LIVING ARROYOS

2020-2021 Annual Report

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Executive Summary

Living Arroyos is a multi-agency partnership in the Livermore-Amador Valley among Zone 7 Water Agency (Zone 7), City of Dublin, City of Livermore, City of Pleasanton, and Livermore Area Recreation and Parks District (LARPD). Initiated in 2013, the Living Arroyos Program (Program) is a unique community engagement opportunity that accomplishes multiple goals and provides additional benefits beyond the once or twice a year cleanup events that have traditionally been the means of public involvement in stream-related issues. Living Arroyos seeks to provide education on renewing and enhancing urban stream and riparian habitats as they relate to the watershed. The Program provides volunteer opportunities to local community groups and individuals, as well as to the broader Bay Area communities. It also provides training opportunities through internships and helps to develop local stewardship leaders. By establishing the connection between people and the arroyos in their own backyards, Living Arroyos interns and volunteers act as ambassadors for the watershed foster a greater understanding of local water management issues impacting streams in the area. In addition to the Program's educational elements, Living Arroyos engages the community through volunteer assistance to complete project goals outlined in the Annual Workplan.

Major Changes and Milestones in 2020-21

- The City of Dublin joined the Program.
- All volunteer activities remained on hold during the 2020-21 program year.
- Four program interns were hired in January 2021. Four long term interns left the program throughout the program year, including Chanddeep Singh who had been involved in the program since 2013.

Summary of Program Accomplishments

During the 2020-21 Program Year interns worked between one and five days a week, for a total of 191 workdays (see Table ES-1 for year-to-year comparison). Despite public health challenges, Living Arroyos staff accomplished a great deal of stream improvement during the eighth Program Year (Table ES-2).

Table ES-1. Summary of Living Arroyos workload for the past 3 years.

Activities	Program Year		
	2018-19	2019-20	2020-21
Number of Workdays	161	161	191
Program Hours	4,829	4,509	4,301
Volunteer Events	16	14	0

Table ES-2. Summary of Living Arroyos stream enhancement activities for the past 3 years.

Activities	Program Year		
	2018-19	2019-20	2020-21
Total stakes planted	336	247	143
Total plants installed *(excluding stakes)*	1,430	869	985
Total gallons of mulch used	N/A	N/A	500
Invasive species removed (gallons)	730	5,620	4,002
Trash removed (gallons)	1,424	4,315	253

Internship Program

Four interns were hired during the 2020-21 Program Year. Interns were currently enrolled or recent college graduates from local colleges or had connections to the Tri-Valley as a past or present resident of the area. Interns had degrees from, or were attending classes at the following schools:

- Las Positas College
- Diablo Valley College
- California State University, East Bay
- California State University, Humboldt

Intern responsibilities this year included:

- harvesting vegetative stakes for planting at project sites
- crafting fascines and installing bank stabilization projects
- hand-watering plantings
- removing invasive plant species
- planting native species
- helping to install drip irrigation systems

Several long-term interns left the program during the 2020-21 Program Year, including: Chanddeep Singh (2013-16 and 2017-21), Mitchell Gonzales (2019-20), Jesse Sanchez (2019-21), Bryan Smith (2019-21) and Richelle Vital (2019-2021).

Program Hours and Field Work

The Program utilized 4,301 program hours and 3,511 project hours during the 2020-21 fiscal year. Program Staff tracked hours used per project for each partner (Table ES-3). Zone 7 Water Agency projects utilized 46% of program hours or 1,630 hours. The City of Livermore projects utilized 52% of program hours or 1,825 hours. The City of Pleasanton utilized 1% of program hours or 43 hours. The City of Dublin utilized <1% of program hours or 13 hours.[1]

Staff utilized 790 hours in outreach, education, scheduling, training, and program coordination; this cost is shared by all partners based upon their share of cost and is factored into the overall program hours. (Table ES-3).

Table ES-3. Program Hours.

Program Partner	Project Hours*	Share of Program
Zone 7	1,630	46%
City of Livermore	1,825	52%
City of Pleasanton	43	1.2%
City of Dublin	13	<1%
Total Project Hours	**3,511**	
*Program Admin Hours***	**790**	
TOTAL PROGRAM HOURS	**4,301**	

**Project Hours are based on actual staff time dedicated to a specific Partner's project. See Section 7: 2020-21 Projects for hours spent per project.*
***Program administration hours are assumed to be proportional to the hours dedicated to each Partner's projects.*

[1] Discrepancies in hours utilized for each Partner compared to the agreed upon cost share may occur within a single Program Year, but staff will ensure the cost-share is met for the overall contract period.

Recommendations

Moving forward, Living Arroyos staff recommends:

- When it is safe to do so, Living Arroyos staff recommends that we continue our efforts in volunteer outreach with the aid of the Program Partners through:
    - Participating in LARPD's booth at the Livermore Farmers Market.
    - Including volunteer event dates in LARPD activities guide.
    - Working with Program Partners to integrate the Living Arroyos volunteer events into their social media presence.
- Improving the educational experience of the internship program through learning opportunities outside of the project sites. Interns and Coordinator will shadow professionals in Watershed Management and Natural Resources. Program partners will aid Coordinator in cultivating connections with said professionals.
- Creating a part-time Field Lead position to accommodate the growing needs of the program partners and further strengthen Program resilience.

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1. INTRODUCTION

The Living Arroyos Program (Program) is a multi-agency partnership among Zone 7 Water Agency (Zone 7) [2], City of Dublin[3], City of Livermore[4], City of Pleasanton[5], and Livermore Area Recreation and Park District (LARPD)[6]. The Program is a unique community engagement opportunity that renews and enhances urban stream and riparian (streamside) habitats in the Livermore-Amador Valley (Valley) and re-establishes the connection between people and the arroyos in their own backyards. In addition, the Program provides training opportunities through internships and helps to develop local stewardship leaders.

Urban streams provide many benefits to the people who live in the area. They are an integral part of the community's water management system by helping to protect neighborhoods from flooding, helping to counteract pollution, and recharging the groundwater basin. The vision behind Living Arroyos is that local volunteers and interns will learn about and care for urban streams by enhancing these natural spaces, which provide habitat for an abundance of native plants and wildlife. The Program seeks to connect people with their local arroyos, their natural settings, and introduce the public to

[2] Zone 7 Water Agency, short for Alameda County Flood Control and Water Conservation District, is responsible for providing flood control and water resource management to the Livermore-Amador Valley. Zone 7 has a service area of approximately 425 square miles of land including the Cities of Dublin, Pleasanton and Livermore, and a portion of San Ramon, and serves approximately 240,000 residents. Within the service area, Zone 7 owns or maintains approximately 37 miles of channels and streams. Zone 7 has been a Program Partner since the Program began in 2013.

[3] The City of Dublin is the local planning authority that encompasses over 15 square miles of land and is home to more than 61,000 residents. Dublin joined as a Program Partner in March 2021.

[4] The City of Livermore is the local planning authority that encompasses over 26 square miles of land, home to more than 89,000 residents. City of Livermore owns and maintains roughly 12 miles of channels and streams within city limits. Livermore has been a Program Partner since the Program began in 2013.

[5] The City of Pleasanton is the local planning authority that encompasses over 24 square miles of land and serves more than 80,000 residents. Pleasanton joined as a Program Partner in 2016.

[6] Livermore Area Recreation and Parks District (LARPD) has assumed the responsibilities of the "Managing Partner" since June 2015. The title "Managing Partner" was changed to "Implementing Agency" under the 2016-17 Workplan.

all the beneficial water-related and ecological benefits provided by the arroyos for the watershed.

Natural stream corridors and their associated riparian ecosystems do not conform to political boundaries, which makes collaboration among various entities an essential component of effective watershed management. The Program is at the heart of a partnership between a local water agency (Zone 7), city governments (Dublin, Livermore and Pleasanton), and the local park district (LARPD) to manage, enhance, and renew urban streams by engaging residents. Living Arroyos partners benefit by sharing costs and leveraging unique resources, aligning community vision of the watershed, avoiding redundancy, and achieving long-term management goals. The real key to making the Program a success is partnering with the people in the communities that in turn benefit from the work.

As it was initiated, the Living Arroyos Program started off with four goals:

(1) Engage residents in hands-on stewardship of natural resources while they experience nature close to home
(2) Increase public awareness of important watershed issues
(3) Improve habitat and water quality of local streams while maintaining and enhancing both public safety and regional flood protection
(4) Strengthen public/private partnerships within the community

As the Program grows and evolves, the goals will be revisited to reflect new members and responsibilities. This report outlines the Living Arroyos Program progress, accomplishments, and lessons learned during the 2020-21 Program Year.

LIVING ARROYOS PROGRAM OPERATING STRUCTURE

The Program was established in July 2013 for the purposes of initiating a public volunteer and internship program that engages the community in the stewardship of local streams within the Northern Alameda Creek Watershed and achieving maximum benefits with minimum costs by leveraging resources and boosting effectiveness in achieving the goals of the program. The Program is operating as a partnership among Zone 7, the City of Dublin, the City of Livermore, the City of Pleasanton, and LARPD (Program Partners). Program Partners collaborate to develop the Annual Workplan (Workplan) by contributing projects for the Program to work on during the Program Year (July 1–June 30) as well as funds to carry out Program work. Zone 7 has the additional role of Fiscal Agent—financial administrator responsible for collecting and administering the funds necessary to

implement the Program. LARPD is the Implementing Partner and is responsible for developing and executing the Workplan including implementing project activities measuring/reporting Program progress and accomplishments. The Implementing Partner is also responsible for preparing the Annual Report.

PROGRAM PARTNER COST SHARE

Program Partner cost share percentages are agreed upon during development of the annual Workplan. These percentages may be modified if other partners join the program in the future or upon mutual agreement of the partners.

Program Partner benefits should be roughly proportional to their contributions, e.g., a Partner contributing 25% of the budget of the program should on average receive 25% of the effort expended, measured in staff, intern, and volunteer person hours, by the program.

Zone 7's Program Cost contribution for Program Year 2020-21 is approximately 42%, City of Livermore's contribution is approximately 50%, City of Dublin's contribution is approximately 5%, and City of Pleasanton's contribution is approximately 3% of the total cost of the program. Program Partners agreed to average the percentages out over the two years of the current task order to reach the agreed upon share of cost.

PROGRAM AREA

There are approximately 120 miles of major creeks, streams, and arroyos within the Livermore-Amador Valley. The Program Area includes Zone 7's Service Area, but work primarily occurs within the city limits of Dublin, Pleasanton, and Livermore, and includes the unincorporated lands around the Chain of Lakes (**Figure 1**). Program activities focus on the more than 45 miles of streams managed by the Program Partners.

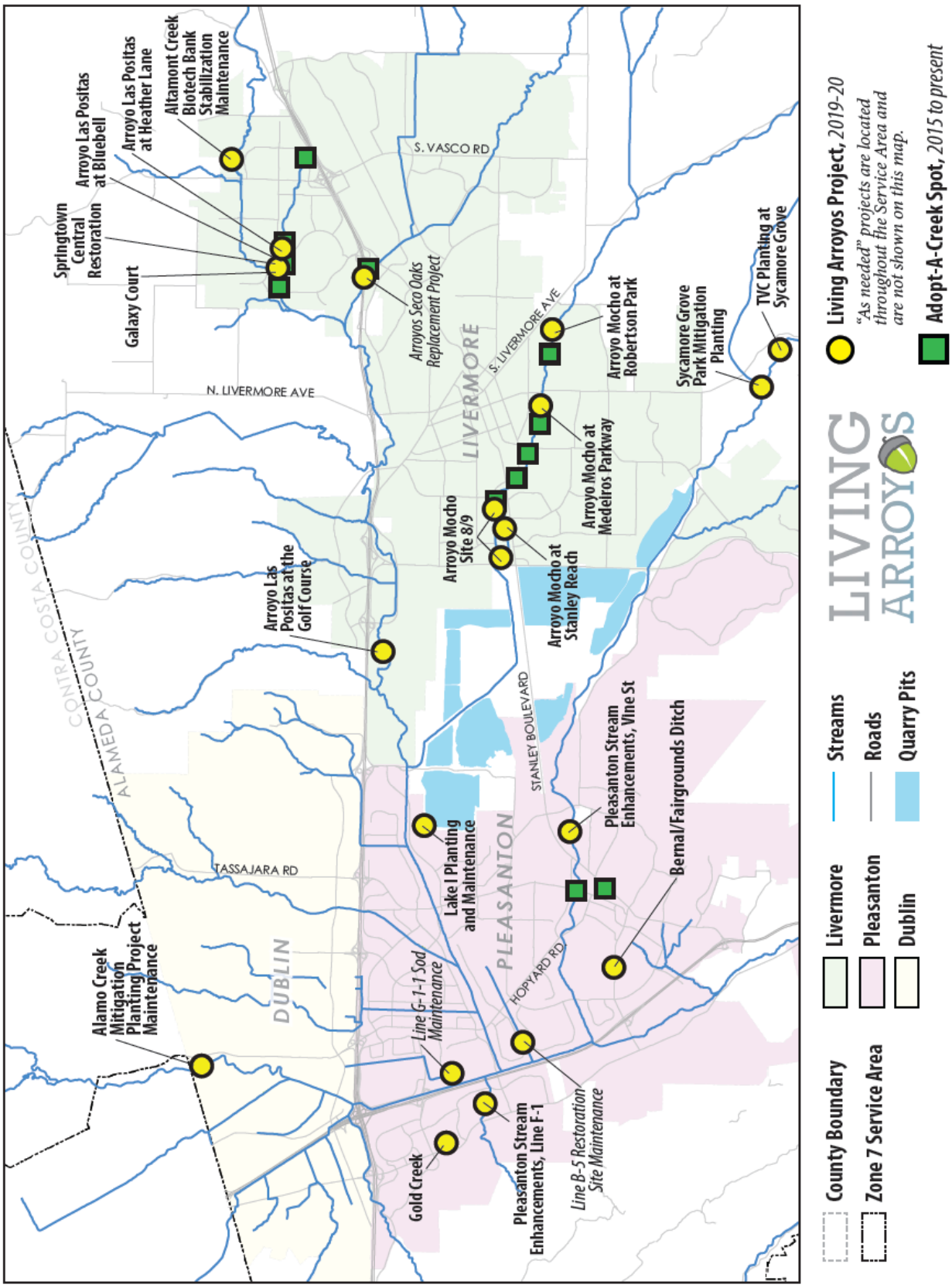

Figure 1. Living Arroyos Program Area (Livermore-Amador Valley), 2020-21.

SUMMARY OF MAJOR CHANGES IN 2020-21

On March 19, 2020, an Executive Order and Public Health Order directed all Californians to stay home except to go to an essential job or to shop for essential needs. All field work was suspended, and all remaining public and private volunteer events were cancelled for the remaining Program Year. Field work was able to resume on May 27, 2020, following the Alameda County Health Department's guidelines, but public volunteer events remained on hold for the entire Program Year.

Four new interns joined the Program in the winter of 2021: Andrew Bagwell, Joseph Hajduk, William Hazelton, and Martin Jarquin. Several long-term interns left the program, including Chanddeep Singh (2013-16 and 2017-21), Mitchell Gonzalez (2019-20), Jesse Sanchez (2019-21), Bryan Smith (2019-21) and Richelle Vital (2019-21). Joseph Hajduk and Martin Jarquin left the program in March 2021 and Andrew Bagwell left in June of 2021. Staffing was incredibly limited from March to June of 2021 during a crucial watering period for plant establishment.

2. INTERNSHIP PROGRAM

Living Arroyos interns are recruited from colleges and universities within 25 miles of the Program Area or have connections to the Tri-Valley as a past or present resident of the area. The driving force behind the intern program is learning by doing. Every year, a handful of college students from the local community are selected as paid interns for the Living Arroyos Program. As Program interns, they learn real-world stream management techniques that complement their in-class learning. Interns are given real time, hands-on responsibility for implementing environmental improvement projects for Program Partners. Interns also interact with and guide volunteers, gaining leadership skills and reinforcing their own knowledge by teaching others. Interns work under the supervision of the Program Coordinator 1–5 days per week, depending upon projects being conducted and intern availability.

Four additional interns were hired during the 2020-21 Program Year. Interns were currently enrolled or recent college graduates from local colleges or had connections to the Tri-Valley as a past or present resident of the area. Interns had degrees from, or were attending classes at the following schools:

- Las Positas College
- Diablo Valley College
- California State University, East Bay
- California State University, Humboldt
- UC San Diego

Intern responsibilities this year included:

- harvesting willow stakes for planting at project sites
- crafting fascines and installing bank stabilization projects
- hand-watering plantings
- removing invasive plant species
- planting native species
- helping to install drip irrigation systems

PHOTO: 2020-21 Crew, Fall 2020 (*from right to left: Richelle Vital, Chanddeep Singh, Bryan Smith, and Mitchell Gonzalez)*

EDUCATIONAL OPPORTUNITIES

Living Arroyos encourages employees to participate in training activities that promote safety and health among employees, as well as opportunities for career development and personal growth. The Program encourages interns to continue learning during their internship time. Educational interests are discussed among interns and the Program strives to identify opportunities to build on that interest.

Staff continued to expand on the educational component of the program by incorporating regular field trips with professionals in natural resource management and natural history. Staff facilitated intensive botanical studies involving botanical drawings, plant identification using dichotomous keys and reading excerpts about the plant's ecological services and ethnobotany. Additionally, intensive bird studies were also added to the regular educational activities to prepare crew members to use the Riparian Bird Index system proposed in previous years.

In addition to the orientation tour and presentation provided to new staff, Living Arroyos staff participated in three educational opportunities during the 2020-2021 Program Year:

- Staff joined Tami Church (Zone 7 Water Agency) to monitor oak growth and gather GPS data at the Stanley Reach (November 2020).
- Staff joined Ranger Eric (LARPD) at Sycamore Grove for the annual Audubon Christmas Bird Count (December 19, 2020).
- Staff also participated in various remote educational opportunities including: the Qualified Water Efficiency Landscaper (QWEL) training, the 2020 California Invasive Plant Council (Cal-IPC) Symposium, and the ReScape Design Qualification training.

Due to restrictions related to COVID-19, field trips and in person group events were put on hold for most of the Program Year.

FEEDBACK FROM PREVIOUS LIVING ARROYOS INTERNS

"What drew you to being an intern with Living Arroyos and what do you like about it?"

"I wanted to feel like I was making a difference. Actually, utilizing the knowledge I gained in college was a bonus. I really enjoy working outdoors in the environment that I can help improve and I am excited to look back years from now to see what we've accomplished on a grander scale." - Megan Arp, 31

"I joined Living Arroyos to gain field experience in natural resource management. I love this job because I get to be outside all day, spot wildlife, and hang out with a fun team of fellow nature-lovers. It has done wonders for my general health and well-being." – Liam Hazelton, 30

3. VOLUNTEER PROGRAM

Volunteers are the heart of the program. Living Arroyos invites the local community to engage and connect with creeks and arroyos that have a personal connection by hosting workdays in which volunteers participate in hands-on activities that protect and enhance the waterways in their area. Volunteering gives them a tangible sense of the value of watersheds, and a stronger understanding of their role in preserving the quality of watersheds. Volunteer days are held on the first and third Saturdays of the month between October and April.

VOLUNTEER WORKDAYS

All public and private volunteer events were cancelled for the Program Year. (Table 2).

Table 1. Volunteer data by Program Year, all years.

Volunteerism Data	2016-17	2017-18	2018-19	2019-20	2020-21
Total volunteer days (9–11:30 am)	11	19	16	14	0
Total unique volunteers engaged	253	389	524	350	0
Total volunteer hours	1,059	1,440	1,590	1,386	0
Average number of volunteers per event	27	25	40	33	0

Table 2. Volunteer activities by Program Year.

Volunteer Activities	2016-17	2017-18	2018-19	2019-20	2020-21
Harvest acorns	--	--	--		--
Plant acorns	--	--	--	1.5 days	--
Plant riparian trees	2.5 days	5 days	10 days	5.5 days	--
Mulch oak sites	2 days	4 days	--	--	--
Spread native grass seeds	--	--	--	--	--
Invasive species removal	6 days	5 days	2 days	3 days	--
Trash removal	0.5 day	5 days	4 days	4 days	--
TOTAL	**11 days**	**19 days**	**16 days**	**14 days**	**0 days**

4. COMMUNICATIONS AND OUTREACH

SOCIAL MEDIA OUTLETS

Living Arroyos continued to utilize the social media outlets that had been developed in the past six years since the Program started:

- Updated and maintained Living Arroyos website at www.livingarroyos.org. This website contains information about the program as well as upcoming workday information and blog posts about events and progress.
- Used Facebook and Twitter to educate and share photos with volunteers and community members.

LIVING ARROYOS APPAREL

Living Arroyos t-shirts and hats are typically distributed at the volunteer appreciation event. Due to precautions around COVID-19, this event was put on hold, and no apparel was handed out.

5. ADOPT-A-CREEK SPOT

This year, Living Arroyos continued to coordinate cleanups for Adopt-A-Creek Spot (AACS)—a sibling program that promotes healthy creeks through active community participation and education. Livermore and Pleasanton both rely on Living Arroyos to carry out AACS coordination tasks.

During the 2020-2021 Program Year, Living Arroyos staff continued to implement best management practices to:

- schedule and coordinate monthly/bi-annual creek cleanup events,
- resolve specific issues regarding creek spots #1-11 (e.g., graffiti, illegally dumped items, homeless camps, etc.), and
- manage disposal of trash/debris/recyclables collected from cleanup events.

In 2020-21 Living Arroyos staff continued coordinating creek cleanups for Program Partners through the AACS. Due to restrictions related to COVID-19, volunteers cleaned up creeks in small groups in their cohort and logged their data using the CleanSwell app.

Two large cleanups were scheduled during the 2020-21 Program Year:

- Creeks to Bay Cleanup in September.
- Community Service Day in May.

The larger cleanups are scheduled as needed depending upon rain events and trash quantities. Due to COVID-19 restrictions, the program was only able to facilitate a smaller Creeks to Bay Cleanup during the month of September 2020.

Table 4. AACS Program Data, 2016-2020

	Program Year			
	2017-18	2018-19	2019-20	2020-21
Volunteers	547	452	223	145
Gallons removed	6,941	4,915	6,259	160

6. 2020-21 PROJECTS

The Living Arroyos Workplan (Workplan) is a living document and outlines project locations, project goals and an estimated project budget. The Workplan also provides details of project planting, maintenance, monitoring, and reporting requirements. The document is amended throughout the Program Year to reflect site additions or alterations.

The Living Arroyos 2020-2021 Workplan included 19 projects within the Livermore-Amador Valley (Table 5) and one sibling program the Adopt a Creek Spot. Over the course of 191 days, Living Arroyos field staff completed project tasks for 16 of the proposed projects (Table 5).

Table 5. Living Arroyos Program Partners and their designated projects, Program Year 2020-21.

PROGRAM PARTNER*	PROJECTS
Zone 7 Water Agency	
Z-1	Arroyo Mocho at Stanley Reach
Z-2	Arroyo Las Positas at Vasco
Z-3	Arroyo Mocho Medeiros Parkway
Z-4	Arroyo Valle Bank Stabilization Project Plantings
Z-5	Alamo Creek Mitigation Planting Project
Z-6	Lake I Planting Project***
Z-7	Minor Biotechnical Bank Stabilization (As needed)
Z-8	Vegetation and Trash Management (As needed)**
City of Dublin	
D-1	Pilot Streambank Compost Application Project**
City of Livermore	
L-1	Arroyo Las Positas at Galaxy Court
L-2	Arroyo Mocho Site 8 and 9 Restoration Area
L-3	Springtown Restoration - Central/Bluebell Drive
L-4	Sycamore Grove Mitigation Plantings
L-5	Arroyo Las Positas at Bluebell (SMP Site 17)
L-6	Arroyo Las Positas at Heather Lane
L-7	Arroyo Las Positas at Golf Drive
L-8	Las Positas Golf Course Mitigation Plantings
L-9	Robertson Park Mitigation Plantings
City of Pleasanton	
P-1	Gold Creek Restoration
P-2	Bernal Hotspots

** LARPD is the Implementing Agency for the Program and does not include project sites in the annual Workplan.*
*** Projects that did not have work to complete this year.*
****Projects that were added mid-year.*

ZONE 7 WATER AGENCY (ZONE 7)

Living Arroyos worked on 7 projects for Zone 7 Water Agency in 2020-21.

Table 6. Zone 7 Hours

Zone 7 Project	Program Hours
Arroyo Mocho at Stanley Reach	1,141
Arroyo Las Positas at Vasco	53
Arroyo Mocho at Medeiros Parkway	125
Arroyo Valle Bank Stabilization Project Plantings	64
Alamo Creek Mitigation Planting Project	148
Lake I Planting Project	97
Minor Biotechnical Bank Stabilization	2
Vegetation and Trash Management	0
TOTAL HOURS	**1,630**

Z-1) Arroyo Mocho at Stanley Reach (Stanley Reach)

The Stanley Reach project was conceived in 2012 as an alternative flood control and reforestation project and was the first project of the Living Arroyos program. The original Workplan for this project involved establishing three distinct habitats on the site in different zones: riparian habitat in channel (Zone A), native grassland along the banks (Zone B), and oak woodland at the top of bank (Zone C).

2020-21 project goals involved additional removal of invasive plant species, summer hand watering, planting acorns in Zone B, and annual monitoring and reporting of vegetation survival status.

ACTIONS: Living Arroyos spent 1,141 program hours on the Stanley Reach in the 2020-21 Program Year (see Table 6).

Program activities at the Stanley Reach for 2020-21 are summarized below:

- Removed 2,222 gallons of invasive plant species by hand.
- Used 83,000 gallons of water to keep riparian vegetation alive in Zone A during the dry season.
- Removed 45 gallons of trash from the channel.
- Planted 420 acorns in Zone B.

A separate monitoring and maintenance report is submitted to Zone 7 that details the specific monitoring of the site.

PHOTO: Interns removing smilo grass (*Stipa miliacea*) February 25, 2021.

Z-2) Arroyo Las Positas at Vasco

Several biotechnical bank stabilization and repair treatments were installed to address erosion damage from the 2017 winter storms along Arroyo Las Positas just east of North Vasco Rd. in Livermore, CA. Treatments included coir logs, wrapped fill lifts (WFLs), use of live stakes at the toe (mulefat and willow), and slop/top of bank plantings (salt grass plugs, other low shrub species, etc.)

ACTIONS: The program utilized 53 hours and 2,550 gallons of water to keep plantings alive during their first summer (see Table 6).

Z-3) Arroyo Mocho Medeiros Parkway

In spring 2019, the Program planted 24 Western Sycamores (*Platanus racemosa*) at Medeiros Parkway. In January 2021, staff installed 8 fascines and 30 willow stakes to repair a bank erosion caused by runoff from the nearby access road.

ACTIONS: The Program spent 125 program hours doing bank repairs, watering, and monitoring the sycamores (see Table 6).

PHOTO: Interns compacting Medeiros Parkway bank repair after installation, January 29, 2021.

Z-4) Arroyo Valle Bank Stabilization Project Plantings

The Arroyo Valle Bank Stabilization Project planting component included a select planting palette to revegetate the repaired slope with native plantings. Site prep and installation of container plants was completed by Ecological Concerns, Inc. in fall 2020. The Program took on weeding and watering tasks in addition to completing the acorn planting.

ACTIONS: The Program spent 64 program hours planting acorns, installing cages, watering, and monitoring the newly planted vegetation at the site (see Table 6). Weeding and repairs to the drip irrigation system were completed as needed. Staff planted 220 acorns, installed 28 tubex tree shelters, and used 3,500 gallons of water to keep plants alive.

Z-5) Alamo Creek Mitigation Planting Project Maintenance

The Program took on maintenance and watering tasks for the Alamo Creek Mitigation Planting Project, which was completed in the spring of 2020 by Ecological Concerns, Inc.

ACTIONS: The Program spent 148 program hours watering and monitoring the newly planted vegetation at the site (see Table 6). Weeding and repairs to the drip irrigation system were completed as needed. The program used 15,550 gallons of water to keep plants alive during the dry season.

Z-6) Lake I Planting Project

The Lake I planting project is on the northwest side of Lake I in between Livermore and Pleasanton. Several hazardous trees were removed, and Zone 7 asked the program to do a limited planting (buckeye seedlings and acorns) and including summer watering for the first three years.

ACTIONS: The program utilized 97 program hours in watering this project during the dry season for the 2020-21 program year (see Table 6).

Z-7) Minor Biotechnical Bank Stabilization

Living Arroyos implemented willow staking efforts in small areas within the Livermore-Amador Valley, as needed, to help stabilize banks and reduce erosion.

ACTIONS: Program staff used 2 hours to monitor biotechnical bank stabilization sites from previous years along the Arroyo del Valle and Alamo Creek (see Table 6).

Z-8) Vegetation and Trash Management (as needed)

Vegetation management and enhancement activities as needed.

ACTIONS: Vegetation and Trash Management was not needed during the 2020-21 program year (see Table 6).

CITY OF DUBLIN (DUBLIN)

The program was tasked with a single project for the City of Dublin during the 2020-21 program year.

Table 7. City of Dublin Hours

Dublin Project	Program Hours
Pilot Streambank Compost Application Project	0
TOTAL HOURS	**0**

D-1) Pilot Streambank Compost Application Project

The program was tasked conducting a pilot project to determine how well compost blankets prevent streambank erosion and prevent invasive weed growth. Compost blankets should also help prep streambanks for future planting and offer carbon sequestration benefits.

ACTIONS: Due to an unusually dry winter, watering for Zone 7 and the City of Livermore started in March 2021 and staff were unable to complete this project during the 2020-21 program year (see Table 7).

CITY OF LIVERMORE (LIVERMORE)

Living Arroyos worked on 8 projects for the City of Livermore in 2020-21.

Table 8. City of Livermore Hours

Livermore Project	Program Hours
Arroyo Las Positas at Galaxy Court	54
Arroyo Mocho Site 8 and 9 Restoration Area	13
Springtown Restoration- Central/Bluebell Drive	262
Sycamore Grove Mitigation Plantings	317
Arroyo Las Positas at Bluebell (SMP Site 17)	9
Arroyo Las Positas at Heather Lane	618
Arroyo Las Positas at Golf Drive	467
Las Positas Golf Course Mitigation Plantings	11
Robertson Park Mitigation Plantings	74
TOTAL HOURS	**1,825**

L-1) Arroyo Las Positas at Galaxy Court (Galaxy Court)

The goals for the Galaxy Court project are to assist the City of Livermore in achieving mitigation goals for the Galaxy Court Culvert Replacement Project. The 2020-21 Workplan called for installation of willow stakes along the newly dredged low flow channel and supplemental watering of upland plants as needed. The native vegetation is intended to compete with and (in time) shade out cattails and tulles in the stream channel that increase risk of flooding in the adjacent neighborhood.

ACTIONS: Living Arroyos spent 54 program hours at Galaxy Court in the 2020-21 program year (see Table 8). The program installed 26 willow stakes at the tow of bank to fill in gaps created from the newly dredged low flow channel. 3,500 gallons of water were used to water stressed upland plants during the dry season.

L-2) Arroyo Mocho Site 8 and 9 Restoration Area

The Arroyo Mocho Site 8 Restoration Area is located near Rockrose Street in Livermore, CA. The area was selected to help mitigate for temporary and permanent impacts for Stream Maintenance Program activities along the Arroyo Mocho. The 2020-21 Workplan called for annual monitoring of the project, including survivorship and photo monitoring.

ACTIONS: Living Arroyos spent 13 program hours at Site 8 and 9 in the 2020-21 program year monitoring the site (see Table 8).

L-3) Springtown Restoration- Central/Bluebell Drive

The Springtown Restoration Project is located between Bluebell Drive and Heather Lane along the Arroyo Las Positas. The 2020-21 Workplan called for removal of lower branches of mature willows and repurposing of branches along Heather Lane, monitoring, and summer watering. As is the case for all the current Springtown mitigation sites, the native vegetation is intended to compete with and (in time) shade out cattails and tulles in the stream channel that increase risk of flooding in the adjacent neighborhood.

ACTIONS: Living Arroyos spent 262 program hours at the Springtown Restoration site in the 2020-21 program year removing branches from maturing willows, monitoring planted materials, and watering during the dry season (see Table 8). 40,361 gallons of water were used on upland plants every 3-4 weeks during the dry season. Staff also removed 195 gallons of invasive weeds from the project site during the 2020-21 program year.

L-4) Sycamore Grove Mitigation Plantings

The Sycamore Grove mitigation planting is in Sycamore Grove Park near the Arroyo Road/Olivina gate entrance in Livermore, CA. This project is to mitigate for the removal of two trees that were destroyed by a wildfire that occurred in 2015 from a downed PG&E powerline. The 2020-21 Workplan called for replanting to replace some of the lost sycamores and summer watering.

ACTIONS: Living Arroyos spent 317 program hours at Sycamore Grove in the 2020-21 program year plantings, mulching, watering, and monitoring the project site (see Table 8). The program planted seven native riparian trees, used 110 gallons of mulch, and 21,900 gallons of water during the dry season.

L-5) Arroyo Las Positas at Bluebell (Bluebell)

The Bluebell site is located on the Arroyo Las Positas near Bluebell Drive and is on the opposite bank from the Galaxy Court site. The goal of the project is to establish a native canopy to shade the creek to address on site mitigation requirements from the Stream Maintenance Program. The 2020-21 Workplan called for annual vegetation and photo monitoring.

ACTIONS: Living Arroyos spent 9 program hours at Bluebell in the 2020-21 program year monitoring planted materials and taking photo points (see Table 8).

L-6) Arroyo Las Positas at Heather Lane (Heather Lane)

The Arroyo Las Positas at Heather Lane was originally planted in 2019 with additionally plantings occurring in 2020. The long-term goal of the project is to prevent flooding during

heavy storm events caused by water pooling due to the channel being clogged with cattails. The site is focused on developing a riparian canopy to shade out cattails and to mitigate for impacts created by the low-flow channel that was created in 2019. In the 2020-21 Workplan the program was tasked with planting and monitoring the project as well as conducting summer watering and hand weeding.

ACTIONS: Living Arroyos spent 618 program hours at Heather Lane in the 2020-21 program year (see Table 8). Program staff planted 299 native plants and 160 acorns during the rainy season. Staff also installed 11 fascines as part of bank repairs and 46 willow stakes throughout the reach. 415 gallons of invasive weeds were removed by hand and 64,609 gallons of water were used during the dry season.

PHOTO: Richelle Vital installing a willow stake at Heather Lane on January 13, 2020.

L-7) Arroyo Las Positas at Golf Drive (Golf Drive)

The Arroyo Las Positas at Golf Drive is a mitigation project on a secondary channel the empties into a pond at the end of Golf Drive in Livermore, CA. The site mitigates for onsite disturbances caused in 2019 through in channel vegetation management. The Program was tasked with planting in designated areas, watering during the dry season, and monitoring for survivorship and photo points.

ACTIONS: Living Arroyos spent 467 program hours at the Golf Drive in the 2020-21 program year (see Table 8). Staff planted 517 native plants, 296 acorns, and 41 willow stakes during the rainy season. A total of 15,650 gallons of water were used during the dry season to keep plants alive.

L-8) Las Positas Golf Course (Golf Course) Mitigation Plantings

The Golf Course site is located on the Arroyo Las Positas at the Las Positas Golf Course. This project addresses the Tier 2 mitigation requirements for maintenance work which occurred along Collier Canyon to address storm related damages from 2017. The 2020-21 Workplan called for annual monitoring of vegetation for survival and photo monitoring.

ACTIONS: Living Arroyos spent 11program hours at the Golf Course in the 2020-21 program year (see Table 8) monitoring the site.

L-9) Robertson Park Mitigation Plantings

The Robertson Park mitigation plantings is part of the City of Livermore's Stream Maintenance Plan and is meant to mitigate for damages that have occurred along the Arroyo Mocho. The 2020-21 Workplan called for re-planting sections of the project that were underperforming and annual monitoring of planted materials and capturing photo points.

ACTIONS: Living Arroyos spent 74 program hours at Robertson Park in the 2020-21 program year (see Table 8). Program staff planted 123 native plants and used 210 gallons of mulch around the plantings.

CITY OF PLEASANTON (PLEASANTON)

Living Arroyos worked on two projects for the City of Pleasanton in 2020-21.

Table 9. City of Pleasanton Hours

Pleasanton Project	Program Hours
Gold Creek Restoration	31
Bernal Hotspots	12
TOTAL HOURS	**43**

P-1) Gold Creek Restoration

Gold Creek is an ongoing vegetation management project that focuses on the removal of invasive species along Gold Creek in Pleasanton. The 2020-21 Workplan called for two field days to remove invasive English ivy and Texas privet prior to the start of the rain year.

ACTIONS: The Program spent 21 program hours at Gold Creek during the 2020-21 Program Year (see Table 9). Staff removed 720 gallons of invasive weed from the project site on October 13 and 14, 2020.

PHOTO: Richelle Vital (left) and Chanddeep Singh (right) removing invasive ivy on October 13, 2020.

P-2) Bernal Hotspots

The Bernal Ditch runs along Bernal Avenue, directly across from the Alameda County Fairgrounds in Pleasanton, California. There are restaurants, fast food eateries and a 24-hour gas station/mini-market within a quarter mile of the ditch. Both the fairgrounds and the downtown area are high traffic areas on weekends. This location is one of the few waterways in the City of Pleasanton that has been monitored in the past for collecting trash. The Program was tasked with cleaning the hotspot on a quarterly basis.

ACTIONS: The Program cleaned the Bernal Hotspots twice during the 2020-21 program year, using 12 program hours (see Table 9). Staff removed 19 gallons of trash from the project site over the course of two separate days, October 24, 2020, and January 23, 2021. Due to watering demands during the dry season, staff were not able to complete the required four cleanups.

7. SUMMARY OF PROGRAM ACCOMPLISHMENTS

During the 2020-21 Program Year, interns worked approximately one to five days a week, for a total of 191 workdays.

Over the years, with help from our hard-working volunteers, the Living Arroyos field staff accomplished a great deal of stream improvement during the third Program Year (Table 10).

Table 10. Living Arroyos stream enhancement and management activities for the past 5 years.

Activities	PROGRAM YEAR				
	2016-17	2017-18	2018-19	2019-20	2020-21
Total acorn sites planted	--	--	--	360	393
Total acorns planted (3 per site)	--	--	--	1,080	1,180
Total acorns collected	--	--	--	1,513	2,145
Total stakes harvested	--	--	--	247	239
Total willow stakes planted	517	572	336	230	143
Total riparian trees planted	605	701	1,430	869	985
Total mulch used on plants (gallons)	8,285	3,112	--	--	500
Total invasive species removed (gallons)	13,661	29,713	730	5,620	4,002
Total trash removed (gallons)	634	1,674	1,424	4,315	94
Total water applied (gallons)	--	--	--	262,175	278,020
Total plants propagated	--	--	--	860	437

8. PROGRAM EXPENDITURES

BUDGET

The Living Arroyos Program budget (Table 11) is composed of both **Program Costs** to run the program as mutually agreed upon by Program Partners. **Project Costs** are the responsibility of the Project Proponent and not presented here. [7]

Table 11. Living Arroyos projected and actual Program Costs for the 2020-21 rounded.

Item	Projected Budget	Actual Expenditures	Billed to date (%)	Budget Remaining
Personnel (staff and interns)	$191,000	$163,397	86%	$27,603
TOTAL PERSONNEL	**$191,000**	**$163,397**	86%	$27,603
Field Equipment & Supplies	$3,000	$3,134	104%	-$134
Equipment Rental	$4,750	$277	6%	$4,473
Volunteer Supplies	$500	$0	0%	$500
Travel	$2,500	$2,895	116%	-$395
Event Costs	$2,000	$0	0%	$2,000
Marketing/Outreach	$1,500	$450	30%	$1,050
Training	$750	$586	78%	$164
TOTAL DIRECT COSTS	**$15,000**	**$7,343**	**49%**	**$7,657**
TOTAL	**$206,000**	$170,739.99	83%	$35,260

[7] ***Program Costs*** *include the following:*

- *Program Coordinator salary and benefits, and intern stipends*
- *Purchase or rental of equipment that can be used for multiple projects; equipment storage; and consumable supplies related to the volunteer and/or intern programs*
- *Travel, trainings, and other miscellaneous expenses causally related to the Program; and*
- *Communication activities and elements to ensure consistent messaging among Partners and to the public.*

Project Costs *include the following:*

- *Any elements that remain with the project site (e.g., irrigation systems, signage, plants, planting supplies, etc.)*
- *Contractors engaged to carry out project specific tasks (e.g., hydro seeding, installation of irrigation systems, etc.)*
- *Any other project specific costs requested by the Program Partner*

Actual expenditures for the Program were within the budgeted amount for 2019-20 (Table 10). In some areas, Program Costs were far below projected amounts. This is likely due to times when Living Arroyos operated with a smaller crew due to intern turnover, staff training and equipment use that was provided in large part by LARPD, and other learning opportunities did not have registration fees associated with it. In addition, the need to reduce Program activities due to precautions around COVID-19 resulted in reduced work hours while Partners determined safety protocols, and cancellation of volunteer activities including the annual volunteer appreciation event.

EQUIPMENT PURCHASES

The following equipment items were purchased for the Program as Program Costs:

- 2" Female Aluminum Camlock
- 2" Male Aluminum Camlock
- 1 ½" Fire Nozzle
- 2 1" Aluminum Fire Nozzle
- 1 25' Red 1 ½ " Double Jacket Fire Hose
- 2 2" Male Camlock x 2 ½ " Female Camlock adapter
- Aluminum 1 ½" Female NH to 1" Male NH Adapter
- Aluminum 1" Female NH to 1 ½" Male NH Adapter
- 1 50' 1 ½ " Double Jacket Fire Hose
- 3 White 1" x 25' Double Jacket Firehose
- 1 Yellow 1" x 50' Double Jacket Fire Hose
- Green 2" Camlock Suction Hose
- 4 6ft T-Posts and Post Clips
- Biodegradable flagging material
- Wooden flagging posts
- Spray paint
- Potting soil
- Frost protecting blanket
- 7 Wood Handled Hoes

9. FUTURE RECOMMENDATIONS

Increase Volunteer Outreach

When it is safe to do so, Living Arroyos staff recommends that we continue our efforts in volunteer outreach with the aid of the Program Partners.

To increase volunteer outreach, staff recommends:

- Participating in LARPD's booth at the Livermore Farmers Market.
- Including volunteer event dates in LARPD activities guide.
- Working with Program Partners to integrate the Living Arroyos volunteer events into their social media presence.

Improve Educational and Professional Development Opportunities for Interns

Staff recommends building on existing efforts and creating a more robust program to offer educational and professional opportunities for interns. For several years now, interns have requested assistance developing skills that could bolster their resumes and help them enter the job market as a young professional or help them apply for graduate school.

To improve education and professional development opportunities for interns, staff recommends:

- Working with Program Partners to identify job shadowing opportunities.
- Working with Program Partners to do regular (monthly or quarterly) 1-on-1 or presentations on the variety of professional pathways in the water, public sector, or environmental field.

Increase Program Resiliency

Field work requires that interns are supervised by the Program Coordinator who is also the only staff person authorized to drive the water trailer and other LARPD vehicles and equipment. Having additional staff trained on this equipment would allow fieldwork to resume when the Program Coordinator has office obligations or is otherwise unavailable (sick, etc.), or to allow multiple crews to operate simultaneously.

To increase program resiliency, staff recommends:

- Explore creating a part-time Field Lead position to have another staff person authorized to operate heavy machinery and drive LARPD vehicles.

10. MEETING PROGRAM GOALS

This section highlights the Program's accomplishments relative to the goals outlined in the 2020–21 Workplan.

Goal #1: Engage residents in hands-on stewardship of natural resources while they experience nature close to home.

Living Arroyos hired a total of four interns from local colleges to give them direct experience in managing natural resources. The hope is that their real-world projects will enhance their classroom learning and give them a greater understanding of water supply, flood management, and watershed resources.

The Living Arroyos Program demonstrated that communities and local agencies can collaborate on stream projects that meet maintenance and permitting objectives.

Goal #2: Increase public awareness of important watershed issues.

To reach a much broader audience, Living Arroyos continued to conduct outreach to the public through social media outlets, collaboration with school administrators, and local community organizations.

Goal #3: Improve habitat and water quality of local streams while maintaining and enhancing both public safety and regional flood protection.

Living Arroyos field staff completed project tasks for sixteen projects, including planting and plant maintenance (e.g., watering), biotechnical erosion control measures, trash cleanup, non-native invasive species removal, as well as monitoring the success of past projects to learn and plan. All project tasks were aimed at improving local stream conditions.

Goal #4: Strengthen public/private partnerships within the community.

Local agencies continue to support the program and are seeing a benefit in leveraging resources and working across boundaries to achieve common goals. Living Arroyos continued to cultivate community relationships with local school groups and businesses. The demand for volunteer events during the 2020-21

program year has persisted despite such activities being put on hold. Many local groups and businesses reached out to Staff to schedule events for them.

This review illustrates that the Living Arroyos Program efforts are providing benefits for streamside habitat and water quality and strengthening partnerships among local agencies and within the community.