

## A Full Cost Accounting of the 2010 Schultz Fire



**Cover photo:**

A plume of smoke from the Schultz Fire dwarfs the San Francisco Peaks, north of Flagstaff, Arizona. *Photo by Mike Elson, USDA Forest Service, Coconino National Forest*

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## Executive Summary

The Schultz Fire of 2010 burned just over 15,000 forested acres and caused the evacuation of hundreds of homes. Heavy floods followed the fire, resulting in extensive damage to property downstream from the charred hillsides. Nearly three years later, seasonal flooding is still a concern and residents continue to live under the threat of swift floodwaters that may carve unanticipated pathways through their sloping neighborhoods.

Official reports from city, county, state, and federal governments have listed response and mitigation costs of the fire and flood at nearly \$60 million. This study adds to those costs, exploring the impacts on private property owners, as well as societal costs that are often overlooked when quantifying the full impact of disasters.

Through analysis of Coconino County Assessor's records, a survey of residents in the fire/flood impact area, and the perceived value of both endangered species habitat and human life, this study conservatively estimates the total impact of the Schultz Fire at between \$133 million and \$147 million. The major costs and drivers explored are the following:

- Loss in personal wealth due to reduced property values: \$59,353,523
- Official expenditures of government agencies and utilities: \$59,104,394
- Destruction of habitat: \$400,000–\$14,200,000
- Loss of life: \$6,000,000
- Structural damage: \$3,097,978
- Cleanup: \$1,825,127
- Unpaid labor: \$1,516,103
- Armoring against flooding: \$823,100
- Fire evacuation costs: \$223,572
- Flood Insurance Premiums: \$198,034

The total impact is considered conservative because it excludes measures such as volunteer work by nonprofits; destruction of recreation areas, timber, and archaeological sites; physical and mental health costs; the degraded viewshed (beyond effects on property values); and the long-term impacts to the region's amenity-based economy.

In addition to the cost accounting, this study examines some non-financial impacts as reported by the survey responses. The mental, physical, and financial tolls taken on residents of the flood area are immeasurable.

This study was performed by the Alliance Bank Business Outreach Center at Northern Arizona University's W.A. Franke College of Business upon the request of the Ecological Restoration Institute. Invaluable support was provided by many in northern Arizona, including Coconino County staff and the many area residents who offered their personal stories.

## Schultz Fire Full Cost Accounting

The true financial impact of wildfire is elusive. The government dollars spent containing fires are easily accountable, as are mitigation costs when efforts are the work of auditable agencies and utility companies. Similarly, personal damages that result in insurance claims are quantifiable, although often difficult to obtain due to their private nature. These commonly identified losses and expenditures are often reported after particularly devastating fires, but they do not tell the entire story. Extending beyond economics—psychological implications are particularly disturbing—the full financial damages of fire dwarf the numbers that appear in the wake of catastrophic burns.

A full cost accounting of wildfire's impact is an essential tool for the purposes of policy decisions. In addition to more fully describing the destruction in terms of dollars, this information could ideally inform cost-benefit analyses of preventative actions. The Ecological Restoration Institute (ERI) at Northern Arizona University (NAU) solicited the Alliance Bank Business Outreach Center (ABBOC) at NAU's W.A. Franke College of Business for this study, which seeks to quantify the full financial impact of 2010's Schultz Fire. The Schultz Fire burned 15,000 acres north and west of the City of Flagstaff and adjacent communities. Although no private residences were destroyed during the three-week event, more

than 700 properties were evacuated during the initial, wind-blown spread of the fire. After the charring of steep slopes on the eastern San Francisco Peaks, several neighborhoods were subject to severe floods which have repeated every summer since the event.

Two units of the ABOC, the Arizona Hospitality Research and Resource Center (AHRRC) and the Arizona Rural Policy Institute (RPI), provided the bulk of the research. A survey was created and disseminated by the AHRRC to residents of the areas affected by evacuation and flooding, under the guidance of Coconino County Supervisors Mandy Metzger and Liz Archuleta. The survey response rate of 24% provided a confidence rate of 95% and a margin of error of +/- 5%. These responses were analyzed and the answers extrapolated to the entire population, resulting in a picture of the personal losses experienced by the residents of the evacuation and flood areas. Researchers worked closely with the Coconino County Assessor's Office to draw an estimate of loss of personal wealth resulting from property devaluation caused by both flood damage and diminished aesthetic value stemming from the blackening of the mountainside.

Other quantifiable financial impacts are traced to the loss of endangered species habitat, one death resulting from the fire's impact, and the costs of social services. All of these numbers are added to the reported costs of fire/flood response and mitigation as reported by the city, county, state, and federal governments, as well as utilities and several non-profit organizations.

This study is intended to provide a comprehensive yet conservative estimate of the overall financial impact of the Schultz Fire. Although these methods may be reproduced for other fires, the results are specific to a fire footprint adjacent to a metropolitan area with resultant heavy flooding.

## Financial Consequences of Wildfire

As stated, the traditionally reported costs come from government agencies and utilities with strict reporting standards. In the case of the Schultz Fire these have been associated with fire and flood response and ongoing flood mitigation. Table 1 illustrates the sources of more than \$59 million spent on these efforts, primarily from Coconino County (\$14.8 million), the U.S. Forest Service (\$14.4 million), the National Resources Conservation Service (\$7.7 million), Federal Highway Administration (\$6.2 million), Federal Emergency Management Agency (\$5.7 million), City of Flagstaff (\$5.5 million), Arizona Department of Transportation (\$3 million), and Arizona Division of Emergency Management (\$1.1 million).

Efforts to determine the full costs of wildfire are not new; many such studies have been published in recent years. Each fire has different impacts, as each takes place in a unique time and space. Various cost drivers are more or less identifiable depending on the details of the fire, so no two studies are alike. The following list shows six catastrophic fires that burned in the western states early in the century, and the calculated ratio of suppression costs to full costs:

- Canyon Ferry Complex, Montana, 2000: 53%
- Cerro Grande, New Mexico, 2000: 3%
- Hayman, Colorado, 2002: 20%
- Missionary Ridge, Colorado, 2002: 25%
- Rodeo-Chedeski, Arizona 2002: 15%
- Old, Grand Prix, Padua, California 2003: 5%<sup>1</sup>

According to the findings of this study, the suppression costs of the Schultz Fire were approximately 6–7% of the total computed cost. Each of these fires had unique characteristics. Although the Shultz Fire burned out of control adjacent to a major city, private property was successfully saved through the quick action of fire crews. The major cost drivers were response and mitigation costs, and the loss of property value. By comparison, the Rodeo-Chedeski Fire burned hundreds of homes in several communities, driving up the private costs. The Cerro Grande Fire of 2000 burned through 400 homes as well as the Los Alamos National Laboratory.

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<sup>1</sup> "True Cost of Wildfire in the Western U.S." – Western Forestry Leadership Coalition. Lakewood, Colorado. April 2010

**Table 1: Government and Utility Costs of the Schultz Fire, 2010–2014**

Funding Agency	Fire Response 2010	Flood Response 2010	Flood Mitigation 2011–2012	Flood Mitigation 2012–2014 (Projected)	Totals
City of Flagstaff	\$32,909	\$750,548	\$4,668,264		\$5,451,721
Coconino County		\$5,200,000	\$4,483,116	\$5,138,000	\$14,821,116
Coconino County Resource Advisory Council			\$157,000		\$157,000
Arizona Division of Emergency Management (ADEM)		\$789,000	\$346,149		\$1,135,149
Arizona Department of Transportation (ADOT)			\$3,038,074		\$3,038,074
Summit Fire Department	\$28,000	\$51,100	\$23,000	\$45,000	\$147,100
Unisource Energy Services		\$182,600			\$182,600
Arizona Public Service		\$115,000			\$115,000
Doney Park Water		\$89,434			\$89,434
Federal Emergency Management Agency (FEMA)		\$3,943,000	\$100,000	\$1,679,000	\$5,722,000
US Forest Service (USFS)	\$9,400,000	\$4,150,000	\$615,200	\$230,000	\$14,395,200
Natural Resources Conservation Service (NRCS)			\$550,000	\$7,100,000	\$7,650,000
Federal Highway Administration (FHWA)		\$1,200,000		\$5,000,000	\$6,200,000
<b>Total</b>	<b>\$9,460,909</b>	<b>\$16,470,682</b>	<b>\$13,980,803</b>	<b>\$19,192,000</b>	<b>\$59,104,394</b>

Source: Paul Summerfelt, City of Flagstaff

## Full Accounting

The costs considered below supplement the previously reported government and utility funds to provide a more complete picture of the costs of the Schultz Fire. These included diminished property values, fire evacuation costs, flood insurance premiums, home content replacement costs, armoring against future flooding, unpaid labor, property cleanup, structural damage, loss of life, and loss of habitat.

## Diminished Property Values

One of the largest financial impacts of the fire was the loss of personal wealth through reduced property values. Estimating this effect in dollars required the following steps:

1. Define the impacted area to include all parcels experiencing a reduction in value that can be reasonably traced to results of the fire, including:
  - Flood and erosion damage
  - Compromised access due to erosion, flooding, and debris
  - Degraded viewshed
  - Perceived risk to property in the wildland-urban interface (WUI)
  - Elevated market uncertainty due to proximity to flood-damaged properties



2. Calculate property values before the fire and after the full effects of the flood were realized. This includes:
  - Identifying a valid sample of properties within the previously defined impact area that have the same dimensions during pre- and post-fire periods<sup>2</sup>
  - Determining the drop in full cash value (FCV) among these properties
  - Adjusting for the drop in property values occurring during this period in the overall real estate market
3. Apply the average drop in value attributable to the fire to the aggregate value of the population of affected parcels in 2009.

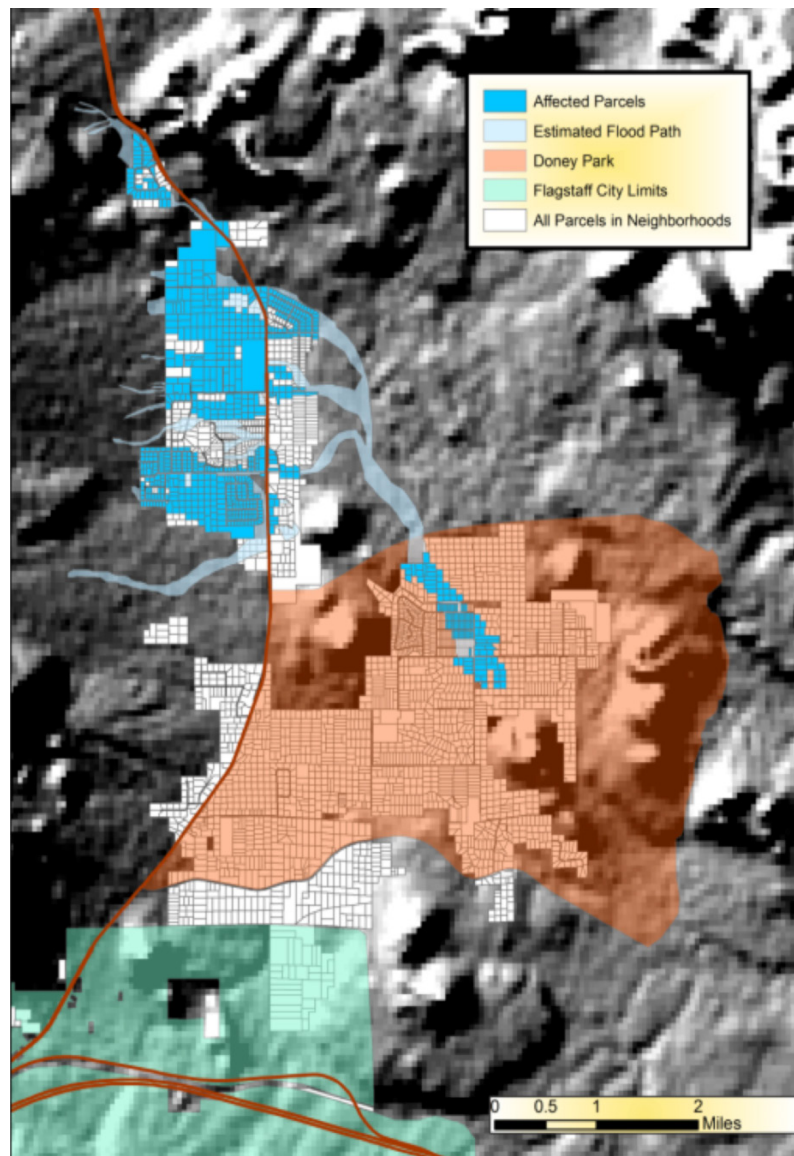
The result of this analysis indicates that the fire directly and indirectly contributed to a loss of approximately \$60 million in the personal wealth of local property owners.

### ***Affected Properties***

The affected area, as defined for this study, includes the following neighborhoods:

**Figure 1: Map of the flood area and affected parcels**

- Timberline
- Macann
- Fernwood
- Sunset Crater
- Anasazi Trail
- Koch Field
- Stardust
- Frontier Hills
- Slayton Ranch
- Sunset Vista
- Pioneer Valley
- Rio Rancho
- Aspen Glen
- Wapatki Trail
- Hutchison Acres
- Forest Survey Tract
- North Peak Area
- Pine Mountain<sup>3</sup>



<sup>2</sup> Due to variances such as splitting parcels, only those with identical acreages were used.

<sup>3</sup> This area definition was provided by Coconino County's GIS Department.

These neighborhoods lie in the area shown in Figure 1, in relation to Flagstaff city limits and the Doney Park census-designated place (CDP). The properties that fall along the estimated flood zone were re-valued by the county during the summer of 2010 in order to reflect the immediate damage done to property and rights-of-way. This analysis used 2011 for post-fire values, assuming that an accelerated decrease in value would take more time to become apparent.

### ***Changes in Property Values***

In 2011, the affected areas collectively included approximately 3,200 parcels. Each parcel has a parcel number assigned by the county, and in order to determine the change in value between years, RPI staff isolated parcels that were identified by a consistent parcel number in 2009 and in 2011. Just over one thousand (1,073) properties were assigned a constant number across these years, and this sample, representing approximately one-third of the total population, was used to estimate the change in property values experienced in the affected area.

Based on value data provided by the Coconino County Assessor's Office, the full cash value (FCV) of these properties was 20% less in 2011 than in 2009. The average value of a parcel in 2009 was \$312,274; in 2011 it was \$249,645<sup>4</sup>. The sample area lost an estimated \$67 million in value during that time. Table 2 indicates the changes in value demonstrated by the selected sample.

**Table 2: The Change in Full Cash Value of Parcels in Affected Neighborhoods between 2009 and 2011**

	Full Cash Value 2009	Full Cash Value 2011	Change in Value, 2009–2011	Change in Value as a %, 2009–2011
Average	\$312,274	\$249,645	-\$62,629	-20%
Median	\$283,460	\$221,790	-\$61,670	-22%
Aggregate	\$335,069,540	\$267,868,865	-\$67,200,675	-20%

### ***Correcting for Overall Market Decline***

The value of properties throughout the region was declining during the period between 2009 and 2011 due to a declining housing market. Therefore, the value was adjusted for the overall decrease when quantifying the effects of the fire. Decreases in both the City of Flagstaff and Coconino County were calculated, indicating an overall fall of 12% in the city and 13.4% in the county. Table 3 shows the aggregate FCV in each of these geographies in both years.

**Table 3: The Change in Full Cash Value of Parcels in the City of Flagstaff and Coconino County between 2009 and 2011**

Total FCV	2009	2011	Change in FCV 2009–2011
City of Flagstaff	\$7,697,683,416	\$6,773,784,531	-12.0%
Coconino County	\$17,790,931,957	\$15,413,415,042	-13.4%

Source: Coconino County Assessor Web Site

The market adjustment used in this analysis was based on the county decline of 13.4%. Although the affected area is located adjacent to Flagstaff city limits and experiences many of the real estate trends of the city, the county number was chosen because it would yield a more conservative estimate.

Were the sample affected area to have declined in value at the same pace as the overall county, the loss would have been an average of \$41,731 per parcel and \$44,777,502 over the entire area. Table 4 below compares that estimated reduction in FCV to the actual area reduction as calculated in Table 2. The result is a reduction in value attributable to the fire of 6.7% of 2009 FCV. In terms of dollars, this incremental loss was \$20,898 per parcel on average, and \$22,423,173 across the entire sample.

<sup>4</sup> This sample includes both developed and vacant parcels.



**Table 4: Calculation of Value Loss Attributable to the Schultz Fire**

	<b>Full Cash Value 2009</b>	<b>Estimated 2011 FCV 13.4% Reduction</b>	<b>Actual 2011 FCV</b>	<b>Variance between <i>estimated</i> and <i>actual</i> 2011 FCV</b>	<b>Variance as % of 2009 FCV</b>
Average	\$312,274	\$270,542	\$249,645	\$20,898	6.7%
Median	\$283,460	\$245,579	\$221,790	\$23,789	8.4%
Aggregate	\$335,069,540	\$290,292,038	\$267,868,865	\$22,423,173	6.7%

### ***Expansion to Population***

Factors including parcel splits and changes in county operations contributed to most parcels in the population not fitting the same descriptions in 2009 and in 2011. Therefore, the loss in value for the entire affected area must be estimated based on that of the sample. County records of value in 2009 were not obtainable, so the loss was estimated using 2011 values.

The aggregate value of the sample parcels in 2011 was \$267,868,865. The loss attributable to the fire and flood was \$22,423,173—approximately 8.4% of the 2011 FCV. Assuming that the same ratio of loss to FCV applies to the population, this would indicate that the total loss was nearly \$60 million (8.4% of \$709 million). This calculation is shown in Table 5.

**Table 5: Calculation of Value Reduction across all Affected Neighborhoods**

	<b>2011 FCV</b>	<b>Value Reduction Attributable to Fire (8.4% of 2011 FCV)</b>
Sample	\$267,868,865	\$22,423,173
Population	\$709,041,545	\$59,353,523

## **Survey Findings**

The survey conducted by ABBOC was distributed to residents in the Schultz Fire and Flood area in order to gain an understanding of the impacts of the fire and flood, primarily the out-of-pocket costs incurred by private landowners. While the costs to federal, state and local governments (Coconino County in particular) had been calculated, the personal costs borne by the residents of the impacted area had not yet been estimated. This survey was a rare attempt to quantify the costs to residents of this natural disaster.

The questionnaire consisted of five sections: 1) Description of residence; 2) Costs due to the Schultz Fire; 3) Property damages due to the Schultz Flooding; 4) Schultz Flood consequences and cost estimates; and, 5) Schultz Fire and Flood-related Health Issues.

The official mailing list of addresses of all residents in the Schultz Flood area was obtained from Coconino County. An initial postcard announcing the survey was sent to all area addresses on November 7, 2012. The postcard was followed by a mail-out of the survey packet on November 13, 2012. The survey packet consisted of a letter of introduction from Coconino County Supervisors Liz Archuleta and Mandy Metzger (Appendix A); the four-page survey form (Appendix B); and a postage-paid return envelope. It was requested that the survey be returned by November 30 (although an additional week was added to the deadline).

The initial mailing went to 1,397 households in the affected area; of these, 58 were returned as undeliverable, for a final population of 1,339. Three surveys were not filled out, one was a duplicate form, and 20 were received too late to be included. The final total of 321 completed surveys produces a response rate of 24%, providing a confidence level of 95% and margin of error of +/- 5%. The data tables for all survey findings are included in Appendix E, while the findings

most pertinent to costs incurred by residents are described below. Additionally, the survey ended with an open-ended opportunity for comment; these comments are located in Appendix D.

Overall, more than half of survey respondents (56%) were located west of Highway 89, closer to the mountain and Schultz burn area, while 44% were located east of Highway 89 (of these, 25% were in Doney Park specifically). Overall, these properties had been owned an average of 13 years, and two-thirds of them included barns or other outbuildings in addition to the residence.

### ***Fire-related Costs***

Upon the initial flare-up of the fire, authorities evacuated more than 700 downwind properties<sup>5</sup>. This evacuation caused residents to incur costs for emergency lodging, meals, and transportation. Additionally, many of the residents in the area keep livestock, and the costs of evacuating these animals, as well as temporarily boarding more common pets, were significant.

The survey asked residents to report costs incurred while they were evacuated from their homes. These expenses were categorized as *Lodging*, *Food*, *Animal-related*, *Transportation*, and *Other*. Survey participants were also asked to report wages that they were unable to earn as a result of evacuation, but the numbers reported were quite small and therefore considered insignificant. These lost wages will be discussed in a later section. The answers to this question are listed in Table 6.

**Table 6: Fire-related Costs**

	<b>Average</b>	<b>Respondents with Expenses</b>	<b>% of Respondents</b>
Lodging	\$125	79	25%
Food	\$94	111	35%
Animal related	\$54	60	19%
Transport	\$67	80	25%
Other	\$2,004	56	18%
<b>Total</b>	<b>\$356</b>	<b>149</b>	<b>47%</b>

The responses reporting fire-related evacuation costs were extrapolated to the entire population. The resulting estimates indicate average total costs of \$223,572 due to the fire itself. This calculation is illustrated in Table 7. This table uses only the calculated *Total* column, to create a more reliable and conservative figure.

**Table 7: Applying Fire-Related Costs to Total Population**

<b>Population</b>	<b>Estimated Portion with Expenses</b>	<b>Estimated Number of Properties Affected</b>	<b>Average Cost</b>	<b>Total Estimated Cost</b>
1,339	47%	627	\$356	\$223,572

According to survey responses, evacuees spent an average of three nights away before being allowed to return home. As the fire was contained before burning its way into any residential areas, no significant financial damages to private property were caused in this phase of the disaster.

### ***Flood-related Costs***

Flooding below the burn area began with the first significant rainfalls shortly after the fire had been contained. Property owners who had not experienced flooding before now found their homes and yards inundated with each heavy rain.

<sup>5</sup> Up In Smoke: Schultz fire chars 5,000 acres; 750 homes evacuated." *Arizona Daily Sun*. June 21, 2010. [www.azdailysun.com](http://www.azdailysun.com). Retrieved February 12, 2013.

## Flood Insurance

The vast majority of survey respondents (96%) said their properties had never been damaged by flooding or runoff *prior to the Schultz Flood*; consequently, virtually no one in the area had, or was required to have, flood insurance. In the aftermath of the Schultz Flood, however, fully 50% of those surveyed had obtained flood insurance. Forty seven percent of respondents indicated whether or not they have maintained this coverage; 83% answered yes, with an annual premium of \$357.

As Table 8 indicates, expanding this response rate to the population suggests that 555 households still pay flood insurance and the estimated aggregate cost of the premiums is nearly \$200,000 annually.

**Table 8: Estimated Annual Cost of Flood Insurance Premiums**

Population	Proportion with Expense	Proportion Continuing Coverage	Estimated Number of Properties Affected	Average Cost	Total Estimated Cost
1,339	50%	83%	555	\$357	\$198,034

This figure is an annual cost, likely to be repeated. But as flood mitigation efforts reduce the risk of future flooding, the number of homeowners purchasing flood insurance is likely to decrease. Consequently, premiums in future years will be ignored for the purposes of this study.

## Cleanup

One of the most common sources of expense and effort was the cleanup of property. Homes were inundated with water as well as mud and ash. Many yards were completely covered in polluted soils. Problems with noxious weeds emerged after the flooding and desirable grasses and other plants in many cases were choked out by the mud.

The survey included the following question:

*Estimate specific costs associated with cleanup of your home and property in the following categories.*

Table 9 lists the results of the cleanup question, including calculated average and median costs, and a total of all responses. This question also included an option for respondents to report on time spent cleaning—these labor hours will be addressed in a later section.

Almost half of respondents incurred some form of cleanup cost, with an average of \$2,779. The largest itemized cost was in the *Paid Services* category, although fewer households incurred this cost.

**Table 9: Cleanup Costs**

	Average	With Expense	% of Respondents
Cleaning Supplies – Equipment Purchased	\$630	104	33%
Cleaning Supplies – Equipment Rented	\$704	64	20%
Paid Services	\$2,154	77	24%
All Other Cleanup Costs	\$1,619	90	29%
Total	\$2,779	156	49%

Expanding these results to the population yields a total cleanup cost of \$1.8 million. This number was calculated, as Table 10 shows, by applying the ratio and average costs to the entire area, suggesting that 657 properties spent money on cleanup.

**Table 10: Cleanup Costs Applied to Population**

Population	Estimated Portion with Expense	Estimated Number of Properties Affected	Average Cost	Total Estimated Cost
1,339	49%	657	\$2,779	\$1,825,127

**Home Contents**

As many homes and other buildings were filled with water and mud during the flood, the next question concerned damage to non-structural property:

*Estimate costs to your home contents/owned possessions in the following categories.*

The answers to this question can be seen in Table 11. The average total cost was \$1,628, based on 80 responses. Specific categories included *Vehicles*, *Furniture*, *Home Electronics*, and *Tools/Generators*. The highest average costs were reported in the *Other* categories; therefore they cannot be elaborated.

**Table 11: Damage to Home Contents**

	Average	Respondents with Expense	% of Respondents
Vehicles (includes RVs, ATVs etc.)	\$731	42	13%
Furniture	\$194	26	8%
Home Electronics	\$63	31	10%
Tools, Generators	\$487	32	10%
Other Expense #1	\$862	26	8%
Other Expense #2 (\$)	\$747	14	4%
Other Expense #3	\$1,383	9	3%
Total	\$1,628	80	25%

Table 12 expands the total figure from Table 10 to the population, resulting in a total estimated impact of \$548,235.

**Table 12: Damage to Home Contents Applied to Population**

Population	Estimated Portion with Expense	Estimated Number of Properties Affected	Average Cost	Total Estimated Cost
1,339	25%	337	\$1,628	\$548,235

**Structural Damage**

The costliest damages were those done to the structures themselves. The next question attempted to quantify these costs, collecting them in both dollars and labor:

*The following section focuses on structural damage to your home, other buildings, and enhancements on your property. Please estimate damage costs and unpaid time in each category.*

Again, the labor aspect will be addressed below. Damaged property included home interiors, electrical, plumbing, porches, foundations, garages, mechanical systems, and landscaping, among many. The most common and highest cost damages were to *outside features*, such as culverts and driveways. Table 13 shows the itemized results of the responses, and the calculated average of \$4,701. Half reported paying these costs.

**Table 13: Structural Damage**

Structural Damage	Average	With Expense	% of Respondents
Interior doors and walls (including painting)	\$722	37	11.7%
Interior floors, carpets, ceilings	\$771	36	11.4%
Built-in cabinets, shelves and appliances	\$265	25	7.9%
Electrical	\$37	20	6.3%
Plumbing (except septic system)	\$205	19	6.0%
Septic system and wastewater	\$72	23	7.3%
Footings and foundation	\$130	20	6.3%
Porches and decks	\$589	28	8.9%
Garages and workshops	\$1,056	35	11.1%
Porches and decks – Barns and sheds	\$1,528	40	12.7%
Hot tubs/spa	\$72	25	7.9%
Mechanical Systems (heat, AC, built in pumps)	\$343	29	9.2%
Exterior walls, windows, doors, roofing, painting	\$311	30	9.5%
Outside features – Landscaping (culverts, driveways, etc.)	\$5,212	99	31.3%
Structural Damage – Total Cost	\$4,701	158	53%

Applying the average to the population indicates a total cost of more than \$3 million (see Table 14).

**Table 14: Structural Damage Applied to Population**

Population	Estimated Portion with Expense	Estimated Number of Properties Affected	Average Cost	Total Estimated Cost
1,339	53%	707	\$4,379	\$3,097,978

### Flood Control

Flagstaff experiences a characteristic summer monsoon as well as runoff during times of quickly melting snow. Residents of the flood zone therefore can expect flooding to occur at certain times every year. To mitigate the damage of the floods, they have armored their homes with an array of materials, including sandbags, concrete barriers, and earthen berms. Much of the work and cost associated with this armoring was incurred by aid organizations, the county, and volunteers. The more drastic measures—requiring earth moving equipment and strong barriers—involved significant expenses. Table 15 shows the results of the survey's armoring questions.

Well over half of respondents (65%) have armored their properties to some extent, but only 31% of these attached a cost. The average cost of those who paid for this enhanced flood protection was more than \$3,000. Expanding these results to the population yields a total armoring cost of \$823,100.

**Table 15: Cost of Armoring Property, Applied to Population**

Population	Estimated Portion with Expense	Estimated Number of Properties Affected	Average Cost	Total Estimated Cost
1,339	20%	266	\$3,089	\$823,100

### Labor

Commonly overlooked in disasters like the Schultz Fire is the opportunity cost of time spent on repairing damage and replacing items destroyed by flooding. Each hour spent on these activities can be quantified in financial terms by considering it “volunteer” work. This is commonly referred to in economic terminology as “opportunity cost.” Many thousands of hours of labor were logged by homeowners, friends, family members, volunteers, and others. In terms of economic impact, these hours reduce productivity in other areas and thus have a measurable financial impact.



Survey respondents indicated the unpaid hours of work that were required to repair or replace damaged property. The average time spent on home contents and possessions was 23 hours, a cost incurred by 20% of respondents. When expanded to the entire population, this implies that 269 households spent a combined 6,279 hours cleaning or installing new home contents.

More hours were spent repairing structural damages to homes and other buildings. The average of 132 hours per respondent was calculated based on 39% of respondents. Expanding this figure to the total suggests that 535 properties required unpaid working hours for a total of more than 70,000 hours. Added to the previous total (damage to contents/possession), this indicates there is a need to account for nearly 77,000 hours of unpaid labor.

**Figure 2: Volunteers clean up flooded property**



*Photo courtesy of the United Way of Arizona*

A dollar amount can be applied to the value of volunteer work. This was done using the value of volunteer time as described by Independent Sector, a leadership network for nonprofit organizations<sup>6</sup>. This organization estimates that, in 2010, the value of an hour of volunteer work in Arizona was approximately \$19.71. After applying that value to these hours, the total value of unpaid labor was \$1.5 million. These calculations are shown in Table 16.

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<sup>6</sup> [http://independentsector.org/volunteer\\_time](http://independentsector.org/volunteer_time)



**Table 16: Value of Unpaid Labor Applied to Population**

Estimated Dollar Value of Unpaid Hours Spent for Repair/Rehabilitation/Replacement					
Labor Type	Average Hours	Number of Households	Total Hours	Value of One Hour	Total Value of Volunteer Hours
Damage to home contents/ possessions	23	269	6,279	\$19.71	\$123,759
Structural damage to home, other buildings, and enhancements	132	535	70,642	\$19.71	\$1,392,344
Total	—	—	76,920	\$19.71	\$1,516,103

### Social Service Agencies

As is often the case in disasters, community members showed up eager to help their neighbors. The number of people offering aid and the effort they expended cannot be expressed in numbers, but volunteerism is an essential part of the story of the fire's impact.

To examine a portion of the volunteer effort, ABBOC staff contacted the United Way of Northern Arizona, which helped coordinate hundreds of volunteers, primarily during the initial flooding. Although the United Way handled only a portion of the active volunteers, it was likely the largest of the active agencies doing so.

From July through September of 2010, approximately 1,050 United Way volunteers filled, delivered, and placed sandbags and wattles throughout the flood-prone areas of the affected neighborhoods. They also assisted with mud and debris removal and outdoor property repair. The United Way recorded 2,235 volunteer hours during this time, a number that would indicate foregone wages of nearly \$45,000 if using the value structure cited earlier in this study.

The United Way also used assistance funding to provide home repairs to 25 families. These repairs included flooring, drywall, painting, earthwork, labor, building supplies, emergency shelter, and miscellaneous supplies. Additionally, the organization coordinated specially-skilled volunteers who offered professional services to those in need.

**Figure 3: Volunteers coordinated by the United Way of Northern Arizona lay sand bags in an anticipated flood path**



*Photo courtesy of the United Way of Arizona*

The impact of these volunteers was noted by many residents in the survey’s final, open-ended question:  
*Is there anything else you would like to tell us about how the Schultz Fire and Flooding affected you and your family?*

Many of the responses praised the work of the volunteers. Table 17 lists several of the comments.

**Table 17: Individual Responses Praising Volunteer Efforts**

THE SUPPORT ENCOURAGEMENT & TOOLS OF OUTREACH FROM OUR FIRE DEPARTMENTS, COCONINO COUNTY & MANAGEMENT FROM EMERGENCY SERVICES HAS BEEN TREMENDOUS AND SO VALUABLE. MY HEART FELT THANKS GOES OUT TO ALL OF THEM & THE PEOPLE WHO SACRIFICED TO HELP THEIR NEIGHBORS THAT THEY HAD NEVER MET.
WE ARE MORE APPRECIATIVE FOR THE PROPERTY THAT WE HAVE. THANKFUL FOR OUR NEIGHBORS AND FLAGSTAFF COMMUNITY.
WE WANT TO COMMEND THE COUNTY FOR THEIR HANDLING OF THIS DISASTER-SUPPLIES AND HELP WERE AVAILABLE IMMEDIATELY AND THE GRANT WILL HELP PROTECT THE AREA FROM FUTURE FLOODING. COMMUNICATION HAS BEEN GREAT. THANK YOU FOR DOING THIS SURVEY!
YOUR SURVEY MENTIONS NOTHING REGARDING THE ASSISTANCE PROVIDED BY OTHERS FOR OTHERS. IS THERE NO MEASUREMENT FOR COMMUNITY SPIRIT? LIZ AND MANDY & COUNTY STAFF (PERU, BERTELION, ANDRIANI) ARE TO BE COMMENDED.

### Other Costs

While the survey explored costs other than those previously discussed, the responses were not always significant enough to apply to the population. Among these costs were moving-related expenses for families forced to relocate; evacuation and moving costs for pets and livestock; household wages lost during the flooding; and costs associated with illnesses and injuries stemming from the flood and fire.

Table 18 shows these costs, and although they have not been expanded to the entire population, they certainly show a meaningful impact on those who incurred them.

**Table 18: Other Flood-related Costs**

Cost	Average	Number of Responses
Moving-related costs	\$332	19
Pet/livestock related costs	\$367	28
Household wages lost due to the flood	\$3,086	33
Illness/injury	\$1,735	17

### Health

In terms of health issues, about one in 10 respondents (9%) reported a personal injury or accident due to the Schultz Fire and Flooding. Back injuries were the most common by far, but injuries also included chest pains, injuries to knees and shoulders, tendonitis, stepping on nails/foot punctures, among others. Other respondents (13%) reported becoming ill or sickened as a result of the fire and subsequent flooding; most common were a host of respiratory issues (trouble breathing, allergies, asthma), as well as a number of conditions related to mental stress and psychological trauma.

The average post-insurance, out-of-pocket cost associated with treating these health-related injuries and illnesses was \$1,735.

The survey included a number of open-ended questions urging residents to share the health problems they experienced due to the flood and fire. The tables on the following pages list the answers to these questions. Although these issues will not be quantified in financial terms, they represent a cost that must be acknowledged if one is to fully understand the fire's impact.

Table 19 (see page 16) contains the answers to the question:

*Did anyone in your household have a physical injury/accident due to the Schultz Fire and Flooding?*

The answers range from back pain to broken bones. Most of these stem from the physical work of cleanup and armoring against future floods. Most answers give no indication how the injury happened, but the hard physical efforts residents expended in defense of their homes is obvious.

Table 20 (see page 17) contains the answers to the question:

*Did anyone in your household experience illness/sickness due to the Schultz Fire and Flooding?*

Again, the answers vary from mild (dust allergies) to serious (small heart attack, depression). Particularly jarring is the emotional toll shown through these answers. Many residents' lives have been changed forever.

**Table 19: Individual Responses, Injury/Accident**

BACK INJURY DUE TO SANDBAGS-SHOVELING FOOT-LOWER EXTREMITIES INJURY-LIFTING  
 BAD BACK-CHIRO TREATMENTS  
 BODY STRAINS & SPRAINS (KNEES,BACK,SHOULDERS,NECK,ANKLES)  
 BROKE MY HIP WHEN I WAS REPAIRING THE DAMAGE TO THE FRONT YARD WHEN I FELL ON  
 A HARDENED LUMP OF GRAVEL THAT WAS WASHED DOWN FROM THE DRIVEWAY.  
 BUT SORE BACK & MUSCLE BY MOVING SAND BAGS!  
 CHIROPRACTIC WORK & ORTHOPEDIC WORK DUE TO MOVEMENT OF SANDBAGS & DIRT  
 BERM WORK.  
 CLEANING CULVERT BITTEN BY SPIDERS  
 DEVELOPED BILATERAL ELBOW TENDONITIS AND SHOULDER PAIN FROM HEAVING  
 SANDBAGS ONTO/OFF TRUCK AND CARRY TO DEFENSIVE LINES.  
 GOT REAL SICK FROM BLACK TOXIC SEPTIC SOIL DUMPED ALL AROUND MY HOME. DOG  
 NEARLY DIED OF KIDNEY FAILURE.  
 HIATAL HERNIA WITH ASSOCIATED GERD (FROM LIFTING SAND BAGS)  
 I HAD BEGUN HAVING BACK SPASMS FROM LIFTING & MOVING SAND BAGS & DIGGING MUD.  
 HAD SURGERY PROCEDURES LAST YR TO KNEE & BACK.  
 I JUST HAD ROTATOR CUFF SURGERY ON LEFT SHOULDER & REDAMAGED IT WHILE SAND  
 BAGGING  
 INDIRECTLY. THE RUINED FENCES ARE GATHERED IN PART OF THE PROPERTY & ONE PERSON  
 & ONE DOG HAD IMPAILMENT INJURY BOTH OF WHICH REQ\_ER  
 INJURED BACK FROM LOADING/UNLOADING & STACKING LARGE AMTS OF SANDBAGS.  
 KNEE INJURY WHILE STACKING SANDBAGS (ED)  
 LOTS OF BLISTERS!  
 MANY DAYS OF VERY HARD LABOR >>> MUSCLE & BACK PAIN  
 MY HUSBAND IS RETIRED DISABLED. HE FELL AND REINJURED HIS KNEE (RIGHT) WHILE  
 PUTTING SANDBAGS AND WATTLES IN PLACE.  
 NAIL PUNCTURE, CUTS & ABRASIONS TO HANDS, UPPER & LOWER EXTREMITIES.  
 NON STOP BACKBREAKING WORK CAUSED MUCH BACK PAIN & CHEST (IN PART CHEST PAIN  
 DUE TO PREVIOUS RIB INJURY)  
 PUNCTURED FOOT  
 ROTATOR CUFF TEAR  
 SLIPPED DISC IN BACK-WEEKS OF LAYING SAND BAGS-HIGH BLOOD PRESSURE/BACK & NECK  
 PAIN  
 STRAINED MUSCLES RELATED TO MOVING THOUSANDS OF SANDBAGS  
 THREW OUT BACK  
 TORE INGUINAL HERNIA, WHICH HAD BEEN SURGICALLY REPAIRED NOV 2009  
 WALL OF WATER TOOK ME DOWN ON THE PROPERTY



**Table 20: Individual Responses, Illness/Sickness**

ALLERGIES TO DUST  
ALLERGIES-NEVER HAD THEM BEFORE, BUT HAVE THEM NOW.  
ANXIOUS ATTACKS SLEEPING PROBLEMS  
ASTHMA ATTACKS DUE TO SMOKE & SMELL OF WATER  
ASTHMA LIKE SYMPTOMS-COUGHING FROM SMOKE, SORE THROATS  
BREATHING DIFFICULTY  
CARDIAC-PVC'S ASSOCIATED TO STRESS.  
DEPRESSION  
DEPRESSION BECAUSE WE WERE READY TO SELL HOUSE BUT OF COURSE COULDN'T.  
DUST-SOIL CONTAMINATION-NON POINT SOURCE  
EMOTIONAL DISTRAUGHT  
EMOTIONAL TRAUMA  
EXHAUSTION!  
EXTREME PANIC-FEAR-SADNESS-ANGER-DEPRESSION  
EXTREME STRESS! THE FIRE COULD HAVE BURNED RIGHT THROUGH OUR NEIGHBORHOOD.  
(THANK YOU FIRE DEPARTMENT FOR KEEPING IT FROM DOING THAT)  
FLOOD MUD & INSECT INFESTATION  
HAD RASH DURING CLEANUP-ON HANDS AND ARMS. ALSO WAS DEEPLY DISTRESSED FOR  
FOLLOWING SIX MONTHS.  
HARD TO BREATHE FROM SMOKE AND DUST AFTER  
INCREASED ALLERGIES DUE TO DUST & SILT  
I'VE BEEN GETTING THERAPY FOR PTSD \$70 PER SESSION WHICH MY INSURANCE DOES NOT  
COVER.  
LOST WEIGHT DUE TO CLEANUP  
MENTAL STRESS  
PNEUMONIA, IN SPITE OF USING MASKS DURING CLEANUP  
POLLEN COUNT WAY UP. DUST TERRIBLE FROM SILTY MUD OFF OF MOUNTAIN, HARD ON  
SINUSES.  
RESPIRATORY PROBLEMS  
RESPIRATORY PROBLEMS DUE TO INCREASED DUST POLLUTION  
RESPIRATORY PROBLEMS DUE TO POSSIBLE INHALING LOTS OF SMOKE.  
RESPIRATORY/STOMACH  
SMALL HEART ATTACK  
SMOKE INHALATION (HEART PATIENT)  
SMOKE INHALATION DURING FIRE EVAC >>> ER VISIT & FOLLOW UP WITH SPECIALISTS  
STRESS OF FLOODING & FIRE ADDED TO WIFES HEART ATTACK IN THE FALL.  
STRESS RELATED FLU  
THE DUST CONTINUES TO BE AN ISSUE AND MAY HAVE LONG-TERM DELAYED  
CONSEQUENCES THAT ARE NOT YET APPARENT-ESPECIALLY W/OUR CHILDREN.  
UNLESS YOU COUNT SERIOUS STRESS! I ENDED UP ON MEDICATION FOR STRESS (BUT THAT  
WAS MULTIFACTORIAL)  
WE ARE STILL SICK OVER IT. OUR LIVES & LIFESTYLE IS FOREVER CHANGED.

## Lost Home Value

The final question of the survey asked respondents to estimate the value of their property both before (2009) and after (2012) the Schultz Fire and Flood. The results, as seen in Table 21, indicate a fall of more than \$105,000 during that three-year period. The estimated loss was calculated at approximately 30%.

**Table 21: Homeowner Estimates of Loss in Value, 2009–2012**

	Mean	Median	Responses
Estimate the market value of your home in 2009	\$349,241	\$300,000	238
Estimate the current market value of your home in 2012	\$244,138	\$220,000	237

As a comparison figure for the analysis performed using county data, this is a useful figure<sup>7</sup>. The county data analysis indicated an overall decline of 20% in values between 2009 and 2011. For several reasons, the two cannot be compared:

- The period of analysis is one year shorter than the county analysis
- The numbers don't correct for overall market decline
- These numbers are based on homeowner perceptions
- The populations are different—the previous analysis considered a larger population to account for viewshed effect
- The previous analysis included vacant lots

Considering these differences, the two estimates are reasonably close, and the county data estimate is further seen as conservative.

## Black Bill Park Neighborhood Association

The survey conducted by AHRRC for this study is not the first to gauge the impact of the Schultz Fire. In 2010, the Black Bill Park Neighborhood Association, a group of residents formed to give those affected by the fire a unified voice, distributed a survey. Although the goals of the two instruments were different, some data provided by the 127 respondents can be used to check the figures stated above.

The question most useful to this document was:

*Estimate the cost for replacement or remediation of your losses.*

Answers to these questions have been analyzed to check their similarity to those in the AHRRC survey.

Working off midpoints (the results were reported in ranges), it appears that those who responded had a median cost of \$7,500. It is not known from how large a population these numbers were drawn, so expanding these numbers to the entire impacted area is impossible.

In order to compare surveys, the assumption was made that the comparable costs from the AHRRC survey were those in the following categories:

- Structural damage (\$3,097,978)
- Cleanup (\$1,825,127)
- Unpaid labor (\$1,516,103)
- Armoring (\$823,100)
- Home Contents (\$548,235)

The total of five costs is \$7,812,543. Dividing this number by the population of affected properties (1,339) yields an average cost of \$5,835.

The two studies differ too much to draw any solid conclusions through comparison, but these calculations (\$5,835 vs. \$7,500) indicate that the results of the AHRRC study are conservative.

<sup>7</sup> This is not to suggest that either owner perception or county valuation are superior to the other, the two are separate measures of a difficult estimate.

## Habitat

*The following analysis was authored by Dr. Gary Snider. The Shultz Fire also impacted habitat for the federally threatened Mexican Spotted Owl (*Strix occidentalis lucida*). Federal investment in the recovery of this species is significant across its entire range in the Southwest. This section uses several analyses in order to attach an economic value to habitat impacted in the fire. The full and cited version of this analysis is In Review and will be published in the summer of 2013.*

The Mexican spotted owl (MSO) inhabits mixed-conifer and pine-oak forests and rocky canyonlands in the southwestern United States and Mexico. Two primary reasons were cited for the original federal listing of the MSO as a threatened species in 1993: 1) historical alteration of its habitat as the result of timber-management practices; and, 2) the threat of these practices continuing. As with all listed species, the federal government identifies areas of critical habitat (CH) that are required for the species recovery. In the case of the MSO, this includes both protected and restricted habitat. Protected habitat includes: 1) 600 acres around known owl sites within mixed conifer forests, or 2) pine-oak forests with slopes greater than 40% and where timber harvest has not occurred in the past 20 years. These areas are commonly referred to as *protected activity centers* or *PACs*. Restricted habitat includes areas outside of protected habitat which owls utilize for foraging and dispersing.

Over the past 10 years, wildland fire has resulted in the greatest loss of critical habitat relative to other actions (e.g., such as forest management, livestock grazing, recreation, etc.) throughout the U.S. range of the MSO. This has led experts to conclude that presently the largest threat to MSO is the risk of stand-replacing wildfire. Landscape-level wildland fires, such as the Rodeo-Chediski Fire (2002) and the Wallow Fire (2011), have resulted in the loss of tens of thousands of acres of occupied and potential MSO habitat across significant portions of its range. However, scientists still do not know the extent of the effects of wildland fires on the actual MSO population.

Despite the variability of fire effects and existing gaps in knowledge regarding short- and long-term effects on habitat and owl responses to wildland fire, it is believed that stand-replacing crown fires pose a severe threat to Mexican spotted owls. This is especially true when considering that approximately 33,000 PAC acres (55 PACS) were severely impacted by high-severity, stand-replacing fire in the 2002 Rodeo-Chediski Fire. In 2011, the largest wildland fire in Arizona history, the Wallow Fire, seriously impacted 76 MSO PACs. During the ten-year period 2002–2011, approximately 80% of MSO PACs on the Apache-Sitgreaves National Forest have been placed in jeopardy by wildfire.

Over the past 15 years, hundreds of thousands of CH and PAC acres have been drastically altered and/or lost as the result of unnatural, high-severity wildfire.

In 1995, the USFWS estimated it would cost approximately \$40 million over a 10-year period for the MSO recovery effort). Data on actual (estimated) expenditures for the period 1996 through 2011 range from a low of \$1.25 million in 2009 (the middle of an economic recession) to a high of \$6.58 million two years later in 2011. The average expenditure for the 16-year period was \$3.44 million/year. In 2012, the USFWS estimates it will cost a minimum of \$43 million through 2022 for the MSO recovery effort (USFWS 2012a). That “minimum” expenditure estimate would translate to an average of \$4.3 million per year. During the 25-year period (1997–2022) the USFWS will have spent at least \$100 million on the “recovery” of the MSO. Therefore, we know that the MSO must be worth, by definition, at least \$100 million. If we assume the existence of 1,000 PACs based on the literature, then the USFWS is spending, a minimum, of \$100,000 per PAC.

Noted economists John Loomis and Earl Ekstrand estimated a range of economic benefits, each corresponding to an increasingly conservative assumption of how widespread benefits are for protecting the MSO and its habitat in the four-corner states of Arizona, Colorado, New Mexico, and Utah. Their most conservative estimate placed the benefit value at about \$2 billion. In 1997, approximately 90% of the MSO 600-acre PACs were located in the forests of Arizona and New Mexico. At that time, the number of PAC acres remaining in Arizona and New Mexico was estimated to be approximately 570,000 acres. Dividing the \$2 billion by the 570,000 acres yields a value of \$3,500/PAC acre, thus placing the value of each 600-acre PAC at \$2.1 million. This value is in 1997 dollars. To convert 1997 dollars to 2012 dollars we multiply \$2.1 million by 1.36 to get a value of \$2.86 million/PAC.

The number of PAC acres in the forests of Arizona and New Mexico is continuously being reduced due to unnatural crown fire. The result is to increase the value per PAC estimated in the Loomis and Ekstrand study. Twenty percent would represent a conservative estimate of the number of PACs lost over the past 15 years. The result is an estimated

value of approximately \$4,385/PAC acre (in 1997 dollars) and \$2.6 million/PAC (in 1997 dollars), with \$2.6 million times 1.36 equaling approximately \$3.54 million/PAC (in 2012 dollars).

In 2010, the Schultz Fire burned 15,051 acres along the eastern flanks of the San Francisco Peaks. Impacts from this fire were of great concern as 78% of four MSO PACs were within the fire perimeter and 88% of these PAC acres experienced moderate to high burn severity. These are short-term impacts. Based on watershed, geologic, and hydrologic assessments, there exists a threat of increased, continued erosion, loss of short and long-term soil productivity, and debris landslides into MSO PACs and CH. Soil retention and productivity is essential for recovery of MSO habitat because of the length of time it will take, under the best of conditions, to develop suitable habitat. At \$3.54 million/PAC the value of the four PACs is estimated to be \$14.2 million (2012).

**Value estimates for the four PACs range from \$400,000 (\$100,000/PAC) to \$14.2 million.**

## Loss of Life

In the month following the fire, a child drowned during severe flooding downstream of the burned area. While the emotional toll taken by such incidents is immeasurable, it is sometimes appropriate to attach a dollar value to the loss of a life.

Attributing a dollar amount to life is difficult, but a number of government agencies routinely do so in order to estimate the value of certain policies, such as pollution controls and transportation regulations. A cost/benefit analysis is conducted, determining the amount that an agency is willing to spend in order to save one life. As this study has the potential to influence policy, a similar approach is appropriate.

The term used for this valuation is *Value of a Statistical Life* (VSL), and the figure varies greatly by agency and from year to year. The U.S. Office of Management and Budget noted in 2012 that the Department of Transportation uses a value of \$6.2 million (in 2011 dollars) while the Environmental Protection Agency uses \$6.3 (in 2000 dollars)<sup>8</sup>. Rather than determine which agency figure is most analogous to this case, a flat figure of \$6 million will be used for simplicity.



An aerial view of the Schultz Fire burn area and wide flood path. Note the proximity of the residential area to the flood zone. *Photo courtesy of the Ecological Restoration Institute*

<sup>8</sup> *Fiscal year 2013: Analytical perspectives: Budget of the U.S. Government*. United States Office of Management and Budget. U.S. Government Printing Office. Washington, D.C. 2012. Page 99.





The force of the flood waters, which contained large amounts of debris and ash, carved deep channels below the Schultz Fire burn area. *Photo courtesy of the Ecological Restoration Institute*



Residents used sandbags to create a berm against the heavy floodwaters that inundated their property after the fire. *Photo by Deborah Soltesz*



## Total Impact

All of the previously discussed costs of the Schultz Fire and Flood added together yield a conservative impact estimate of between \$133 million and \$147 million, as of 2013 (see Table 22).

**Table 22: Total Estimated Impact of the Schultz Fire/Flood**

Total Impact	
Loss in Property Value	\$59,353,523
Government Agencies	\$59,104,394
Loss of Life	\$6,000,000
Structural damage	\$3,097,978
Cleanup	\$1,825,127
Unpaid Labor	\$1,516,103
Armoring	\$823,100
Home Contents	\$548,235
Fire Evacuation Costs	\$223,572
Flood Insurance Premiums	\$198,034
Habitat	\$400,000–\$14,200,000
Total	\$133,090,066–\$146,890,066

Dividing this total by the number of acres burned during the fire (rounded to 15,000) yields a cost of between \$8,873 and \$9,793 per acre. These numbers, while likely conservative, describe the overwhelming financial toll taken by the Schultz Fire. They are intended to provide a clearer picture of how such fires affect communities, governments, non-profits, and property owners.

Ecological Restoration Institute staff have estimated that treatment costs tend to run between \$500 and \$1,000 per acre, and that typically 30% of a given project area is thinned. Table 23 estimates a range of costs to thin 15,000 acres, using both low and high numbers. The result is between \$2.25 million and \$15 million.

**Table 23: Cost Estimates, Treating Burn Area**

Estimate	Acres Thinned	Cost Per Acre	Total Thinning Cost
High	15,000 (100%)	\$1,000	\$15,000,000
Low	4,500 (30%)	\$500	\$2,250,000

## Conclusion

In conclusion, it is sobering to note that by treating a significant portion of the Schultz Fire imprint with an investment of \$15 million could have greatly reduced the cost of the Schultz Fire and avoided the damage and loss of life associated with post-fire flooding that is now conservatively estimated to be between \$133 and \$147 million.

## Appendices

### ***Appendix A: Letter to residents introducing survey***

October 30, 2012

Dear Coconino County Resident:

This survey packet is being sent to all residents who live in the area impacted by the Schultz Fire & the related Schultz Flood. The Ecological Restoration Institute at Northern Arizona University is developing a full-cost accounting of these events and is asking for your assistance in this effort; the Arizona Hospitality Research Center is facilitating the survey distribution. As residents who were perhaps affected by these events, you may have had personal out-of-pocket expenses that have not been captured in any cost accounting to date by Coconino County or other government agencies.

The results from this survey will be used in publications designed to help elected officials, budget administrators and interested citizens understand the full impact and costs of unnatural fire and associated flooding. Although other studies have calculated the cost of damages to government, few have done an exhaustive job of understanding the impacts on private citizens.

Demonstrating the cost of these combined disasters can also be used to justify the importance of investing in forest restoration and hazardous fuel thinning to avoid catastrophic fire in the future. We, therefore, urge you to respond to this survey and answer all the questions as completely as you can. Please be assured that all the information collected will be held in the strictest confidence; all results will be analyzed and posted only in the aggregate and no residents will ever be individually identified.

If you have any questions about how to answer the survey you can contact Thomas Combrink at NAU at 523-9194 or [Thomas.Combrink@nau.edu](mailto:Thomas.Combrink@nau.edu).

We thank you in advance for your attention to this important survey and appreciate your willingness to assist us in this critical endeavor. Be sure to return it in the postage-paid envelope no later than November 30, 2012.

Sincerely yours,

Liz Archuleta  
Coconino County Supervisor

Mandy Metzger  
Coconino County Supervisor

## Schultz Fire and Related Flooding: Property Owner Damage & Cost Questionnaire

This survey consists of five sections. Part I briefly describes your residence. Part II addresses the Schultz Fire specifically. Parts III & IV relate to consequences of the Schultz Flood, and Part V briefly addresses any health issues related to both the Fire & Flood events.

Please answer as completely as possible and return the survey in the postage-paid envelope no later than Friday **NOVEMBER 30, 2012**.

### PART I - RESIDENTIAL SITUATION

1. Where is your home/property situated? (choose one)

- ☐ Timberline Neighborhood  
 ☐ Wupatki Trails  
 ☐ Hutchison Acres  
 ☐ Doney Park  
☐ Fernwood Neighborhood  
 ☐ Anasazi Trails  
 ☐ Swede Acres  
 ☐ Other (specify):

2. Is this your primary residence?

- ☐ Yes  
 ☐ No .....If not, is it a: ☐ Second Home

On average, how many weeks/year do you occupy this home?

- ☐ Investment/Rental Property

On average, how many months/year is it on the rental market?

- ☐ Other (specify):

3. How many years have you owned this home?

How old is this house?   Years

4. What type of foundation does your home have?

- ☐ Slab On-Grade (ground level)  
 ☐ Posts & Piers Raised Foundation  
☐ Raised Slab (fill above ground level)  
 ☐ Mobile with Tie Downs & Anchors  
☐ Concrete Footing & Stemwall  
 ☐ Other Foundation (specify):

If raised, how many inches is the structure elevated above ground level?

Inches

5. Do you have a garage on the property? ☐ No   ☐ Yes ..... Select the type:

- ☐ Attached Garage  
 ☐ Detached Garage  
 ☐ Under-the-House

6. Do you have barns/sheds/workshops on the property? ☐ No   ☐ Yes ..... How many?

7. Do domestic animals/livestock live **outdoors** on the property? ☐ No   ☐ Yes

### PART II - SCHULTZ FIRE EVENT

8. During the time that the **Schultz Fire** was burning, did members of your household evacuate & leave the area overnight? ☐ No   ☐ Yes ..... How many nights?

Where did you stay? (mark all that apply)

- ☐ With Family/Friends  
 ☐ Campground/Camping  
☐ Hotel/Motel  
 ☐ Other (specify):  
☐ Red Cross Shelter

9. Did you evacuate any domestic animals during the time the **Schultz Fire** was burning?

- ☐ No  
 ☐ Yes ..... How many nights?

Where were they relocated? (mark all that apply)

- ☐ They stayed with Me  
 ☐ Private Boarding Facility  
☐ With Family/Friends  
 ☐ Other (specify):  
☐ Emergency Shelter (Ft. Tuthill)

10. Did anyone in your household have lost wages due to the **Schultz Fire Event** (NOT flooding related lost wages)? Do not include paid annual leave.

- ☐ No  
 ☐ Yes ..... Estimate total household wages lost: \$

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11. Estimate all expenses incurred by household members related directly to the fire event (not including subsequent flooding) and prior to any insurance claims that were paid.

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Lodging/Camping \$

Transportation \$

Food/Meals \$

Other Expenses \$

Pet/Animal Related \$

(specify:)

### PART III - SCHULTZ FLOODING EVENT(S)

12. Prior to the Schultz fire, had your home/property ever been damaged by flooding from rain/weather events? (do not include roof leaks/frozen pipes etc.)

☐ No ☐ Yes .... Approximately how many times?  Where was the damage? ☐ Interior of Home  
(mark all that apply) ☐ Exterior Home/Structures  
☐ Non-structural

13. Did you obtain flood insurance as a result of the Schultz fire?

☐ No ☐ Yes ..... Coverage Type? ☐ Home/Living Structure ☐ Other Residential Structures ☐ Renter Contents  
(mark all that apply) ☐ Home Contents ☐ Other Residential Contents

..... Do you renew it annually? ☐ No ☐ Yes ..... How much are you paying annually? \$

14. Was your home/property damaged as a result of the Schultz flood? ☐ No ☐ Yes

15. Did the flooding make it necessary for you or other home occupants to stay in temporary housing due to evacuation or flood-related repairs/cleanup?

☐ No ☐ Yes ..... How many days did you or other occupants spend in temporary housing due to evacuation or flood-related repairs/cleanup?  Days

..... How much money did your household spend on the following due to this relocation?

Temporary Housing: \$

Food/Meals (in excess of what you normally spend): \$

Transportation Costs (in excess of what you normally spend): \$

16. What type of flood damage occurred on your property? (mark all that apply)

- ☐ No flood damage  
☐ Non-structural (driveways, landscaping, fences etc.)  
☐ Home Foundation/Area Under Home  
☐ Exterior Home/Structures (including attached garages)  
☐ Interior of Home (living space)

How high did water/debris get relative to the interior floor of your home, if any?  Inches

17. Indicate the sources/dynamics of flood damage that occurred to your home and property: (mark all that apply)

- ☐ 1. Water Surge/Runup (a sudden flow of water associated with a storm event)  
☐ 2. Inundation/Saturation (the buildup of water overflow or ponding)  
☐ 3. Erosion/Scarification  
☐ 4. Septic System Back-up  
☐ 5. Mud/Debris Deposition  
☐ 6. Other (specify):   
☐ 7. No flood damage

From the list above, which item was the greatest source of financial damage to your home/property?   
Make selection by writing in the assigned number. (Example: Erosion/Scarification = 3)

18. How long after the worst of your flooding did it take you to get your home back to pre-flood condition?

- ☐ Less than a month ☐ 4 to 6 months ☐ More than a year ☐ Home was abandoned  
☐ 1 to 3 months ☐ 7 to 12 months ☐ Still working on repairs



#### PART IV - SCHULTZ FLOODING COST ESTIMATES

The following section is to determine the dollar cost and unpaid hours for loss, repair, replacement and cleanup of your home, possessions and property that resulted from the Schultz flooding.

*Estimate all costs prior to any associated insurance reimbursements. If you have no costs enter "0".*

19. Estimate specific costs associated with **clean up** of your home and property in the following categories:

Cleaning Supplies/Equipment Purchased	\$	<input type="text"/>	All Other cleanup costs	\$	<input type="text"/>
Clean up Equipment Rented	\$	<input type="text"/>	Total Unpaid hours for clean up:	#	<input type="text"/>
Paid Services (Restoration Co., Cleaning Services etc.)	\$	<input type="text"/>			

20. Estimate costs to your **home contents/owned possessions** in the following categories:  
(note: "contents" are personal property kept inside the home or garage/buildings that are not affixed)

	Damage & Loss Cost or Value (\$)	Unpaid Hours to Repair/Install (#)
Vehicles (include RVs, ATVs etc) .....	<input type="text"/>	<input type="text"/>
Furniture .....	<input type="text"/>	<input type="text"/>
Home Electronics .....	<input type="text"/>	<input type="text"/>
(computers, A/V, small appliances, etc.)	<input type="text"/>	<input type="text"/>
Tools, Generators, etc. ....	<input type="text"/>	<input type="text"/>
All Other <input type="text"/> .....	<input type="text"/>	<input type="text"/>
(specify): <input type="text"/> .....	<input type="text"/>	<input type="text"/>
<input type="text"/> .....	<input type="text"/>	<input type="text"/>
<b>TOTAL OF ABOVE</b>	\$ <input type="text"/>	# <input type="text"/>

21. The following section focuses on **structural damage to your home, other buildings, & enhancements** on your property. Please estimate damage costs and unpaid time in each category. *If you have no costs enter "0".*

	Damage & Loss Cost or Value (\$)	Unpaid Hours to Repair/Install (#)
Interior doors & walls (include painting) .....	<input type="text"/>	<input type="text"/>
Interior floors, carpets, ceilings .....	<input type="text"/>	<input type="text"/>
Built-in cabinets, shelves & appliances .....	<input type="text"/>	<input type="text"/>
Electrical .....	<input type="text"/>	<input type="text"/>
Plumbing (excluding septic system) .....	<input type="text"/>	<input type="text"/>
Septic system & wastewater .....	<input type="text"/>	<input type="text"/>
Footings and foundation .....	<input type="text"/>	<input type="text"/>
Porches and decks .....	<input type="text"/>	<input type="text"/>
Garages and workshops .....	<input type="text"/>	<input type="text"/>
Barns and sheds .....	<input type="text"/>	<input type="text"/>
Hot tub/spa .....	<input type="text"/>	<input type="text"/>
Mechanical Systems (heat, A/C, built-in pumps) .....	<input type="text"/>	<input type="text"/>
Exterior walls, windows, doors, roofing, painting .....	<input type="text"/>	<input type="text"/>
Outside features/ landscaping .....	<input type="text"/>	<input type="text"/>
(fencing, culverts, driveways, etc.)	<input type="text"/>	<input type="text"/>
<b>TOTAL OF ABOVE</b>	\$ <input type="text"/>	# <input type="text"/>

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22. Indicate the primary source of your structural damage value estimates.

☐ Contractor Estimate (before repairs) ☐ Your own assessment

☐ Contractor Invoice (after repairs) ☐ Other (specify):

23. Have you installed any physical **flood control measures** on your property since the Schultz flood?

☐ Yes ..... What measures?

☐ No

☐ Construction of ditches/culverts

☐ Flood walls/Jersey barriers

☐ Stacked sandbag walls/wattles

☐ Other (specify)

Total estimated cost to you of such preventive measures: \$   
(DO NOT include government or United Way provided services/supplies)

24. Did you have any **moving related costs** (including storage unit rental, rental trucks/trailers & paid labor) due to the Schultz flooding? ☐ No ☐ Yes ..... Total estimated cost \$

25. If you are willing to share this information, did you lose any **irreplaceable possessions** or items of sentimental value (photos, heirlooms, etc.)? ☐ No ☐ Yes

26. Did you have any **pet/livestock** related costs due to the Schultz flooding? (include veterinary, boarding, damaged feed, etc.) ☐ No ☐ Yes ..... Total estimated cost \$

27. Did anyone in your household have **lost wages** due to the Schultz flooding? (exclude lost wages from the fire in Question #10)  
Do not include paid annual leave.

☐ No ☐ Yes ..... Total estimated household wages lost: \$

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#### PART V - SCHULTZ FIRE & FLOOD HEALTH ISSUES

The following section concerns health-related issues you and your household may have experienced due to the Schultz fire and flood.

28. Did anyone in your household have a physical **injury/accident** due to the Schultz fire & flooding?

☐ No ☐ Yes ..... If you would like, provide details here:

29. Did anyone in your household experience **illness/sickness** due to the Schultz fire & flooding?

☐ No ☐ Yes ..... If you would like, provide details here:

30. If your household had medical expenses for injuries or illness as a direct result of the Schultz fire and flooding, please estimate the total cost (include all costs before any insurance payments): \$

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31. In your opinion, please estimate the market value of your property before the Schultz Fire/Flood and the current market value. 2009 Value: \$  Current 2012 Value: \$

Is there anything else you would like to tell us about how the Schultz fire and flooding affected you and your family?

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Thank You for your time & information!

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## Appendix C: Habitat Literature Cited

- Coconino N.F. 2010. Schultz Fire: Burned Area Emergency Response Report. July 8, 2010. Flagstaff, AZ. 167p.
- Fletcher, K.W. 1990. Habitats used, abundance and distribution of the Mexican spotted owl, *Strix occidentalis lucida*, on National Forest system lands. USDA Forest Service, Southwestern Region, Fletcher, K.W. 1990
- Ganey, J.L., G.C. White, A.B. Franklin, J.P. Ward, and D.C. Bowden 2000. A pilot study on monitoring populations of Mexican spotted owls in Arizona and New Mexico: second interim report. 41p.
- Ganey, J.L., W.M. Block, and S.H. Ackers 2003. Structural characteristics in forest stands within home ranges of Mexican spotted owls in Arizona and New Mexico. *Western Journal of Applied Forestry* 18(3):189-193.
- Gutiérrez, R.J., A.B. Franklin, and W.S. LaHaye 1995. Spotted owl (*Strix occidentalis*). p. 1-28 in The birds of North America, No. 179. Poole, A and F. Gill (eds.). *Academy of National Science*, Philadelphia, and *The American Ornithologists*, Washington, D.C.
- Hampton, H.M., S.E. Sesnie, B.G. Dickson, J.M. Rundall, T.D. Sisk, G.B. Snider and J.D. Bailey, unpublished report, 2008. Analysis of Small-diameter Wood Supply in Northern Arizona. ForestERA Project, Center for Environmental Sciences and Education, Northern Arizona University, Flagstaff [available online at <http://www.forestera.nau.edu>].
- Jenness, J.S., P. Beir, and J.L. Ganey 2004. Associations between forest fires and Mexican Spotted Owls. *Forest Science* 50(6):765-772.
- Littell, J.S., D. McKenzie, D.L. Peterson, and A.L. Westerling. 2009. Climate and wildfire area burned in western U.S. ecoprovinces, 1916–2003. *Ecological Applications* 19:1003–1021.
- Loomis, J and E. Ekstrand 1997. Economic benefits of critical habitat for the Mexican Spotted Owl: A scope test using a multiple-bounded contingent valuation survey. *Journal of Agriculture and Resource Economics* 22(2):356-366
- Loomis, J and E. Ekstrand 1998. Alternative approaches for incorporating respondent uncertainty when estimating willingness to pay: the case of the Mexican spotted owl. *Ecological Economics* 27:29-41.
- Mellin, T.C., W.J. Krausmann, K.B. Clark, and C.F. Enquist. 2000. Assessing gross changes within vegetation types associated with Mexican spotted owl habitat in New Mexico and Arizona. Pages unnumbered in J.D. Greer (ed.), Eighth biennial Forest Service remote sensing applications conference, Albuquerque, New Mexico, USA. 12 pp.
- Miller, J.D., H.D. Safford, M.A. Crimmins, and A.E. Thode. 2009. Quantitative evidence for increasing forest fire severity in the Sierra Nevada and southern Cascade Mountains, California and Nevada, USA. *Ecosystems* 12:16-32.
- USFWS. 1993. Endangered and threatened wildlife and plants: Final rule to list the Mexican spotted owl as a threatened species. *Federal Register* 58:14248-14271.
- . 1995. *Recovery plan for the Mexican spotted owl*. Vol. 1, Albuquerque, NM. 347p.
- . 2012a. *Mexican Spotted Owl Recovery Plan, First Revision*. Albuquerque, NM. 413p.
- . 2012b. Biological and Conference Opinion: The continued implementation of the Land and Resource Management Plan for the Tonto National Forest and National Grasslands of the USDA Forest Service Southwestern Region. Cons. #2012-F-0011, Albuquerque, NM. 169p.
- Westerling, A.L., H.G. Hidalgo, D.R. Cayan, and T.W. Swetnam. 2006. Warming and earlier spring increase western U.S. forest wildfire activity. *Science* 313:940-943.



## Appendix D: Answers to Open-ended Final Question

*Is there anything else you would like to tell us about how the Schultz Fire and Flooding affected you and your family?*

1) WE NEVER HAD PRAIRIE DOGS BEFORE THE FLOOD. WE ARE INUNDATED WITH THEM NOW AND SPEND HUNDREDS OF DOLLARS TRYING TO GET RID OF THEM. 2) HOME VALUES 3) HEARTACHE & WORRY FOR FUTURE ISSUES.

A DIRT DRAINAGE DITCH (COPELAND DITCH) ONLY A FEW FEET WIDE AND NOT VERY DEEP RAN THROUGH MY AND NEIGHBORS PROPERTY. THE COUNTY NEVER MAINTAINED THE DITCH-KEPT IT DUG OUT, THIS LACK OF MAINTENANCE CAUSED MUCH OF THE FLOODING ON MY STREET. THE DITCH NOW ABOUT 40 FEET WIDE 10 FEET DEEP, LINED WITH ROCKS, CONCRETE FLOOR AND FENCED RESULTED IN A LOSS TO ME AND NEIGHBORS OF 1/3 ACRE OF OUR 2 1/2 ACRE LOTS THAT WE CAN NO LONGER USE. WE RECEIVED NO COMPENSATION FOR THIS LOSS.

ADDENDUM TO PROPERTY DAMAGE QUESTIONNAIRE FOR 10885 N. LINDA LANE, BEATRICE COOLEY: DAMAGE TO 3 DOUBBLE GARAGE DOORS HAS YET TO BE ADDRESSED. SIMILARLY, FENCING IN FRONT AND BACK WILL NEED TO BE REPLACED AT SOME POINT AND THE LANDSCAPING ISSUE IS ONE THAT WILL BE YEARS BEFORE COMPLETED. I STILL HAVE K-RAIL IN MY FRONT YARD AND THE ON-GOING ISSUE OF WEEDS WILL CONTINUE TO BE A SIGNIFICANT PROBLEM AS WILL THE PILES OF DIRT AND DISINTEGRATING SAND BAGS THAT REMAIN ON MY PROPERTY. I DO APPRECIATE THE EFFORT TO GATHER THIS INFORMATION, HOWEVER.

ALL DAMAGE (FLOODING) OCCURED BECAUSE OF BLOCKAGE OF A NATURAL TRENCH BY A HOME OWNER UP FLOW.

ALSO SPENT \$3500 IN CPA FEES TO FIGHT IRS IN GETTING A CASUALTY LOSS DEDUCTION. MY PROPERTY USED TO LOOK LIKE A PARK"

ALTHOUGH OUR ACTUAL PROPERTY WAS NOT DAMAGED, WE INCURRED LOSS STATED IN QUESTIONS 19 AND 20 FROM OUR STORAGE UNIT AT COPELAND LANE BEING FLOODED. THERE ARE A SIGNIFICANT NUMBER OF PEOPLE WHO INCURRED MUCH MOR SUBSTANTIAL LOSS OF PROPERTY WHEN THESE UNITS WERE FLOODED. THESE PEOPLE MAY NOT LIVE IN THE AFFECTED GEOGRAPHIC AREA, THEREFORE MAY NOT HAVE RECEIVED YOUR QUESTIONNAIRE.

BETWEEN THE MARKET & THE FIRE-I NO LONGER HAVE A RETIREMENT.

CAUSED A LOT OF TENSION BETWEEN NEIGHBORS. WE NOW KNOW WHO OUR FRIENDS ARE AND WHO CAN'T BE TRUSTED.

COST TO REMOVE 5 TO 6 FT OF BLACK MUD WAS \$10,000

COUNSELING NEEDS TO BE PROVIDED,FREE OF CHARGE,TO INDIVIDUALS WHO HAD LARGE LOSSES. EMOTIONAL & PSYCHOLOGICAL WELL BEING ASSESSMENTS NEEDED.

COUNTY DID AN OUTSTANDING JOB OF OUTREACH AND RESPONSE TO OUR AREA. FOREST SERVICE ON THE OTHER HAND, WAS PATHETIC, ESPECIALLY WITH RESPECT TO THEIR ACTIONS ON IMMEDIATELY ADJACENT AREA

COUNTY DID NOTHING TO ASSIST WITH FLOOD OR PREVENTION IN THE MCCANN ESTATE COMMUNITY. SHAME ON YOU. PROPERTY TAXES NEED TO BE ADJUSTED DOWN BECAUSE OF FLOOD.



*Appendix D: Answers to Open-ended Final Question (cont.)*

COUNTY/AND COUNTY SUPERVISOR DISTRICT 2-CAN NOT BE TRUSTED. AND ARE CAUSING TROUBLE BETWEEN NEIGHBOR TO GET WHAT THE COUNTY WANTS. AND AT HUGE WASTE OF TAX PAYER DOLLAR. MORE OVERSIGHT OF COUNTY-PUBLIC WORKS & RIGHT OF WAY DEPT A MUST!

DECREASED PROPERTY VALUES & COST TO HAUL DEBRIS OUT OF 2 1/2 ACRES (FLOODED 19 TIMES). GOUGING PIECES(? ILLIGIBLE) ON FRONT END LOADER, TRUCKS TO HAUL DEBRIS AWAY; PONDING, DEBRI FLOW TO ACREAGE STILL A PROBLEM AS WELL CULVERT REMOVED BY COUNTY NOT REPLACED.

DEVALUED MY PROPERTY & HOME

DUE TO ALL THE SOIL EROSION & DEPOSIT, THERE HAS BEEN A SIGNIFICANT INCREASE IN DUST OVER THE ENTIRE AFFECTED AREA. IN ADDITION, WE LIVE ON A PRIVATELY MAINTAINED ROAD THAT WAS SEVERLY DAMAGED IN THE FLOODING & THE RESIDENTS HAVE BEEN UNABLE TO AFFORD TO REPAIR IT & THE COUNTY WON'T HELP. THERE ARE EMOTIONAL & RELATIONSHIP COSTS RESULTING FROM THE FIRE & FLOOD EVENTS AS WELL.

DUE TO THE DEPRESSED VALUES IN THIS AREA WE HAVE CHOSEN TO SELL THIS PROPERTY AND SUBSEQUENTLY BUILD ON ANOTHER LOT IN THE FLAGSTAFF AREA. OUR PROPERTY IS CURRENTLY IN ESCROW.

DURING FLOOD EVENTS ITS DANGEROUS & DIFFICULT TO ACCESS OUR HOME. ON ONE OCCASION I MISJUDGED THE TIMING & SIZE OF A FLASH FLOOD WHILE ON MY WAY HOME. ROADS WERE STILL OPEN & A PERSON FROM THE COUNTY THOUGHT IT WAS SMALL ENOUGH FOR ME TO DRIVE THRU IN MY TRUCK. I WAS NEARLY WASHED OFF OF CAMPBELL JUST PAST CRISP HILL RD. VERY SCAREY EXPERIENCE!! HAVE NIGHTMARES ABOUT FLOODS,FIRES A LOT LESS.

DUST

EMOTIONAL DISTRESS EVERY TIME IT RAINS

EVEN IN THE AREAS THAT DIDN'T ACCUMULATE MUD, THE FLORA AND FAUNA OF OUR YARD HAS CHANGED DRAMATICALLY. WE ARE COMBATting WEEDS WE DID NOT PREVIOUSLY HAVE. SOIL PH CHANGED DRASTICALLY & HAS KILLED NUMEROUS TREES IN OUR YARD. ALL OF THAT LIKELY WILL CONTRIBUTE TO A DECREASED PROPERTY VALUE.

EXPENSES-EXPENSES-EXPENSES-NO FLOOD INSURANCE-PROPERTY INSURANCE DIDN'T DO & OUR PROPERTY TAXES NEVER WENT DOWN-LIZ ARCHULETA IS A DISAPPOINTMENT & DISGRACE

EXTENSIVE EROSION AND CHANNELING OCCURED IN A WASH THAT RUNS THROUGH OUR LOT.

EXTREMELY EMOTIONAL TO WATCH THE FIRE AND CLOSURE OF HOUSING AREAS. THE CAMPBELL DITCH IS ON MY PROPERTY. IT WAS 100% FILLED WITH THE FIRST FLOOD SINCE THE DRAINAGE DRAINS 1/3 OF THE PEAKS.

FIRE: DELAYED VACATION PLANS BY TOW DAYS; PROPERTY VALUE; WE DO NOT CONSIDER OUR PROPERTY TO BE IN THE FLOOD ZONE, BUT THE COUNTY MUST; IF THIS IS THE CASE THEN TO SELL THE PROPERTY W/BANK FINANCING WE WOULD SEE CONSIDERABLE LOSS IN VALUE.

FLOOD WATER RAN DOWN THE STREET NEXT TO US AND CLOGGED THE DRAINAGE UNDER OUR DRIVE, BUT WE WERE ABLE TO CLEAN DRAINAGE DURING EVENT TO AVOID ROAD DAMAGE.

FOR THE FIRST YEAR SLEEPLESS NIGHTS EVERY TIME WE HEAR RAIN. WE LIVED IN A CONSTANT ALERT" STATUS-NEVER TRAVELLING

HARD TO ESTIMATE HOURS PUT INTO FLOODING ISSUES AS SPENT NUMEROUS HOURS DURING FLOODS CLEANING DITCHES, REMOVING SEDIMENT, FILLING (ILLEGIBLE). WE HAVE DELAYED SOME LANDSCAPING AS WE STILL GET FLOWS ON PROPERTY.

HAVE DONE SIGNIFICANT CONSTRUCTION ON PROPERTY SINCE THE FLOOD SO MARKET COMPARISONS ARE MEANINGLESS.

HOUSE WILL BE VALUED NEXT YR AT 60000. HOWEVER, ASSESSORS OFFICE CLAIMS, TAXES WILL NOT BE REDUCED. FLOOD CAUSED A LOSE OF VALUE IN PROPERTY.

I AM FORTUNATE TO LIVE ON ELEVATED HILLSIDE. NO DAMAGE TO MY HOME FROM FLOODING. HOWEVER, DIRECTLY ACCROSSED THE STREET MY NEIGHBOR HAD EXPENSIVE DAMAGE TO THEIR HOME CAUSING THEM TO ABONDON THEIR HOME. OCCAISONALLY THEY COME TO THEIR PROPERTY TO CLEAN-UP.

I BOUGHT 500 WORTH OF METAL STAKES TO HOLD STRAW BALES IN AN AREA TO DEFEND MY HOME

I CANNOT ESTIMATE MARKET VALUE MY HOME WAS NOT EFFECTED BY FLOODING

I HAVE NO IDEA OF VALUE CHANGES AS THERE HAVE BEEN TWO FACTORS-FLOOD AND RECESSION THEREFORE WITHOUT HAVING AN INDEPENDENT APPRAISAL DONE THERE IS NO WAY FOR ME TO KNOW.

I LIVE IN A FLOOD ZONE NOW.

I PURCHASED THE HOUSE IN MARCH 2011, AFTER THE FIRE AND FLOODING. AS FAR AS I KNOW, THE HOUSE DID NOT RECEIVE ANY DAMAGE FROM EITHER.

I WAS MINIMALLY EFFECTED EXCEPT FOR REMOVING SEDIMENT BUILDUP IN DRIVEWAY DITCH CROSSING WHICH RESULTED IN 50 OR 50 HOURS OF LABOR AND UP TO 12 GALS OF FUEL FOR MY TRACTOR (50.00). THE HOME DEVALUATION IS DEBATABLE, THE LOWER VALUE DUE MORE TO ECONOMY THAN THE FLOOD.

I WOULD ESTIMATE AN ADDITIONAL 100 HOURS OF UNPAID TIME INSTALLING FLOOD CONTROL MEASURES BEYOND COUNTY & OTHER AGENCY ASSISTANCE. WE HAVE NOT REPAIRED FENCING & LANDSCAPE DAMAGE AND DO NOT PLAN TO UNTIL FLOODING HAS STOPPED. WE HAD AMAZING FRIENDS & VOLUNTEERS OR OUR COSTS WOULD HAVE BEEN MUCH GREATER.

I'M GUESSING AT THE HOME VALUES ABOVE. THE WHOLE AREA IN THE FIRE/FLOOD, INCLUDING OUR HOME, IS WORTH LESS NOW EVEN THOUGH WE HAD VERY LITTLE DAMAGE FROM WATER FLOW.

IT CREATED INCREDIBLE BURDEN AS I HAD TO MOVE OUT OF OUR FAMILY HOME. I AM FINALLY RETURNING AFTER 3 YEARS.

IT HAS CHANGED OUR LIVES FOREVER AND THE IMPACT BOTH PSYCHOLOGICALLY AND FINANCIALLY WILL NEVER BE ABLE TO BE UNCOVERED IN THE WAKE OF SUCH A DEVASTATING DISASTER.

IT HAS NOT ENDED. THE MONSOON BRINGS FLOODING OF VARYING DEGREES EVERY SUMMER SINCE 2010. THE NEIGHBORHOOD IS STILL CHALLENGED BUT FLOOD MITIGATION BY COCONINO COUNTY WILL HELP.

*Appendix D: Answers to Open-ended Final Question (cont.)*

IT IS WHAT IT IS-DO WHAT YOU HAVE TO TO PROTECT YOUR PROPERTY-THE JERSEY BARRIERS WORKED GREAT AND WILL PROBABLY STAY FOREVER-MY NEW WALL IS A SECONDARY LINE OF DEFENSE-

IT MADE ME HAPPY TO LIVE IN SUCH A GREAT COUNTY WITH GOOD GOVERNMENT. COCONINO COUNTY WAS SO ORGANIZED & PROACTIVE. GREAT JOB!

IT MADE THE PEAKS UGLY, THANKS A LOT SIERRA CLUB FOR NOT ALLOWING FOREST THINNING.....

IT TOOK 2 YEARS TO RECOVER. WE HAVE LOST THE USE OF PART OF OUR PROPERTY PERMANENTLY. WE ALSO HAD TO BUY A TRACTOR TO MANAGE SOME OF THE REBUUILDING OF HORSE FACILITIES. IT WAS VERY EXPENSIVE.

IT WAS A MAJOR DISRUPTION, BILLS WERE FORGOT, THERE WAS MANY HOURS OF CLEANUP OUTSIDE, NOT TO MENTION FLOOD PREVENTION SANDBAG WALLS TO BE BUILT! OUR HOUSE LOOKED LIKE A MESS OUTSIDE FOR 2 YRS AFTER BEFORE WE FELT SAFE RELANDSCAPING WHICH LUCKILY MY HUSBAND COULD DO FOR FREE! IT WAS HARD AND WE DIDN'T KNOW WHAT TO DO.

JUST FILLING OUT THIS FORM UPSETS ME (MY LAST HOUSE BURNED DOWN IN A WILDFIRE) I AM STILL WORKING ON REPAIRING BOTH MY YARD & INTERIOR DAMAGE AS I HAVE THE \$\$ TO DO SO. AM DOING ALL THE WORK MYSELF.

KEEP THE POLICE FAR AWAY, BECAUSE ALL THEY DO IS GET IN THE WAY AND DON'T HELP ANYONE.

LACK OF COMMUNICATION FROM THE COUNTY OFFICIALS. LOST VALUE IN OUR PROPERTY/ HOME. HIGHER TAXES.

LIZ ARCHULETTA WORKED & GAVE SO MUCH TO THIS COMMUNITY ON BEHALF OF THE COUNTY. IT WAS A TRAGEDY FOR SURE. WE ARE SO THANKFUL THERE WAS MINIMAL LOSS OF LIFE.

LOSE OF FAVORITE NEARBY RECREATIONAL AREA, AESTHETICS. OTHERWISE, WE'RE ON A HILL-NOT IMPACTED BY FLOODING.

LOSS OF PANORAMIC VIEW OF TREES ON PEAKS-LOSS OF PROPERRTY VALUE AND FUTURE MARKETABILITY-WIDESPREAD SEDIMENT DEPOSITS ALLOWING INFESTATION OF WEEDS ON PROPERTY.

LOSS OF RENTAL INCOME-\$15000

MANY REPAIRS & IMPROVEMENT WERE PUT OFF FOR 2 YEARS TO DETERMINE HOW SUBSEQUENT FLOODING WOULD AFFECT OUR PROPERTY. WE STILL HAVE DIRT BERMS & SANDBAGS IN PLACE. THERE WILL STILL BE FUTURE LABOR AND COSTS INVOLVED WITH GETTING OUR PROPERTY BACK TO PREFLOOD CONDITIONS.

MASSIVE FINANCIAL LOSS (SEE #31) BUT NOT THE TYPE OF LOSS SUFFERED BY MANY PEOPLE IN THE AREA.

MY HUSBAND WANTED TO MOVE OUT AND SELL PROPERTY SINCE I DID NOT AGREED, HE FILED FOR DIVORCE AND MOVED OUT!

MY LOSS PERTAINS TO THE DOLLAR AMOUNT OF A PERMANENTLY DEMINISHED UNOBSTRUCTED LONG-RANGE VIEW OF A BURNED MOUNTAIN. SINCE MY HOME IS ATOP A 150' HILL, IT IS NOT SUBJECT TO FLOODING.

MY MAIN EXPENSES WERE TO TRAVEL TO FLAGSTAFF AND ASSESS THE DAMAGE AND FIX IT. I FLEW TO AZ AND WORKED FOR 3 DAYS. THE NATIONAL GUARD WAS GREAT.
MY PARENTS LIVE LOWER IN THE VALLEY, THEIR PROPERTY WAS COVERED IN MUD. IN THE WINDY SEASON FEB-JUNE, THE ENTIRE VALLEY FILLS WITH DUST. THE MUD FLOWS HAVE ALLOWED ALLERGIC WEEDS TO FLOURISH & BLOW POLLEN DOWN WIND, CAUSING GENERAL DUST BOWL MISERY.
MY PROPERTY TAXES HAVE RISEN SIGNIFICANTLY SINCE THE FLOODING AND I AM UNABLE TO GET A SUBSTANTIVE ANSWER AS TO WHY.
NEGATIVE STIGMA ABOUT PROPERTY REGARDLESS OF NOT HAVING BEEN FLOODED""
NO
NO
NO
NO DAMAGE
NO WATER ENTERED HOUSE DURING FLOOD, FOR WEEKS AFTER, TRAFFIC THROUGH THE HOUSE RUINED CARPET AND FLOORING.
NOT EVERYONE AROUND HAS FIXED DAMAGE. SANDBAGS STILL IN PLACE.
NOT POSSIBLE TO REALISTICALLY SEPARATE FLOOD/FIRE EFFECT FROM THE COUNTRY-WIDE HOUSING VALUE COLLAPSE.
NOT SURE TO WHAT EFFECT THE FLOOD WILL HAVE ON HOME VALUE.
OUR BIGGEST LOSS COMES FROM THE FACT THAT COCONINO COUNTY HAS TAKEN APPROXIMATELY 1/3 OF AN ACRE OF OUR LAND TO BUILD THE COPELAND CANAL. THIS ACTION IS CURRENTLY BEING CONTESTED LEGALLY. THE COST ASSOCIATED WITH THAT ACTION TO US IS OVER 7200 DOLLARS SO FAR. DUE TO THE FACT THAT THE CASE IS STILL PENDING I CANNOT AT THIS TIME PROVIDE DETAILS. THE LOSS OF THE LAND, COST OF LEGAL FEES ARE ONLY PART OF THE LOSS, THE REST IS THE LOSS OF MARKET VALUE DUE TO THE BUILDING OF THE CANAL ON THE PROPERTIES ALONG IT. IT CAN ARGUABLY BE STATED THAT THE LOSS WILL REACH THE 10'S OF THOUSANDS.
OUR HOME WAS DEODORIZE DUE TO THE SMELL OF SMOKE, OUR GRANDDAUGHTER HAS BRETHING PROBLEMS DUE TO DOWNS. \$9771.68 FOR DEODORIZE AND REMOVAL OF SMOKE SMELL. INSURANCE PAID FOR THIS.
OUR HOUSE & PERSONAL PROPERTY WAS SLURRIED DURING FIRE. ALL EXTERIOR SURFACES NEEDED TO BE RE-PAINTED. HAVE NOT WORKED ON REPAIRING LANDSCAPE-LOST GRAVEL, PLANTS, GRASS, FENCES. DOG GOT OUR OF YARD (DUE TO DOWN FENCE) TORE ACL IN KNEE.
OUR HOUSE IS A BIT HIGHER AND SUSTAINED NO DAMAGE-WE ARE VERY CONCERNED ABOUT CURRENT MARKET VALUE HOWEVER.
PLEASE CONTACT JONATHAN A. [REDACTED] HE LIVED IN THE HOUSE (FOR LOSSES)
PRIOR TO THE SCHULTZ FIRE & SUBSEQUENT FLOODING IN THE AREA OUR PROPERTY IS PRACTICALLY WORTHLESS AS BUYERS ARE AFRAID TO BUY IN THIS AREA, BECAUSE THEY REALIZE THAT A SEVERE WEATHER EVENT COULD CAUSE EXTREME FLOODING.
RECURRING ANXIETY



*Appendix D: Answers to Open-ended Final Question (cont.)*

SECOND CHANCE CENTER FOR ANIMALS SHOULD HAVE BEEN GIVEN THE NEEDED ZONING/SPECIAL USE PERMIT TO CONSTRUCT THE 20 STALL DONATED MARE MOTEL ON THEIR UNUSED SOUTH 5 ACRES WHICH WOULD HAVE PROVIDED NEEDED LIVESTOCK REFUGE FOR THIS DISASTER AND POSSIBLE FUTURE EMERGENCIES/DISASTERS. LIZ ARCHULETA PLAYED A KEY ROLE BLOCKING THIS ZONING AND FAILING TO PROVIDE THE COMMUNITY A NO TAX EMERGENCY PLAN FACILITY. SHAME ON THE COUNTY.

SEE ATTACHED LETTER (NOTE: LETTER IS TWO PAGES TYPED)

TERRIBLE INCREASE IN TAXES (PROPERTY) FOR NO BUILDINGS ON PROPERTY AND ONLY 6-8 TREES.

THANK YOU FOR GATHERING THIS INFORMATION. WAYNE R., 14190 VENTOSO CT, [REDACTED]

THE BLACK MUD IS VERY HARD TO GET RID OF,CONTINUES TO SHOW UP IN THE YARD, HAD BEEN TOLD-NOT GOOD FOR KIDS TO PLAY IN DUE TO CONTAMINATION THRU DUMP, PEOPLES' SEPTIC. SANDBAGS NEED TO BE REMOVED-THIS IS A BURDEN. WE HAVE NOT BEEN REIMBURSED, WHATSOEVER. THANK YOU.

THE COUNTY DOWN GRADED OUR HOME VALUE SUBSTANTIALLY BUT WE DON'T KNOW HOW MUCH WAS MARKET ADJUSTMENT V. SCHULTZ FIRE DEVALUATION. WE PAID \$323000 IN '05-YOU CAN FIGURE OUT THE REST.

THE DAMAGE CAUSED BY THE FIRE/FLOODS WAS MORE THAN I COULD AFFORD TO REPLACE (FENCING,TREES,LANDSCAPING, DRIVEWAY ETC) SINCE IT'S NOT COVERED BY INSURANCE SO MOST OF IT HAS NOT BEEN REPLACED AT THIS POINT. THE MENTAL AND PHYSICAL STRESS IS ONGOING WITH EACH MONSOON SEASON.

THE EMOTIONAL HEALTH OF MY YOUNGER CHILDREN WAS IMPACTED DUE TO FEAR OF FIRE AND FLOOD.

THE FIRE ISN'T AFFECTING VALUE SO MUCH AS ECONOMY IS.

THE FLOOD DAMAGE WAS DUE DIRECTLY TO THE INEFFECTIVE MANAGEMENT OF THE STATE,COCONINO COUNTY AND THE LACKADAISEY ATTITUDE OF THE REGIONAL FORRESTER, WHICH TO THIS DATE GOES ON. THANKS.

THE FLOOD DIDN'T GET MY HOUSE IT GOT MY BUSINESS. BETWEEN FIRE & FLOOD IT WAS CLOSED FOR SIX WEEKS TO CLEAN MUD OUT OF BUILDING AND OFF EQUIPMENT. I ESTIMATE THE COST OF LOST REVENUE AND CLEANUP AT MY SHOP (5 ACERS) TO BE CLOSE TO \$30,000. WHY ISNT' COMMERCIAL PROPERTY INCLUDED IN THIS SURVEY?

THE FLOOD IN JULY 2010 SWEEPED THROUGH THE FRONT OF OUR PROPERTY AND UP TO THE DOORSTEP. THE HOUSE WAS NOT DAMAGED, BUT THE LANDSCAPING REQUIRED MUCH WORK-STILL A WORK IN PROGRESS. WE CONSIDER OURSELVES FORTUNATE COMPARED TO OTHERS CLOSER TO THE MTN.

THE FLOOD MITIGATION EFFORTS REALLY WORKED WELL TO PREVENT FUTURE FLOODING. THE FLOOD STOPPED A COUPLE OF BLOCKS WEST OF OUR HOUSE.

THE FLOOD WAS MUCH WORSE, IN TERMS OF LONG TERM DAMAGE-PHYSICAL AND FINANCIAL-THAN THE FIRE. THE CONSTANT RISK OF FLOOD (ESP JULY-SEPT) IS STRESSFUL.

THE FLOODING WAS WITHIN A FEW HUNDRED YARDS OF MY HOUSE. WE SAND BAGGED,GOT FLOOD INS (\$385)2010/20111 BUT CANCELLED THE INSURANCE 2012. USED THE SAND BAGS TO MAKE A HORSESHOE PIT.

THE FLOODS HAPPEN EVERY YEAR IF IT RAINS HARD. THIS SEEMED MORE LIKE A 100 YR OR 500 YR FLOOD.

THE MAIN NEGATIVE IMPACT WAS ON OUR ROAD & OUR DRIVEWAY. WE ARE ON A PRIVATE ROAD WE MAINTAIN OURSELVES. IT WAS TOTALLY WASHED OUT & HAD TO BE GRADED & ALL NEW MATERIAL PUT IN

THE MENTAL STRESS & NEIGHBORS BICKERING CAN'T BE MEASURED IN \$ OR TIME. THE FRUSTRATIONS & DELAYS W/COUNTY, THE DIFFERENT STORIES, NONE OF THIS CAN BE MEASURED-THE LACK OF CARING FROM FOREST SVCS IS TERRIBLE & I WILL NOT SUPPORT ANY OF THEIR EFFORTS IN OTHER AREAS.

THE ONLY INCIDENT TO MY PROPERTY WAS DEBRIS WHEN THE ROAD FLOODED.

THE SCHULTZ FIRE/FLOOD DID NOT AFFECT US AS MUCH AS OUR NEIGHBORS DUE TO THE FACT THAT OUR CONTRACTOR THOUGHT IT WAS AN AREA FOR POSSIBLE FLOODS & BUILT OUR HOUSE AT A LITTLE HIGHER ELEVATION.

THE SCHULTZ FLOOD DID NOT GO BEYOND SILVER SADDLE ROAD SOUTH

THE SOIL IS STILL FULL OF ASH DIRT THAT JUST WON'T GO AWAY.

THE SUPPORT ENCOURAGEMENT & TOOLS OF OUTREACH FROM OUR FIRE DEPARTMENTS, COCONINO COUNTY & MANAGEMENT FROM EMERGENCY SERVICES HAS BEEN TREMENDOUS AND SO VALUABLE. MY HEART FELT THANKS GOES OUT TO ALL OF THEM & THE PEOPLE WHO SACRIFICED TO HELP THEIR NEIGHBORS THAT THEY HAD NEVER MET.

THE VALUE OF THIS HOME IS HIGHER NOW BECAUSE WE INSTALLED A FENCE AROUND THE PERIMETER.

THE WATER NEVER ENCROACHED ON PROPERTY. IT DID COME WITHIN APPROX 600 TO 800 FEET. THE EARTH BERM WAS FOR POSSIBLE FUTURE STORMS.

THERE STILL IS A LOT OF WORK TO DO, A LOT OF MONEY WAS WASTED ON STUDIES THAT DIDN'T HELP FLOOD VICTIMS

THERE WAS SUBSTANTIAL WORRY AND INCONVENIENCE

THESE VALUES ARE DOCUMENTED ON IRS CASUALTY LOSS. NUMBERS REFLECT BOTH OF MY PROPERTIES, ONE HOME, SHOP, AND VACANT LOT NEXT DOOR. ALSO HAD PROPERTY RECENTLY APPRAISED AND REFINANCED.

THIS AREA WAS NOT CONSIDERED A FLOOD PLAIN AND THE FLOODING WAS A DIRECT RESULT OF THE SHULTZ FIRE. IN MY OPINION, THE FIRST ACT DIRECTLY CONTRIBUTED TO THE DAMAGE OF MY PROPERTY. MY INSURANCE DID NOT AGREE-SECURED INS.

THIS FIRE COULD HAVE BEEN AVOIDED BY SOME COMMON SENSE BY THE LOCAL FIRE DEPT. I HAVE HAD A RECENT APPRAISAL WITHIN THE LAST 4 MONTHS. MY PROPERTY WAS NOT FLOODED BUT IS BEING JUDGED BY HOMES THAT WERE!

THIS HAS BEEN AN ALMOST IMPOSSIBLE THING TO COME UP WITH AS WE SIMPLY ATTACKED THESE THINGS AS THEY CAME UP AND CERTAINLY DIDN'T KEEP TRACK OF THE TIME OR PERSONAL EXPENSE.

THIS HOME IS WORTHLESS THAN THE MORTGAGE. THE HOUSE & PROPERTY ARE GOING INTO FORECLOSURE. AS A SENIOR CITIZEN THIS IS JUST HORRIBLE. SOMETHING MUST BE DONE TO STOP THE FLOODING. I'VE LOST EVERYTHING IN MY HOME & LAND. NO ONE DOES ANYTHING BUT TALK!!

THIS IS NOT ONLY FROM THE SCHULTZ FIRE/FLOOD BUT ALSO THE HOUSE MARKET.

*Appendix D: Answers to Open-ended Final Question (cont.)*

VALUE OF HOME NOW WOULD BE HIGHER IF WE HAD NOT LOST OUR VIEW SHED.

VIEW IS RUINED OF MOUNTAIN AND IS CONSTANT REMINDER. HOUSE MORTGAGE IS UPSIDE" DOWN. PLEASE DIVERT CURRENT FLOODING @ WUPATKI ASAP."

WE (THE GOVERNMENT) SHOULD NOT SPEND UNNECESSARILY, THIS EVENT IS EXTREMELY UNLIKELY TO BE REPEATED.

WE ARE LISTED AS THE WORST OF THE FLOOD ZONE, YET OUR PROPERTY HAS NOT FLOODED & WE HAD NO DAMAGE. THE FLOOD ZONES HAVE NOT BEEN REASSESSED & OUR MARKET VALUE HAS NOT RETURNED.

WE ARE MORE APPRECIATIVE FOR THE PROPERTY THAT WE HAVE. THANKFUL FOR OUR NEIGHBORS AND FLAGSTAFF COMMUNITY.

WE ARE ON HIGH GROUND AND DO NOT HAVE FLOODING.

WE ARE SITUATED ON THE EAST SIDE OF CRISP HILL. THAT KEPT THE FLOOD FROM COMING DIRECTLY AT US. THE FLOODING CAME DOWN CAMPBELL AVE AND INTO HUTCHINSON ACRES. BUT IT DID COME DOWN OUR ROAD (VALLEY VIEW DR) FROM CAMPBELL BECAUSE THERE WAS SO MUCH WATER. IT FLOODED OUR DRIVEWAY BUT THE CINDERBLOCK PLANTERS I HAD BUILT KEPT THE FLOOD FROM GETTING TO THE HOUSE.

WE ARE STILL TRYING TO DEAL W/ALL THE ISSUES IT HAS COST & CAUSED.

WE CALL GAS CO TO CHECK OUT AND REFILL WASHOUT (AREA OF DRIVEWAY) DUE TO INSTALLATION OF GAS LINE IN DRIVEWAY RATHER THAN ON THE SIDE.

WE DID NOT OWN THE HOME DURING SCHULTZ FLOOD. OUR HOME IS ON A HILL, SO THERE WAS NO DAMAGE FROM THE FLOOD.

WE DO NOT LIVE IN COCONINO COUNTY. THANK GOD TOO MANY GREEDY DEMOCRATS.

WE EXPERIENCED DEPRESSION, NIGHTMARES, LOSS OF TREES & PLANTS, EXCESSIVE EXTRA WORK TO PROTECT OUR PROPERTY, LOSS OF PROPERTY VALUE & VALUE IN OUR NEIGHBORHOOD; OUR BEAUTIFUL VIEW HAS BEEN IRREPARABLY DAMAGED & WE WILL NEVER SEE THE TREES AGAIN IN OUR LIFETIME. ANXIETY EVERY TIME IT RAINS.

WE EXPERIENCED WATER ON OUR PROPERTY UP TO THE HOUSE. IT DID NOT ENTER OUR HOUSE. WE TRIED TO SELL THE HOUSE IN 2010 BUT COULDN'T SO NOW WE'RE RENTING IT OUT.

WE HAD NOT FLOOD DAMAGE BUT HELPED FRIENDS WHO DID; 60-70 HOURS. FRIENDS ON PINON HAD SERIOUS FLOOD DAMAGE TO BARN. WE BOARDED THEIR 2 HORSES WITH OURS FOR 20 MONTHS AT NO COST. A NEIGHBOR CONSIDERED EXTRA HORSES A NUISANCE & SUED US. WE INCURRED \$9000 PLUS COST FOR ATTORNEY FEES BEFORE SUIT WAS DISMISSED, A DIRECT RESULT OF HELPING FRIENDS W/FLOOD DAMAGE.

WE HAD STARTED A LOAN MODIFICATION IN FEB 2009 & WERE CONSIDERING SELLING. THE FLOODING FROM THE FIRE DESTROYED THE MKT VALUE & EQUITY IN OUR HOME; YET THE LENDER (OUT OF STATE) STILL THOUGHT THE HOME WAS WORTH AROUND \$300K IN 2011 & STATED THEY WOULD ONLY CONSIDER AN OFFER CLOSE TO THAT; THEN OFFERED A MODIFICATION THAT ONLY CUT THE PAYMENT <\$55/MO AND ADDED OVER \$40K TO OUR LOAN BALANCE, WHICH WE DECLINED.

WE HAVE A GREAT COMMUNITY THE LAWS IN PLACE FOR FOREST HEALTH SUCK IF WE HAD BEEN BETTER STEWARDS MAYBE THIS WOULD HAVE NOT BEEN SO BIG

WE HAVE A PRIVATE ROAD AND WE HAVE TO MAKE REPAIRS WHEN IT FLOODS SEVERAL TIMES A YEAR. SPENT FUNDS TO MAKE A LOW WATER CROSSING FOR LESS DAMAGE.

WE HAVE TWO OTHER PROPERTIES (RECENTLY PURCHASED AS RENTAL INCOME) IN THE SUNSET CRATER ESTATES NEIGHBORHOOD. THE ONE AT 7872 E GEMINI HAD SIGNIFICANT DAMAGE (FLOODING) TO THE FRONT BEDROOM, CARPET DAMAGE, WALL SATURATION, ETC. WE HAD TO BUILD A FLOOD WALL & RAISE THE FLOOR ETC. WE BELIEVE THAT THE WEIGHT OF THE WATER ALSO CAUSED DAMAGE TO THE SEPTIC TANK (CRACKED) ALSO, PROPERTY VALUATIONS DROPPED BY 2/3 OF THE 2008-2009 VALUE.

WE JUST WISH WE COULD PUT OUR PROPERTY BACK TO PREFLOOD CONDITION, BUT NOTHING HAS BEEN DONE UPHILL OF US TO PROTECT OUR AREA.

WE MISSED THE FLOODING BY 1/2 MILE (THE INITIAL FLOODING) NOTHING SINCE.

WE PURCHASED THIS HOME IN FEB 2012-WE WERE NOT INVOLVED IN THE SCHULTZ FIRE/ FLOOD. TO OUR KNOWLEDGE THIS HOME WAS NOT DAMAGED.

WE THANK GOD THAT NO HOMES WERE LOST. WE WERE BLESSED, THAT IT DIDN'T FLOOD ON OUR STREET OR PROPERTY.

WE WANT TO COMMEND THE COUNTY FOR THEIR HANDLING OF THIS DISASTER-SUPPLIES AND HELP WERE AVAILABLE IMMEDIATELY AND THE GRANT WILL HELP PROTECT THE AREA FROM FUTURE FLOODING. COMMUNICATION HAS BEEN GREAT. THANK YOU FOR DOING THIS SURVEY!

WE WERE FORTUNATE IN THAT THE FLOOD WATERS DID NOT ENTER OUR HOME, BUT MERELY INUNDATED (TEMPORARILY) MOST OF OUR BACK ACRE. WE SPENT A LOT OF TIME AND ENERGY USING SANDBAGS & WATTLES TO PREPARE FOR A 2ND FLOOD, WHICH NEVER CAME.

WE WERE FORTUNATE IN THAT THE FLOOD WATERS MISSED OUR PROPERTY BY 200 YARDS. WE HAVE SINCE MOVED (DUE TO UNRELATED MATTERS) AND ARE CURRENTLY RENTING. THE PRIMARY COST TO US HAS BEEN THE DEVALUATION OF HOMES IN OUR NEIGHBORHOOD. THE FLOOD COMPOUNDED THE EXISTING ECONOMIC PROBLEM/CRASH.

WE WERE HEART BROKEN"-WE LOST OUR BEAUTIFUL MOUNTAIN VIEW! OUR NEIGHBORHOOD NOW LOOKS TERRIBLE. WE ARE STILL EXTREMELY DEPRESSED AND ANGRY-THIS DID NOT HAVE TO HAPPEN! THANKS TO THE INCOMPETENT AND MISMANAGED US FOREST SERVICE!:. OUR LIVES AND FINANCES HAVE BEEN BADLY DAMAGED."

WE WERE NOT AFFECTED AT ALL.

WE WERE ONE OF THE FORTUNATE OWNERS WHOSE INSURANCE-FARMERS-PICKED UP A LOT OF THE COST OF OUR EXTERIOR LOSSES-MINUS DEPRECIATION & DEDUCTIBLE.

WE WERE ONE OF THE LUCKY ONES-HOUSES A FEW DOWN FROM US GOT WATER.IT STOPPED 3 HOUSES DOWN. A HOUSE SOLD FOR \$300000 CASH OUT HERE-I DON'T KNOW OUR VALUE. OUR HOUSE IS BUILT A LITTLE HIGHER THAN MOST OUT HERE. HOPEFULLY THE WORK THEY'VE DONE WORKS!

WE WERE PLANNING TO RELOCATE IN SUMMER 2011 FOR WORK. IT WOULD HAVE IMPROVED OUR FAMILY FINANCES BUT DUE TO THE DROP IN THE PRICE OF OUR HOME, WE COULD NOT AFFORD THE LOSS. WE ARE NOW HELD HOSTAGE UNTIL THE FLOOD MITIGATION IS DEVELOPED.

WE WOULD APPRECIATE YOU FINISHING UPPER CAMPBELL.

WELL, WE GOT LOCKED OUT OF THE WOODS FOR TWO YEARS..../HOUSING VALUES?



## Appendix D: Answers to Open-ended Final Question (cont.)

WE'RE ON TIMBERLINE TRAIL HIGHER THAN OTHERS. WATER/FIRE DIDN'T REACH US.

WHAT IS THE STATUS OF THE INVESTIGATION OF WHO STARTED THE FIRE?

WITHOUT RUNOFF DRAINAGE CONTROL CHANNELS, EROSION DAMAGE WILL LIKELY CONTINUE THROUGHOUT THE AREA.

YOUR SURVEY MENTIONS NOTHING REGARDING THE ASSISTANCE PROVIDED BY OTHERS FOR OTHERS. IS THERE NO MEASUREMENT FOR COMMUNITY SPIRIT? LIZ AND MANDY & COUNTY STAFF (PERU, BERTELION, ANDRIANI) ARE TO BE COMMENDED.

## Appendix E: Data Tables for All Survey Findings

Schultz Fire and Related Flooding

Schultz Fire Event

During the time that the Schultz fire was burning did members of your household evacuate and leave the area overnight?

	Count	Column N %
No	151	49.5%
Yes	154	50.5%
Total	305	100.0%

Schultz Fire and Related Flooding

Schultz Fire Event

If you evacuated, how many nights did you stay away?

	Mean	Median	Minimum	Maximum
Nights evacuated	3	3	0	10

Schultz Fire and Related Flooding

Schultz Fire Event

Did you evacuate any domestic animals during the time the Schultz Fire was burning?

	Count	Column N %
No	151	49.5%
Yes	154	50.5%
Total	305	100.0%

Schultz Fire and Related Flooding

Schultz Fire Event

If you evacuated domestic animals, how many nights did they stay away?

	Mean	Median	Minimum	Maximum
Nights animals evacuated	4	3	1	30

Schultz Fire and Related Flooding

Schultz Fire Event

Did anyone in your household have lost wages due to the Schultz Fire event (NOT flooding related lost wages)?

	Count	Column N %
No	274	89.5%
Yes	32	10.5%
Total	306	100.0%

Schultz Fire and Related Flooding

Schultz Fire Event

Estimate total household wages lost.

	Mean	Median	Minimum	Maximum
Wages Lost	\$3,287	\$701	0	\$80,000

Schultz Fire and Related Flooding

Schultz Fire Event

Estimate expenses incurred by household.

	Mean	Median	With Expenses	Missing	%
Lodging	\$125.19	\$0.00	79	237	25.0%
Food	\$93.54	\$100.00	111	205	35.1%
Animal related	\$53.70	\$0.00	60	256	19.0%
Transport	\$67.00	\$27.50	80	236	25.3%
Other	\$2,004.30	\$35.00	56	260	17.7%

Schultz Fire and Related Flooding

Schultz Flooding Event(s)

Did you obtain flood insurance as a result of the Schultz Fire?

	Count	Column N %
No	158	50.0%
Yes	158	50.0%
Total	316	100.0%

Schultz Fire and Related Flooding

Schultz Flooding Event(s)

What type of coverage did you obtain?

	Count	Column N %
Coverage type - Other Residential Structures	21	15.1%
Coverage type - Other Residential Contents	9	6.5%
Coverage type - Renter Contents	2	1.4%
Coverage type - Home-Living Structure	135	97.1%
Coverage type - Home Contents	86	61.9%
Total	139	100.0%

Schultz Fire and Related Flooding  
 Schultz Flooding Event(s)  
 Do you renew your flood insurance annually?

	Count	Column N %
No	26	17.1%
Yes	126	82.9%
Total	152	100.0%

Schultz Fire and Related Flooding  
 Schultz Flooding Event(s)  
 If you renew your flood insurance annually, how much do you pay for flood insurance?

	Mean	Median	Minimum	Maximum
How much are you paying annually for flood insurance?	\$357	\$350	\$140	\$900

Schultz Fire and Related Flooding  
 Schultz Flooding Event(s)  
 Was your home damaged as a result of the Schultz flood?

	Count	Column N %
No	170	53.8%
Yes	146	46.2%
Total	316	100.0%

Schultz Fire and Related Flooding  
 Schultz Flooding Event(s)  
 Did the flooding make it necessary for you or other home occupants to stay in temporary housing due to evacuations or flood-related repairs-cleanup?

	Count	Column N %
No	281	92.4%
Yes	23	7.6%
Total	304	100.0%

Schultz Fire and Related Flooding  
 Schultz Flooding Event(s)  
 How many days did you or other occupants spend in temporary housing due to evacuations or flood-related repairs-cleanup?

	Mean	Median	Minimum	Maximum
Days spent in temporary housing	3	3	0	10

Schultz Fire and Related Flooding

Schultz Flooding Event(s)

How much money did your household spend on the following due to this relocation?

	Mean	Median	Minimum	Maximum
Temporary Housing	\$112	\$75	\$0	\$350
Food-Meals (in excess of what you normally spend)	\$125	\$88	\$0	\$750
Transportation (in excess of what you normally spend)	\$112	\$40	\$0	\$750

Schultz Fire and Related Flooding

Schultz Flooding Event(s)

What type of flood damage occurred on your property (mark all that apply)?

	Count	Column N %
No flood damage	138	46.2%
Non-structural (driveways, landscaping, fences etc.)	160	53.5%
Home foundations - Area under home	8	2.7%
Exterior home - Structures (including attached garages)	40	13.4%
Interior of home (living space)	15	5.0%
Total	299	100.0%

Schultz Fire and Related Flooding

Schultz Flooding Cost Estimates

Estimate specific costs associated with cleanup of your home or property in the following categories.

Question 19 Cleanup costs	Mean	Median	Valid	Missing	% Valid
Cleaning supplies Equipment purchased	\$629.75	\$30.00	104	212	32.9%
Cleaning Supplies-Equipment Rented	\$703.58	\$0.00	64	252	20.3%
Paid Services	\$2,153.83	\$200.00	77	239	24.4%
All other cleanup costs	\$1,618.96	\$100.00	90	226	28.5%
Total unpaid hours for cleanup	138.54	49.00	136	180	43.0%
Average total cleanup costs \$1,335.68					

Schultz Fire and Related Flooding

Schultz Flooding Cost Estimates

Estimate costs to your home contents/owned possessions in the following categories.

Question 20. Estimated Costs home contents owned possessions Damage & Loss	Mean	Median	Valid	Missing	Valid %
Vehicles (includes RVs, ATVs etc.)	\$730.95	\$0.00	42	274	13.3%
Furniture	\$194.23	\$0.00	26	290	8.2%
Home Electronics	\$62.90	\$0.00	31	285	9.8%
Tools, Generators	\$486.56	\$0.00	32	284	10.1%
Other expense #1	\$862.12	\$137.50	26	290	8.2%
Other expense #2 (\$)	\$747.14	\$155.00	14	302	4.4%
Other expense #3	\$1,382.78	\$200.00	9	307	2.8%
Home contents/owned possessions - Total of all costs (\$)	\$1,402.95	\$0.00	73	243	23.1%



Schultz Fire and Related Flooding

Schultz Flooding Cost Estimates

Estimate costs to your home contents/owned possessions in the following categories.

Exterior	Mean	Median	Valid	Missing	Valid %
Interior doors & walls (including painting)	\$721.51	\$0.00	37	279	11.7%
Interior floors, carpets, ceilings	\$770.97	\$0.00	36	280	11.4%
Built-in cabinets, shelves and appliances	\$265.20	\$0.00	25	291	7.9%
Electrical	\$37.10	\$0.00	20	296	6.3%
Plumbing (except septic system)	\$205.05	\$0.00	19	297	6.0%
Septic system & wastewater	\$71.74	\$0.00	23	293	7.3%
Footings and foundation	\$130.00	\$0.00	20	296	6.3%
Porches and decks	\$589.29	\$0.00	28	288	8.9%
Garages and workshops	\$1,056.46	\$0.00	35	281	11.1%
Porches and decks - Barns and sheds	\$1,527.50	\$0.00	40	276	12.7%
Hot tubs-spa	\$72.00	\$0.00	25	291	7.9%
Mechanical Systems (heat, AC, built in pumps)	\$342.79	\$0.00	29	287	9.2%
Exterior walls, windows, doors, roofing, painting	\$310.83	\$0.00	30	286	9.5%
Outside features-Landscaping (culverts, drive ways, etc.)	\$5,211.82	\$2,000.00	99	217	31.3%
Structural damage - Total Cost	\$4,701.28	\$675.00	158	158	50.0%
Average total hours to replace or repair	158.61	30.00	122	194	38.6%

Schultz Fire and Related Flooding

Schultz Flooding Cost Estimates

Indicate the primary source of your structural value estimates.

	Count	Column N %
Contractor estimate (before repairs)	10	9.4%
Contractor invoice (after repairs)	27	25.5%
Your own assessment	66	62.3%
Other	23	21.7%

Schultz Fire and Related Flooding

Schultz Flooding Cost Estimates

Have you installed any physical flood control measures on your property since the Schultz flood?

	Count	Column N %
No	101	35.3%
Yes	185	64.7%
Total	286	100.0%

Schultz Fire and Related Flooding

Schultz Flooding Cost Estimates

Total estimated cost to you of such preventative flood measures.

	Mean	Median	Valid N
Total estimated costs of preventative measures	\$3,089	\$600	88

Schultz Fire and Related Flooding

Schultz Flooding Cost Estimates

Did you have an moving related costs (including storage unit rental, rental trucks-trailer & paid labor)?

	Count	Column N %
No	272	96.5%
Yes	10	3.5%
Total	282	100.0%

Schultz Fire and Related Flooding

Schultz Flooding Cost Estimates

Total estimated moving related costs?

	Mean	Median	Valid N
Total cost of moving related	\$332	\$25	19

Schultz Fire and Related Flooding

Schultz Flooding Cost Estimates

Did you have any pet or livestock related costs due to the Schultz flooding (including veterinary, boarding, damage feed etc.)?

	Count	Column N %
No	273	92.5%
Yes	22	7.5%
Total	295	100.0%

Schultz Fire and Related Flooding

Schultz Flooding Cost Estimates

Total estimated pet/livestock related costs.

	Mean	Median	Valid N
Total cost pet or livestock related	\$367	\$100	28

Schultz Fire and Related Flooding

Schultz Flooding Cost Estimates

Did anyone in your household have lost wages due to the Schultz flooding?

	Count	Column N %
No	262	90.3%
Yes	28	9.7%
Total	290	100.0%

Schultz Fire and Related Flooding

Schultz Flooding Cost Estimates

Total estimated household wages lost due to the Schultz flooding?

	Mean	Median	Valid N
Total estimated household wages lost	\$3,086	\$500	33

Schultz Fire and Related Flooding  
Schultz Fire and Flood Health Issues

Did anyone in your household have a physical injury/accident due to the Schultz fire and flooding?

	Count	Column N %
No	271	90.9%
Yes	27	9.1%
Total	298	100.0%

Schultz Fire and Related Flooding  
Schultz Fire and Flood Health Issues

If your household had medical expenses directly related to the Schultz fire and flooding please estimate the total costs?

	Mean	Median	Valid N
Cost of illness	\$2,172	\$0	61

Schultz Fire and Related Flooding

Estimate market value of your property before the Schultz Fire/Flood and the current market value.

	Mean	Median	Valid N
Estimate the market value of your home in 2009	\$349,241	\$300,000	238
Estimate the current market value of your home in 2012	\$244,138	\$220,000	237

These tables contain basic analysis of raw survey data. In some cases, extreme outliers were removed for the purpose of accurately predicting population characteristics. This explains any discrepancies between Appendix E and the body of this study.







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