

Zone 7 Water Agency

Flood Protection Program

2017 Annual Report

April 2018



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1. OVERVIEW

Introduction and Background

Zone 7 of the Alameda County Flood Control & Water Conservation District (Zone 7 Water Agency) was established in 1957 by the voters of the Livermore-Amador Valley in order to place water management, including flood control, under local control through a locally-elected Board of Directors. Zone 7's programs for flood protection and water supply are integrated. Since the 1960s, Zone 7 has imported water from the State Water Project and artificially recharged the local groundwater basin using abandoned quarries, local streams, and flood facilities during the dry season when capacity is not needed to convey storm flows. Zone 7 provides for the management of flood and storm waters in order to protect life, property and habitat from damage and destruction within a 430-square-mile area.

In addition to providing wholesale potable water supply to the businesses and residents of Dublin, Livermore, Pleasanton and the Dougherty Valley portion of San Ramon, Zone 7 also sustainably manages the groundwater basin for the Livermore-Amador Valley and provides untreated irrigation water to Eastern Alameda County agricultural customers.

Although many programs and projects satisfy multiple objectives, Zone 7's Flood Protection Program includes four major sub-programs. Additional details about these sub-programs and descriptions of some of the major activities that occurred during 2017 are in the sections that follow. Where appropriate, the Strategic Planning Priority has been noted (SPP: #).

- Administration

Administration includes staffing and training, legal, safety, property management, and regulation compliance.

- Watershed Protection and Collaboration

The Watershed Stakeholder Collaboration Program includes participation in a variety of local and regional efforts with specific emphasis on collaboration with the many public and individual stakeholders in the watershed.

- Capital Improvements

The key Capital Improvement Program activities include planning, data collection, hydrologic and hydraulic modeling, financing and budgeting, design and construction management, and working with other entities such as developers, cities, and NGOs to further partnerships on projects identified in the Stream Management Master Plan (SMMP).

- Maintenance

The key Maintenance Program activities for the 37 miles of Zone 7-owned channel facilities include emergency repairs, routine maintenance and repairs, clearing debris from channels and access roads, vegetation management along the channels, inspections to ensure the system is in good working condition to receive and convey storm waters, and rehabilitation of existing facilities. Maintenance also includes annual monitoring of past project sites in accordance with all permit requirements.

Highlighted Accomplishments from 2017

The following are some of the key accomplishments related to the Flood Protection Program by Zone 7 in 2017, all of which are described in more detail in the following chapters:

- Completed nine emergency bank repairs totaling 1,580 linear feet; 4,380 feet of access road repair; re-installation of five drainage inlets; 1,000 feet of new curb and cutter drainage; one drainage pan; one concrete outfall repair; 2 desilting projects; and one log crib wall biotechnical repair. (SPP: 2.1)
- Zone 7 staff took emergency measures to stabilize damages to the flood control channels that occurred during the winter storms of 2017 and continues efforts on permanent repairs, including collaboration with federal and state agencies. (SPP: 2.1)
- Zone 7 managed various maintenance activities, such as vegetation management, downed tree removal, hydroseeding, fence and gate repairs, and debris and trash removal, totaling an additional \$500,000. Further, the planning, permitting, design and construction management was performed directly by Zone 7 staff. (SPP: 2.1)
- Staff is finalizing an amendment to the Stream Management Master Plan (SMMP) using updated modeling and proposing projects to address flood-prone areas, while still implementing key ideas of the original SMMP. In addition, long-term financial planning for the SMMP projects is ongoing and will be addressed as part of one of the phases of the SMMP Update. (SPP: 2.2, 2.3)
- Zone 7 completed a conceptual design of Medeiros Parkway (an SMMP project) and shared it with stakeholders. Zone 7 also commenced engineering design, which continues into 2018 along with permitting. (SPP: 2.4, 2.7)
- Zone 7 staff chaired two multi-agency working groups that support environmental studies and collaboration in the Alameda Creek watershed. (SPP: 2.5)
- Contracted with the United States Geological Survey (USGS) in continuing the sediment study and adding a fourth gauge to the study which helps with tracing where sediment originates in the northern part of the watershed through Alamo Canal and South San

Ramon Creek, augmenting gauge data already being collected from the Arroyo Mocho and Arroyo las Positas watersheds. (SPP: 2.5)

- Zone 7 collaborated with the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) by acting as the local sponsor for a bank stabilization project at 7852 Foothill Road, with reimbursement through NRCS' Emergency Watershed Protection Program. (SPP: 2.5)
- Zone 7 partnered with the Alameda County Resources Conservation District (RCD) on two Altamont Creek sites that were identified as benefiting from water quality improvements, such as plantings using native species and willow materials. RCD and NRCS conducted the last round of monitoring in spring 2017. Initial monitoring of the Confluence Project shows that certain species performed better, and that survival at the upstream site was higher than the downstream site possibly due to heavier recreational traffic at the downstream site. Initial monitoring at the Willow Project shows that willow survival was good. (SPP: 2.5)
- Zone 7 collaborated with students from the Foothill High School and the City of Pleasanton on an arroyo clean-up effort to remove litter and debris along a reach of the Arroyo Mocho between Hopyard Road and Stoneridge Road. A total of 17 tires and two shopping carts, with an estimated weight of 600 pounds, were removed from the arroyo. (SPP: 2.5)
- The Living Arroyos Program, in collaboration among Livermore Area Recreation and Park District (LARPD), City of Livermore and Zone 7, seeks to improve the urban streams and streamside habitats of the Livermore-Amador Valley and to engage the local community. Volunteers and Living Arroyos staff harvested and planted willow stakes, and performed other maintenance activities along the Arroyo Mocho at the Stanley Reach Project, including replanting riparian trees during the fall, applying mulch to over 1,000 oak seedlings, removing over 10,000 gallons of non-native invasive weeds through hand weeding or using string trimmers, and several stream clean-ups following high-flow events in the winter. (SPP: 2.5)
- Zone 7 is a member of the Bay Area Flood Protection Agencies Association (BAFPAA). In 2017, in addition to the continued work on the Advanced Quantitative Precipitation Information (AQPI) project, BAFPAA has held several joint meetings with the Regional Water Quality Control Board (RWQCB) and the California Department of Fish and Wildlife (CDFW) to explore opportunities for better coordinated regulatory permitting processes. BAFPAA agencies, including Zone 7, also shared their experiences from the 2017 flood emergencies and disaster relief and recovery (SPP: 2.5)
- The Flood Protection Program supported three grant applications. One award is in final negotiations as of 2017. (SPP: 2.6)

- As a part of the Stream Maintenance Program (SMP), staff began pursuing programmatic permits from CDFW, RWQCB, and the United States Army Corps of Engineers (USACE). (SPP: 2.8)
- Collaborated with local municipalities and park districts in their planning and construction of trail projects utilizing Zone 7's flood control channel maintenance access roads.
- Zone 7 collaborated with the Dublin San Ramon Services District (DSRSD) and the City of Pleasanton on their respective sewer projects that pass through Zone 7 property.
- Staff development activities in 2017 included attending the State of the Estuary and Floodplain Management Association conferences, completing a Qualified SWPPP Practitioner/Developer course, and regularly attending webinars hosted by the American Society of Civil Engineers.

2. ADMINISTRATION

Zone 7's Flood Protection Program's administrative tasks include those related to staffing, planning, budget preparation, preparing board agendas and presentations, updating and managing current agreements and contracts, and issuing permits as appropriate. Flood Control protection staff coordinated extensively with other agencies to minimize impacts to the public and utilize Zone 7-owned properties for other compatible community uses such as trails. In addition, Flood Control protection staff routinely engages with the public to address citizen complaints and inquiries.

The following is a description of the key administrative activities that occurred in 2017:

Permits: Routine Maintenance Agreement

Activities that may impact the environment are subject to regulatory compliance, including California Environmental Quality Act (CEQA) and authorizations from regulatory agencies. Zone 7's channel maintenance work is covered by a Routine Maintenance Agreement issued by the California Department of Fish and Wildlife (CDFW). The permit specifies the allowable activities, seasonal work windows, mitigation measures, and reporting requirements. Zone 7 has secured a five-year (2016 – 2020) extension of this Agreement. Many projects also require United States Army Corps of Engineers (USACE) and/or Regional Water Quality Control Board (RWQCB) approvals. Larger projects, or those that could impact special species or habitats, require "individual" permits from CDFW and other agencies.

Contract Administration and Management

Zone 7 staff administers and manages various consultant and vendor contracts related to flood protection projects. This includes the preparation and administration of requests for proposals, contracts, and right-of-way documents. Staff is also responsible for preparing Zone 7 Board agenda items pertaining to flood protection.

Zone 7 staff routinely receives requests from private entities, as well as public agencies, regarding using flood protection facilities for their projects. While temporary access is usually granted by issuing encroachment permits, long-term access is usually provided, when warranted, through a license agreement. A license agreement is board-approved and will generally spell out the terms of operating within a Zone 7 facility, as well as indemnify Zone 7 from any liabilities that may occur from that entity's use of the property.

In 2017, Zone 7 staff developed a number of requests for proposals, annual purchase orders, and consultant contracts; administered various construction contracts; and responded to several requests from developers. Specifically, Zone 7 executed the following documents: 1) acceptance of a fee property for access to Arroyo Seco and vacating an abandoned existing access easement with the developer for a Chevron Gas Station project located adjacent to the arroyo; 2) a

Development Impact Fee collection deferral agreement with a Livermore property owner; 3) a task order with Livermore Area Recreation and Park District (LARPD) to manage weed control spraying services; and 4) multiple contracts for engineering support and construction services for the emergency and permanent repairs resulting from the 2017 winter storms.

Encroachment Permit Program

The Encroachment Permit Program involves engineering design review, inspection, and issuance of encroachment permits. Encroachment permits are necessary when adjacent neighbors have exhausted all other options and request use of Zone 7's access roads for access to work within their properties, or when improvement work is proposed within Zone 7's right-of-way or easement by a local or state agency. The program involves developing permit terms, conditions, fees, insurance and bond requirements. In 2017, Zone 7 issued 19 encroachment permits to both private entities and public agencies and coordinated with applicants to assure safe access to Zone 7 facilities.

U.S. Army Corps of Engineers PL 84-99 Federal Assistance Program

Zone 7 participates in the U.S. Army Corps of Engineers (USACE) Public Law 84-99 (PL 84-99) Federal Assistance Program. The program provides federal funding for Presidential-declared storm-related disasters to complete and rehabilitate damaged and eligible facilities participating in the program. USACE will repair 26 sites damaged as a result of the federally declared storm events in 2017 with construction scheduled for 2018; this is discussed in section 6, Storm Events of 2017.

Trail-Use Collaboration and Support

In 2017, Zone 7 staff continued collaboration with the City of Pleasanton, City of Livermore, City of Dublin, East Bay Regional Park District (EBRPD) and local trail groups on matters related to the public trails on Zone 7 maintenance roads. Staff assisted the City of Livermore with developing plans for a future public trail on the south side of Stanley Reach. In addition, staff has been participating in the City of Pleasanton's Trails Master Plan development by attending public meetings and participating in discussions with their landscape architecture team to provide Zone 7's input, as the preliminary plan includes development of trails along Zone 7 maintenance roads.

Alameda Countywide Clean Water Program

Zone 7 is a member of the Alameda Countywide Clean Water Program which fosters a culture of stewardship of the county's creeks, wetlands, and the Bay (<http://www.cleanwaterprogram.org>). In 2017, Zone 7 participated in the Alameda Countywide Clean Water Program by implementing

best management practices in its maintenance activities, responding to illicit discharges, and contributing data for the Clean Water Program semi-annual reports. Per Clean Water Program requirements, staff kept track of violations such as shopping carts, debris, and spills in the channels and prepared reports for the Clean Water Program. By staying proactive and being prepared for action when violations arose, Zone 7 has been able to effectively reduce the amount of runoff pollution. Zone 7 also participated in Earth Day 2017, Coastal Clean-Up Day, and Dublin Pride Week activities.

In May 2017, in collaboration with students from the Foothill High School and the City of Pleasanton, nine students initiated an arroyo clean-up effort to remove tire, shopping carts, and other debris along a reach of the Arroyo Mocho between the Hopyard Road bridge and the Stoneridge Road bridge. A total of 17 tires and two shopping carts, with an estimated weight of 600 pounds, were removed from the arroyo.



Joint Exercise of Powers Agreement for Aquatic Pesticides NPDES Permit

In compliance with the statewide General National Pollutant Discharge Elimination System (NPDES) Permit for the discharge of aquatic pesticides to waters of the United States, Zone 7 entered into a Joint Exercise of Powers Agreement (JEPA) in 2003 with the Contra Costa County Public Works Department, Contra Costa County Flood Control and Water Conservation District, Alameda County Public Works Agency, City of Antioch, and City of Concord to monitor and implement aquatic pesticide use. Flood Control staff attend meetings and contract agreement discussions with the selected consultant. All JEPA member agencies share equally in the costs of monitoring and testing for each pesticide being used and for the costs associated with coordination and administration of the JEPA. Zone 7 is in compliance with the NPDES permit when aquatic pesticides are used for keeping flood protection channels clear of obstructive vegetation.

Since the commencement of the 2013 Statewide General NPDES Permit for Residual Aquatic Pesticide Discharges from Algae and Aquatic Weed Control Applications, Zone 7 continued actively participating in the JEPA work group to share common interest and knowledge with

other Bay Area flood control agencies to ensure full compliance with the new permit requirements.

In 2017, staff continued participation in the JEPA and to pay for the annual program costs. Zone 7 has been in good standing and in full compliance with the NPDES permit since its inception.

Employee Development and Staff Training

In 2017, Zone 7 staff had the opportunity to participate in a number of training and educational events to improve staff productivity and employee development.

Floodplain Management Association (FMA) 2017 Annual Conference (Long Beach, CA)

Two staff members attended the FMA conference. In addition to networking and attending seminars on watershed modeling, programmatic permitting, emergency flood funding, and future use of remote imagery for maintenance work, staff participated in presenting work on the Alameda County watershed models in collaboration with Environmental Science Associates and Alameda County staff.

San Francisco Estuary Partnership State of the Estuary Conference (Oakland, CA)

Four staff members attended the biennial State of the Estuary Conference in support of the Zone 7 SMMP poster presentation at the conference.

QSD / QSP Training (Oakland, CA)

One staff member completed a Qualified SWPPP Developer / Qualified SWPPP Practitioner class. The knowledge gained through this course is being implemented to support use and maintenance of construction Best Management Practices (BMPs) on maintenance projects run by Zone 7 flood control staff, and the section plans to engage additional staff members in the training.

American Society of Civil Engineers (ASCE) Live Webinars

Section participated in a total of five live webinars presented by ASCE instructors. This participation is part of an ongoing program to ensure that the section remains abreast of developing technologies, repair methods, and watershed management practices that are applicable to Zone 7 needs in the flood control channel network. Topics covered included slope stability, stream structures, and construction BMPs.

Grant Applications

In 2017, the Flood Protection Program supported three grant applications:

- 1) River Parkways Grant Program - \$500,000 for Arroyo Mocho Floodplain and Riparian Forest Restoration Project
 - Status: award in final negotiations as of 2017
- 2) Proposition 1 Stormwater Grant Program - \$500,000 for Arroyo Mocho Floodplain and Riparian Forest Restoration Project
 - Status: No award
- 3) California Urban Rivers Grant Program \$3,000,000 for Arroyo Mocho Floodplain and Riparian Forest Restoration Project
 - Status: No award
- 4) U.S. EPA Water Quality Improvement Fund (WQIF) - \$1,667,000 for Preparing for the Storm: Riparian Restoration, Sediment Reuse, and Urban Greening to Enhance Stream and Watershed Resilience. Joint application with the San Francisco Estuary Institute (SFEI), H.T. Harvey, SF Bay Joint Venture, and several local partners.
 - Status: Awarded \$1.131 million and contracting with sub-awardees is underway

3. Watershed Protection and Collaboration Program

The Watershed Protection and Collaboration Program represents staff participation in a variety of local and regional watershed efforts, with specific emphasis on collaboration with the many public and individual stakeholders in the Northern Alameda Creek Watershed.

Alameda Creek Fisheries Restoration Workgroup

The Alameda Creek Fisheries Restoration Workgroup was formed in early 1999 as a collaborative effort among many parties focusing on water flows and habitat restoration in the Alameda Creek watershed to explore opportunities related to steelhead trout. A Memorandum of Understanding (MOU) was authorized by the 17 Workgroup members in 2006, and Zone 7 is one of the core funding partners. The MOU covered ten years and has since expired; a new MOU is under development.

A comprehensive study plan, the “Alameda Creek Population Recovery Strategies and In-Stream Flow Assessment for Steelhead Trout,” was completed in 2008. Work included an assessment of hydrologic and habitat conditions, identification of strategies for population recovery, and monitoring.

Zone 7 staff currently chairs this workgroup, developing the agendas and facilitating the meetings. As a funding partner, we also help guide the studies done on behalf of the workgroup, and seek ongoing collaboration from all stakeholders. Meetings are typically held quarterly and are open to the public. In 2017, four meetings were held including a field trip to the San Francisco Public Utilities Commission (SFPUC) Calaveras Dam Replacement Project and Alameda Creek Diversion fisheries bypass mitigation project.

Alameda Creek Watershed Forum

The Alameda Creek Watershed Forum consists of representatives from several local agencies, environmental groups, industries and organizations. The Forum’s mission is to protect and enhance water-related beneficial uses and resources in the Alameda Creek Watershed in order to create a healthy and sustainable watershed for the community. The Forum promotes collaboration and the sharing of information among all stakeholders. The Forum, led by a small planning committee, typically hosts two events per year: a spring conference and a fall technical/focused workshop.

Meetings were sidelined in 2017 so the group could assist in planning a County watershed conference.

Arroyo de la Laguna Agency Collaborative

The Arroyo de la Laguna Agency Collaborative is comprised of agencies and municipalities with facilities that drain into the arroyo and the greater Alameda Creek Watershed. More specifically, collaborators include the Alameda County Flood Control and Water Conservation District (Zone 5/6), Alameda County Water District, Contra Costa County Flood Control and Water Conservation District, SFPUC, Zone 7, and the Cities of Dublin, Livermore, Pleasanton, and San Ramon. The Alameda County Resources Conservation District (RCD) and National Resources Conservation Service (NRCS) are also engaged in the Collaborative, as much of their work is in or around our waterways. This Collaborative discusses the arroyo as a whole to better understand the scientific and engineering data that is available along with what goals for the arroyo will benefit the stakeholders and local residents. The RCD is particularly interested in working to better position the local agencies for possible future federal funding or grant opportunities.

Zone 7 serves as unofficial chair of the Collaborative, setting meetings and agendas and helping to foster inter-agency collaboration.

Living Arroyos Program

The Living Arroyos Program was initiated in 2013 with the dual goals of improving the urban streams and streamside habitats of the Livermore-Amador Valley by engaging the local community and of improving community understanding and appreciation of the arroyos through such involvement. The Livermore Area Recreation and Parks District continued in their role as the managing partner, and the cities of Livermore and Pleasanton continued as project partners.



The Program includes a year-long internship program where local college students learn hands-on about stream ecology and channel maintenance while also developing leadership and public-speaking skills by working with the community during volunteer workdays. The Program increases opportunities for local residents to engage in hands-on stewardship and establish relationships to the streams in their own backyards, while contributing to long-term vegetation management strategies across the valley.

In 2017, the volunteers and Living Arroyos staff harvested and planted willow stakes, and performed other maintenance activities along the Arroyo Mocho at the Stanley Reach Project, including replanting riparian trees during the fall, applying mulch to over 1,000 oak seedlings, removing over 10,000 gallons of non-native invasive weeds through hand weeding or using string trimmers, and conducting several stream clean-ups following high-flow events in the winter.



The Program continues to be a huge draw for volunteers with over 250 unique volunteers donating their time at 11 volunteer events. The number of volunteers on any given volunteer day ranged from as few as five up to 30+ volunteers with several repeat volunteers. Over 80% of volunteers came from within the Tri-Valley Area. As in previous years, the Program was a big hit with high school student service groups and continues to draw from a wider audience with added projects in Pleasanton.

Sediment Study

Flood Protection staff had been monitoring and assessing sediment transport within Arroyo Mocho and Arroyo Las Positas between 2010 and 2016 in an effort to directly support improved modeling for design and compliance purposes and decisions about future operations and maintenance of flood protection facilities. This effort was initially started in September 2010 with a Phase 1 contract with San Francisco Estuary Institute (SFEI). Three gauge stations, Arroyo Mocho near Pleasanton (AMP), Arroyo Mocho at Hagemann (AMH) and Arroyo Las Positas near Livermore (ALPL), were monitored. Phase 2 was initiated in November 2012, with a plan to complete the study over the following two seasons (2012-2013 and 2013-2014). Staff and SFEI were hoping for more substantial rain events to provide more information on sedimentation.



The recent drought years and lack of large storms resulted in data collection limited to smaller events. As of the end of 2016, data was insufficient to describe the processes of supply, transport, and deposition during wetter periods such as those that occurred during the early to mid-1980s and mid-1990s. Further, suspended and bedload data collection during more extreme events is needed to complete modeling and designs.

To fill the data gap for wet weather sampling, in 2017, staff contacted the U.S. Geological Survey (USGS) and inquired about having them provide sampling coverage. The estimate was initially only for the three gauges that SFEI has been studying but an additional fourth gauge was added to this study, Alamo Canal near Pleasanton (ACNP), which helps trace where sediment originates in the northern part of the watershed. The Alamo Canal gauge, which collects information on runoff from South San Ramon Creek and its tributaries along with Alamo Creek, provides an even better, and more complete, picture of where and how much sedimentation is coming through our system when data is compared to an existing downstream USGS gauge at Arroyo de la Laguna at Verona (ADLLV.) At the end of each year for the next five years, SFEI staff will generate an annual summary based on the sampling data collected by USGS. This summary is being appended to the overall data set that SFEI has been administering since the inception of the sedimentation study in 2010.

Lines B-5 and G-1-1 Revegetation Demonstration Project

In 2012, Zone 7 collaborated with the RCD and the NRCS on a demonstration project assessing the feasibility of improving bank stability at two locations in Pleasanton. With limited additional flow capacity, deep-rooting native grasses (sod) were installed at Line G-1-1 in lieu of larger shrubs or trees to preserve capacity. A short distance away native trees and shrubs were planted at Line B-5 (Pleasanton Canal) for bank stabilization. Both sites continue to be maintained by the Living Arroyos crew who mow and hand weed both sites, and limb up trees along Pleasanton Canal (Line B-5). Both sites performed well during heavy winter rains in 2017 - the first real test of the two bank treatments.



Upper Altamont Creek Demonstration Projects

Zone 7 partnered with the Alameda County RCD and NRCS on two sites that were identified as potentially benefiting from water quality improvements, making them eligible for funding from the EPA's San Francisco Bay Water Quality Improvement Fund:

1. The **Altamont Creek Confluence Planting Project** (Confluence Project) installed cover vegetation as a Best Management Practice (BMP) to improve water quality along approximately 570 linear feet of stream within two project areas located upstream and downstream of Bluebell Drive, respectively. Several different locally-collected and locally-adapted species were grown at the Watershed Nursery and planted by volunteers on a Saturday Planting Day Event hosted by Zone 7.
2. The **Upper Altamont Creek Willow Demonstration Project** (Willow Project) installed live willow material as a BMP to improve water quality and protect eroding banks along an incised reach of creek upstream of Vasco Road. BMPs were implemented at ten sites along this stretch of creek. Willow bank stabilization techniques included varying combinations of stakes, willow fascines, modified willow walls, and use of long-rooted native grasses to see the pros and cons of the different configurations.

Both projects were constructed in 2015 and RCD/NRCS staff will monitor the level of success through 2017. This recent winter was the first real test of these willow applications. RCD and NRCS staff conducted the last round of monitoring in spring 2017.



Stream Maintenance Program (SMP)

In 2017, Zone 7 initiated work to secure programmatic permits from the three major permitting agencies – CDFW, Regional Water Quality Control Board (RWQCB) and the U.S. Army Corps of Engineers (USACE). Once in place, these permits will provide certain assurances to complete routine channel maintenance in a timely fashion.

Initial tasks include (1) review of 10 years of maintenance work, and (2) a mapping exercise to confirm stream ownership, inventory, and mitigation opportunities.

Bay Area Flood Protection Agencies Association (BAFPAA) Accomplishments

Zone 7 has been a member of the BAFPAA since its inception and continues to actively participate. In addition to the continued work on the Integrated Regional Water Management (IRWM) Proposition 84 grant, of which \$19 million was awarded to BAFPAA for the Advanced Quantitative Precipitation Information (AQPI) project, BAFPAA has held several joint meetings with the RWQCB and the CDFW to explore opportunities for better coordinated regulatory permitting processes. This includes not only more expedited permitting timelines, but also more defined mitigation requirements. BAFPAA's focus of 2017 was working to build relationships with the regulatory community as a whole and furthering the grant-funded projects, like Flood Control 2.0 and AQPI.

Zone 7 staff also worked with other BAFPAA agencies to learn more about their programs and how they addressed the flood emergencies from early 2017. During the flood emergency, BAFPAA members shared key information with each other regarding working with USACE, the Federal Emergency Management Agency (FEMA), and California Office of Emergency Services (Cal OES) on disaster relief and recovery. For more information on Zone 7's Declaration of Flood Emergency and disaster recovery efforts, see Section 6, Storm Events of 2017.

Public Outreach

In 2017, Zone 7 staff documented, responded to, and investigated 132 complaints and inquiries related to flood control facilities and activities. Typical inquiries included complaints about homeless encampments, trail user complaints about graffiti and illegal dumping (e.g., shopping carts, tires, sofas, mattresses, etc.), downed tree branches and untrimmed vegetation on Zone 7's property, and neighbors' complaints of dust and vibration generated by moving equipment. By working calmly and reasonably with residents, staff was able to resolve many of their concerns while educating them about flood protection activities.

4. CAPITAL IMPROVEMENT PROGRAM

While Zone 7 owns and maintains approximately 37 miles of improved and unimproved channels throughout the Livermore-Amador Valley, there are approximately 80 additional miles of unimproved channels that flow through the Alameda Creek Watershed. The function of the Capital Improvement Program (CIP) is to address the regional flood protection needs and continue to improve the overall flood protection infrastructure for multiple public benefits. This involves the administration, planning, and implementation of the Stream Management Master Plan (SMMP) Program and its projects, as well as the administration and collection of development impact fees for development's share of the SMMP. Staff provides hydrologic and hydraulic modeling support to assist in the reassessment and prioritization of SMMP projects, as well as to evaluate future development impacts. To assist in planning efforts, staff strives to improve Zone 7's data collection from stream and rainfall gauge monitoring systems, to use for modeling purposes and to implement an early-warning flood system. When the opportunity arises, Zone 7 will often try to collaborate with other public entities and developers to help implement core objectives of the SMMP, such as maintaining natural floodplains or restoring channel reaches with biotechnical solutions. In addition, Staff reviews development referrals to identify potential impacts to Zone 7's flood protection facilities.

Stream Management Master Plan

In August 2006, the Zone 7 Board adopted a new flood control master plan, the SMMP. The SMMP included 45 individual multi-benefit projects throughout the Livermore-Amador Valley while focusing mainly on regional storage of flood and storm waters within the Chain of Lakes to limit peak flows downstream. The SMMP also focuses on achieving project goals by incorporating multi-benefit and environmentally-friendly objectives, while forming partnerships with related agencies.

Staff is in the process of finalizing an amendment to the SMMP using updated modeling and proposing projects to address regional flood-prone areas, while still implementing key ideas of the original SMMP. With new hydrologic and hydraulic modeling, Staff is able to better understand where potential flooding problems are in the Livermore Valley; this understanding allows us to update our SMMP projects to better reflect the needs of the area. This will also facilitate prioritizing projects for the next CIP and facilitate a review of Development Impact Fees (DIF). With new development starting to pick up once again, more opportunities are becoming available for Zone 7 to collaborate with developers prior to project implementation and to incorporate key SMMP ideas into these development projects. For 2017, staff continued discussions on implementing a couple of SMMP projects, described further below.

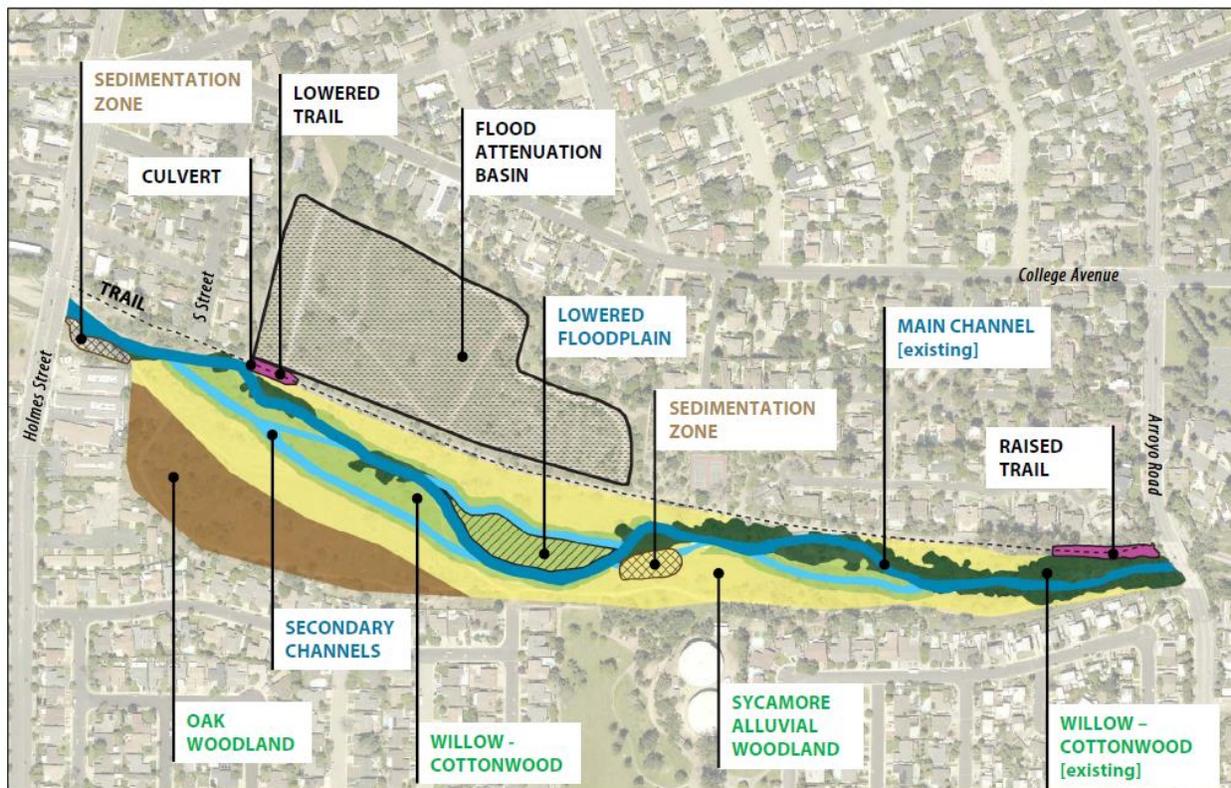
The DIF continues to be collected to mitigate for the creation of new impervious surfaces by new developments. While the SMMP is in the process of being updated, the DIF remains unchanged until the update is complete. Additional funding sources likely will be necessary to implement the SMMP in whole. Long-term financial planning for the SMMP projects is ongoing and will be addressed as part of one of the phases of the SMMP updates.

Arroyo Mocho Floodplain and Riparian Forest Restoration Project (Medeiros Parkway)

This project is identified in Zone 7's SMMP and CIP to improve regional flood protection. The project is located along a reach of the Arroyo Mocho surrounded by largely undeveloped parcels commonly known as Medeiros Parkway, between Holmes Street and L Street/Arroyo Road in Livermore.

The purpose of the project is to create a natural floodplain along the Arroyo Mocho, which will provide stormwater detention while promoting natural habitat and allowing compatible recreational use by preserving existing trails as well as allowing for the future City development in Oak Grove Nature Reserve. The project may also help mitigate sedimentation issues along Holmes Street while promoting a more natural hydrograph that mimics historical conditions. As an additional benefit, the natural floodplain may increase groundwater recharge capacity which will improve groundwater supply and quality sustainability for the Livermore Valley Groundwater Basin.

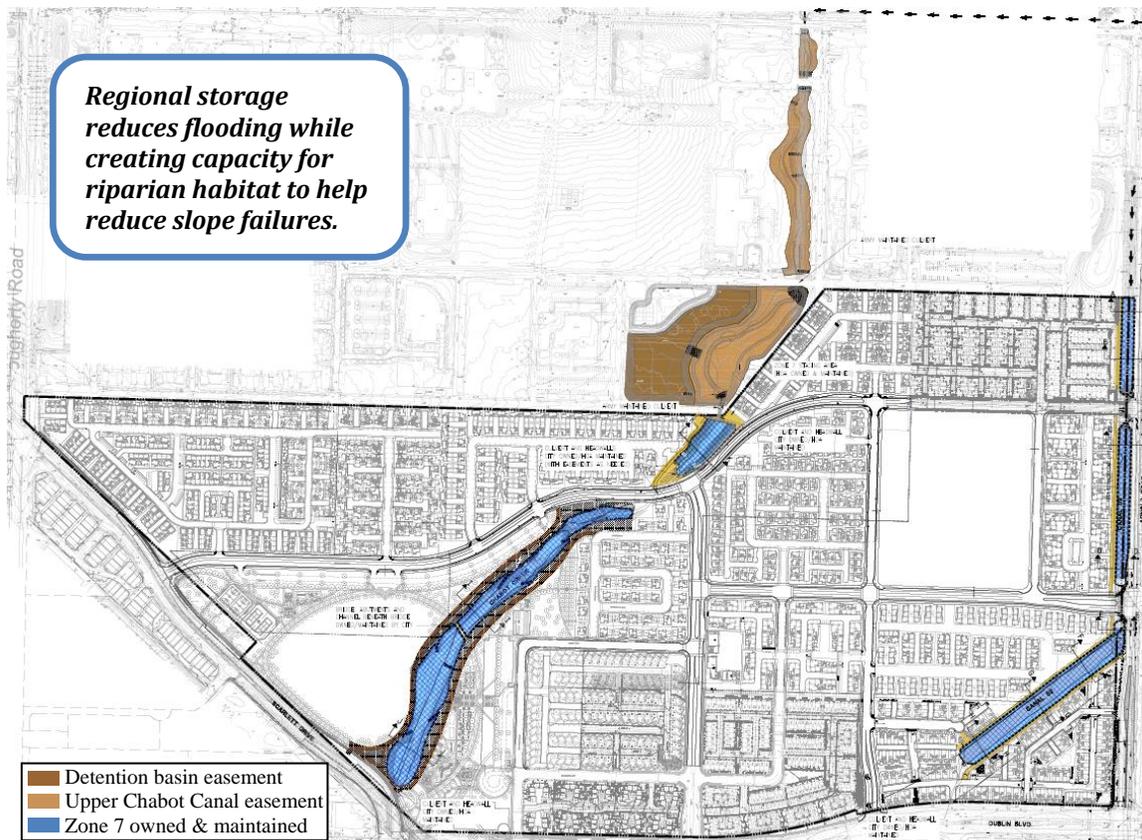
In 2017, Zone 7 commenced work on our engineering design. We prepared a conceptual design which we shared with City of Livermore, Livermore Area Recreation and Park District, and the public at stakeholder meetings. Our conceptual design is shown in the graphic below.



Work on our engineering design and project permitting will continue in 2018. The Project was selected for a grant from the California Natural Resources Agency River Parkways Program in 2016.

Chabot Canal Regional Stormwater Detention (SMMP Project R.8-2)

In July 2017, Dublin Crossing, LLC, entered into a Developer Reimbursement Agreement with Zone 7 to construct a regional flood storage detention basin facility on the U.S. Army’s Camp Parks Reserve Training Area, in correlation to their new Development, the Boulevard. The purpose of the regional flood detention storage in the Camp Parks area is to reduce the risk of flooding and potential sediment loading while promoting a more natural creek through the proposed development that mimics historical conditions. The project will reduce flooding downstream of the development and also create additional capacity in downstream areas experiencing bank slides, allowing Zone 7 to plant riparian plants that will help stabilize the banks in an environmentally sensitive manner. The Developer worked with staff in 2017 to finalize the detention basin plans, incorporating Regional Water Quality Control Board (RWQCB) and California Department of Fish and Wildlife (CDFW) input. Staff and the US Army drafted easement language for the detention basin, and were able to finalize the language and accept the easement in 2017. The detention basin is scheduled to be completed during the summer of 2018.



Development Referral Review Program

The Development Referral Program is an interagency program designed to keep public agencies abreast of public projects and private developments that may have an impact on an agency's facilities or operations. Staff reviews and evaluates other public agencies' and private parties' development plans and inquiries, environmental documents (CEQA), master plans, improvement plans, and engineering studies for impacts on Zone 7 flood control facilities and/or proposed projects identified in the SMMP. In 2017, Zone 7 staff conducted 20 reviews. Some of the reviews included evaluating the Dublin Ikea Project; Chik-fil-A restaurant in Livermore; and the Dublin Blvd Widening Project in Dublin.

Flood-Flow Monitoring and Mitigation

Zone 7 actively monitors stream flows in the channels both historically and in real time. With this information, staff can estimate the amount of flow coming through the watershed to help direct Zone 7's actions to address problems and maintain flood protection facilities.

Additionally, staff performs facility inspections before and after large storms. The pre-inspection is to confirm there are no obstructions that could compromise the facility's capacity to move water while the post-inspection is to check for obstructions and damages caused by rainfall events. Inspections are photo documented to provide chronological history of damage. Due to the large amount of rainfall in winter 2017, staff from other sections assisted Flood Control with facility inspections.

In 2017, Zone 7 began incorporating the use of ArcGIS Collector in facility inspections; this is further discussed in the sub-section GIS Collector (under section 5, Maintenance Program).

Early Flood Warning System Development

Development of an Early Warning System started in 2014, and continues at this time. The objective is to help staff identify any potential flooding concerns before they occur and to provide notice to the public to facilitate their own responses. This system requires a large network of streamflow gauges providing real-time streamflow data in the Livermore Valley to be effective. Zone 7's Early Warning System also includes a video camera monitoring two staff gauges on Arroyo de la Laguna behind Sunol Glen Elementary School. Staff increased the height of these gages after the water rose above them during the winter of 2017.



Storm Central, a web based communication system for the 13 stream gauges, has played a significant part of Zone 7's monitoring capabilities, as tracking flows and stream gauge heights can help indicate when emergency measures might be necessary. It also allows real-time public access to the data. At present, additional work needs to go into identifying typical peak levels for each gauging location, as certain stations only provide gauge height data, and not necessarily stream flow or elevation. Storm Central can be accessed from the following address: <https://stormcentral.waterlog.com/public/Zone7>

Other elements used for the Early Warning System are forecast sites such as the National Weather Service California Nevada River Forecast Center and Advanced Hydrologic Prediction Service and local precipitation gauging stations. Lastly, U.S. Geological Survey (USGS) stream gauge data is checked for overall correlation of the data to field observations.

Staff began developing a Flood Control Section Emergency Plan in 2017 that incorporates the Early Flood Warning System. Refinement of the Plan continues into 2018.

5. MAINTENANCE PROGRAM

Zone 7 owns and maintains approximately 37 miles of improved and natural channels throughout the Livermore-Amador Valley. Vigilant upkeep of these channels and the adjacent access roads and facilities is among the Flood Protection Program's highest priorities. The Maintenance Program involves routine, major, and emergency maintenance of and repairs to the Flood Protection Program facilities. Such activities are directed toward preventing minor problems from becoming major flooding problems, minimizing unnecessary damage to private property through proactive planning, preserving and maximizing flood carrying capacity of existing creeks and channels, and post-storm rehabilitation of damaged flood protection facilities.

As part of the maintenance program, staff is dedicated to implementing environmentally-friendly repair solutions that juxtapose the need for proper flood protection with progressive engineering practices. Design considerations, therefore, incorporate green techniques and bioengineering as much as possible in order to minimize mitigation requirements and the impact on the sensitive environment existing within channel boundaries. Typical bioengineering solutions include brush walls, willow stakes, and log crib walls, for example.

In addition to maintenance of Zone 7 facilities, staff maintains a general awareness of flood-prone and damaged areas throughout the Zone 7 region, including flood control channels owned by Dublin, Pleasanton, and Livermore, as well as the Arroyo de la Laguna south of Pleasanton. Staff continues to initiate and maintain communication with the relevant entities regarding observed shortcomings in these areas.

For flood control channels within the scope of Zone 7 jurisdiction, staff actively plans each summer for a list of projects encompassing several priority levels. To implement the various maintenance projects, Zone 7 staff plan and execute all aspects of the program, including project management, planning, scheduling, California Environmental Quality Act (CEQA) compliance, permit acquisition, surveying, design, cost estimates, construction management, and inspection.

Annual Maintenance/Repairs

In 2017, Zone 7 staff identified, planned, designed and managed the \$1,083,500 Annual Maintenance and Emergency Contract with Fanfa, Inc.

- Nine emergency bank repairs totaling 1,580 linear feet
- 4,380 feet of access road repair
- Re-installation of five drainage inlets
- 1,000 feet of new curb and gutter drainage
- One drainage pan
- One concrete repair to an outfall
- Two desilting projects

- One log crib wall as part of an effort to increase utilization of biotechnical solutions
- Protection and stabilization of damages to remain unrepaired through winter 2018

The following photos show a few of the key projects implemented under this year's contract:



Desilting: Before and After



Construction of bank repairs





Vibratory tamping for bank stabilization



Curb & gutter installation



Log crib wall construction

Vegetation Management Program

In 2017, Zone 7 staff administered a Vegetation Management Program, which cleared obstructive vegetation such as weeds and tall grasses that could impair the flow of water in channels and vehicle access along channel access roads. The program also aimed at reducing the fire fuel loads per the requirements of the local Fire Marshals. In addition, permitted herbicides were applied by qualified contractors to inhibit the growth of obstructive vegetation and control weed growth.

With the exception of clearing vegetation for annual maintenance/repair projects by staff, in 2017, the majority of vegetation clearing was handled through various maintenance contractors under annual service contracts. Zone 7 utilized the following contract labor providers to assist with such maintenance activities under Zone 7's direction: California Conservation Corps (CCC), East Bay Conservation Corps (EBCC), Pacheco Brothers Gardening, Inc., and Bruce Balala Mowing.

LARPD Contract - \$160,000

In 2017, Zone 7 continued with the use of Livermore Area Recreation and Park District (LARPD) to provide contract labor for vegetation management activities within Zone 7's facilities. Such activities included spraying of maintenance roadways and control of broad leaf plants and aquatic vegetation within the facilities. Expenditure on this contract for 2017 was \$160,000.



Bruce Balala Mowing Contract - \$120,000.00



In 2017, Zone 7 staff administered and managed an annual contract with Bruce Balala Mowing to provide district-wide mowing services for the major improved channels and other facilities owned by Zone 7. The mowing consisted of cutting tall weeds and grasses along channel embankments to meet the local Fire Marshal's requirements for establishing a fire break. Expenditure on this contract for 2017 was \$120,000.

**California Conservation Corps (CCC) and East Bay Conservation Corps (EBCC)
Contracts - \$50,000 each**



In 2017, annual contracts with the CCC and EBCC involved crews for projects requiring manual labor such as the facility winterization program, trash/debris cleanup and trimming of trees and vegetation. Total expenditure on both contracts for 2017 was \$100,000.



In addition to routine vegetation trimming and removal along fencelines, major efforts included removal of accumulated sediment on Line J-1, tree trimming and blackberry removal on Arroyo Valle, and vegetation trimming along a Caltrans-owned portion of Line T to facilitate access to Zone 7's portion of the channel.

Pacheco Brothers Gardening, Inc., Landscape Contract - \$50,000

Zone 7 uses the annual contract with Pacheco Brothers Gardening, Inc. for tree maintenance, such as tree trimming to ensure adequate vehicle clearance, removal of broken tree limbs and replanting of trees where applicable. Expenditure on this contract for 2017 was \$50,000.



Inspection Program

Throughout the year, Zone 7 staff performed inspections to ensure that Zone 7's channel facilities would be ready for the next big storm event. The inspection program consisted of multiple elements including routine facilities inspection, project-specific inspection, storm watch inspection, and on-call emergency response.

Routine Facilities Inspection

Zone 7 staff members perform routine inspections of all 37 channel miles and associated facilities on a monthly basis. These inspections allow the section to maintain awareness of channel conditions, including areas susceptible to damages from erosion, bank failures, trespassing, and homeless encampments. Issues noted during the facility inspections feed into section prioritization of work for vegetation management, facility repair, and maintain public health and safety, as well as the project matrices for capital improvement work.

In addition to maintaining a hard log documenting the inspection processes, staff have begun implementing the use of GIS Collector to streamline the inspections (see GIS Collector section).

Project-Specific Inspection

Zone 7 staff performed inspections for both Maintenance and Capital Projects. Staff is generally responsible for inspecting any project that requires an encroachment permit from Zone 7 as well. Staff inspectors act as the eyes and ears for the project engineer and report their findings on a daily basis. Only after communicating with the project engineer does the inspector inform a contractor of the directive.



Storm Watch Inspection

During major storm events, Zone 7 staff immediately shift into a pre-emergency response mode, working to minimize the loss of life and property. Flood-fighting activities, such as responding to emergency phone calls, storm monitoring, and field patrols, were top priorities during the storm season. Zone 7 staff documented all areas that are more prone to problems during storms.



On-Call Emergency Response

For emergency situations, such as flooding or major damage to facilities and other property-related issues, Zone 7 staff are on-call and ready to respond as necessary. In addition, Zone 7 issues annual contracts to support these efforts. In 2017, staff needed to perform several emergency bank stabilization measures and debris removal due to the extreme storm events. In addition, Zone 7 staff responded to one hazardous material spill incident when a vehicle accident on I-580 resulted in fuel entering a flood control channel.



Horizontal Drilling Bank Stabilization Program

This program involves the installation of a number of horizontal drains to minimize bank instability due to the high groundwater table or otherwise trapped water along the west bank reach of Alamo Canal. These horizontal drains are perforated PVC pipes that are strategically installed at locations

with seepage evident in the bank. Perforations are designed to capture the surrounding water and empty it into the channel, releasing hydrostatic pressure and thereby avoiding bank failures. This program also involves a monitoring program to evaluate the effectiveness of the drains and periodic surveying of the banks.



Miscellaneous Facility Maintenance Activities

Facility Fencing Repairs

Zone 7 protects its facilities from trespassers through the use of fencing along property lines. When fencing is damaged, it becomes a liability to Zone 7 if the fencing is not repaired. An annual contract with a fencing contractor is used to repair fences that have been damaged and to install new fences and gates as needed to maintain the required level of safety and security in Zone 7-owned facilities.



Hydroseeding

After channel embankment repairs, all denuded areas are hydroseeded by Zone 7 contractors. Hydroseeding of repaired embankments encourages the re-establishment of appropriate vegetative cover. In 2017, an annual hydroseeding contract was used to meet this need.



Homeless Encampments

Homeless encampments along flood protection facilities are another issue Zone 7 deals with under our routine maintenance program. In 2017, staff, with the assistance of the respective city Police Departments, removed and cleaned up various sites in Dublin, Pleasanton and Livermore. Camps had to be promptly removed before they became a safety and sanitation liability to the agency and before the trash/debris left behind inhibited flow within the creeks.



Zone 7 also adopted a new safety procedure to provide guidelines for employees dealing directly with occupants of these encampments.

Storm Drain Pipe Inspection



Some of Zone 7's storm drain pipes are aged, corroded and leaking, thereby causing channel embankment failure. Inspection of the storm drain pipes is needed and routinely performed as part of facility inspections to identify and repair damaged pipes before any embankment failure occurs.

Proactive replacement of corroded storm drain piping has prevented embankment failure in many of Zone 7's flood control facilities. Inspections continued in 2017.



Rodent Control

When considering the maintenance of a flood protection facility, the inevitable subject of rodent control always arises. Rodents, specifically ground squirrels, cause damage to the flood control banks by burrowing through the ground, causing water intrusion and destabilization of the flood control banks. Zone 7 uses the services of a pest control contractor to control and trap foxes/squirrels and other pests within the 37 miles of channels owned by Zone 7.



Graffiti Abatement

In 2017, Zone 7 staff continued efforts to abate graffiti found within flood control facilities.



Before



After



Mitigation Monitoring and Reporting Program

A typical Zone 7 Flood Control capital improvement project does not end after the construction is completed. Typically, a project requires ongoing monitoring and mitigation of project impacts. As a requirement for project approval, Zone 7 must provide a mitigation and monitoring report to various regulatory agencies, such as the California Department of Fish and Wildlife (CDFW), California Regional Water Quality Control Board (RWQCB), US Army Corps of Engineers (USACE), and U.S. Fish and Wildlife Service, for a period of five to ten years after project completion to show that the mitigation for the improvements are performing as intended.

Current mitigation and monitoring efforts include:

- 1) Arroyo Mocho Stanley Reach Riparian Restoration and Channel Enhancement Project, (Phase 1).
 - Zone 7 is required to monitor both the biological and physical conditions of the restored channel reach for a period of ten years (2015-2024) to insure that restoration

work does not affect the channel integrity and to ensure the riparian plantings are successful. Zone 7 staff performs the mitigation monitoring and reporting.

- An as-built report was submitted to the regulatory agencies in early 2015. In fall of 2017 staff initiated field work to support the annual monitoring report.
- The large storms of winter 2017 were the first real test for the Project since construction in 2013. The roughened channels did not entirely perform as expected and corrective actions are likely warranted to ensure the facility continues to provide 100-year flood protection in future years. The design consultant has assessed the status of the project, and we expect to receive recommended actions from them in the coming months.
- The resources agencies have been supportive of allowing other agencies to meet their own project mitigation requirements by reimbursing Zone 7 for certain costs related to construction of this restoration project. To date, Zone 7 has been reimbursed for about four acres. Staff continues to receive inquiries on this front from local agencies and consultants seeking mitigation options.

2) Annual Priority Streambank Repair Projects

- Bank repairs are completed on an annual basis; the nature of these projects required permit authorizations from all three major regulators—CDFW, RWQCB, and USACE. Permits include required monitoring for five years.

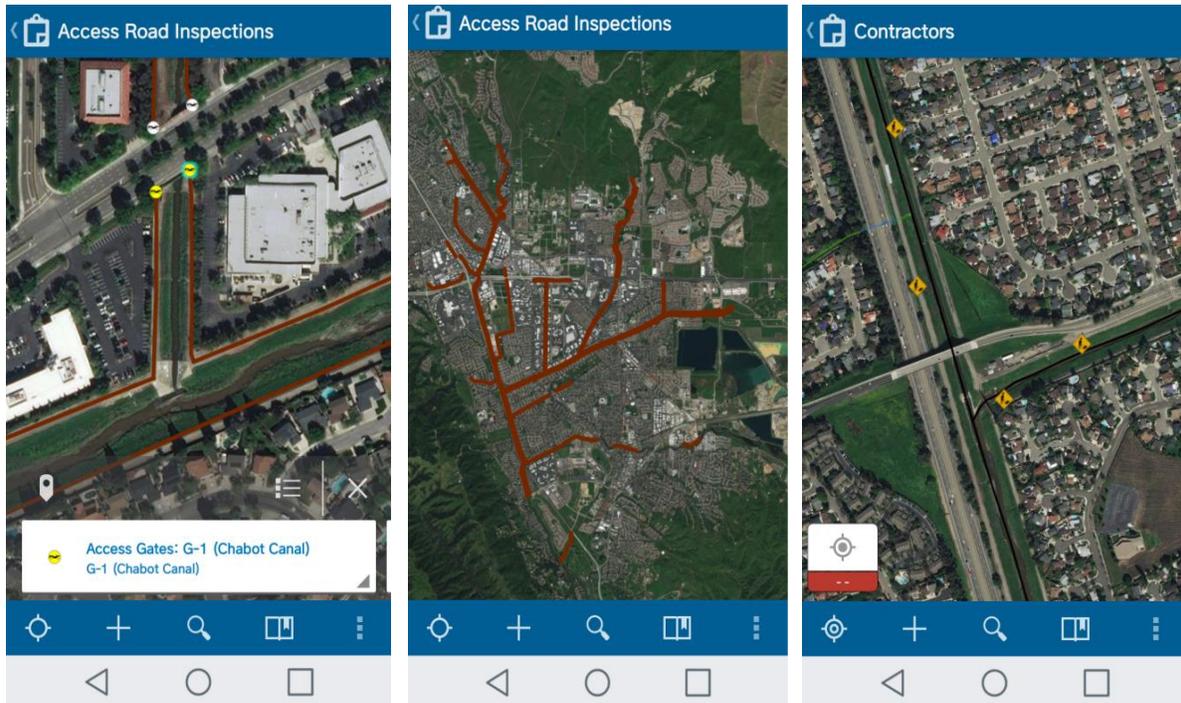
Asset Management

As a part of its responsibilities, Zone 7 plans for the maintenance and replacement of its property, including flood control channels, fences, gates, signs, and access roads. In 2017, staff began to document all of Zone 7's assets in ArcGIS to create and manage a long term plan for their maintenance, monitoring, and replacement. Efforts include utilizing existing databases, updating data, as well as collecting, digitizing, and geo-referencing additional data.



GIS Collector

In 2017, Zone 7 staff pilot tested a GIS smartphone app made by ESRI called Collector for ArcGIS that uses the phone's GPS to allow users to view existing maps and edit or create new data points in the field. Collector is compatible with ArcGIS online, allowing other users with access to the online maps to view updates in real time. The platform ArcGIS Online allows data to be uploaded from or downloaded to ArcGIS, making it easy to integrate with existing data. This field technology was initially utilized to track storm damages and is now being expanded for use in Asset Management.



6. Storm Events of 2017

FEMA/Cal OES

Flood control channels in Zone 7's service area experienced extensive damage during the winter 2017 storms. As Zone 7's service area was included within a federal Major Disaster Declaration for these storms, repairs of the resulting damages could be eligible for reimbursement from the Federal Emergency Management Agency (FEMA). Zone 7 hired a consultant from PMA Consultants to manage the emergency funding application process, which has since been handed over to in-house staff. While the application process continues into 2018 through coordination with the California Office of Emergency Services (Cal OES), Zone 7 expects reimbursement for costs related to emergency protective measures, debris removal, and repairs of a few bank slides. Any damages that occurred within channels that are part of the USACE PL 84-99 program were ineligible for FEMA funding.

USACE

Zone 7 staff also worked with the US Army Corps of Engineers (USACE) to seek repairs of the damages that occurred during the winter storms of 2017. USACE teams inspected the damaged sites in spring 2017; sites' eligibility for federal repair depends on having good standing in the PL 84-99 program as well as a benefit to cost ratio greater than one. USACE will repair 26 sites under the PL 84-99 program in 2018, and may consider the remaining slides in the program at a later date. Under the PL 84-99 program, USACE manages the design and construction of the repairs, obtains federal permits, and contributes 80 percent of the construction cost while the local sponsor (Zone 7) contributes 20 percent of the construction cost, obtains state and local permits, and signs a Project Coordination Agreement. Construction is expected to begin in summer 2018.

Other Repairs

Zone 7 continues to work on repairs to the other damages that will receive federal or gubernatorial assistance. Seven of the most critical repairs were designed in-house and constructed in 2017 under the Fanfa contract. Zone 7 hired the engineering design consulting firm MacKay and Soms to design all of the repairs that would not be completed by USACE. They completed the design of Phase I, which includes the higher priority sites, in 2017 and continue to design Phase II in 2018. Construction is anticipated for Phase I in the summer of 2018.

NRCS/Verona

In February 2017, the National Resources Conservation Service (NRCS) released an announcement concerning the availability of post-flood assistance for private landowners. It indicated that in the wake of California flooding, the NRCS in California was meeting with landowners and other agencies to assess damage and offer technical and financial assistance where possible. Assistance programs through NRCS include the Emergency Watershed Protection Program (EWP) and the Environmental Quality Incentives Program (EQIP).

The property owner at 7852 Foothill Rd. in Pleasanton contacted Zone 7 and the City of Pleasanton on Friday, February 24th regarding the continuing, significant bank erosion at the property. Staff from Zone 7, the City of Pleasanton, and NRCS was onsite within a few hours. The homeowner suggested that the majority occurred in the February 2017 storms. Staff documented a 35 foot vertical slope located about 13 feet from the landowner's pool and 63 feet from the house. A visual assessment about one week later revealed that the bank had retreated an additional 3 to 5 feet.

NRCS swiftly initiated the EWP process, which allows NRCS to provide immediate assistance to communities to mitigate potential hazards to life and property resulting from flooding and erosion. This process requires a local agency sponsor to request assistance from NRCS on behalf of the landowner. Requirements include providing funding up-front and having contracts for design, permitting, construction, mitigation, and long-term operation and maintenance for the project constructed with EWP funding. EWP can provide up to 75% of the costs (estimates are capped at the value of the threatened structures) of construction only. All other costs must be borne by the local sponsor or the landowner. There are no guarantees of reimbursement from the program.

Upon securing necessary environmental authorizations, Zone 7 initiated an interim action in March 2017 and a full scale stabilization project in July 2017. Staff expects reimbursement of \$759,000 from NRCS and \$172,500 from Cal OES to help offset the \$2.9 million total cost.

Before and after photos:



Emergency Measures



During the winter of 2017, staff took various emergency measures to prevent the damages from escalating into a condition that would endanger life or property. This included removal of more than 2,000 cubic yards of silt and vegetative and mixed debris system-wide to prevent this debris from

blocking the channels and maintenance roads. In addition, staff directed stabilization of bank damages including temporary repairs, shoring embankments, and covering damages with plastic to prevent further rain exposure. These activities were reimbursable under FEMA Category A (debris removal) and Category B (emergency measures), and Zone 7 received a sum of \$103,637 from FEMA and Cal OES.



City of Livermore Levee Fix

Before



along some of the creeks that flow through Livermore. The City of Livermore proceeded

February 2017 storm events caused significant damage to public facilities



After

with the 2017 Storm Damage Repairs Project at 9 locations within the City, which consisted of emergency repairs to stabilize the storm damage sites during summer 2017 to prevent additional damage the following winter. One of the nine locations included the repair of a levee between Arroyo las Positas and the Southern Conveyance Facility east of El Charro Road. This reach of Arroyo las Positas is owned and maintained by Zone 7 while the Southern Conveyance Facility is maintained by the City via an existing agreement. The City agreed to be the lead for the repair, performing it under the City's Stream Maintenance Permit Program. Repair costs may be eligible for reimbursements from FEMA and Cal OES. Due to the time constraint of the work window, the quantity limitation under the Stream Maintenance Permit Program, the scope of work under the emergency repair project, and the overall project budget, the levee repair work was limited to stabilization of the levee to a point where no additional damages during the 2018 winter would be substantiated. Permanent repair would most likely be undertaken under Zone 7's jurisdiction in 2018.

7. Tri-Valley Partners

Dublin San Ramon Services District (DSRSD)

DSRSD needed to rehabilitate 8,000 feet of a major sewer pipeline that runs under a busy commercial zone on Village Parkway in Dublin. Installed in 1960, the Dublin trunk sewer was nearing the end of its useful life. Sulfides in the wastewater were flaking away the pipe's interior concrete surface.

The 33- to 42-inch diameter pipe is buried 15 feet underground and carries about half of



the District's wastewater to the treatment plant. To dig up and replace such a large pipe would have taken months, rather than weeks, and cost far more than the project's \$5.5 million price.

Instead, the District selected cure-in-place pipe (CIPP) rehabilitation. With CIPP technology, a specialty contractor sets up a temporary bypass pipeline to keep sewage flowing, then cleans the existing pipe and inserts a flexible liner, one section at a time, through existing manholes. The liner bonds with the interior of the old pipe, adding 50 years to its expected life.



Choosing an efficient route for the sewer bypass pipe with little or no trenching was key to the project's success. If run through the Village Parkway commercial zone, the bypass pipe would have to be buried in shallow trenches. That would have heavily impacted local businesses and prolonged both bypass installation and street refurbishment.

Zone 7 Water Agency was able support this project by permitting the bypass pipe to route along flood channels. This saved \$1.2 million in construction costs. As part of this project, seven (7) drainage inlets and 1,400 ft of concrete v-ditches were installed by the contractor for Zone 7 along Line F-4 to improve drainage.

City of Pleasanton Sewer Project

The City of Pleasanton began construction of the Meadowlark Sewer Siphon Project in July 2017. The project involves the construction of a new 10-inch sewer line from Regency Drive and Meadowlark Park west of I-680 to Corte Mateo, where the line must go under Arroyo de la Laguna. Construction involved horizontal drilling below Arroyo de la Laguna at a minimum of 10 feet below the existing channel grade. The work involved closing off a portion of Zone 7's right-of-way to vehicular traffic; a five-foot opening remained open for recreational users. Zone 7 issued an encroachment permit for the work, which included construction of a new manhole for access to the sewer pipeline.

Caltrans

The storm events of 2017 produced some uncontrolled runoff from I-680 adjacent into Zone 7's Alamo Canal



facility that caused significant damage to the channel slopes in two locations adjacent to Stoneridge Drive off-ramps.

Caltrans maintenance workers installed a temporary asphalt dike to ensure future runoff does not exacerbate the erosion issue at one location. The second location, consisting of approximately 100 feet of damage to both Caltrans and Zone 7 right-of-way, requires a larger design strategy to implement both temporary and permanent repairs. Zone 7 and Caltrans staff are currently collaborating on an approach to repairing this area.

