal 2019
Wetlands - restricted
Scale: 1:2,857
0 20 40 80 Meters
Map created February 2020

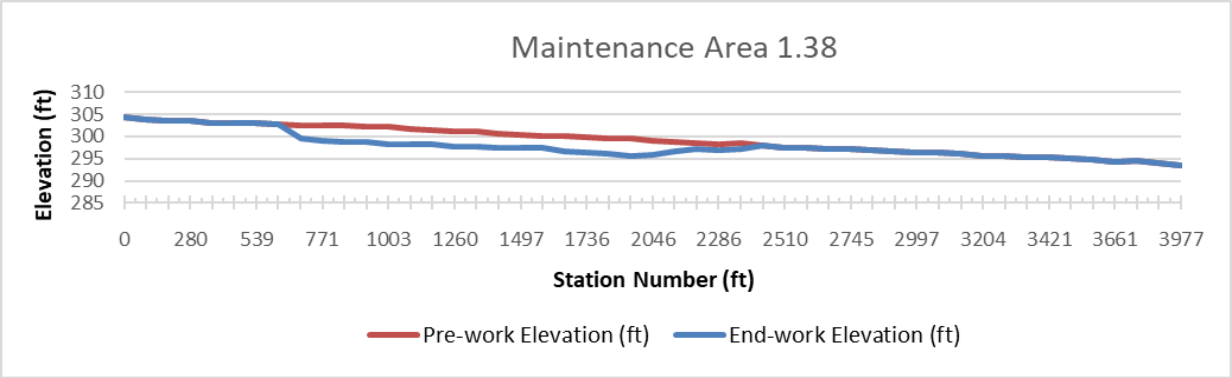

6.11
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0110
Channel 6.11
Access Routes
Vegetation Removal 2019
Wetlands - restricted
Scale: 1:2,916
0 20 40 80 Meters
Map created February 2020

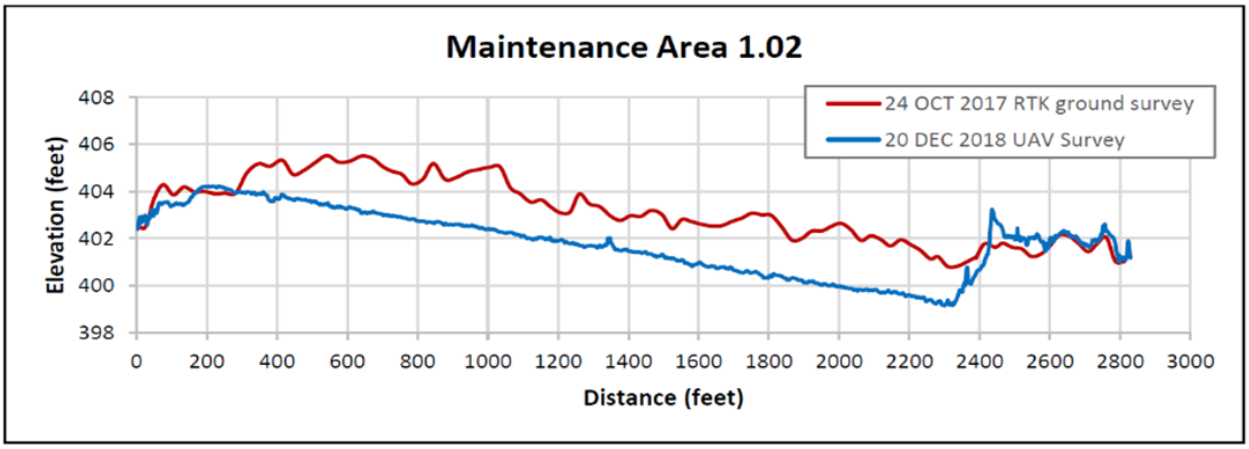

Mitigation area
sprayed followed with
mowing
6.11
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0111
Mitigation Area 6.11
Access Routes
Vegetation Removal 2019
Arundo Mitigation 2019
Wetlands - restricted
Scale: 1:2,916
0 20 40 80 Meters
Map created February 2020

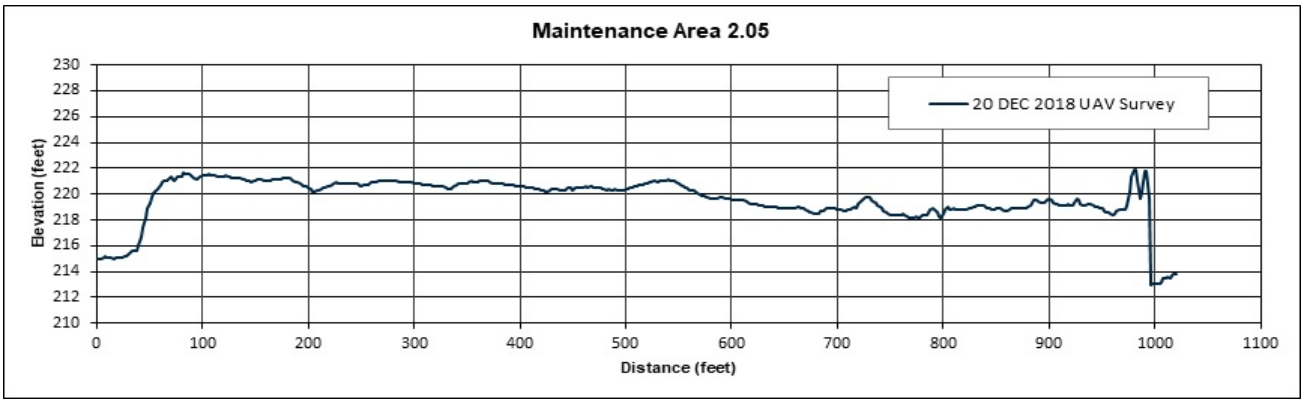

6.12
RCD MC
RESOURCE CONSERVATION DISTRICT OF MONTEREY COUNTY
2019 SMP
Project Activities
VRF # 0112
Selective Treatment
Area 6.12
Access Routes
Vegetation Removal 2019
Wetlands - restricted
Scale: 1:1,620
0 12.5 25 50 Meters
Map created February 2020

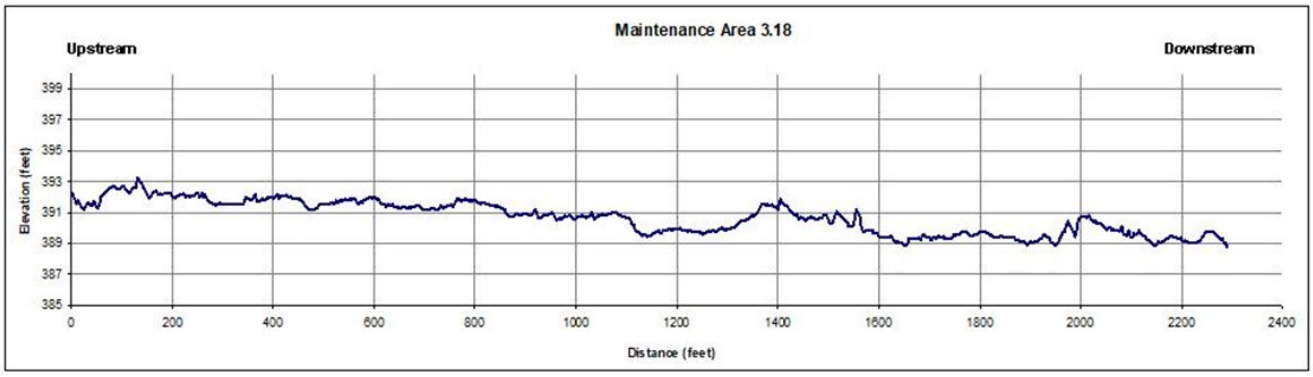
7 Longitudinal Profiles

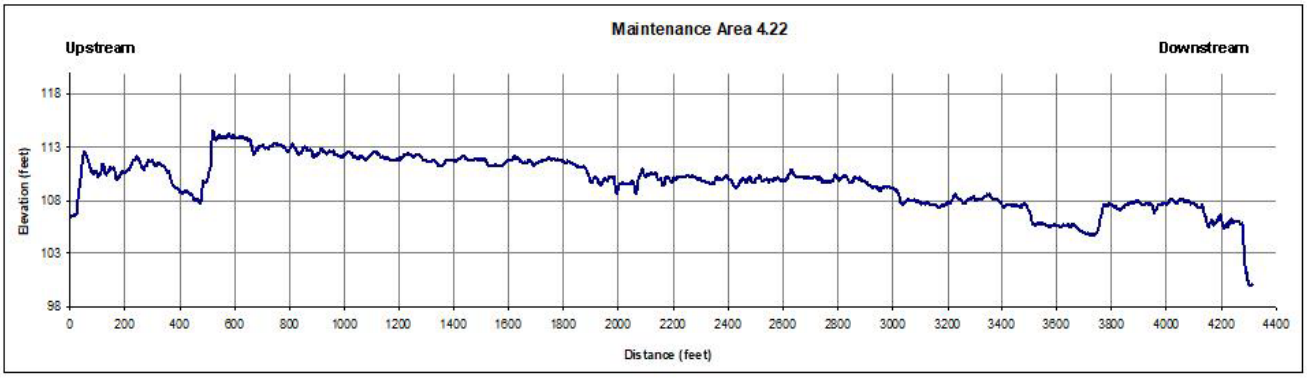


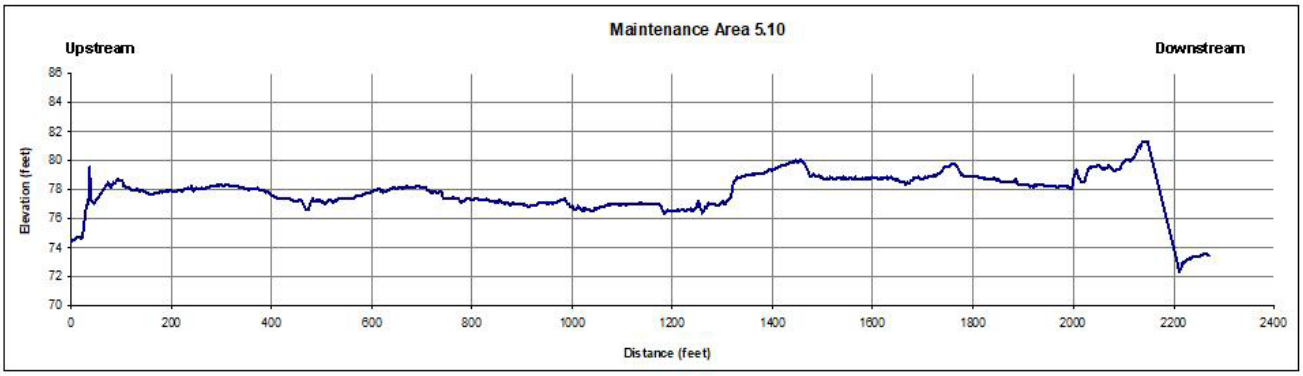


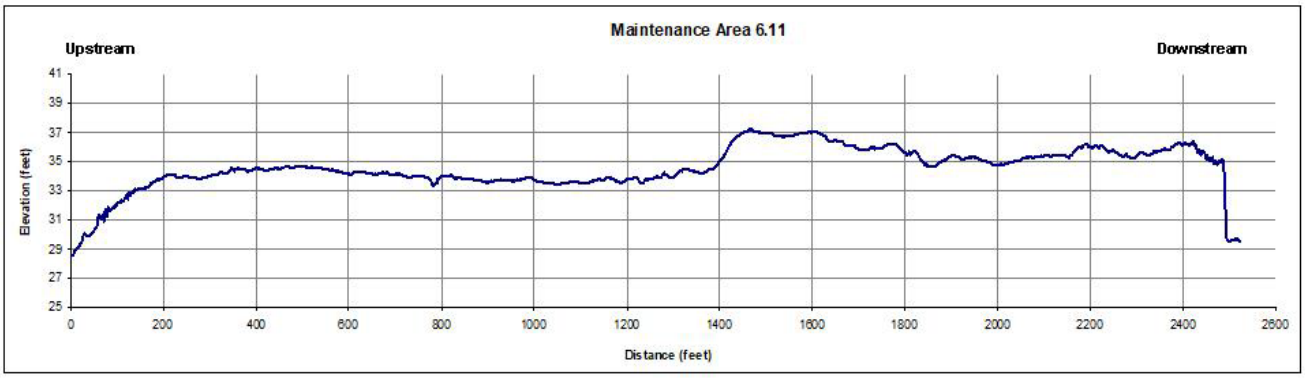



Maintenance Area 2.05
20 DEC 2018 UAV Survey
Elevation (feet)
Distance (feet)
230
228
226
224
222
220
218
216
214
212
210
0
100
200
300
400
500
600
700
800
900
1000
1100


Maintenance Area 3.18
Upstream
Downstream
Elevation (feet)
Distance (feet)
399
397
395
393
391
389
387
385
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400


Maintenance Area 4.22
Upstream
Downstream
Elevation (feet)
Distance (feet)
118
113
108
103
98
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
2800
3000
3200
3400
3600
3800
4000
4200
4400


Maintenance Area 5.10
Upstream
Downstream
Elevation (feet)
86
84
82
80
78
76
74
72
70
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
Distance (feet)


Maintenance Area 6.11
Upstream
Downstream
Elevation (feet)
41
39
37
35
33
31
29
27
25
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600
Distance (feet)

Appendix A: Work Plan Approvals

April 10, 2019

VIA ELECTRONIC MAIL

Shaunna Murray
Monterey County Water Resources Agency
1441 Schilling Place, North Building
Salinas, CA 93901
Email: murraysl@co.monterey.ca.us

Dear Ms. Murray:

RE: APPROVAL OF 2019 EARLY WORK PLAN FOR THE SALINAS RIVER STREAM MAINTENANCE PROGRAM, WATER QUALITY CERTIFICATION NO. 32716WQ02

Thank you for submitting the April 3, 2019 Early Work Plan – 2019 Season (Plan) for the Salinas River Stream Maintenance Program. The Central Coast Water Board approves the proposed activities described in the Plan, provided that all activities are conducted as described in the Plan and as required in Water Quality Certification No. 32716WQ02.

Please contact Mark Cassady at 805-549-3689 or Mark.Cassady@waterboards.ca.gov, or Phil Hammer at 805-549-3882 or Phillip.Hammer@waterboards.ca.gov with any questions.

Sincerely,

for
John M. Robertson
Executive Officer

cc:

Greg Brown
U.S. Army Corps of Engineers
Email: Gregory.G.Brown@usace.army.mil

Bill Stevens
National Oceanic and Atmospheric Administration
Email: William.Stevens@noaa.gov

Linda Connolly
California Department of Fish and Wildlife
Email: Linda.Connolly@wildlife.ca.gov

June 12, 2019

VIA ELECTRONIC MAIL

Shaunna Murray
Monterey County Water Resources Agency
1441 Schilling Place, North Building
Salinas, CA 93901
Email: murraysl@co.monterey.ca.us

Dear Ms. Murray:

RE: APPROVAL OF 2019 WORK PLAN FOR THE SALINAS RIVER STREAM MAINTENANCE PROGRAM, WATER QUALITY CERTIFICATION NO. 32716WQ02

Thank you for submitting the June 7, 2019 Fall Season Work Plan (Plan) for the Salinas River Stream Maintenance Program. Central Coast Water Board staff approves the proposed activities described in the Plan, provided that all activities are conducted as described in the Plan and as required in Water Quality Certification No. 32716WQ02.

Please contact Mark Cassady at 805-549-3689 or Mark.Cassady@waterboards.ca.gov, or Phil Hammer at 805-549-3882 or Phillip.Hammer@waterboards.ca.gov with any questions.

Sincerely,

for
John M. Robertson
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Greg Brown
U.S. Army Corps of Engineers
Email: Gregory.G.Brown@usace.army.mil

Bill Stevens
National Oceanic and Atmospheric Administration
Email: William.Stevens@noaa.gov

Linda Connolly
California Department of Fish and Wildlife
Email: Linda.Connolly@wildlife.ca.gov

Central Coast Regional Water Quality Control Board

October 9, 2019

VIA ELECTRONIC MAIL

Shaunna Murray
Monterey County Water Resources Agency
1441 Schilling Place, North Building
Salinas, CA 93901
Email: murraysl@co.monterey.ca.us

Dear Ms. Murray:

RE: APPROVAL OF CORRECTED 2019 WORK PLAN FOR THE SALINAS RIVER STREAM MAINTENANCE PROGRAM, WATER QUALITY CERTIFICATION NO. 32716WQ02

Thank you for submitting the revised maps for the 2019 Fall Season Work Plan (Plan) for the Salinas River Stream Maintenance Program. You have proposed sediment removal from Maintenance Area (MA) 1.06 rather than from MA 1.02 as was originally described. Central Coast Water Board staff approves the proposed activities described in the corrected maps, provided that all activities are conducted as described in the Plan, related submittals, and as required in Water Quality Certification No. 32716WQ02.

Please contact Mark Cassady at 805-549-3689 or Mark.Cassady@waterboards.ca.gov, or Phil Hammer at 805-549-3882 or Phillip.Hammer@waterboards.ca.gov with any questions.

Sincerely,

for
John M. Robertson
Executive Officer

cc:

Jennifer Bodensteiner
Monterey County Water Resources Agency
Email: BodensteinerJM@co.monterey.ca.us

Greg Brown
U.S. Army Corps of Engineers
Email: Gregory.G.Brown@usace.army.mil

Bill Stevens
National Oceanic and Atmospheric Administration
Email: William.Stevens@noaa.gov

Linda Connolly
California Department of Fish and Wildlife
Email: Linda.Connolly@wildlife.ca.gov

Appendix B: Long-Term Effectiveness Assessment Plan

Salinas River Stream Maintenance Program
Long-Term Effectiveness Assessment Plan

Prepared by:

Monterey County Water Resources Agency
The Nature Conservancy
The Resource Conservation District of Monterey County
Conservation Collaborative

***Revised* DRAFT**

May 5, 2017
Updated May 2018
Second Update May 2019

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Introduction

The Salinas River Stream Maintenance Program (SMP) is a program involving a cooperative planning and design process with agencies, stakeholders, landowners and growers. The SMP Project Team has developed a Long-Term Effectiveness Assessment Plan (Plan) to evaluate the SMP's overall effectiveness at achieving projected flood reduction benefits while also protecting beneficial uses and habitat function. The Plan is designed to assist in identifying both project- and watershed-based actions that can be implemented to optimize the effectiveness of the SMP. The Plan also tries to link the activities and outcomes of the SMP to increased understanding of the role of the SMP to overall watershed health and function.

The design and permitting process for the SMP refined the objectives to ensure maintenance activities accomplish the following:

- Provide a level of flood risk reduction for the farming community that is meaningful and can be modeled and measured through reductions in water surface elevation, depth and velocity of inundation, and/or duration of inundation.
- Promote natural hydrologic and geomorphic processes that support steelhead migration and floodplain use, while reducing the impacts of potential stressors such as stream velocity, stream temperature, and floodplain stranding of fish.
- Protect, enhance, create and/or manage a mosaic of habitat types and structures across the Salinas River floodplain to support a suite of native wildlife species, while reducing stressors such as invasive plant infestations and avoiding loss of uncommon, important riparian and wetland habitat types.

The objective of the SMP is not to restore the Salinas River to its historical condition, but to enhance key ecological and functional attributes through stream maintenance for flood risk reduction. Proposed maintenance activities recognize that the hydrology of the system has been impacted by dams, levees, and other encroachments, and that the ecology of the system has been modified from a large river and floodplain system supporting a mosaic of habitat types to a river confined by levees and farmlands, and restricted to a small fraction of its historical floodplain. It should be noted that the SMP was developed to address flood risk reduction from flows at the 5-year and 10-year storm which in the Salinas River can be up to 45,000 cfs. Studies conducted during the design of the program noted that program activities and benefits would be primarily localized within the activity area or within the River Management Unit (RMU).

This Plan describes the information that will be collected, the monitoring activities that will be conducted, and the analyses that will be performed to evaluate the SMP's overall effectiveness. There is also a desire to more clearly understand the role of the SMP on watershed health and function over the long term and this plan will assist in gathering information for such evaluation. However, changes resulting to the watershed will likely take decades to document especially with the drought conditions for the period of years the SMP has been implemented which have been dominated by low flows.

Results from this plan therefore will take time to truly document change at the targeted storm levels the SMP is implemented for. This is important to note at the initiation of any watershed monitoring effort and interpretation of associated data. The Plan may also be used by watershed planners to propose or modify projects and programs within the Salinas River basin over the long term. The draft Plan was submitted for review and approval by the Central Coast Water Board Executive Officer by May 31, 2017, with the 2016 SMP Annual Report. After comments were received from the Central Coast Water Board, a revised draft has been prepared and submitted with the 2017 SMP Annual report for review and approval. In the meantime, data collection efforts have been initiated and are continuing for future use.

A. Effectiveness Monitoring

Maintenance Areas (MAs) were developed throughout the Salinas River in order to select areas where maintenance can be focused through the life of the current SMP. Most MAs are in the form of secondary channels which mimic the natural braiding of the Salinas River by running parallel to the low-flow channel and are activated during higher flows (i.e., 5-year flow events) to increase the flood-carrying capacity of the river. The proposed locations of MAs have been preferentially aligned along meander cutoffs, low-lying undeveloped areas, and former river alignments to mimic the historical braiding of the Salinas River. The sediment transport characteristics and other river morphology data related to secondary channel function have not been captured on the Salinas River at this scale.

Data Collection

In order to determine how the MAs are functioning with regard to flows and to assess the sediment transport characteristics of the MAs, topographic surveys of select MAs will be completed. Features such as deposition, scour, tie-ins, length of channel, and centerline will be collected. Surveys will extend from the low flow channel of the Salinas River on the upstream tie-in point then down through the MA and out the downstream tie-in and back into the low flow channel. Surveys will utilize a survey-grade GPS or similar instrument, in order to collect relatively accurate horizontal and vertical data. Other data collection techniques may be utilized instead, such as aerial data collection via a drone or similar device. This technology still has some limitations for use over large areas that have multiple property owners and so needs some additional research before it can be committed to the SMP monitoring. Data will need to be able to be reproduced and so temporary benchmarks or other survey controls may need to be installed.

Monitoring Activities

The select MAs will be distributed throughout the entire Program Area by including a minimum of one for each River Management Unit (RMU) that has received work. An additional MA will be selected and monitored if more than ten MAs are constructed within an RMU. The MAs will be selected based on a variety of criteria such as: proposed for work in year 1 or 2 of the Program start, accessibility, ability to set up survey control network, and regular participation in Program over the ten-year period. Based on the selection criteria as well as the spatial distribution of the RMUs, these select MAs will provide a representative sample of the riverine processes taking place throughout the watershed and in the RMUs at the flows associated with the SMP design.

The surveys will be conducted up to two times within the first year, in order to capture the topographic data before and after construction of the MAs. This will occur during or just after the maintenance season. The first survey establishes the baseline data and will be performed once vegetation is initially removed, in order to get accurate ground surface data. A second survey will occur during the same maintenance season, only if any grading activities occurred, in order to collect the final ground surface data prior to any riverine flows.

The pre-construction surveys the following year will capture any changes in topography that may occur after a large flow event activates the MAs, typically during the late summer. If the MAs were not activated by riverine flow the preceding winter, then this survey will not be necessary. The final survey the prior year will still be valid documentation of the ground surface conditions. If grading occurs in subsequent years then a post-construction survey will also be required to set a new baseline prior to the following winter, in order to capture any changes as a result of riverine flows.

Analyses Performed

The Salinas River has a mobile, sand-rich bed as documented historically through scour chains and other measuring methods. Therefore, it is assumed that the MA locations are in a dynamic section of the river and may experience scour or relocation in larger flow events (5-year or greater). The repeat collection of survey data in the same areas following significant flow events will help staff better understand sediment dynamics (e.g. scour and deposition) at these specific locations throughout the watershed.

In order to determine whether the MAs are functioning as lower-velocity bypass channels, the data will be looked at as a longitudinal profile before and after flow events to understand where vertical changes are happening. An estimated volume of material will be calculated as well as any corresponding velocity changes based on changes in areas of deposition over time. In addition, the centerline and tie-in locations will be analyzed in plan view in order to see horizontal changes. These changes over time will be catalogued in reference to permanent structures that are not altered due to high river flows so that longer-term changes can be understood.

It is expected to find both horizontal and vertical changes in the system, and this data will help guide future maintenance seasons in determining if adaptive management needs to take place. Some MAs may no longer function either through being disconnected from the low-flow channel, or if they have eroded away. This data collection effort will aid in tracking those changes as well as inform decisions on how areas may need to be re-designed.

B. Design Verification Monitoring

Extensive two-dimensional flood modeling of the Salinas River took place to aid in the design of the SMP activities. Existing conditions as well as various project activities were modeled under the 2-year, 5-year, and 10-year flows as well as a recent flow event from March 2011. Ultimately, the MAs are supposed to be activated and functioning during an approximately 5-year flow event, at most sites. Since over 100 miles of river were modeled, with numerous tributaries, the flows fluctuate over the length of the river based on the hydrologic patterns of different storm events.

Data Collection

Landowners and other SMP Participants will be queried after seasons where there were flow events equal to or exceeding 25,450 cfs (5-year event), as measured at USGS stream gage 11152500 near Spreckels, to find out if their MAs were activated. This will be done via the annual outreach during the late spring when the MCWRA sends out a request for information to active Participants of the Program. The landowners and Participants will then submit the information and any relevant photos to the MCWRA.

The topographic data collected for the Effectiveness Monitoring described above could also be useful in determining if and how water is flowing through the MAs. Google earth aerial imagery or drone data, if available, will be used to monitor the location of the MAs as well as changes in channel complexity over time. Monterey County has subscribed to Google imagery that is available every 6 months or every few years depending on the area.

There are four USGS stream gage stations on the Salinas River within the Program Area. They are located in the vicinity of the communities of Bradley, Soledad, Chualar, and Spreckels. The USGS performs rating curve adjustments regularly to the stream gages in Monterey County during different size storm events with a focus on capturing peak flow data. Some of this data is published online and additional data is available from the USGS by request. MCWRA staff works closely with the USGS and should be able to receive velocity data that may match up with the modeled flow data.

Monitoring Activities

MCWRA staff will monitor all significant flow events equal to or exceeding 25,450 cfs (5-year event), as measured at USGS stream gage 11152500 near Spreckels, during each rainy season. USGS data is first released as provisional and final data may not be available in time to be used. In addition, MCWRA staff will monitor the release of aerial imagery to identify those images released after an event of this magnitude. This selected imagery will then be used by Project Team staff to monitor changes in the locations of the low-flow channel relative to the MAs using GIS tools.

Analyses Performed

Assumptions were made during the design process based on the best available scientific data. MAs are assumed to be activated at approximately a 5-year flow event and to flow downstream through the MA or back into the MA based on different hydraulic conditions. Now that some of the MAs have been constructed, additional data can be collected and analyzed to better understand if the SMP functions as designed. Since the flood model includes a static land terrain model, real-life changes to the riverine features provide a greater level of detail than the modeling efforts. The collection of the annual topographic surveys will help in determining if the MAs functioned the way the model predicted through the analysis of the features left behind. We will know if they activated at the design flow and modifications to location or elevation may be necessary based on this outcome. The effectiveness of selective vegetation treatment versus full removal of vegetation within a MA will also be considered.

The review of archived and current aerial photography will be used to determine how channel complexity changes after a moderate flow event, at an RMU level. The analysis will include channel

complexity achieved through the construction of MAs versus occurring more naturally, as well as if the MAs are diminishing or are reshaped. This then guides whether or not constructing MAs through just vegetation or combined with sediment removal has an impact of increasing geomorphic and hydraulic features across the floodplain. Depending on those results, activities that are linked with increasing channel complexity may then be encouraged or optimized in more areas of the river channel.

C. Flood Reduction Monitoring

The two-dimensional flood model results were used to compare existing conditions and the proposed project (targeted vegetation clearing). Estimated flood reduction benefits from the project were calculated by acreage of land not inundated after all project components were constructed. During the 10-year flow, these values were broken down by RMU as shown below:

RMU	1	2	3	4	5	6	7
Pre-project inundation (acres)	7,176	2,970	6,220	data unavailable	data unavailable	6,557	7,450
Post-project inundation (acres)	7,062	2,677	5,800	data unavailable	data unavailable	6,453	7,330
Total change (acres)	114	293	420	170[1]	40[1]	104	120

[1] These values represent the total change in acres during then 5-year flow.

Data Collection

If a flow event equal to or exceeding 42,800 cfs, as measured at USGS stream gage 11152500 near Spreckels, occurs then it is anticipated that significant flooding and associated damages will also occur. Events of this magnitude are typically associated with disaster relief efforts and therefore, the media and other sources will be gathering publicly available information. It is desired to capture the observed extent of flooding. Historically, the County Agricultural Commissioner has surveyed the landowners and growers about the extent of flooding specifically related to crop loss and food safety. This data is helpful for determining those flood boundaries along the agricultural land adjacent to the Salinas River. Additional flooding reports and any available aerial imagery are good sources of the extent of flooding. High water marks may be available after the floodwaters recede in areas that do not have available data. MCWRA and project team partners will work collaboratively in the community to encourage and help develop and process the survey data so that loss of top soil and time of inundation can be factored into the dataset.

The USGS performs rating curve adjustments regularly to the stream gages in Monterey County during different size storm events with a focus on capturing peak flow data. Some of this data is published online and additional data is available from the USGS by request. MCWRA staff works closely with the USGS and should be able to receive velocity data that may match up with the modeled flow data.

Monitoring Activities

MCWRA staff will monitor all significant flow events equal to or exceeding 42,800 cfs, as measured at USGS stream gage 11152500 near Spreckels, during each rainy season. USGS data is first released as provisional and final data may not be available in time to be used.

Analyses Performed

After a 10-year flow event or greater occurs, as measured at the Spreckels stream gage, MCWRA and Project Team staff will analyze the data collected to determine how the observed extent, time of inundation and depth of flooding compares to the flooding characteristics predicted by the hydraulic model at full project completion. This will be performed at an RMU level and will consider how much work has been completed at the time of the flood event.

Changes throughout the watershed may contribute to how and why flooding changes over time. It will be critical to this evaluation to assess what changes are directly associated with the project implementation and what changes are unrelated. One of these external factors include a change in land use which may affect stormwater detention opportunities, infiltration rates, runoff rates, and quantities. This can be seen by looking at historic travel times and other indicators of flow. In addition, events like the multi-year drought that much of the western states have recently experienced, can severely alter river function and impact native vegetation condition throughout the system. Evapotranspiration, percolation and recharge are all affected which impacts the floodplain function. This results in less predictability of flow volumes and timing. Some common practices used in agriculture and urbanized areas can also influence riverine flooding. Examples may include discharge of wastewater, irrigation methods, slopes, levees, and land cover. It will be critical to have a good understanding of issues like these in order to compartmentalize the benefits associated with the SMP.

Flooding patterns from these larger storm events will help guide future decisions about the suite of stream maintenance options. Data analysis about how much the stream maintenance activities have curtailed flooding will provide insight as to what other stream maintenance activities could be proposed or what modifications may need to happen. This includes possible widening MAs, adding more MAs, increasing infiltration areas for stormwater, or adding off-channel storage of floodwaters. This analysis may also provide insight to the greater community regarding other modifications to their practices that could positively influence flooding.

D. Biological Function Monitoring

The objective of the RMU approach is to reduce flood risk to agricultural land adjacent to the Salinas River while maintaining or enhancing natural habitat and ecological and hydrological processes. The Maintenance Areas not only spread water across a larger active floodplain area which reduces flooding but also brings water to a larger footprint which increases the viability of vegetation communities.

The Program was developed with avoidance as a key component to reduce potential impacts. There are established work windows and work locations that avoid impacts to flowing water, avoid the need to

dewater which could directly impact fish or amphibians, and avoid using large equipment during nesting bird season. In addition, the Program provides specific Best Management Practices (BMPs) and avoidance measures to address impacts resulting from implementation and includes a biological monitoring program to ensure direct take of species is reduced to the greatest extent possible during annual implementation.

Additionally, the Program has been designed to specifically avoid most sensitive or rare habitat types and focus maintenance on areas with more transient, early successional vegetation and/or areas dominated by either *Arundo donax* (arundo) or dense stands of *Salix* spp. (willow) which have become ubiquitous within many portions of the action area. The main activities for compensatory mitigation are the eradication of arundo and the planting of underrepresented tree types within the watershed. This design approach was intended to promote increased diversification of riparian habitat conditions in the larger SMP area outside of Maintenance Areas.

Data Collection

MCWRA monitors steelhead through an environmental compliance program related to the Salinas Valley Water Project. The 404 permit issued by the U.S. Army Corps of Engineers contained a Biological Opinion from the National Marine Fisheries Service that included requirements for on-going monitoring for threatened distinct population segment, South Central California Coast Steelhead trout (Oncorhynchus mykiss). The MCWRA provides annual reports to NMFS to document the monitoring program results. The three main goals of the fish monitoring program are (1) to quantify the presence of the threatened steelhead trout in the lower Salinas River system (population monitoring), (2) to monitor river flows to ensure adequate water for fish passage (migration monitoring) and (3) to monitor water quality to determine habitat suitability (habitat monitoring).

In arundo mitigation areas, MCWRA and RCD will document progress toward meeting the mitigation success criteria for arundo removal and assess plant recruitment into these areas over time. In each RMU where arundo mitigation occurs, one site will be chosen for plant community monitoring. If more than ten mitigation areas in an RMU are treated, an additional site will be added. At each site, four transect surveys will be completed: two inside the arundo mitigation area, and two 'controls' outside the arundo mitigation area. Data collected will include number of resprouting arundo canes, percent cover of arundo and different plant guilds (native and nonnative herbaceous vegetation, grasses, and woody vegetation), and a list of all species found in the transect. Photo points will be established at each transect. Data will be collected annually after the first year of arundo mowing. Additionally, all other arundo mitigation areas will be surveyed by RCD each year after the first year of spraying. These surveys will assess percent cover of arundo and dominant plant species. Tree planting sites will be assessed annually by MCWRA and RCD to determine survival of trees planted in previous years. This data will be collected with georeferencing data so the locations can be tracked individually.

During pre-maintenance surveys, biologists collect data on species and/or potential habitat specifically focused on the state species of concern provided by the California Department of Fish and Wildlife. If a

critical species is identified, then the location and relevant data would be entered into the California Natural Diversity Database if warranted.

MCWRA and RCD are under contract with Pathways for Wildlife to conduct a pilot wildlife camera trapping study. One site will be chosen in four of the RMUs for the pilot study. A paired design will be implemented to compare maintained areas with unmaintained areas at each site. Cameras will monitor the presence, movement, and abundance of larger mammals (e.g., bobcat, deer, coyote, fox, badger) continuously for six months (May-October). Twice a month for six months, transects will be surveyed at each site inside and outside of maintained areas to document animal tracks and sign. Funding will be sought to continue the study beyond the first year.

Monitoring Activities

Salinas River flows and reservoir storage are monitored throughout the year to determine if triggers from the Salinas Valley Water Project's Biological Opinion are met which may require specific flow targets through the river.

Arundo removal and native tree planting areas will be visually inspected annually prior to and during the maintenance season. Data will be recorded using the Collector program using georeferencing tools to ensure that each area is monitored individually. All impact areas will also be monitored for special status species prior to and during the maintenance season.

Total impact areas will continue to be monitored as well as avoidance areas including wetlands to determine if there are shifts in these sensitive areas year to year.

Analyses Performed

Plant community data will be analyzed by MCWRA and RCD to look for trends over time in species composition and diversity and in percent cover of different vegetation types. Data from inside arundo mitigation areas will be compared to data in 'control' areas outside mitigation areas to determine whether community composition in treated areas begins to approach the composition of untreated areas without active restoration. If plant communities are not beginning to recover, more active restoration (i.e., planting desirable vegetation or additional weed control) will be considered.

The time to reach arundo mitigation success criteria will also be analyzed, and factors that may affect the rate of success, such as timing of herbicide treatments, type/rate of herbicide applied, etc., will be examined. This will lead to adaptive management for future arundo treatments.

Wildlife monitoring data will be analyzed to compare species diversity and abundance between paired maintained and unmaintained ('control') sites. The data will show whether there are different species or numbers of individuals using maintained and unmaintained areas, which will be used to assess the program's effect on wildlife. Because the species using the Salinas River riparian corridor are largely unknown due to lack of previous studies, the data will provide valuable information to wildlife permitting agencies if/when permits are renewed, and may lead to changes in required protective measures.

Only specific native trees may be planted as mitigation in order to increase diversity within the riparian area creating a mosaic. Once these tree plantings become established it will increase diversity of riparian habitat conditions. There are many other factors that influence the age and size of vegetation communities within the riparian habitat and therefore cannot be attributed specifically to the SMP. An analysis will be performed to determine if more hydraulic and geomorphic connections across the floodplain will increase habitat abundance and success of native plant growth, to the extent practicable. The results will lead to questions regarding weed control, size and location of MAs, tie-in benefits to habitat, and other sediment options such as bar ripping that may be beneficial in more locations. This will inform future design of selective vegetation removal and avoidance criteria.

E. Watershed Assessment

MCWRA manages various projects throughout the Salinas River Basin and is working on two major studies that will assist in both the collection of relevant data and the analyses to assess the SMP and its effects within the larger context of the Salinas River watershed within Monterey County. The long-term goal of this type of assessment is to understand the river system dynamics and to identify actions that may optimize watershed health and function. This will be done through the lens of MCWRA's Mission and Vision as well as area of responsibilities.

The watershed assessment will be done in two phases. The first will focus on questions such as:

- The interaction between the SMP and known watershed issues, such as flood control, groundwater management, river flows, reservoir releases, water quality, habitat loss, ecological function loss, and fish habitat and passage
- The interaction between the Project and all other MCWRA river management activities (current and planned), such as reservoir operations and activities downstream
- The cumulative effect of the Project and all other MCWRA river management activities (current and planned) on watershed health and function

Phase two will expand on the previous items to include the following:

- The most effective use of management resources to optimize watershed health and function while also achieving MCWRA river management activity purposes, such as the optimal collective use of mitigation resources
- Potential implementation actions or modifications to the Project or other river management activities to optimize watershed health and function, while also achieving MCWRA river management objectives
- Recommended implementation actions or modifications to the Project or other river management activities to optimize watershed health and function, while also achieving MCWRA river management activity purposes

The MCWRA is currently working on two projects that will provide the necessary data, monitoring and analyses to answer the questions stated above. Those projects are described in more detail below.

Data Collection, Monitoring and Analyses – Basin Investigation

The *Salinas River Groundwater Basin Investigation, Salinas Valley, California* is being performed by the U.S. Geological Survey and managed by the County of Monterey. The project period coincides with Federal Fiscal Years 2016-19 and will provide an improved understanding of the source, movement and use of surface water and groundwater, and help to predict the potential effects of continued ground-water overdraft and related seawater intrusion. This study will be very beneficial in the data collection and analyses required in a Long-Term Effectiveness Assessment and Watershed Assessment.

The objectives of this study are to: (1) refine the geohydrologic framework of the Salinas Valley, (2) develop integrated hydrologic models, (3) quantify the historical hydrologic budget of the valley and evaluate total water demand for existing and future uses, (4) provide the required deliverables of the settlement agreement, Salinas Valley Water Coalition et al v. County of Monterey: Monterey County (MC, 2010), (5) develop hydrologic modeling tools to help evaluate and manage the water resources, and (6) incorporate climate model results into the integrated hydrologic model and evaluate the potential effects of climate change for selected scenarios. The study will develop a greater understanding of the geohydrology of the Salinas Valley and evaluate the potential hydrologic effects of future groundwater development on different parts of the valley which would aide in the potential development of a new groundwater management plan. These modeling tools will specifically be used to evaluate, on an annual basis during the study period (2014 – 2018), groundwater-level elevations and the extent of seawater intrusion.

The proposed study will include five main tasks: (1) geohydrologic model development, (2) surface-water hydrologic model development, (3) development of an integrated groundwater/surface-water hydrologic model, (4) analysis of water availability, and (5) report/information preparation. Previously compiled geologic information and databases will be used to develop the geohydrologic framework of the Salinas Valley. This framework will include the creation of a texture model and related layering and structural barriers to groundwater flow. Climate, land-use, geologic, hydrologic, and water-quality data previously compiled and assembled into databases and a Geographic Information System along with current monitoring networks will be used to develop models and comparison information needed to calibrate hydrologic models. Geohydrologic and hydrologic models will be developed as part of this study to more accurately assess and simulate the storage and flow of water in the Salinas River Groundwater Basin. The hydrologic model will be used to evaluate how selected land- and water-use and climate scenarios affect the availability of surface water and groundwater in the Salinas Valley, and will include a predictive analysis of groundwater and surface water conditions under two proposed buildout conditions: year 2030 for the General Plan settlement, and year 2042 for the Sustainable Groundwater Management Act (CADWR, 2014). Of particular importance will be using the hydrologic model to analyze changes in surface-water and groundwater flow, as well as changes in groundwater storage and related seawater intrusion, in different hydrologic regions of Salinas Valley as influenced by current and projected water use and potential climate change.

Data Collection, Monitoring and Analyses – Salinas River Long-Term Management Plan

The MCWRA has several programs, projects and facilities within the Salinas Watershed, which is occupied by several listed species and associated critical habitat. Certain MCWRA activities that currently have federal Endangered Species Act coverage under Section 7, will only maintain that coverage for a limited timeframe. Therefore, in order to obtain/maintain long-term ESA incidental take coverage for many of the MCWRA's operations, maintenance, and facilities a Habitat Conservation Plan (HCP) should be developed. In conjunction with this need, the MCWRA had conducted a series of public meetings in 2013, throughout the Salinas Valley to gather ideas and feedback for the development of a Long-term Salinas River Management Plan. The information gathered in those meetings confirmed the need for a long-term plan that could be developed with stakeholder input and participation. The Agency has received grant funding from the California Coastal Conservancy for the development of a Long-term Salinas River Management Plan (Phase 1). It is anticipated that this Plan will address several re-occurring issues in the Salinas River Watershed including, but not limited to:

- Salinas River Stream Maintenance Program
- Salinas River Lagoon suitability as rearing habitat for O. Mykiss
- Salinas River Lagoon flooding and sandbar management
- Old Salinas River suitability as a migration corridor for O. Mykiss
- Opportunities for O. Mykiss population enhancements
- ESA compliance for Agency's ongoing operations and maintenance activities
- New project compliance with ESA (i.e., the proposed Interlake Tunnel Project)

The plan is intended to:

- Develop a current conditions analysis of the Salinas River system that takes into account current data, literature, and models and provides for incorporation of new data. This analysis would account for a variety of conditions in a water year as well as current water operations. This assessment would build off current models, including the Salinas River Stream Maintenance Program, groundwater modeling, and take into account various projects and plans in place and in development to project key future conditions (i.e. ILT, SGMA, hydrologic model, Pure Water Project treating waters in the Salinas Reclamation Ditch and Blanco Drain, etc.).
- Identify data gaps and gather priority data. Perform a data gap assessment of the Salinas River system to identify additional studies to complete. These studies would provide additional review for (i) assumptions regarding physical or biological conditions in the system that have yet to be developed specific to the Salinas River system; (ii) projects that might be able to be conducted in the short term, which provide benefit to the system; and (iii) analysis of landowner/operator opportunities to engage in further voluntary conservation planning.
- Identify long-term management goals and objectives, environmental design opportunities, flood risk reduction strategies, endangered species act compliance strategies, habitat management options, and detail results in a set of potential projects for permitting and future environmental review, building upon current river system framework. Identify an operational system that

allows for a suite of project opportunities and a well-developed plan that establishes a coordinated set of outcomes that mitigate flooding, promote aquifer recharge, and improve habitat management.

- Analyze landowner/operator opportunities for voluntary conservation planning.
- Develop a strategy to manage goals and objectives with flexibility and co-benefits clearly defined, incentives outlined for participation by various stakeholders, and be compatible with existing land and water rights and uses.

The schedule for completion of the Salinas River Long-Term Management Plan is February 28, 2019. At that time both state and federal environmental review and HCP development will commence (Phases 2 and 3). The process for planning and developing an HCP is thoroughly described in the recently updated (2016) Habitat Conservation Planning and Incidental Take Permit Process Handbook written by U.S. Fish and Wildlife Service and National Marine Fisheries Service. With an idealized timeline, the process will take approximately four years.

F. Timeline and Interim Objectives

Two Long-Term Effectiveness Reports (Reports) will be developed based on the analyses, assessments, and other information identified in this Plan. The Reports will be prepared by qualified personnel with expertise in the biology of riparian ecosystems, fluvial geomorphology, and hydrologic and hydraulic modeling of braided riverine systems. The data collection is primarily performed by biological monitors under supervision of a qualified biologist and by hydrologists. The monitoring activities and analyses performed will be performed by individuals with expertise to make conclusions in their field(s) based on the data collected.

Data will be collected annually, and preliminary analyses will be performed to ensure that the data for each year is valid. Specific sites will be selected per RMU to perform specific analyses such as Effectiveness Monitoring. The goal is to have a more complete data set for representative sites in each RMU so that better conclusions can be made across disciplines. The SMP team will continue to research more efficient ways to collect data to utilize technological advances that may be appropriate for monitoring items within the Plan.

The first Report will cover the Project implementation field seasons from 2016 through 2020. It will be submitted to the Regional Board with the Annual Report by May 31, 2021. It will cover all Plan activities through the first phase listed in the Watershed Assessment. The final Report will cover nine years of Project implementation through the 2024 field season and will cover all items including the second phase of the Watershed Assessment. This Report will be submitted to the Regional Board with the Annual Report by May 31, 2025.