

Flood Control District



Revegetation and Erosion Control for the Aspen Fire

One of the biggest dangers resulting from significant fires is that of downstream flooding, erosion and debris flows due to destruction of large amounts of vegetation. A mountain fire exacerbates this danger due to large topographic relief and distant downstream concentration points. Early post-fire hydrologic estimates from the US Forest Service indicated that some of the watersheds burned during the Aspen Fire could produce up to 3 to 5 times the quantity of runoff from a given area when comparing post-fire to pre-burn conditions.

Pima County Flood Control District (FCD) staff working together with the Natural Resource Conservation Service (NRCS), crafted an agreement to implement measures under the Emergency Watershed Protection (EWP) Program to reduce the potential damage from increased flows expected during the post-burn condition. These measures were implemented in a phased approach to maximize the benefit and began even before the smoke from the fire had cleared.

The initial phase of the program involved protection of public infrastructure that survived the fire in the Summerhaven area. This involved the physical protection of the Mt. Lemmon Wastewater Treatment Facility through placement of numerous 5500 pound Jersey barricades at the upstream overbank area of Carter Canyon Wash immediately north and west of the facility. Additionally, the Operators trailer at the treatment plant was removed from the overbank area of the wash and the pad decreased in elevation downstream of a bend in the wash to allow a flow-thru area for anticipated increased flows. Decreasing the elevation of the overbank area also provided a measure of protection for the Zimmerman School by allowing for increased flow handling capacity in the channel of the wash. Design also was initiated for the construction of bank protection measures in the lower areas of Carter Canyon Wash to prevent excessive bank erosion.

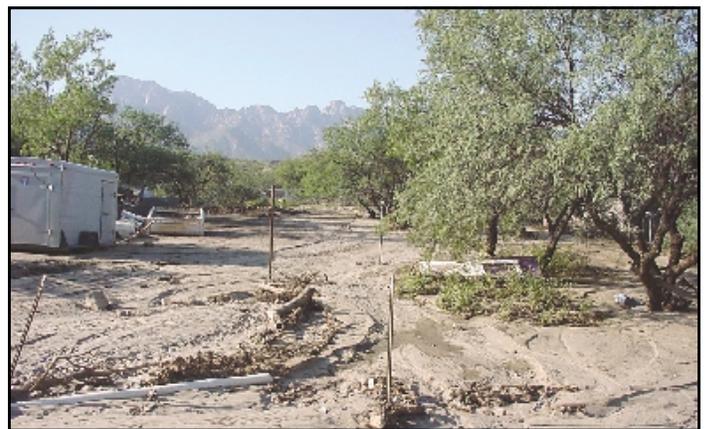
Another significant effort completed during the initial phases of

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Summer Flooding Comes to Canada Del Oro Wash

A series of flow events occurred in the watershed for the Canada del Oro Wash during August 2003 causing damage to area homes, outbuildings, sheds, fencing, etc. The last event, on the evening of August 25, 2003, resulted in the evacuation of residents in approximately 40 homes from the area north and south of Golder Ranch Road. Pima County Sheriff's deputies and Rural Metro Fire Department crews went door-to-door urging residents to seek higher ground as floodwaters flowed into the area. Blackened by the soot from the Aspen fire, floodwaters quickly filled the bottomland, flowing under and into mobile homes and entering site built homes, garages, sheds and tack rooms. As owners tried desperately to assist, many animals, horses, dogs, goats and other livestock escaped the oncoming flows.

Pima County Administrator Chuck Huckelberry, along with other county officials, held an area meeting the following evening to inform residents of emergency services available to them. Officials



shared information on the Flood Control District's Floodprone Land Acquisition Program and provided applications to property owners. Pima County Community Services provided information

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the project was to clear significant quantities of wood and other debris from the main drainage channels in the Summerhaven area. These efforts were deemed necessary in order to prevent the formation of debris dams that could form at any number of locations within the Sabino Canyon Watershed. Once a debris dam forms, water and additional smaller debris continues to accumulate behind it for an indeterminate time period until the holding capacity of this dam is exceeded and it breaches. The breach often results in a

downstream flash flood, due to the sudden release of a "wall of water" along with the accumulated debris, which could destroy anything in its way.

Once immediate protective actions were initiated and residents were provided access to their properties, the second phase of the EWP Program was initiated. This involved the distribution of sandbags for erosion protection and containment of ash, as well as distributing an appropriate grass and grain seed mix and weed-free mulch to residents to allow them to begin the revegetation process. FCD and NRCS staff provided basic instruction to residents on the proper

Aspen Fire Flood Control Improvements

Photos courtesy of Flood Control Design Engineering

Aerial Mulching



Aerial Seeding



Aerial Seeding and Mulching Results



Hydro Seeding



Straw Bails and Waddles



installation procedures for these measures and sometimes assisted residents with their transport and installation. During this phase an estimated 30,000 sandbags, over 2500 pounds of seed, and 150,000 pounds of mulch were distributed and applied.

As the second phase continued, FCD began working with our contractor to implement additional revegetation and erosion control measures in the Summerhaven area as Phase 3 of the EWP program. The measures implemented during this phase consisted of application of seed to re-establish vegetative cover as quickly as possible and to compliment the measures employed by the US Forest Service BAER Team on federal lands. Several different seeding and mulching techniques were used on burned areas depending on a number of factors. These factors included the intensity of the burn area, steepness of the slopes, and accessibility by road. Seed (5625 pounds) was applied by Helicopter to 225 total acres of the Summerhaven area, aerial mulch application was deployed on top of 75 acres of the seeded areas, hydroseeding was completed on 75 acres and a special bonded fiber matrix was utilized on 8 acres of the steepest slopes accessible by ground vehicles. These activities were all essentially completed within 4 weeks after the fire was fully contained. Gentle summer rains that followed seeding and mulching operations resulted in rapid establishment of a vegetative ground cover that

helped in controlling the potential damage due to erosion in the Summerhaven area.

As the ground cover was germinating, staff from the NRCS were initiating Phase 4 of the EWP program. This phase, which is currently in progress, consists of conducting site-specific inspections of individual lots within the Summerhaven area and developing site-specific Conservation Treatment Site Plans. These plans, recently completed for all of nearly 900 lots, outlined treatments that were deemed necessary to mitigate potential erosion hazards on these individual lots. Approximately 215 of the plans contained structural measures such as straw bales check dams, straw bale diversions, straw wattles, sand and/or gravel bag diversions and check dams. A signature from each resident authorizing the implementation of the structural measures on their property must be obtained. The county contractor, Groundskeeper, has been completing these structural measures, as well as applying as-needed supplemental seed and mulch by hand to parcels that demonstrate lack of vegetative cover, as signed plans are received. It is anticipated that all of the treatments will be completed before the end of the calendar year and such treatments will remain viable for several years until the natural recovery process brings the flooding and erosion hazards back to a condition that existed before the Aspen Fire occurred.

Summer Flooding

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on temporary living arrangements for flood victims, boarding and foster care for animals, and information on other emergency services. Officials provided roll-off dumpsters at strategic locations to assist residents in clean up efforts. Several families who were unable to return to their flood-damaged homes have temporarily relocated with other family members, friends, or to area motels.

To assist homeowners who expressed a desire to relocate to avoid future flood risk, the county has hired independent appraisers. To date, 60 owners of over 74 parcels have requested county appraisals. Appraisals are currently underway and some reports have been completed. Property owners widely agree that the Flood Control District should prioritize those whose property damage

forced relocation. Second to receive offers will be those whose property was damaged (buildings, land, and fences) but who were able to remain in their homes. Vacant land will be acquired last.

Under the Floodprone Land Acquisition Program (FLAP) property owners are offered an appraised value based on similar flood prone land values in the community. In the Canada del Oro flooding, a blend of both flood prone land comparables and regular comparables will be used for comparison purposes. Additionally, homes in this area of Catalina will be appraised as they existed prior to the summer flooding. Improvements are evaluated based condition, age, building materials, etc. Since 1983, FLAP has spent almost \$40,000,000 to acquire over eleven thousand acres of property. Once acquired, improvements are demolished and the land is allowed to return to a natural state. Habitat reverts to a pre-development condition over time.

As appraisals are completed, offers are made to property owners, and improvements are removed from the acquired land, the flood area will once again be available to safely convey floodwaters.

Underground aquifers will be replenished by reduced pumping from the area wells. Most importantly, many families will no longer be vulnerable to Mother Nature and her forces on this part of the Canada del Oro Wash.



Microburst Hits Ajo, Arizona

On the evening of July 29, 2003 from approximately 7:45 to 9:00 P.M. a very strong thunderstorm battered Ajo, Arizona. Unofficial rainfall amounts ranged from 2.7 to 4 inches of rain in one hour! Described by the National Weather Service as a "wet microburst", the storm cell was relatively small but very intense and flooded numerous residences throughout the community. It was not uncommon to see one and two-foot debris lines on chain link fences. Several trees within the Gibson Arroyo were uprooted, broken apart and stripped of bark.

The majority of the flooding was associated with the Gibson Arroyo. In some locations the flooded areas were wider than what is shown on the

Flood Insurance Rate Maps. Flooding also occurred from southern tributaries. The most severe flooding was upstream and downstream of the Phelps Dodge Railroad, which was overtopped.

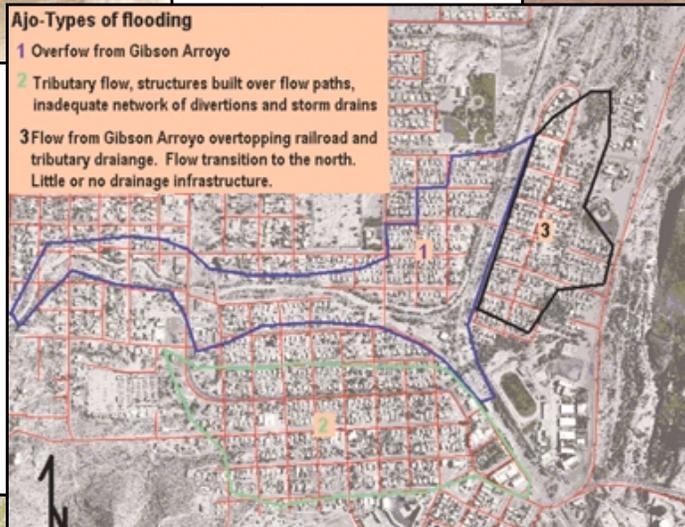
Though damages to public infrastructure were minimal, the department was quick to remove debris from the roads and sediment from under the 2nd Avenue Bridge. The department also mailed information to impacted residents and held a town meeting on August 7, 2003 to provide information about the event and the services available. The department has retained the services of TetraTech Inc. to further assess the flood and initiate master drainage planning efforts for the community of Ajo.



Flood damages to the foundation of a residence on Solana Avenue



Looking across Arroyo Avenue at debris and sediment damage



Damage to properties on Second Avenue



Sediment and large debris on Cedar Street dip crossing