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5 **Willingness-to-pay for prescribed fire in the Colorado (USA) wildland urban interface**

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18 **Abstract**

19 During the summer of 2001, survey data were collected from Colorado residents living near public
20 lands (i.e., the wildland urban interface). Data were collected by telephone after mailing respondents a
21 survey. These data include detailed information of respondents' views towards wildfire management and
22 willingness-to-pay (WTP) values for prescribed burning. Results indicate that Colorado residents living
23 near public lands are aware that fire is a natural process in their area and are in favor of using prescribed
24 burning for fire risk reduction. They also are WTP an annual tax for prescribed fire undertaken on the
25 public lands near their homes. Respondents' support for adopting a fire risk mitigation policy based on
26 prescribed fire depended on perceived fire frequency intervals. The substantial WTP values for prescribed
27 burning indicate that the public living in the wildland urban interface could potentially pay an annual tax so
28 the burden of wildfire management need no longer predominantly lie in the hands of the general taxpayers.

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30 Keywords: Prescribed burning; controlled burning; wildfire management; contingent valuation; public
31 involvement.

1 **1. Introduction**

2 The state of Colorado, located in the Rocky Mountain region of the United States, is composed of
3 numerous vegetation classes; from dryland crops in the lower plateau, to Douglas Fir in the foothills, and
4 Spruce Fir and Ponderosa Pine in the alpine areas (Romme et al., 2001, Theobald et al., 2003). Prior to
5 European settlement, the lower elevation forests of Colorado experienced frequent low intensity surface
6 fires approximately every one to 30 years (Larimer County, 2005; Veblen et al., 2000). In the higher
7 elevation forests, fires occurred at a lower frequency, only once every 50 to 500 years, but they were
8 typically of a higher intensity than the fires at lower elevations and were commonly stand replacing
9 (Erickson, 2002; Veblen et al., 2000; Larimer County, 2005).

10 European settlement in the 19th century changed the traditional fire patterns in Colorado. During
11 this period, United States land use policy focused on fire suppression, which resulted in most all fires being
12 immediately extinguished. High rates of population growth and amenity migrants throughout the 20th
13 century brought a substantial number of rural residential properties into the wildland urban interface¹ and at
14 a nontrivial risk of catastrophic loss of property due to wildfire. The 20th Century policy of fire suppression
15 has both reduced the number of Colorado wildfires and caused a large build-up of fuels in the forests.
16 While fire suppression may lead to a smaller number of fires, the fuel build-up yields larger and more
17 intense fires. It is hypothesized that a return of frequent small fires, in the form of prescribed burns, may
18 decrease the amount of fuels in the Colorado forests and possibly reduce the chances of high intensity
19 wildfires in the wildland urban interface.

20 Public support for selected fire policy alternatives such as prescribed burning has become part of
21 the decision criteria for federal land management. In particular, the National Forest Management Act and
22 the National Environmental Policy Act require active participation of the public in management decisions
23 (USDA Forest Service, 2000; National Environmental Policy Act, 1969). A number of factors may
24 contribute to public support for fire policy alternatives, particularly prescribed burns for wildlife risk

¹ The wildland urban interface is defined as those homes that are near undeveloped public lands and bear a risk of landscape fires damaging their property. In our study, we defined the wildland urban interface as those properties located within 10 miles of an undeveloped public land such as a National Forest or National Park.

1 mitigation. Understanding or awareness of the policy (e.g., Zwolinski et al., 1983; Cortner et al., 1990;
2 Cortner et al., 1984; Loomis et al., 2001; Loomis et al., 2000), perceived and actual risk of wildfire, and
3 personal experience with either wildfires or prescribed burns (e.g., Vogt, 2003) have been found to
4 correlate with support for fire prevention policy including prescribed burning.

5 Many studies have been conducted to understand public awareness and support for prescribed
6 fires. In 1999, Loomis et al. (2001) found 65.5% of Florida residents had heard of prescribed fires (Loomis
7 et al., 2001; Loomis et al., 2000), while Zwolinski et al. (1983) found 84.3% of residents in Tucson, Arizona
8 had heard of prescribed burning (Cortner et al., 1990; Cortner et al., 1984; Zwolinski et al., 1983). Vogt
9 (2003) took this question one step further and asked respondents if they had ever witnessed a prescribed
10 burn. She found 16.5% of Colorado residents had witnessed a prescribed burn, while almost 67% of
11 Florida respondents had witnessed a prescribed burn (Vogt, 2003). This seems likely as the state of Florida
12 has a very active prescribed burning program (Loomis, 2001).

13 However, awareness and experience should not necessarily imply support unless those experiences
14 were positive. One year after our study, the Pacific Southwest Research Station and the North Central
15 Research Station of the Forest Service both did surveys to find out public views for prescribed burning
16 support. In the Pacific Southwest study it was discovered that on a scale of 1 to 8 where 1 is strongly
17 disapprove and 8 is strongly approve, residents of four states, California, Arizona, Colorado and New
18 Mexico rated both the approval and effectiveness of controlled burns as being between 6.1 and 6.6,
19 showing respondents in favor of controlled or prescribed burning (Winter and Cvetkovich, 2003). In the
20 North Central Research Study, respondents were asked to rate approval of prescribed burning as a fuel
21 management technique. Respondents rated prescribed burning on a scale of -3 to +3 where: +3 is strongly
22 disapprove, 0 is neutral, +3 is strongly approve. In Colorado, the average response was approximately 0.85
23 (moderately in favor) for prescribed burning, while in Florida the response averaged 2.15 (highly in favor)
24 of prescribed burning. Potentially, it could be that Florida residents may have had a higher approval rating
25 because more of them had seen prescribed fires (67%) than had Colorado residents (16.5%) (Table 1).

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1 The Behavior Research Center (2002) in Arizona found that 87% of respondents approved of
2 using prescribed burning, while Loomis et al. (2001) found a 65% approval rating in Florida. The
3 infamous 1988 Yellowstone National Park fires brought the concept of wildfires to the forefront of the
4 public's mind. To see what effect this actually had, Manfredo et al. (1990) surveyed people in the
5 immediate vicinity of Yellowstone (Montana and Wyoming) and people in the other 48 United States.
6 Some 55% of Montana and Wyoming residents and 48% of the rest of the country were found to be in
7 support of using prescribed burning (Manfredo et al., 1990). Bright et al. (1993) asked a similar question of
8 visitors to Yellowstone National Park in the Fall of 1987 (before the famous 1988 Yellowstone fires).
9 Bright found that 86% of respondents approved of using prescribed burning for fuel reduction (Bright et al.,
10 1993). Gardner et al. (1987) found a 61.7% prescribed burning approval of Southern Californians. In
11 Tucson, Arizona, Taylor and Daniel (1984) found a 91.7% approval rating while Zwolinski et al. (1983)
12 found an 80% approval rating. Taylor and Daniels rating may have been higher than Zwolinskis because
13 the respondents were given informational brochures with their surveys detailing the ecological importance
14 of fire (Table 1). None of these studies focused specifically on Colorado.

15 Support for the use of prescribed burning does not tell us whether people feel that their home
16 might be in danger of wildfire (perceived risk) nor whether the historical record and current conditions
17 create a potentially dangerous fire situation (actual risk). Nelson et al. (2003) found that 68% of Minnesota
18 respondents believed their home was at risk from wildfire and Monroe and Nelson (2004) found that 84%
19 of homeowners in Florida and Minnesota were aware of their risk to wildfire. Higgason discovered that 48-
20 78% of Colorado respondents living in the WUI believed that a wildfire would threaten their neighborhood
21 at their current location (Higgason, 2002). Of these respondents, less than 47% believe that their home was
22 prepared to survive a wildfire. Primary concerns of wildfire were loss of property, loss of life, and loss of
23 visual appeal (Higgason, 2002).

24 The Colorado State Forest Service did a survey in 1995 to find out the "actual" risk of homes in
25 western Larimer County Colorado (where a significant portion of our study was conducted) and they found
26 that actual loss potential due to wildfire was 57% (Larimer County, 2005). Based on the recent Colorado
27 studies, we may be able to tentatively contend that perceived and actual fire risks are roughly in line with

1 one another; on average people do not appear to be either overly optimistic or pessimistic about their
2 individual risk of catastrophic loss from wildfire.

3 Awareness, experience, and public support for prescribed fire as a fire risk mitigation alternative
4 coupled with perceived and real risk of residential damage due to wildfire should translate into a pledge of
5 financial support for the policy. Loomis et al. (2002) conducted a contingent valuation study of Florida
6 residents asking their willingness-to-pay (WTP) for prescribed burning in their area. He found that Florida
7 residents were WTP \$557 annually (90% confidence interval: \$387-\$1249) for prescribed burning. Winter
8 and Fried (2001) asked respondents from Crawford County, Michigan if they would be WTP to reduce
9 wildfire danger to their homes by creating a defensible space.² They found respondents were WTP an
10 annual fee of \$57/ year in increased property taxes for risk reduction (Winter and Fried, 2001; Winter and
11 Fried, 2000). This number is different from Loomis because respondents in the Winter and Fried study are
12 paying for vegetation removal on their property, not an annual fee for prescribed burning.

13 In our study, we attempt to see if Colorado residents living near the Colorado wildland interface
14 are knowledgeable about the natural fire regime in the area surrounding their home, if they are in favor of
15 prescribed burning, and if this favorability transforms into a WTP for prescribed burning. To do this,
16 Colorado residents living within the wildland urban interface were asked about their views towards
17 wildfires, wildfire risk, and WTP for prescribed burning. Our hypothesis was that Colorado residents
18 would be knowledgeable about wildfire and wildfire frequency in their areas and would have a WTP for
19 prescribed burning on public lands near their homes. We also hypothesize that WTP will be higher if their
20 perceived fire danger and perceived fire frequency are relatively high.

22 **2. Methods**

23 2.1. The Survey

² A defensible space refers to when the designated area around your home (approximately 30 meters in diameter) is “maintained so as to be free of any features that would tend to increase the risk of damage from wildfire (WHIMS, 2002; Larimer County, 2003).” In general, the vegetation surrounding the home (including shrubs, trees, vegetative litter, and woodpiles, etc.) are removed so there is nothing available to burn.

1 To gather public wildfire opinion information, a survey booklet entitled ‘Managing Fires on Public
2 Lands: What Do You Think?’ was created. The survey was initially developed and then modified in a
3 series of focus groups in Colorado and California. Focus groups were helpful for question wording and for
4 determination of the range of values to use for the WTP question. The modified survey was pretested and
5 consideration of all pretesting comments resulted in the surveys final version. The final version of the
6 survey included eight pages of questions and two color pictures that were inserted into the survey for use
7 with some of the questions (Figure 1). The first picture is a low intensity prescribed burn one year after fire
8 in a Colorado ponderosa pine forest where most underbrush was killed, however, standing trees were not.
9 This picture was to be used alongside low intensity prescribed burn questions. The second picture was of a
10 high intensity burn one year after fire in a Colorado ponderosa pine forest where all underbrush and
11 standing trees were killed. This picture was to be used with the high intensity wildfire questions. The
12 forests in these two pictures were similar in stand density (trees per hectare) and tree size (d.b.h. - diameter
13 at breast height). We felt that these pictures were easier for respondents to conceptualize than to present
14 data of actual stand density and tree sizes, because many people may not understand those numbers and
15 because visual appeal has been shown to be among the most important factors people consider in weighing
16 fire risk management alternatives.

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18 <<< Insert Figure 1 Here >>>

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20 One hundred and fifteen survey participants in twelve wildland urban interface communities located
21 within ten miles of a forest (undeveloped wildland): Leadville, Twin Lakes, Nederland, Rollinsville, Estes
22 Park, Masonville, Bellevue, rural Fort Collins, Red Feather Lakes, Dinosaur, Creede, and Pagosa Springs
23 were contacted randomly by phone during the Summer of 2001 and asked to participate in a
24 phone/mail/phone survey. Of the 103 people who agreed to participate in the study, a follow-up phone
25 interview was scheduled approximately seven days from the initial call and a survey was mailed to their
26 homes. This was enough time for the participant to receive the mail survey and go through it at their
27 leisure before the follow-up phone interview. During the follow-up phone interview, respondents were
28 asked for their responses to the mail survey and then asked to place their survey in the self addressed

1 stamped envelope to be mailed back to us. In this way, we had their results logged in twice: once from the
2 phone interview and again from the mail survey.

3 In all, 115 people were contacted with 103 who agreed to do the survey and 12 who did not. Of the
4 103 who agreed to complete the survey, 99 people followed through. Therefore, the response rate of those
5 contacted was 86% and the response rate of those contacted that said they would complete the survey was
6 96%.

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10 2.2 Survey Questions

11 In order to test our hypothesis, we needed to determine perceived fire danger, perceived fire
12 frequency, and WTP for prescribed burning. To determine perceived fire danger, we asked respondents a
13 yes/no question as to whether they felt their home was at risk of burning down from a wildfire. The exact
14 question wording is as follows:

15 Are you concerned that a fire on public lands may endanger your home?
16 (Circle One) Yes No

17
18 To determine perceived fire frequency, we asked respondents first to look at the photo of the forest
19 one year after a high intensity burn (Figure 1b.). Then we asked:

20 Take a look at Photo #1 (Figure 1b.), this is a photo of a forest one year after a high intensity
21 wildfire. In your opinion, how often does a wildfire such as shown in Photo #1, occur in the area
22 where you live. For example, once every 5 years, once every 10 years, twice a year, etc.
23 _____ Fire frequency

24

25 Next we wanted to determine the public value for prescribed burning. For the purposes of this
26 survey we defined prescribed fire as “Prescribed fires or controlled burns are those fires that are set
27 purposely in a designated area to accomplish one or more specific objectives such as removal of
28 underbrush and dead wood to reduce available fire fuel, reduce the number of wildfires, and/ or reduce
29 wildfire intensity.”

30 Following the economic valuation literature previously cited, we used the contingent valuation
31 method (CVM) technique to form this question. CVM is a stated preference method where people are

1 typically asked for their WTP for a particular non-market good. The collected information can then be
2 aggregated to estimate a demand function that represents public WTP.

3 The contingent valuation WTP question for this study focused on the decision to adopt a
4 prescribed burning program for mitigating fire risk. Respondents were then to use their perceived fire
5 frequency information to answer the following WTP question about the public lands in their area:

6 Using prescribed burning (Photo #1: Figure 1a.), public land management agencies could reduce
7 the frequency of a wildfire (Photo #2: Figure 1b.) on the public lands surrounding your home such
8 as National Forests and National Parks by half. Would you pay an increase of \$X a year more in
9 taxes for a prescribed burning program such as this?

10

11 (Circle One) Yes No

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13 The WTP question was asked as a dichotomous choice—would you pay \$X each year for a
14 prescribed burn policy, yes or no, where \$X varied across the sample from \$5 through \$1500. These values
15 were determined in the focus groups.

16 The responses to the dichotomous choice WTP question would then be analyzed using a logistic
17 regression model. The logistic regression model is appropriate when the dependent variable represents a
18 qualitative response such as yes or no. For our model, the dependent variable is y_i ; where $y_i=0$ if the
19 respondent is not WTP for prescribed fire and $y_i=1$ if the respondent is willing to pay their bid amount.

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21 **3. Results and Discussion**

22 Respondents were mailed an eight page survey to obtain their views towards wildfire management
23 and WTP values for prescribed burning. Survey results provided a great deal of insight into the public's
24 views of wildfire and wildfire management. The first set of survey questions yielded information about
25 basic wildfire knowledge (Table 2). This information showed that 100% of respondents had read or heard
26 about wildfires and 98% had read or heard about prescribed fires on either National Forests, National Parks
27 or other public lands. All respondents' homes were located in the wildland urban interface with 34% of
28 properties bordering public lands.

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Sixty one percent (61%) of respondents were concerned that a fire on public lands may endanger their home. This is what we call the “perceived wildfire risk.” This concern value is logical because many of the respondents have proper defensible space surrounding their homes or live in a town center where they are in less danger of fire; even though they are in the wildland urban interface. Perceived wildfire risk estimates were comparable to actual wildfire risk. Actual wildfire risk to homes near forests in Larimer County, Colorado, an area that represents several of our study locations, estimated that 57% of homes in the WUI had high fire loss potential (Larimer County, 2005). We believe this indicates that respondents are knowledgeable of the wildfire ecosystem of their area. These results also concur with study that was published one year after our study in which Higgason (2002) showed that 48-78% of Colorado respondents believed a wildfire could threaten their neighborhood.

To determine perceived fire frequency, respondents were asked to state how often they believe fire to occur on the public lands closest to their home. Results show that 92% of respondents felt that wildfires occurred at least once every 30 years in their area. A small percentage (<5%) believed that fires occurred less than once every 50 years. These results follow actual fire frequency rates in their area. In the lower elevation ponderosa pine forests (that a majority of the respondents live in), fires do occur frequently (less than once every 30 years) and in the higher elevation lodgepole pine and spruce fir forests that a small percentage of the respondents may live in, fires occur less than once every 50 years (Romme et al., 2001; Theobald et al., 2003; Larimer County, 2005; Veblen et al., 2000; Erickson, 2002) (Figure 2).

We then asked respondents to select which fire management technique they would prefer if they had to choose only one (Figure 3). Over 86% of the respondents believed that prescribed fires should be conducted, however, they varied as to which wildfire management policy should accompany the prescribed fire management technique (i.e., whether to also allow wildfires to burn but protect homes, allow wildfires to burn freely and do not protect homes, or to immediately extinguish wildfires). Only 10% of respondents were not in support of prescribed fires and 4% of respondents were not sure. This represents a high public acceptance of prescribed fires. One year after our study, the USFS asked Colorado residents opinion on

1 forest fire management. This study showed that 20.4% of respondents believed “all fires must be
 2 extinguished regardless of cost (Winter and Cvetkovich, 2003).” We believe this statement is similar to our
 3 statement in which “all wildfires should be extinguished and prescribed fires should not take place.” In our
 4 study, only 7% of respondents believed this. We believe this to be the case because our respondents lived
 5 in the WUI area while the USFS chose random Colorado homes. Four percent (4%) of respondents in the
 6 USFS study did not answer, which correlates with our 4%. Nine percent (9%) of the USFS respondents
 7 believed that “fires must be allowed to take their natural course when burning in wildland or wilderness
 8 areas, even if structures are involved.” And 66.4% of USFS respondents believe that “we probably have to
 9 let some fires burn, but must protect residences.” We can not exactly determine which of our questions
 10 these correspond with, but we do know that 50% of our respondents felt that homes should be protected
 11 while 4% of our respondents believed that fires should burn freely.

12 The fire frequency information, in conjunction with the background questions, makes it reasonable
 13 to infer that respondents are knowledgeable about wildfire, wildfire risks, and fire frequency in their area.
 14 This may make it easier for fire managers to introduce forest fuel reduction by prescribed fire into areas
 15 near the wildland urban interface of Colorado.

16 While there have been several studies of Colorado residents after our study took place, no
 17 Colorado study besides this one has asked Colorado residents for their WTP value for prescribed burning.
 18 In our study we find that, overall, 66% of the respondents were WTP for prescribed fires. At the low level
 19 of \$5 annually, all respondents were WTP for prescribed fire, while at the higher level of \$1500 annually,
 20 only 14% were.

21 A logit regression model was estimated on the WTP bid for prescribed fires, this is the “base
 22 model.” The results of the base model showed that the bid variable was significant at the 99% level.

23 Logit results are as follows (with P-Values in parenthesis):

24 WTP for Prescribed fire(yes, no) = 1.208 – 0.0018BidAmount
 25 (0.000) (0.002)

26
 27 The logit results enable us to calculate the median, mean and confidence intervals for WTP. To
 28 calculate the median value, we use the formula (Hanemann 1984):

1 Median = $C / (-\text{Bid Coefficient})$, where C is the constant term.

2 While the formula for the mean value is (Hanemann 1989):

3 Mean = $\ln(1 + e^C) / (-\text{Bid Coefficient})$

4 Using the simulation approach of Park et al. (1991), we were able to calculate the confidence intervals.

5 Mean, median, and confidence intervals (CI) calculated are presented in Table 3. These results
6 show respondents have a high WTP for prescribed fire management. The mean value for prescribed fire
7 was \$796 with a 90% confidence interval of \$545 and \$1583.

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9 <<< Insert Table 3 Here >>>

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11 To test our hypothesis that WTP will be higher if perceived fire danger and perceived fire
12 frequency are relatively high, danger and frequency variables were added to the base model. Results are as
13 follows (with P-Values in parenthesis):

14

15 Prescribed Fire = 2.333 – 0.003 Bid – 0.852 Danger – 0.024 Freq

16 (P-Values) (0.000) (0.001) (0.174) (0.033)

17 McFadden $R^2 = 0.185$

18 Where: Bid = The bid amount (Range \$5-\$1500)

19 Danger = Respondents' perceived danger as to whether they felt their home was in danger of a
20 wildfire burning it down (1=yes, 0=no)

21 Freq = Respondents' perceived wildfire frequency on the public lands in their vicinity (once every
22 five years = 5, once every 10 years = 10, etc.)

23 Because interpretation of the coefficient in a logit model is not direct or straightforward as it is in
24 an ordinary least squares (OLS) regression, coefficients were converted into WTP values. To do this, all
25 coefficient values except the bid amount were divided by the absolute value of the bid coefficient
26 (Cameron 1988; Richardson 2002). Results show that if the number of wildfires that is perceived to occur
27 in the vicinity of the respondents increases (fire frequency), their WTP increased (\$8/year). In this same

1 way, if the respondent felt that their home was in danger of burning in a wildfire (wildfire danger), their
2 WTP increased by \$284. However, the wildfire danger variable was not significant.

3 One potential implication of these results relates to the public provision of services to protect
4 private property. Most property owners own private insurance to mitigate the potential financial loss due to
5 accidents including weather events such as flood and fire. People who live in areas prone to flood (within
6 the 100 yr floodplain) are often required to carry flood insurance and in some particularly risky floodplains,
7 insurance is impossible to obtain, discouraging development. No such fire loss insurance requirements exist
8 for those who choose to live in the wildland urban interface of Colorado. Since the average annual WTP is
9 about \$800 and the average home in the study region is about \$240,000 (average property value is
10 \$300,000). Annualizing the price of the home at 5% would yield an annual value of \$12,000. Therefore, if
11 we can assume a total loss of built property (the home) in the event of a fire, the implied individual
12 perceived risk is about 1/15 annually (one fire in 15 yrs). This aligns with actual fire risk in the area, as the
13 lower elevation forests of Colorado, where a majority of respondents live, experienced frequent low
14 intensity wildfires approximately every one to 30 years prior to European settlement (Larimer County,
15 2005; Veblen et al., 2000). If we assume that people are rational, then we must conclude that the public is
16 expected to subsidize the mitigation of the private fire risk voluntarily entered into by these people. Based
17 on these calculations, their annual WTP of \$800 aligns actual risk with perceived risk of living on the
18 wildland urban interface.

19 20 **4. Conclusions**

21 Wildfire suppression policies in the western United States have created a large build-up of wildfire
22 fuels. This has resulted in wildfires of extremely high intensity, which is cause for concern because an
23 increasing number of people are building homes in the wildland urban interface (WUI). One method that
24 can be used to alter the risk profiles of wildfire damage is prescribed burning. In this study, we attempted
25 to see if people living in the Colorado wildland urban interface were knowledgeable about wildfires and
26 prescribed fires and see if they had a willingness-to-pay (WTP) to reduce the risk of their home burning in
27 a wildfire.

1 Surveyed Colorado wildland urban interface (WUI) homeowners were found to be knowledgeable
2 about the natural occurrence of wildfire in their area. They were aware that their homes may be at risk
3 from wildfire and were well-informed that prescribed burning could be used as a fuel reduction technique.
4 Over 85% of respondents approved of public land managers using prescribed burning to reduce wildland
5 fuels and approximately 66% had a willingness to pay (WTP) for prescribed burning in their areas. Mean
6 annual WTP for prescribed burning was nearly \$800, this value was dependent on respondents perceived
7 fire frequency.

8 Many discussions with older respondents revealed that homeowners living in the wildland urban
9 interface were not only aware of the danger to their homes, but in the past readily did something about it.
10 Prior to illegalization, many homeowners would backfire their properties to reduce the risk of a wildfire
11 burning their homes. Backfiring is a process in which potential wildfire fuel loads in the vicinity of their
12 homes was reduced by burning the land surrounding their home. Therefore, backfiring is a type of
13 prescribed burning technique. However, the government eventually banned backfiring.

14 Currently, homeowners can still do something to reduce wildfire fuel loads around their homes,
15 they can clear a 30 meter defensible space. In Colorado, it has been found that homes with the proper
16 defensible space zones that were hit by the 2002 Colorado Missionary Ridge Fire were all saved (Binkley,
17 2003). Some homes with defensible space that were hit by the 2002 Hayman fire, the largest wildfire in the
18 state's recorded history, were also saved (CUSP, 2003; Cohen and Stratton, 2003). While defensible space
19 has been shown to save homes from wildfire, defensible space is not mandatory in most of Colorado and is
20 not a common practice.

21 This study reveals that people living in the WUI are WTP for fuel load reduction on the public
22 lands near their homes via prescribed burning. This implies that homeowners living in a wildfire area know
23 about the wildfire risk to their homes and are willing to do something about it. In the past, homeowners
24 could backfire their properties, but this is no longer allowed without a great deal of paperwork and
25 supervision. As this study showed a high WTP for controlled burning, perhaps prescribed burning can be
26 partially funded by an increased tax on those people living in the wildfire vicinity. Other options could
27 comprise a special wildfire insurance fee included in a home insurance policy or the creation of
28 mandatory defensible space zones. Perhaps it is time to adopt strategies to reduce risk in the wildland

1 urban interface by making the public that voluntarily entered into a wildfire risk area subsidize its
2 mitigation.

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2 Table 1: Public approval of prescribed burning in previous research

Study	Approximate Year	Study Location	Response
Winter and Cvetkovich (2003)**	2002	Colorado Arizona California New Mexico	6.25 (Colorado) 6.6 (Arizona) 6.25 (California) 6.1 (New Mexico) Scale of 1 to 8 where 1 is strongly disapprove and 8 is strongly approve
Vogt (2003)**	2003	Colorado and Florida	Moderate approval in Colorado and High approval in Florida
Behavior Research Center (2002)	2000	Arizona	87% Approval
Loomis et al. (2001)	1999	Florida	65% Approval
Bright et al. (1993)	1993	Yellowstone National Park visitors	86% Approval
Manfredo et al. (1990)	1989	Montana (MT) and Wyoming(WY)/ Other 48 States	MT & WY 55% Approval/ Other States 48% Approval
Gardner et al. (1987)	1987	San Bernadino County, Southern California	61.7% Approval
Taylor and Daniel (1984)	1984	Tucson, Arizona	91.7% Approval (after reading informational brochures)
Zwolinski et al. (1983)	1981	Tucson, Arizona	80% Approval

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**Note that these studies were conducted after our survey was complete.

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Table 2: Respondents general background knowledge	
Read or heard about wildfires on public lands	100%
Read or heard about prescribed fires on public lands	98%
Lived near public lands (within 10 miles)	100%
Land bordered public lands	34%
Felt their home was in danger of wildfire	61%

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Table 3: Willingness-to-pay (WTP) value for Prescribed Fire				
Fire Management Regime	Median WTP	Mean WTP	90% Confidence Interval on Mean WTP	
			Lower Bound	Upper Bound
Prescribed Fire	\$655	\$796	\$545	\$1,583

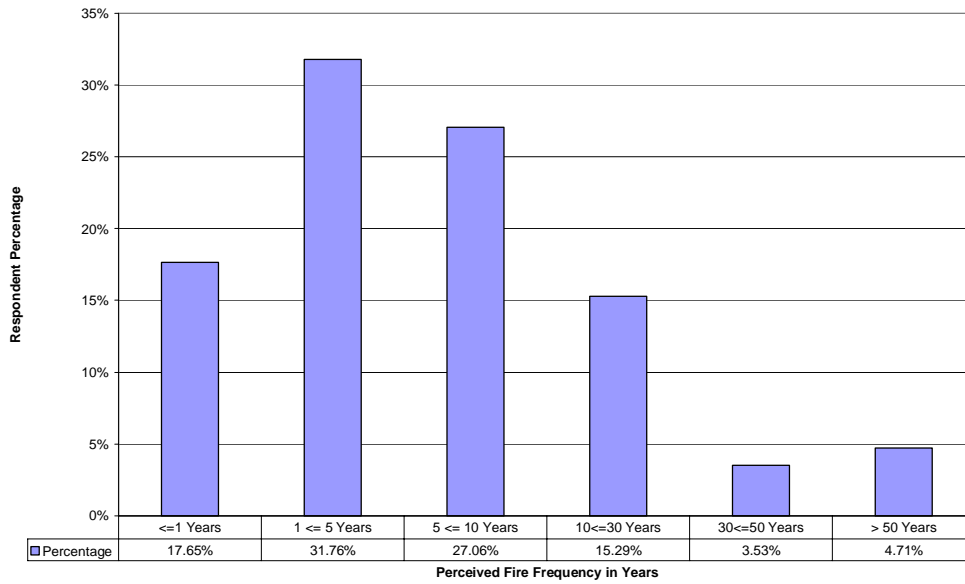
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1 Figure 1: (1a.) One Year Following a Prescribed Fire Low Intensity Burn (left) and (1b.) One Year
 2 Following a Wildfire High Intensity Fire (right).



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8 Figure 2: Respondent Perceived fire frequency for their Area.³

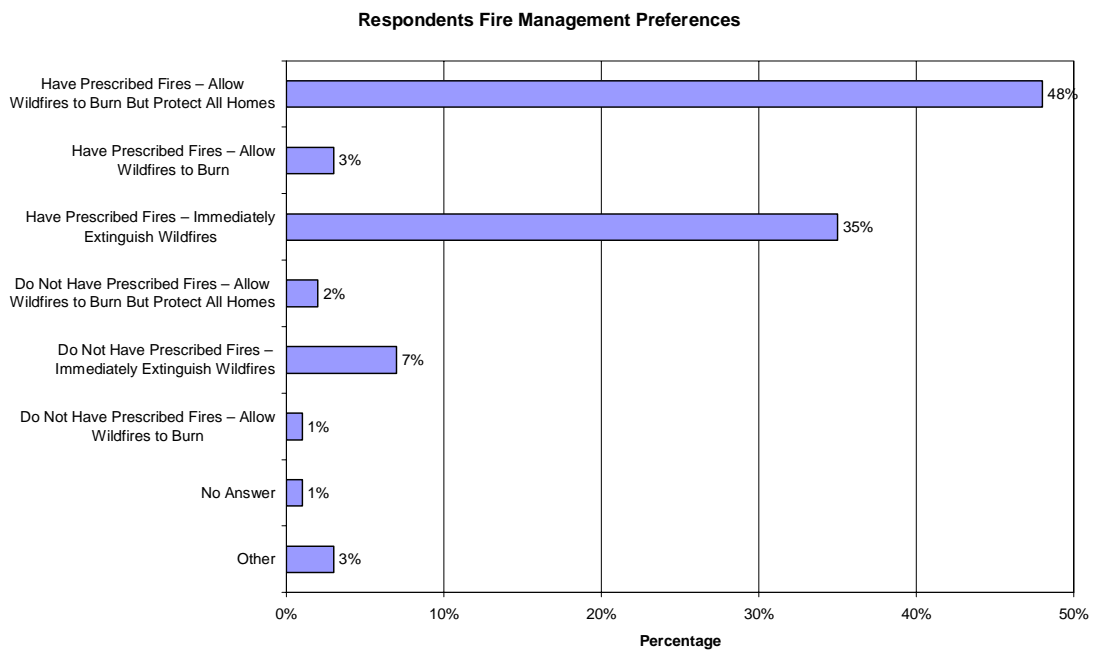


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³ In this figure, <=1 means respondents felt wildfires occurred at least once a year

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Figure 3: Respondents Fire Management Preferences



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