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Prescribed Burn Association Activity, Needs, and Safety Record: a survey of the Great Plains

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Roger Mills Prescribed Burn Association members (Oklahoma) meet to go over burn plan prior to starting. From the survey all burn associations required a written burn plan for each burn. Photo by Karsen Davis.

INTRODUCTION

In 2012, we conducted a survey of the 50 existing prescribed burn associations (PBA) located in five Great Plains states. We sent a 39-question survey via email to the main point of contact for each PBA (Appendix II). The questionnaire inquired about PBA formation, burn history, fire planning, member experience, external assistance, safety record, fuel types, and other information. We had 27 burn associations complete and return the survey, for a 54% return rate: Oklahoma (15 sent, 11 returned), Texas (12 sent, 4 returned), Kansas (7 sent, 2 returned), Nebraska (15 sent, 10 returned) and Colorado (1 sent, 0 returned). Of the re-

The Creek County PBA from northeast Oklahoma was the newest, formed only months before the survey. The average PBA had been formed for 8 years in Texas, 6 years in Oklahoma, 4 years in Nebraska, and 3 years in Kansas (Table 1).

BURN ACTIVITY

Of the 27 responding PBAs 26 reported conducting a total of 1,094 prescribed burns on 472,235 acres since their establishment. On average, each PBA conducted 40.5 burns, with some PBAs posting considerably more fire activity than others. The number of burns conducted per PBA ranged from 0-300 during the survey period, with an overall average of 6.4 burns per PBAs per year. The variation in burning activity is possibly due to differences in experience and how long the PBA had been established. Also some PBAs are just considerably more active than others, for example, one newly established PBA averaged over 25 burns per year for the five years it has existed. The average burn unit size was 319 acres, with total burn unit size ranging from 15 to 1,399 acres. PBAs averaged a total of 14,157 acres burned since they were formed, but some of the most active PBAs have burned more than 100,000 acres. A summary of PBA burning activity is given in Table 2.

Table 1. Information on the number, age and year of formation for PBAs in the Great Plains as of 2012.

| State | # PBAs known in 2012 | # PBAs responding | Average Date PBA Formed | Oldest PBA Formed | Newest PBA Formed |
|--------------|----------------------|-------------------|-------------------------|-------------------|-------------------|
| Oklahoma | 15 | 11 | 2006 | 2002 | 2012 |
| Nebraska | 15 | 10 | 2008 | 1995 | 2011 |
| Texas | 12 | 4 | 2004 | 1997 | 2011 |
| Kansas | 7 | 2 | 2009 | 2001 | 2007 |
| Great Plains | 50 | 27 | 2007 | 1995 | 2012 |

turned surveys, two were returned, but not completed due to one PBA being disbanded and the other stating they had not done anything yet to report. In this fact sheet, we present the results from the questionnaire.

AGE OF PRESCRIBED BURN ASSOCIATIONS

As of 2012, the average PBA in the Great Plains had been in existence for 5 years. The oldest responding PBA was the Prescribed Burn Task Force from central Nebraska, which had been in existence for 17 years.

Table 2. The number of burns and acres burned by state.

| Survey category | Oklahoma | Texas | Kansas | Nebraska |
|---------------------------------|-------------|---------------|------------|--------------|
| Number of PBAs responding | 11 | 4 | 2 | 10 |
| Known # of PBAs | 15 | 12 | 7 | 15 |
| Total number of burns conducted | 303 | 348 | 21 | 422 |
| Total acres burned | 168,334 | 188,515 | 23,970 | 91,416 |
| Avg. burns conducted/year | 30.3 | 23.2 | 4.2 | 24.8 |
| Avg. acres burned/year | 16,833 | 12,568 | 4,794 | 5,377 |
| Avg. acres burned/PBA | 16,833 | 47,129 | 11,985 | 9,142 |
| (range) | (0-100,000) | (152-150,000) | (0-23,970) | (500-60,000) |
| Avg. acres/burn | 556 | 542 | 1,141 | 217 |

GRANTS/DONATIONS

All 27 responding PBAs had received some type of funding through grants or donations. The amount each PBA received ranged from \$500 to \$250,000. Most of these funds have been used to purchase equipment for the association, with some funds for training activities. These grants were in the form of private donations, non-governmental organization grants and donations, as well as state and federal grants.

NEEDS

Each PBA was asked to rank the following needs, 1 thru 6, with 1 being the most important: Train-

ing, Equipment, Membership, Funding, Insurance and New Laws. Overall, training (2.1 average) was the number 1 ranked need, followed closely by both insurance (2.9 average) and membership (3.1 average). Equipment (3.4 average) and funding (4.1 average) ranked 4th and 5th. New laws (4.8 average) were considered to be the least important need by far among responding PBAs (Figure 1). States generally ranked their needs very similarly and only insurance showing a slight difference by state (Appendix I), with both Texas and Oklahoma rating insurance as a greater need than Nebraska and Kansas.

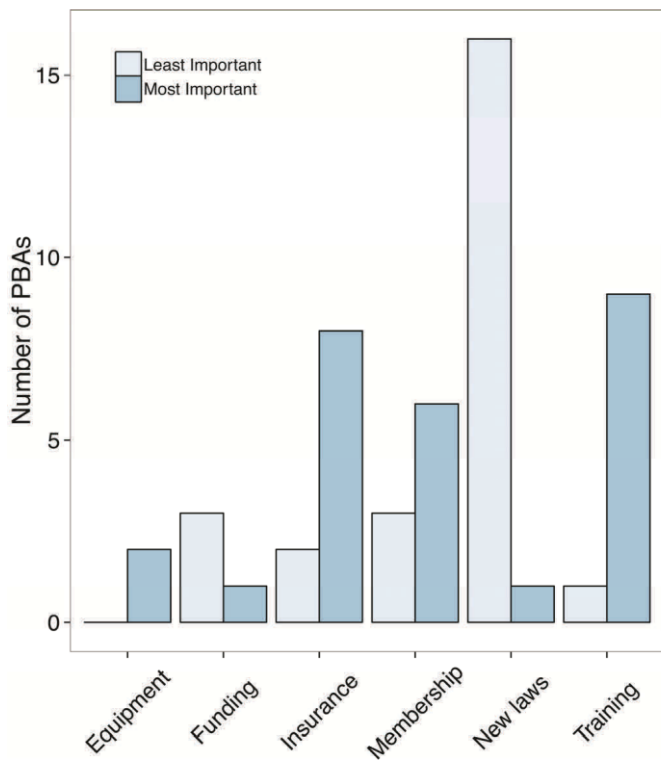


Figure 1. The frequency a factor was listed as the least and most important need among PBAs.

CONDUCTING THE BURN

Goals and objectives. While all factors given in the survey were important, killing and preventing cedars/junipers were identified as the top goals of conducting prescribed burns by PBAs. Killing established cedar/juniper and preventing cedar/juniper encroachment were the only two factors listed by survey respondents as being an objective “always” more than being an “occasional” objective. Goals and objectives associated with livestock production, wildlife, ecological restoration, and CRP maintenance were more often given as “occasional” objectives rather than “always” an objective (Figure 2).

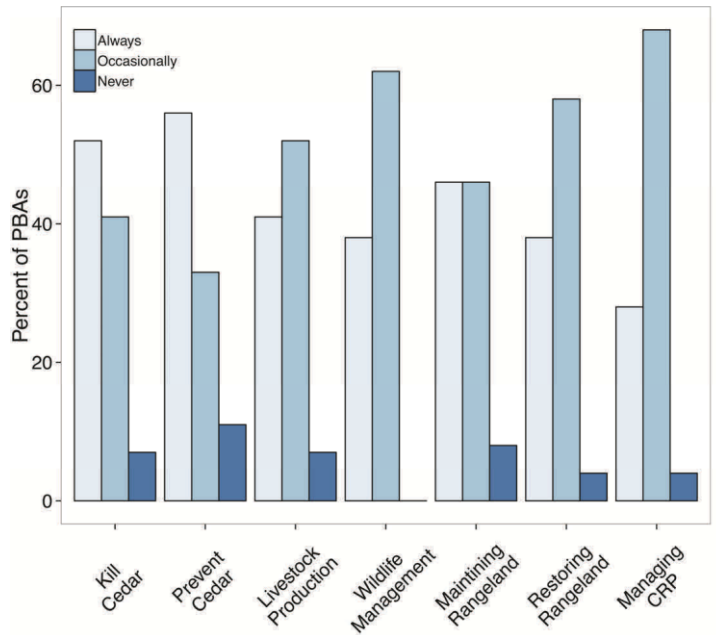


Figure 2. The percent of PBAs listing a factor as always being a goal of prescribed burning, sometimes being a goal, or never being a goal.

Burn plan development All 27 PBAs responding to the survey require a written fire plan for each burn. Throughout the Great Plains, 22% of PBAs responded that most members wrote their own fire plan. 50% of PBAs stated that they get written burn plans or assistance from the National Resources Conservation Service (NRCS) for most of their burns. A small percentage of PBAs get written fire plans or assistance from state wildlife agencies and private consultants for most of their burns. When looking at written fire plans by state, 100% of Kansas PBAs reported that they write most of their own plans, with a small amount of assistance coming from NRCS. In Oklahoma, 18% of PBAs indicated that they write most of their own burn plans, with 73% of PBAs indicating that they received help from the NRCS for most of their burn plans. In Texas, 25% of PBAs reported that they write most of their own burn plans, while the NRCS, cooperative extension, and private consultants each provided supplemental assistance. In Nebraska, 10% of PBAs reported that they write most of their own burn plans, the lowest percent of any state. Almost all PBAs in Nebraska received some support from the NRCS or Pheasants Forever, while 40% of PBAs reported that the NRCS or Pheasants Forever provided assistance with most of their burn plans. (Figure 3)

Training/experience When surveyed about training or experience of members, 65% of PBAs reported that

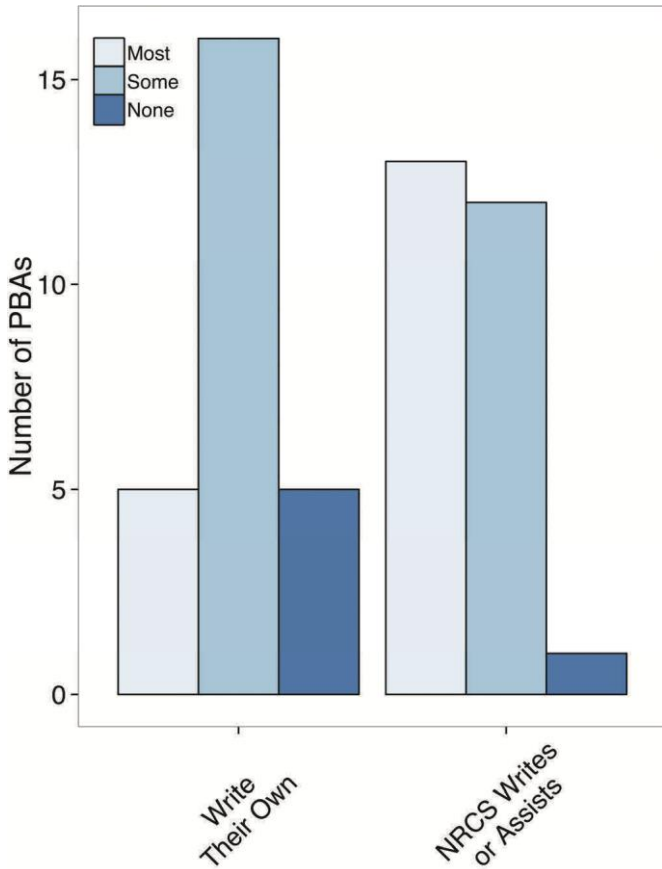


Figure 3. The number of PBAs that write their own burn plans versus those getting assistance from the NRCS. Shown are the number of PBAs that write most, some, or none of their own burn plans, relative to the number of PBAs that get written burn plans or assistance from the NRCS for most, some, or none of their burns.

most members had prior burn experience, and 75% reported that some members had no training or experience prior to joining the PBA. The vast majority of PBAs (88%) indicated that some members had received training or experience with fire prior to becoming involved with a PBA. (Figure 4)

Notification of burns To notify members of an upcoming burn, 63% of PBAs always used a phone or call list; 52% always used email. A few of the PBAs sometimes used a website to notify members of burns. An average of 8.7 members (with a range of 3-15) assisted with each burn.

Firebreak use All types of firebreaks are used by PBAs. Firebreaks included roads, cultivated fields, creeks, mowed line/wetlines, and bladed lines. Roads were the most common type of firebreak (always or sometimes used 100% of the time), followed by mowed lines/wetlines and disked lines (always or sometimes used

96% of the time). Creeks/rivers and dozed/bladed lines were always or sometimes used 80% and 72% of the time, respectively.

There were some differences concerning firebreak use among states. Most notable is that 78% of Nebraska PBAs never used dozed/bladed lines, instead favoring mowed lines or wetlines. In contrast, 25% of Texas PBAs never used mowed line/wetline firebreaks.

Burning windows Prescribed burns were conducted in every month of the year by PBAs, but seasonal preferences were apparent. March and April were the most common prescribed burn months, followed by February and May. This trend was observed for PBAs in each state. In Oklahoma, PBAs burned in every month of the year, but the majority of burns occurred in March and April. In Texas, burns were also conducted in every month, with January, February and March being the main burn season. Kansas only reported burning during five months of the year, with March, April and May being the main months. Nebraska PBAs reported burning in all months except July and August, with March, April and May being the most active burn months.

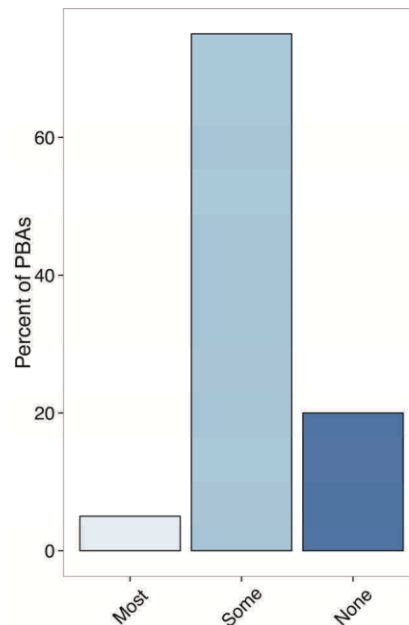


Figure 4. Burn experience of members prior to joining PBAs. Shown are proportions for PBAs where most members had prior burn experience, some members had prior burn experience, or no members had prior burn experience

Important weather parameters Weather parameters that were important to members when conducting a prescribed burn were: wind speed (100% of PBAs), wind direction (100%), relative humidity (96%), temperature (89%), previous precipitation (36%) and soil moisture (24%). The main sources for PBAs to obtain such weather information was from the National

Weather Service (NWS) website (83%) or other weather websites (53%), followed by NWS spot weather forecast (46%).

Equipment used on prescribed burns When asked about equipment used on burns, PBAs indicated the following equipment were always used: drip torch (100% of PBAs), radios, slip-on pump unit and ATV sprayer (89% for each equipment type), ATVs (88%), weather instrument/kit (84%), utility vehicles (65%), flappers/swatters (59%) and fire rakes (46%). The main personal protective equipment always used by personnel on each burn was reported as: gloves (77%), flame retardant shirt (42%), goggles/safety glasses (28%), and flame retardant pants (13%).

Limitations on burning activity When asked what factors limited the number of burns conducted by each PBA each year, the main answers were not enough burn days (72% of PBAs), followed by drought (69% of PBAs), which was at its peak in the region during the survey period. The PBAs recognized that burning during one season of the year was also limiting the number of available burn days (with 48% of PBAs stating it limited the number of burns conducted). Burn bans were the other main factor limiting the number of burns conducted by PBAs (with 38% of PBAs listing burn bans as a limitation).

PBA SAFETY/LIABILITY RECORD

Injury/mortality risk Over the years the PBAs have maintained a very strong safety record. Based on the questionnaire, 1,094 burns have been conducted from 1995-2012 by the PBAs, with no fatalities and only one minor injury reported. The injury was stated as “some minor burns from heat, mainly due to lack of experience and burning too close to the fence.” From the Wildland Firefighter Fatalities Report of 1999-2008 there were 11 reported fatalities on prescribed fires by federal agencies (Fahy 2009). Information about injuries at the federal level cannot currently be separated from wildfire related vs. prescribed fire.

Spotfires and escapes Questions on spotfires and escaped fires were also included as part of the safety record. Spotfires in this survey were defined as any fire ignition that occurred outside the burn unit no matter the source, but is extinguished immediately by equipment and personnel conducting the prescribed burn. Of the 1,094 burns conducted by PBAs in the Great Plains, 17 of the 25 responding PBAs reported having

spotfires. Overall, PBAs estimated that spotfires occurred on a total of 224 burns. That means a spotfire occurred on approximately 1 of 5 prescribed burns conducted. This frequency of spotfire occurrence is the same that was reported from an experienced burn crew working in the same region (Weir 2007).

Even with this frequency of spotfire occurrence, the frequency of escaped fires requiring external suppression support was very low. Escaped fires were defined as any fire ignition that leaves the burn unit, no matter the source, and cannot be immediately contained using the equipment and personnel on the burn. Seven of the 25 responding PBAs reported having 16 escaped fires that they had to call for assistance to suppress, which is 1.5% of the 1,094 total fires conducted by PBAs (Figure 5).

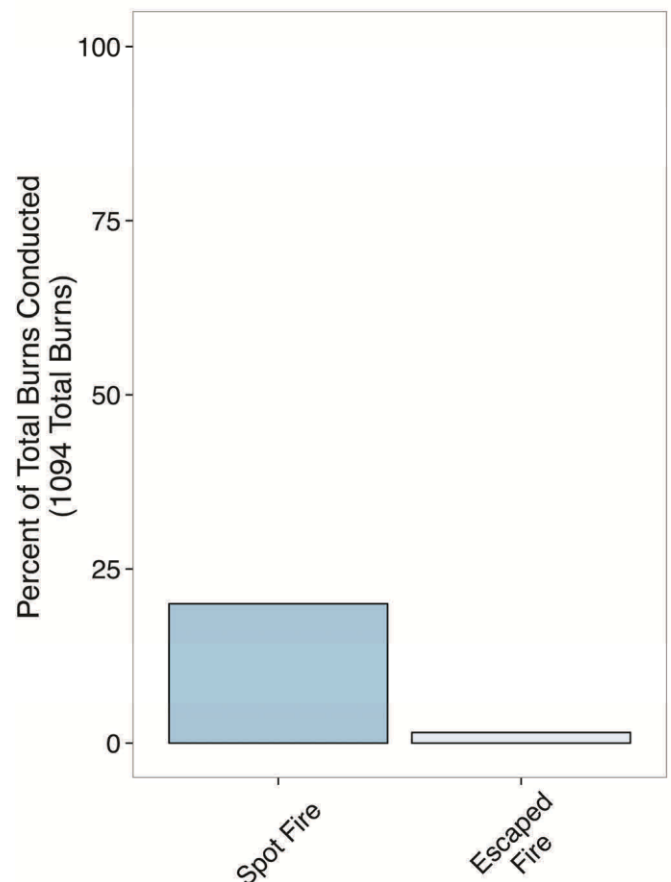


Figure 5. Percent of spot fires and escaped fires across all PBA survey respondents.

The Wildland Fire Lessons Learned Center (WFLLC) released a 2012 report on prescribed fires turned wildfire (2013). The federal definition of an escape is a fire that has exceeded or is expected to exceed initial attack

capabilities or prescription (USDA-Forest Service no date), which is very similar to our escape definition. The 2012 report showed 0.8% rate of escapes for federal agencies in 2012; PBAs had 1.5% escape rate for our multi-year data record (1995-2012). The WFLLC report (2013) showed the size of escapes ranged from 3.5 acres to 21,000 acres for federal agencies. PBAs escapes ranged in size from <0.1 acres to 2,000 acres, and this is with 72% of PBAs not having an escaped fire. It is also important to note that the PBAs reported that volatile or highly flammable fuels, such as cedar/juniper, were present on 75% of the burns conducted.

Liability Issues At the time of the survey, there were no reported insurance claims against any of the PBAs or members. There had been one lawsuit brought against a single PBA due to an escaped fire. The burn was conducted by a member outside of PBA guidelines, without PBA assistance and illegally during a burn ban. The PBA was not directly involved in the actual burn in any way, but was named in the lawsuit because the landowner and person starting the fire were members of a PBA and using PBA insurance. The most damaging escape from a prescribed fire set by a federal agency in WFLLC 2012 report (2013) caused \$11.3 million in property damages and killed 3 civilians. Also there have been no civilian or landowner burn practitioners killed due to PBA escapes or prescribed burns.

SMOKE MANAGEMENT

Twenty-four of 26 PBAs reported that they were concerned about smoke management when conducting burns. Wind direction (96%) was the main factor used by PBAs when preparing a smoke management plan. This was followed by transport wind speed (48%) and category day (45%). In Oklahoma, where a web-based statewide smoke dispersion model is available, 50% of PBAs indicated that members always used it for smoke management planning.

SUMMARY

This survey provides a summary of the activity, needs, concerns and safety record of prescribed burn associations across the Great Plains. The survey shows many PBAs are very active, but others still face many constraints that limit burning activity. Their stated needs are given in this survey, with the top three including training, means of limiting liability (e.g. insurance), and recruitment of new members. In addition, the safety record of PBAs indicates they provide a safe and viable option for landowners and managers who use or would like to use prescribed fire on their lands.



Cross Timbers Prescribed Burn Association (Oklahoma) members patrolling the fire line on a burn. From the survey PBAs conducted 1,094 burns on 472,235 acres. Photo by Verlin Hart.

Furthermore, PBAs are continuing to grow in popularity. When this survey was conducted in 2012 there were 50 known PBAs in seven states, currently (2015) there are 62 PBAs in eight states, along with three statewide burn association alliances and a regional alliance. For more information and an interactive map of PBA locations visit : <http://www.gpfirescience.org/fire-organizations-agencies/>.

For information about PBAs in various states visit the following sites:

- ◆ Oklahoma Prescribed Burn Association www.ok-pba.org
- ◆ Prescribed Burn Alliance of Texas www.pbatexas.org
- ◆ Kansas Prescribed Fire Council <http://www.kglc.org/kansas-prescribed-fire-council/kansas-prescribed-burn-associations>
- ◆ Nebraska Prescribed Burn Associations <http://nebraskapf.com/habitat-programs/faq/>

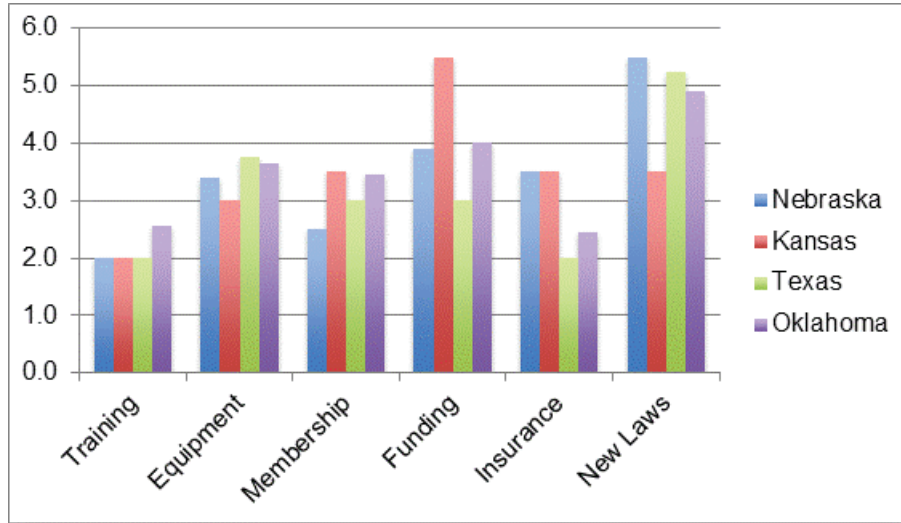


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For more information: www.GPfireScience.org

APPENDIX I. THE RANKED NEEDS AMONG PBAS BY STATE (1=MOST IMPORTANT; 6=LEAST IMPORTANT)



Note: It is important to recognize that inferential power to make comparisons across states is low, given the low respondent rate of Kansas and Texas PBAs (please refer to Table 1 for survey respondent rate).

Appendix II. Prescribed Burn Association Survey Questions.

Prescribed Burn Association Survey
Natural Resource Ecology and Management
Oklahoma State University



Prescribed Burn Association Survey 2012
Natural Resource Ecology and Management
Oklahoma State University

1. What is the name of the burn association?

2. In what state(s) and county or counties does the burn association operate in?

3. What year was the burn association formed?

4. Approximately how many total acres are owned, managed or leased by the membership of the burn association?

5. How many burns has the association conducted since it was formed?

6. Approximately how many acres has the association burned since it was formed?

7. Does the prescribed burn association currently have group insurance coverage?
Select one. Yes *No*

8. Has the burn association ever had group insurance coverage?
Select one. Yes *No*

9. Has the association received any grants or donations for equipment or training purposes? *Select one. Yes* *No* *If Yes, how much have you received?*

10. Rank the following needs of the burn association 1 through 6, with 1 being the most important:

| | | | |
|-----------|-----------|------------|---------|
| Training | Equipment | Membership | Funding |
| Insurance | New Laws | | |

11. On average how many association members assist on each burn?

12. How is the association membership notified of upcoming burns? *Please mark each one.*

| Notification Method | Always Used | Sometimes Used | Never Used | Don't Know |
|---------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Phone or call list | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | |
|---------|--------------------------|--------------------------|--------------------------|--------------------------|
| Email | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Website | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Flyer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Mail | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

13. Where do the association and its members get most of their information about conducting prescribed burns? *Please mark each one.*

| Assistance Provider | Always provides assistance | Sometimes provides assistance | Never provides assistance | Don't Know |
|----------------------------|----------------------------|-------------------------------|---------------------------|--------------------------|
| USDA-NRCS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| US Fish & Wildlife Service | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cooperative Extension | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| State Wildlife Agency | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| State Forestry | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| The Nature Conservancy | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Private Consultant | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Local Fire Department | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

14. Does your burn association require a written fire plan to be completed prior to each burn? *Select one. Yes* *No*

15. Where do members of the association get their fire plans from? *Please mark each one.*

| Fire Plans | Most Members | Some Members | No Members | Don't Know |
|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Write their own | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| USDA-NRCS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| US Fish & Wildlife Service | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cooperative Extension | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | |
|------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| State Wildlife Agency | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| State Forestry | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| The Nature Conservancy | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Private Consultant | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Local Fire Department | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

16. What type of training or experience do most of the members of the burn association have in regards to prescribed burning? *Please mark each one.*

| Prescribed Fire Training | Most Members | Some Members | No Members | Don't Know |
|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| None | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Prior burn experience | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Fire department training/experience | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| NWCG training (S130) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| University/extension training | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Agency training course | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Website training course | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| From reading books & other material | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

17. What type of firebreaks or fireguards is used on the association's burns? *Please mark each one.*

| Firebreak/Fireguard Type | Always Used | Sometimes Used | Never Used | Don't Know |
|---------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Bladed/Dozed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Disked | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Mowed-Wetline | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Roads | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Creeks/Rivers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Fireplow | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cultivated Fields | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Natural Barriers | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Pre-Burned Firebreaks | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

18. In which months of the year does the burn association conduct prescribed burns? *Please mark each one.*

| Month | Always Burn | Sometimes Burn | Never Burn | Don't Know |
|-----------|--------------------------|--------------------------|--------------------------|--------------------------|
| January | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| February | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| March | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| April | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| May | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| June | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| July | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| August | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| September | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| October | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| November | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| December | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

19. Does the burn association receive special exemption to conduct prescribed fires during burn bans? *Select one.* Yes No

If **Yes**, how many burns has the burn association conducted during a burn ban and on approximately how many acres?

20. What factors limit the number of burns conducted by the association each year? *Please mark each one.*

| Factors Limiting the Number of Burns | Very Limiting | Somewhat Limiting | Never Limiting | Don't Know |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Not enough burn days | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Burning only in one season of the year | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Drought | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Not enough fine fuel | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Not enough equipment | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Not enough labor | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Not enough funds | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Burn Bans | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| State Laws | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Smoke/Air Quality Issues | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Local Fire Officials | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

21. Do any of the following groups assist association members with the actual conducting of prescribed burns? *Please mark each one.*

| Assistance Provider | Always provides assistance | Sometimes provides assistance | Never provides assistance | Don't Know |
|---------------------|----------------------------|-------------------------------|---------------------------|--------------------------|
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | |
|------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| USDA-NRCS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| US FWS | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cooperative Extension | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| State Wildlife Agency | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| State Forestry | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| The Nature Conservancy | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Private Consultant | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Local Fire Department | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| University Personnel | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

22. What are the main sources of weather information used prior to conducting burns?
Please mark each one.

| Weather Source | Always Used | Sometimes Used | Never Used | Don't Know |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| National Weather Service Radio | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| National Weather Service Spot Forecast | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| National Weather Service Website | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Television Weather Channels | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Local Radio Station | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Local Television News | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other Weather Websites | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

23. Which of the following weather parameters are important to members of the burn association when conducting a prescribed fire? Please mark each one.

| Weather Parameter | Always Used | Sometimes Used | Never Used | Don't Know |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Temperature | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Wind Speed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Wind Direction | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | |
|-----------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Relative Humidity | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 1 Hour Fuel Moisture | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10 Hour Fuel Moisture | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Live Fuel Moisture | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Juniper/Cedar Leaf Moisture | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Keetch-Byram Drought Index (KBDI) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Previous Precipitation | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Soil Moisture | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

24. What goals and objective are prescribed burns conducted by the association? *Please mark each one.*

| Goal & Objective | Always | Occasionally | Never | Don't Know |
|---------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Kill established Cedar /Juniper | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Prevent Cedar /Juniper establishment | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Livestock Production | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Wildlife Management | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Maintaining existing rangeland/forest | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Restoring rangeland/forest | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Managing CRP or improved pastures | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

25. What type or types of volatile or highly flammable fuels are present on burns conducted by the association? *Please mark each one.*

| Volatile Fuel Type | Always Present | Occasionally Present | Never Present | Don't Know |
|----------------------------------|--------------------------|-----------------------------|--------------------------|--------------------------|
| Cedar /Juniper | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Mechanical treated cedar/juniper | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Cedar/Juniper piles | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other brush piles | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Volatile shrubs | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

26. What percent of the burns conducted by the association have volatile or highly flammable fuels present? *Mark the appropriate percent.*

0% 25% 50% 75% 100%

27. Has a spotfire occurred on any burns conducted by the association? (A spot fire is any fire ignition that occurs outside the burn unit no matter the source, but is extinguished by equipment and personnel at the burn)?

Select one. **Yes** **No**

If the answer is **Yes**, then approximately how many spotfires have occurred on association burns?

28. Has an escaped fire occurred on any burns conducted by the association? (An escaped fire is any fire that leaves the burn unit and cannot be immediately contained using the equipment and personnel at the burn)?

Select one. **Yes** **No**

If the answer was **Yes**, then approximately how many escaped fires have occurred on association burns?

29. Has the association had to call for assistance from local fire departments or other agencies on any escaped fires *Select one.* **Yes** **No**

If the answer is **Yes**, then how many times has the association had to call for the fire department or other agencies to assist with the suppression of an escaped fire?

30. What is the approximate size of the largest spotfire or escaped fire that has occurred on an association burn? acres

31. Has there been any litigation, lawsuits or insurance claims filed against the burn association or a member due to an escaped fire? *Select one* **Yes** **No**

If the answer is **Yes**, then how many?

32. What is the major cause of the spotfires or escaped fires while burning? *Please mark each one.*

| Cause of Spotfire/Escape | Main cause of fires to escape | Sometimes causes fires to escape | Never causes fires to escape | Don't Know |
|---------------------------------|--------------------------------------|---|-------------------------------------|--------------------------|
| Embers from cedar/juniper | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Hardwood leaf litter | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Fire or smoke whirls | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Embers from grass | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Brush piles in unit | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Improperly prepared firebreaks | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

33. Have there ever been any injuries on any of the association's burns?
Select one. Yes *No*

If the answer is **Yes**, then how many and what types of injuries have occurred?

34. Have there ever been any fatalities associated with any of the burns conducted by the association? *Select one. Yes* *No*

If the answer is **Yes**, then how many and what were the causes?

35. From the equipment list below mark the type of equipment used on most burns conducted by the association. *Please mark each one.*

| Equipment | Always Used | Sometimes Used | Never Used | Don't Know |
|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Weather Kit/Instrument | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Drip Torch | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Backpack pump | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| ATV Sprayer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Rake (Fire, leaf, council) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Shovel | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Swatter/Flapper | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Leaf Blower | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Chainsaw | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Slip-on Pumper Units | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Radios | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Road Signs | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| ATV (Four Wheelers) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

| | | | | |
|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| UTV (Gator,Mule,Ranger) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Equipment Trailer | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

List any other equipment that is frequently used that was not listed.

36. From the personal protective equipment (PPE) list below mark the type of PPE normally worn by personnel on each burn conducted by the association. *Please mark each one.*

| Personal Protective Equipment | Always Used | Sometimes Used | Never Used | Don't Know |
|-------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Flame Retardant Shirt | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Flame Retardant Pants | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Flame Retardant Coveralls | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Helmet | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Goggles/Safety Glasses | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Gloves | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Hearing Protection | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Fire Shelter | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

List any other PPE that is frequently used that was not listed.

37. Are members of the burn association concerned with smoke management issues when planning burns? *Select one.* Yes No

38. Which of the following smoke management planning items are used in preparing a smoke management plan? *Please mark each one.*

| Smoke Management Planning | Always Used | Sometimes Used | Never Used | Don't Know |
|--|--------------------------|--------------------------|--------------------------|--------------------------|
| Wind Direction | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Ventilation Rate | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Mixing Height | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Transport Wind Speed | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Category Day | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Smoke Trajectory Map | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Smoke Dispersion models, such as OK-Fire, KSFire | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Smoke Plume Trajectory models, such as V-Smoke | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| National Weather Service Air Quality Forecast Guidance | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Not Concerned with Smoke Issues | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

39. Do any of the local fire departments assist the association with conducting burns?
 Select one. Yes No

If the answer is **Yes**, then in what capacity do they assist? *Please mark each one.*

| Fire Department Assistance | Always | Sometimes | Never | Don't Know |
|---|--------------------------|--------------------------|--------------------------|--------------------------|
| Provides or assists with Training | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Provides personnel to assist on burns | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Provide equipment to assist on burns | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Provide technical advice or assistance | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Association must get fire department permission to burn | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |