Spring Fire Phase 1

Final Report

Prepared for:
Colorado Healthy Rivers Fund Grants
Attn: Chris Sturm

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Huerfano County Water Conservancy District/ Arkansas River Watershed Collaborative
Grant Amount: $149,500
Prepared by: Chelsey Nutter

ARWC
ARKANSAS RIVER
WATERSHED COLLABORATIVE

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Introduction

The purpose of the Spring Fire Phase 1 initiative was intended to provide additional support to Huerfano County following the 2018 Spring Fire. The extra support would come in the form of planning, assessment, mapping, and implementation of recovery projects not included in the Emergency Watershed Protection (EWP) plans. ARWC worked in partnership with the Huerfano County Water Conservancy District (HCWCD) and local agencies to identify the gaps in existing methods and provide additional support to meet these needs. Funding from the CWCB was essential in helping to fill the gaps in recovery efforts and provide extra "boots on the ground" to coordinate, plan, map, and implement projects.

The mission of the Arkansas River Watershed Collaborative (ARWC) is to aid Arkansas Basin communities in addressing locally identified watershed issues for economic, ecological, and social benefit. With the emergence of catastrophic wildfires within the Arkansas River Basin, ARWC has taken an active role in working with communities on fire mitigation and post-fire & flood recovery efforts.

Background

In the months leading up to this grant application, ARWC was asked by the local water conservancy district (HCWCD) and Huerfano County to aid in post-fire recovery. Resulting in the submission of this grant request. The objectives identified in the grant application include:

- Aid in coordinating, evaluating, and prioritizing urgent needs outside of EWP
- Identify gaps in existing EWP work and prioritize projects with partners
- Utilize GIS mapping to identify needs and inform planning, prioritization, and implementation of projects
- Organize, coordinate, and lead volunteer and SWIFT crews
- Implement restoration projects such as clearing & snagging, hillslope treatments, etc. as identified through Tasks 1 & 2
- Provide an engineering analysis of treatments to inform future work
- Provide crew leadership, project management, and grant administration

The first task assigned to ARWC by its stakeholders was to lead an AmeriCorps crew, also known as the National Civilian Conservation Corps (NCCC). The Crew was contracted by the County and consisted of twelve crew members for twelve weeks of work. Additionally, ARWC hired a SWIFT crew from Colorado Correctional Industries (CCI) with a team of seventeen to aid in the ability to meet the objectives identified above and provide increased implementation before the start of the monsoon season.

NCCC joined ARWC in mid-April, and the SWIFT crew arrived in mid-June. ARWC hired Dave Steffan, a local to La Veta and acting Fire Chief to serve as the Crew Lead for both the NCCC and SWIFT crews. Through stakeholder meetings, it was decided that the Middle Creek drainage was the highest priority, followed by Indian Creek and South Abeyta drainages. Stream clearing and hillslope treatments were identified as the necessary treatments to meet the objects defined in the scope of work.

Stakeholder Engagement

The first objective was to meet with Stakeholders and identify projects outside of EWP efforts. ARWC's Executive Director communicated regularly with stakeholders, including weekly updates and meetings. Several meetings were held in early April which included representatives from HCWCD, Huerfano County, La Veta, Walsenburg, NRCS, and Enginuity. Several other meetings were conducted throughout the duration of this project and further explained in the Methods section of this report.

Clearing and Debris Removal

The second objective was to utilize the two Crews to conduct stream clearing and debris removal out of the floodplain along the Middle Creek drainage. The purpose of these activities was to protect escape routes, life, and property by reducing the amount of debris that could cause increased damage during a flood event. The objective of stream clearing is to reduce the amount of hazardous debris from causing additional damage through debris flows or creating debris jams. This treatment and allows the flow to move through the channel during a flood event protecting critical assets.

Hillslope Treatments

The third objective of this project was to implement hillslope treatments which included seeding/mulching, installation of log erosion barriers (LEBs), contour felled logs, and wattles. The ARWC team identified project sites according to stakeholder input, access, landowner approval, funding, and need. Locations in all drainages in the burn scar area were identified as high priority and sites were selected based on the above criteria. Hillslope treatments were conducted in Middle Creek, Indian Creek, and South Abeyta burn scars during this phase.

Methods

Engagement, Planning & Mapping

The ARWC Team worked hard to identify projects that would not adversely affect existing EWP projects and would help in overall recovery efforts. The Team communicated regularly with stakeholders through meetings, updates, and mapping that was provided weekly to our primary points of contact at the HCWCD. HCWCD then worked as the liaison to the larger group (County, Cities, Engineers, NRCS, etc.) providing information on ARWC activities during their weekly phone calls. Whenever the ARWC team identified a proposed project, this information was shared with the HCWCD and their stakeholders, Huerfano County Administrator, and local NRCS Agents for approval. And to assure that our proposals worked favorably with other ongoing projects.

Stream Clearing

Due to weather in April and May, it was decided that work by the NCCC crew would begin at the bottom of the Middle Creek drainage and work upstream. The SWIFT crew would start at the top of the drainage and work downstream when they arrived in June. The NCCC crew primarily used hand tools such as loppers, rakes, and buckets to complete their tasks. Crew Lead David Steffen worked as the sawyer for the Crew. Huerfano County provided limited assistance at the beginning of the project with dump trucks to transport debris to the County dump. Later in the project, it was determined that the County did not have the capacity to continue to provide these services. A local contractor was hired to masticate the remaining debris piles. When the SWIFT Crew arrived in June, they immediately started on stream clearing in the upper sections of Middle Creek. The results of the Crew's dedicated hard work are depicted in the results section of this report.

Hillslope Treatments

The NCCC crew worked on hillslope treatments in Indian and Middle Creek drainages. ARWC crew leads worked as sawyers to provide burnt logs for LEBs, and the Landowner provided wattles in Indian Creek. The NCCC crew worked to install LEBs, wattles, and crib-walls in the burn scar area. Additionally, the NCCC crew used a native seed mix from Western Native Seed Company out of Coaldale, Colorado to seed burned areas in Indian, Middle and South Abeyta drainages. Chips were used from the SWIFT crew's activities for mulch. The NCCC crew seeded and mulched the areas by hand.

The SWIFT crew was highly effective in implementing hillslope treatments in the burn scar areas of Middle and South Abeyta drainages. The name "SWIFT" is an appropriate name for this prison work crew. They worked efficiently and effectively to cut logs for materials, chip all slash, and construct LEBs. The SWIFT crew had four sawyers on the Crew who worked to provide materials for the hillslope treatments. These materials included cutting burnt logs for LEBs, cutting stakes for the LEBs, and then chipping the slash that would be used for mulch by the NCCC crew.

The Crew of sawyers would work ahead of other crew members who would follow behind and install the LEB's, and contour felled logs. The SWIFT crew had two CCI crew bosses and were directed by ARWC's recovery coordinator. The SWIFT crew traveled from Buena Vista, Colorado each Monday, camped during the week on approved State Land Board property, and then returned to Buena Vista on Friday afternoon for the weekend. The results of both Crew's work are depicted in the results section below.

Results

Stream Clearing and Debris Removal

The greatest achievements of the Crew's stream clearing activities were a visible reduction of debris in the flood surges that hit La Veta in late July. The cleaned channel allowed the transport of floodwaters through the town without damage to personal property or infrastructure. The Landowner of the property where worked initially began declared that he only saw one log during the most extreme flood event pass by his estate. The channel clearing activities also helped to prevent erosion of stream banks and the introduction of additional pollutants into the stream system. EWP Engineers- Enginuity analyzed stream clearing activities. Their report indicated that stream clearing efforts in the area were predicted to help reduce the effects of flooding through the Town of La Veta. This information was provided to Chris Sturm and discussed with ARWC Executive Director Chelsey Nutter.

Clearing and Debris Removal Totals for Phase 1 (Middle Creek):

- 9,072 liner-ft of stream cleared
- 24.8 acres of floodplain cleared

Hillslope Treatments

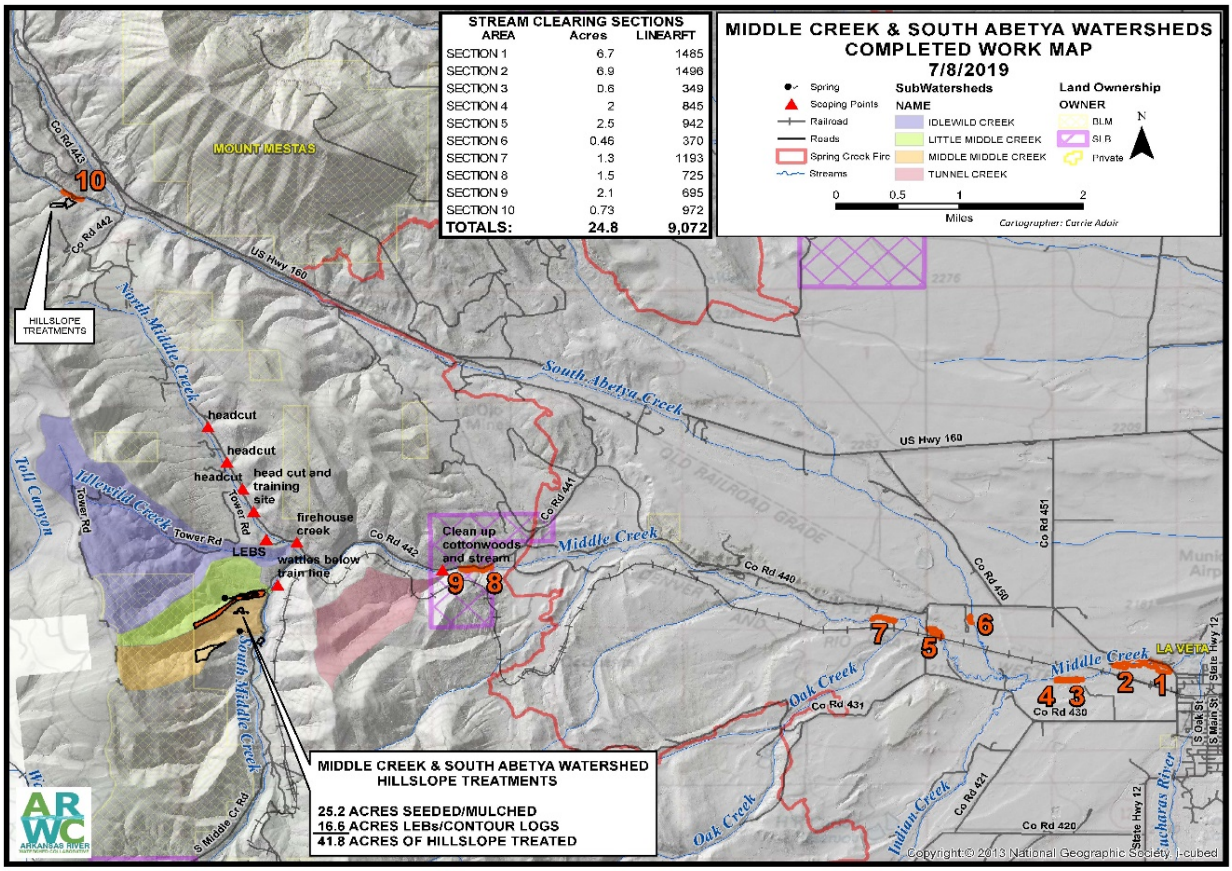
The LEBs that were constructed by the Crew's functioned well in holding back sediment and preventing erosion rills from forming on steep slopes. Monitoring of the structures was conducted after several flood events by the ARWC team. The structures were highly successful in trapping sediment, preventing cuts, and slowing the flow off the burn scar. The results can be seen in the photos below. The seeding and mulching activities were also successful in stabilizing high-intensity burn areas. It was accomplished early enough that the grass was sprouted by the time the monsoon rains came.

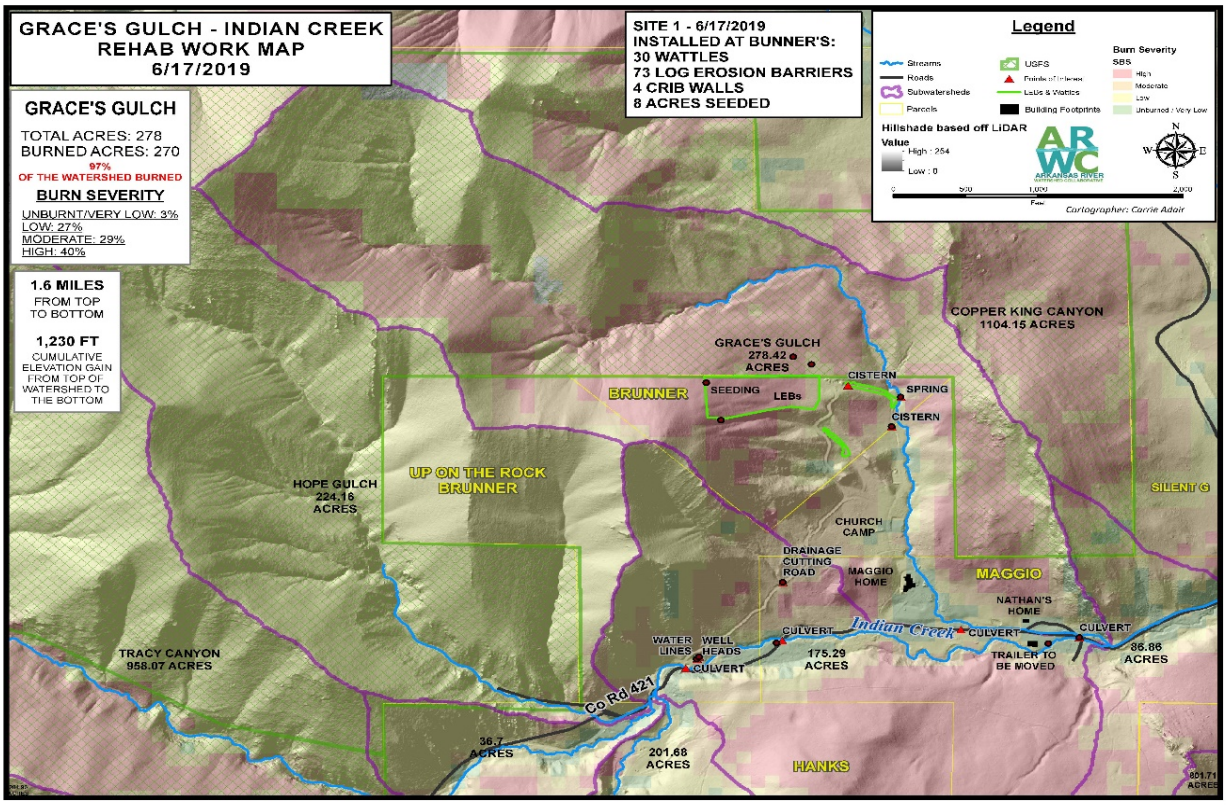
Hillslope Treatment Totals for Phase 1 (Middle, Indian, South Abeyta):

- 30 wattles
- 179 LEBs
- 4 crib-walls
- 33.6 acres seeded and mulched

Maps and Photos of Results

1. Map of Middle and South Abeyta drainages work completed
2. Map of Indian Creek drainage work completed
3. Photos #1 - #5: Before and after stream clearing on Middle Creek. The numbered sections on the photos correspond to the numbers depicted on the Middle/South Abeyta map
4. Photos #6 - #8: LEBs pre-flood events
5. Photos #9 and #10: Seeding/mulching and revegetation
6. Photo #11: Largest flood event that took place on 7/24/19. Photo is of a road that crosses Mid-Middle Creek
7. Photo #12: Before and after of section 1 property on the border of La Veta
8. Photos #13 - #16: LEBs and Contour Felled Logs post-flood event




GRACE'S GULCH - INDIAN CREEK
REHAB WORK MAP
6/17/2019
GRACE'S GULCH
TOTAL ACRES: 278
BURNED ACRES: 270
97%
OF THE WATERSHED BURNED
BURN SEVERITY
UNBURNT/VERY LOW: 3%
LOW: 27%
MODERATE: 29%
HIGH: 40%
1.6 MILES
FROM TOP TO BOTTOM
1,230 FT
CUMULATIVE ELEVATION GAIN FROM TOP OF WATERSHED TO THE BOTTOM
SITE 1 - 6/17/2019
INSTALLED AT BUNNER'S:
30 WATTLES
73 LOG EROSION BARRIERS
4 CRIB WALLS
8 ACRES SEEDED
Legend
Streams
Roads
Subwatersheds
Parcels
USFS
LeBs & Wattles
Building Footprints
Burn Severity
SBS
High
Moderate
Low
Unburned / Very Low
Hillshade based off LiDAR
Value
High : 254
Low : 0
ARKANSAS RIVER
Cartographer: Carrie Adair
COPPER KING CANYON
1104.15 ACRES
GRACE'S GULCH
278.42
ACRES
BRUNNER
SEEDING
LEBs
CISTERN
SPRING
CISTERN
HOPE GULCH
224.16
ACRES
UP ON THE ROCK
BRUNNER
SILENT G
CHURCH
CAMP
DRAINAGE
CUTTING
ROAD
MAGGIO
HOME
MAGGIO
NATHAN'S
HOME
CULVERT
CULVERT
CULVERT
Indian Creek
WATER
LINES
WELL
HEADS
CULVERT
175.29
ACRES
TRAILER TO
BE MOVED
36.86
ACRES
TRACY CANYON
958.07 ACRES
Co Rd 421
36.7
ACRES
201.68
ACRES
HANKS


#1: Section 1- Clearing

#2: Section 2- Clearing

#3: Section 3- Clearing

#4: Section 5- Clearing

#5: Section- 8 Clearing

#6: LEBs Pre-Flood

#7: LEBs Pre-Flood

#8: LEBs Pre-Flood

#9: Seeding/ Mulching

#10: Reveg from Seeding

#11: Flood Event 7/24/19 Middle Creek

#12- Post-Flood (left) Pre-Flood Debris (Right)

#13: Post-Flood LEBs

#14: Before-After LEBs

#15: Post-Flood Contour Felled Logs

#16: Post-Flood Contour Felled Logs

Conclusions and Discussion

Overall, the project was hugely successful, but our work is far from over and only a drop in the bucket when considering recovery success. Huerfano County experienced multiple flood events during the monsoon season. The communities of La Veta and Walsenburg were spared from flooding within their towns, but this does not mean that they are out of harm's way. They are still far from full recovery. All the events that occurred this year were classified as less than 1-year storm events, yet they even caused significant damage in the upper reaches of the basin. A more massive event, in the future, could cause considerable damage to both La Veta and Walsenburg.

Now that the rains have subsided, we must continue to implement projects that may reduce the severity of flooding next monsoon season. We have a small window of time to implement recovery projects, now in the fall, and after snowmelt next spring. New project implementation, funding, and partnerships are essential to mitigate the effects of post-fire flooding for many years to come. Post-fire flooding is a reality for these communities, but all recovery efforts, no matter how small, will play a role in overall recovery.

Although our prescribed treatments worked as planned, they were only tested by relatively small flood events, and significant damage still resulted from post-flooding. The ability of these treatments to make a substantial difference is based on the scale of the projects. Large areas of the burn scar must be treated with hillslope treatments, and new stretches of the stream should be cleared if we are going to be effective. The procedures performed through this project do not work on their own but must be coupled with numerous projects, conducted by multiple partners, throughout the basin to make a difference.

Although hand treatments help in the overall recovery of the project, they must be done on a large scale. Additionally, larger-scale projects such as connecting to floodplains/meadows; construction of sediment basins; repairing stream banks; treating head-cuts; and, seeding and mulching on a large scale are critical to the overall success of recovery efforts for Huerfano County.

The ARWC team monitored the project after each flood event. Since ARWC's Recovery Coordinator is local, and his family lives in the upper reaches of Middle Creek, we can have eyes on the project daily. The ARWC Team will continue to monitor the project for many years to come. The data collected will be valuable information for ARWC moving forward on any future projects in this location or others. ARWC has found that the best way to monitor our treatments is to document results after each flood event and over time. We document the results by visiting the sites and collecting data in the forms of photos, maps, landowner testimonials, and personal observations.

Future funding may allow us the ability to conduct post-flood modeling that could interpret the effects of these treatments in a more conclusive manner. For now, we have been directed by our stakeholders to spend our limited remaining funding on project implementation and to monitor the results using our professional judgment. Although funding through this SOW is dedicated to implementation,

conversations on large-scale modeling and analysis have been discussed with stakeholders. Analysis of post-fire treatments should be conducted and would be a great tool for organizations such as ours to have available as we continue to assist communities post-fire.

We are in favor of analysis but have realized many constraints in how this might be accomplished. The questions that currently arise include: how do you apply the model to different locations; what parameters will be used to conduct the analysis; how do you make a comparison of the results (paired basin?); how do you consider external elements such as homes, agricultural fields, roads, and water rights in the analysis? We look forward to continuing these conversations and helping to answer the questions presented above. A tool that could be utilized to assist in choosing treatments and providing analysis post-flood would be highly beneficial to our organization.

ARWC is currently working under a second Colorado Watershed Restoration Grant under the direction of Chris Sturm. This second phase is being utilized to increase our hillslope treatments and plan for our final CWCB proposal in Phase 3. Phase 3 is anticipated to focus on treatments in the Indian Creek drainage. Our stakeholders identified this drainage as a high priority and an area where existing EWP work is lacking. In addition to the Phase 3 CWCB proposal, ARWC has been working diligently to secure funding from other outside sources. To date, we have secured funding from the USFS and are working with CDPHE on a proposal. Additional financing, partnerships, and implementation of projects are critical as seen in the photos below taken after the first and second flood events of this year.

Photos of Discussion Points and Future Needs

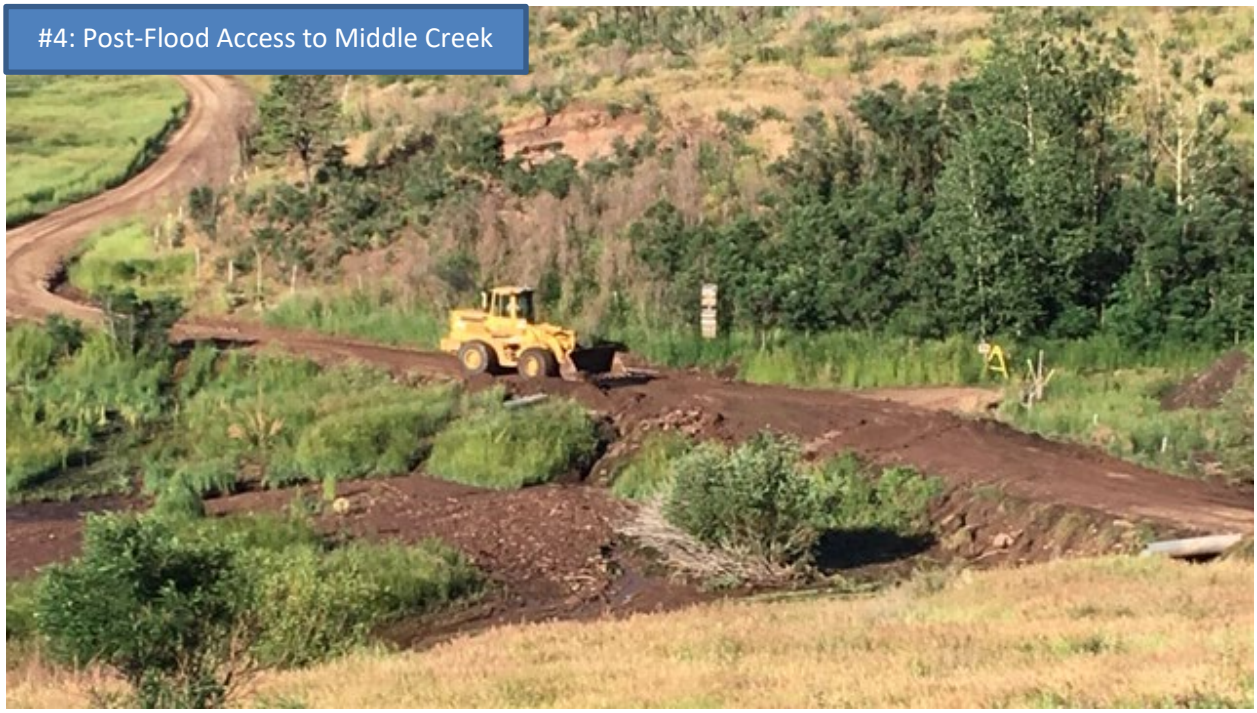
- Photo #1: Largest flood event that took place on July 24th, 2019. Photo taken on the middle reach of Middle Creek. Our primary stream clearing treatments were conducted directly below this location and continued to La Veta.
- Photo #2: Upper reach of Middle Creek. The road is on the left of the picture and significantly eroded.
- Photo #3: Upper reach of Middle Creek. This is directly above the previous photo and the road is completely gone.
- Photo #4: The backside of the Middle Creek drainage. This is the only access road that remains for the upper reaches of the Middle Creek drainage and only escape route for those who live in the upper reaches of the drainage.

#1: Flood Event- Mid-Middle Creek

#2: Post-Flood Upper Middle Creek

#3: Post-Flood Upper Middle Creek

#4: Post-Flood Access to Middle Creek



Actual Expense Budget

Spring Fire Phase 1- Original Budget			
Task	Grant	Match	Total
1. GIS Mapping	$7,000.00	$1,000.00	$8,000.00
2. Coordination & Planning	$10,000.00	$5,000.00	$15,000.00
3. Implementation	$125,000.00	$80,500.00	$205,500.00
4. Grant Administration	$7,500.00	$0.00	$7,500.00
Total Project	$149,500.00	$86,500.00	$236,000.00

Spring Fire Phase 1- Final Budget			
Task	Grant	Match	Total
1. GIS Mapping	$7,004.00	$900.00	$7,904.00
2. Coordination & Planning	$10,351.00	$4,405.00	$14,756.00
3. Implementation	$124,645.00	$97,825.00	$222,470.00
4. Grant Administration	$7,500.00	$0.00	$7,500.00
Total Project	$149,500.00	$103,130.00	$252,630.00

Appendix

No additional documents are included in this report.

References

1. All photos were taken by ARWC employees and the content is provided by ARWC Executive Director Chelsey Nutter