

ARIZONA CHAPTER OF SOIL AND WATER CONSERVATION SOCIETY RESPONDS TO RECOVERY EFFORTS OF ARIZONA'S LARGEST WILDFIRE

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ABSTRACT

The Arizona Chapter of the Soil and Water Conservation Society (SWCS) coordinated a special field demonstration of practices used to prevent soil erosion following the 2002 Rodeo-Chediski wildfire. The Rodeo-Chediski wildfire in east central Arizona, fueled by severe drought conditions, consumed approximately 1,890 square kilometers (467,000 acres) of timber on National Forest, White Mountain Apache Nation, and private lands becoming the largest wildfire in Arizona's history. About 33 square kilometers (8,192 acres) of private land, including 491 homes and businesses were burned. The U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) approved a \$2.9 million Emergency Watershed Protection (EWP) project initiating a large-scale fire recovery assistance program for private landowners affected by the wildfire. Arizona SWCS Chapter members, NRCS EWP detailees, and NRCS Earth Team volunteers joined forces to provide technical assistance and to demonstrate conservation practices, designed to protect lives and property from the effects of flooding and erosion resulting from the wildfire. Practices constructed during the demonstration included seeding, straw mulching, straw bale diversions and check dams, and contour wattles. As a result of the demonstration, a severely burned sub-watershed was completely treated and residents were provided with technical information to assist them with the recovery of their fire-damage property.

INTRODUCTION

Drought impacts all human and natural resources. Impacts are more immediate for some resources than others but ultimately all are negatively impacted in the short and sometimes never-ending long-term. The economies of the western states are vulnerable to the effects of drought because water supplies are limited. Severe or prolonged droughts and the demands for water use in urban areas can conflict with water for other purposes - irrigation, fish and wildlife, recreation, and power generation.

The demand for water supply forecasts for the Western U.S., snowpack information, climate data and analysis, and soil moisture and temperature data has increased. And, requests are coming from a broader group of customers. The Natural Resources Conservation Service (NRCS), National Water and Climate Center, recently reported that the Center's website exceeded the customer access rate of one million hits per month this January - double the previous January's amount.

We have all heard the gloomy pictures painted of the drought:

- ❖ We could be on the verge of a drought that will linger for years, even decades;
- ❖ Mountain snowpack is significantly below normal levels in almost every Western state;
- ❖ Late-winter storms probably won't bring enough precipitation to ease the drought; and
- ❖ El Niño is rapidly weakening.

Well, guess what?

- ❖ The current drought in Arizona and the western United States is not over.
- ❖ The 2003 fire season could be severe - a repetition of the disastrous 2002 fire season.
- ❖ It is a long time between the winter moisture season and the start of the summer monsoon season in Arizona.

Fire has disturbed western landscapes throughout geologic time. Wildfires, although perhaps less frequent than in past generations, are now more likely to inflict severe damage. In recent years, catastrophic fires have

Paper presented Western Snow Conference 2003

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increasingly threatened homes and watersheds and disrupted local economies. As population growth moves into wildland settings, particularly in the western states, vulnerability becomes extreme.

Wildfires, combined with extended drought, have devastated millions of square kilometers of forest and grazing lands in the West. Over the past 3 years, more than 272,000 fires occurred on 74,867 square kilometers (18.5 million acres) across the United States.

Although firefighters finally extinguished the Rodeo-Chediski wildfire, the largest fire in Arizona history, many people have questions about this fire and the host of fires that scorched the West during the past several drought-stricken years. The questions often focus on combinations of the economics of drought (which all ties into timber, recreation, wildlife and wildlife habitat) and the hardships that local people experience due to wildfire and the loss of property. Both the monetary losses and feelings of despair are staggering and cannot be minimized.

Drought and the threat of fire continue to be a very high concern to lawmakers and citizens within the State of Arizona with almost daily media coverage.

CHRONOLOGY OF EVENTS

The Rodeo-Chediski wildfire of 2002 in east central Arizona was an eye-opener. When the first fire, the Rodeo Fire, began on Tuesday, June 18, crews were only a few kilometers away fighting another blaze. "We had people on it, air tankers on it, within about five minutes of them reporting it," said George Leech of the Fort Apache Indian Reservation. "The initial attack was everything we could throw at it." But, the fire quickly progressed through the treetops of a juniper forest containing very little fuel on the ground - an example of extreme fire behavior known as "independent crown fire." After just 90 minutes, the fire was 1.6 kilometers (1.0 mile) wide and 4.8 kilometers (3.0 miles) long, with flame lengths up to 46 meters (150 feet). It was reported that the initial air tanker retardant drops, due to the intense heat simply vaporized before hitting the ground. "Within a period of about seven hours, that fire went from about 2.4 or 2.8 square kilometers (600 or 700 acres) to just under 202 square kilometers (50,000 acres)," Leech said. It had become a "pulsing, plume-dominated fire," with the smoke column repeatedly collapsing on itself, then causing more flare-ups and new columns. In nearly 40 years of fighting wildfires, Leech indicated that he had never seen this kind of fire activity.

Less than 24 hours after the first wisps of smoke appeared, the evacuation of 4,000 people in Pinedale, Linden, and Clay Springs was initiated.

The second fire, the Chediski wildfire, began only 12.8 kilometers (8.0 miles) west of the first on Thursday, June 20, two days later. By Friday morning it had already grown to 28 square kilometers (7,000 acres). An Associated Press Writer quoted a local Overgaard citizen as saying " We figured they'd throw water on it and it'd be over with." Glued to the news in a Payson, Arizona motel the following morning, the woman was further quoted to say, "I still thought I was coming home, then it got worse." The next night fire crews could do little as Overgaard lost more than 200 homes.

These two wildfires, one allegedly caused by arson, and the other by a hiker, were to merge over the course of two weeks into a single massive blaze. The plumes from those fires stretched to the northeast in a broad swath that crossed the state line into New Mexico. The densest part of this smoke pall was 177 kilometers (110 miles) long and 56 kilometers (35 miles) across.

Declared "fully contained" 21 days after the initial fire started the largest wildfire in Arizona history burned across 1,890 square kilometers (467,066 acres) - 730 square miles - of east central Arizona forest. Within the burned area, 1,137 square kilometers (280,992 acres) were on White Mountain Apache Nation lands; 720 square kilometers (177,882 acres) were on Apache-Sitgreaves and Tonto National Forests; and 33 square kilometers (8,192 acres) were on private lands. Some of the 30,000 people evacuated from nine communities faced the wreckage of destroyed homes and businesses. After almost two weeks of evacuation, emotions were more basic; desire to know that your home is safe (or to stand on the ashes if necessary) and to express sympathy for friends who were not so lucky.

RECOVERY PLANS

The White Mountain Apache have a multi-generation connection with the land. Their relationship to the land is right at the core of their being. "Our first priority was to stabilize the land," said Tribal Chairman Dallas Massey Jr. "Then the tribal council and I reviewed our options of salvage recovery."

Within days of the Rodeo-Chediski wildfire outbreak, the White Mountain Apache Tribe requested Federal help to develop a plan to restore fire-damaged land. The assistance included a Burned Area Emergency Response (BAER) team, organized by the Bureau of Indian Affairs (BIA) fire management office and assisted by NRCS. The BAER team began working with a multitude of specialists to develop a recovery plan for this region. A BAER recovery plan must follow established guidelines and must be in compliance with any applicable laws such as the National Environmental Protection Act (NEPA), Endangered Species Act, and the Archeological Resources Protection Act. The BAER team consisted of soil conservationists, foresters, geologists, natural resource planners, hydrologists, archeologists, and biologists, working in cooperation with officials from the BIA, the White Mountain Apache Tribe, and the local community. Natural Resources Conservation Service staff specialists participated on the Bureau of Indian Affairs BAER Team providing technical assistance in engineering, economics, and range science. The BAER recovery plan is the beginning of a three-year, \$10 million process for the White Mountain Apache Tribe to restore the land.

The BAER plan divided the recovery effort into three basic categories, one of which, addressed the elevated risks of increased runoff due to the decimation of soil, shrubs, and trees. The BAER team's initial mission was to prevent hazardous flooding in the watersheds above the communities of Cibecue and Carrizo. These watersheds had been 75 percent burned. BAER team members conducted initial cleaning of storm drainages, posted various warning signs and most importantly, established an early flood-warning system through the Remote Automated Weather Station (RAWS). Today, 11 RAWS stand watch over the communities. The BAER team installed another technical warning system, a stream gauging system located upstream of Cibecue.

Tribal Chairman Dallas Massey Jr. stated, "We realized that the tribe is in an unsecured economic state and eventually, decided to sell parts of the salvage to outside logging companies." The salvage sales are estimated at about 566,400 cubic meters (240 million board feet). The Tribe's own logging company, the Fort Apache Timber Company, will salvage about 354,000 cubic meters (150 million board feet).

A total of 1,137 square kilometers (280,992 acres) were burnt on the reservation, some 60 percent of the total area burnt by the Rodeo-Chediski wildfire. Currently, 117 square kilometers (29,000 acres) of charred trees are being logged and leaving the reservation forever.

As the wildfire was being contained on the Fort Apache Reservation, a Forest Service BAER team began to address burned areas on U. S. Forest Service land. Emergency treatments were prescribed on the most critical areas as rapidly as possible in an effort to protect human life, property, and critical cultural and natural resources. Sub-watersheds were prioritized for emergency treatment based on potential risk of damage to private property and roads and adverse effects to fish and wildlife habitat.

NRCS determined critically burned areas of private, state, and tribal lands were eligible for assistance under the Emergency Watershed Protection (EWP) program. NRCS approved \$2.9 million of Emergency Watershed Protection (EWP) Project funds to initiate a large-scale fire recovery assistance program for private landowners and tribal lands affected by the wildfire. Navajo County, Arizona and the White Mountain Apache Tribe agreed to be project sponsors.

A Recovery Information Center was set up in Heber for people to obtain information and to apply for emergency assistance. NRCS staff worked with Navajo County to develop and distribute an EWP information package to private property owners affected by the fire. NRCS provided outreach and assistance at several community public meetings.

RECOVERY FIELD DEMONSTRATION

The Arizona Chapter of the Soil and Water Conservation Society (SWCS) coordinated a special field demonstration of practices used to prevent soil erosion resulting from the 2002 Rodeo-Chediski Wildfire. Joining forces for this special opportunity were Natural Resources Conservation Service employees, NRCS Emergency Watershed Protection Program detailees from Arizona, New Mexico, Tennessee, and NRCS Earth Team volunteers. Other participants included members of the White Mountain Youth Corps, the local homeowners association and the Heber volunteer fire department.

The Arizona Chapter coordinated this volunteer effort to assist residents of the fire-damaged areas with erosion control efforts and provide interested residents with information about the NRCS Emergency Watershed Protection (EWP) program. The demonstration site was located on the destroyed homesite of the local Homeowners Association's President and even now continues to serve as a guide and example to area residents in their fire recovery efforts.

Volunteers arrived early and received a variety of assignments. Most of them rotated throughout the day, learning about the different structures. Practices constructed during the demonstration included seeding, straw mulching, constructing straw bale diversions and check dams, and anchoring contour erosion control wattles.

Site preparation consisted of setting up information booths and sunshades. The general area was hand mulched in an effort to minimize dust and ash. Volunteers staffed the information area and directed visitors towards the different demonstrations.

Hand seeding and mulching critical areas, are often the first actions needed following a wildfire. Hand mulching is fast and easy and covers the surface ash and dry soil. Mulch is applied to enhance seeding establishment and to provide ground cover. Seeding aids to restore vegetative cover to reduce damages from sediment and from runoff to downstream areas requiring watershed protection. Seeding is also relatively easy and a garden hand broadcast spreader is useful on small and medium parcels. The straw is easy to hand distribute and a little goes a long way. Large areas require mechanical mulching. Adequate ground cover is achieved when 70-90% of the surface is covered by mulch.

Straw bale structures (bale diversions and check dams) begin with wrapping the bales in chicken wire to maintain multi-year performance. An NRCS technical representative marked proper placement and design of each straw bale structure. Straw bale structures are anchored in place across steeper slopes to reduce both soil and water movement. The straw bales must be anchored with rebar driven into the ground and tied together into a continuous chain. A shallow contour ditch helps stabilize and maintain proper alignment of the structure. Gaps between the bales have to be chinked (filled by wedging) with straw to prevent water from escaping between the bales. Straw bale check dams are generally used to stabilize drainage areas and slow down concentrated flows. They have to be well placed and anchored to ensure that they do the job during major runoff events. Once the initial bales are in place, a second row is added, downstream of the center of the dam, to reinforce the structure. The straw bale structures generally continue to function up to 3 years with minimal maintenance.

Tube like bundles of straw, called 'wattles', are typically used on long, less sloping areas that have a potential for sheet erosion during major storms. Wattles are 20 to 30 centimeters (8 to 12 inches) in diameter, 6 to 8 meters (20 to 25 feet) in length, and encased in jute, nylon, or other photodegradable materials. They are placed perpendicular to and staggered across the slope contour in small shovel width troughs, 2.5 to 5.0 centimeters (1 to 2 inches) deep. They are anchored every 1.5 meters (5 feet) with wooden stakes. The straw wattles continue to function up to 1.5 years with minimal maintenance.

Many of the folks that came to the demonstration had maps or photos of their properties and lots of questions. They were all aware of the urgency to "stabilize the land".

TIME FOR RECOVERY

The forests and rangeland of the Rodeo-Chediski area began to heal and recover before much of the fire was put out. Time for recovery is estimated in years. Emergency measures are necessary to protect human life,

property, and natural resources from the potential off-site damages caused by erosion and sedimentation. A burned ridge of newly barren soil can not hold or absorb the water. The resulting runoff can cause a greater catastrophe than the fire itself. Until these barren soils are protected, damage can extend beyond the homes and yards, beyond the community and roads, and into the watersheds, streams and lakes several kilometers from the fire.

CONCLUSION

The Arizona Chapter of the Soil and Water Conservation Society responded to a call for help from homeowners devastated by the Rodeo-Chediski wildfire. The community knew that a variety of technical assistance and resources were available to them through the NRCS Emergency Watershed Program and their Navajo County government sponsors. And, as Navajo County began to clean up debris and repair roads, local homeowners felt the urgency to begin the building process on their own properties.

The opportunity to organize and partner with local homeowners, volunteers, and county and Federal governments challenged the Arizona Chapter into action. This special field demonstration provided local property owners the opportunity to obtain information about the Emergency Watershed Program, visit with NRCS technical specialists, and even schedule technical assistance. The President of the Homeowners Association has promised to maintain the demonstration erosion control practices and structures as a reminder of the local people's effort to rebuild their community.

ACKNOWLEDGEMENTS

The writer is grateful to George A. Couch Jr., Ronald F. Hemmer, and Jean I. Nodzon, for their valued editorial review.

REFERENCES

Extensive print and electronic news coverage of the Rodeo-Chediski wildfire from a variety of public, private, professional, governmental and institutional sources are available as reference and information.