

GPE publication 2015-08

Synthesis of elements of traditional fire knowledge

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INTRODUCTION

On nearly every continent, prior and current cultures have practiced land management using fire. Huffman calls the knowledge acquired by people “Traditional Fire Knowledge” (TFK), which consists of “fire-related knowledge, beliefs and practices that have been developed and applied on specific landscapes for specific purposes by long time inhabitants.” Huffman compiled studies describing fire practices of people in 27 countries across six continents over a broad timeframe to test her hypothesis that TFKs include common elements.

Huffman synthesized information from 35 studies, providing information about fire dependent cultures, including knowledge from historical societies and present day indigenous peoples. She also compared fire practices in these traditional fire cultures and how they differ from the way modern management uses fire.

FINDINGS

The studies revealed that a majority of cultures drew upon knowledge about fire effects on vegetation and animals, seasonality, fuel moisture, timing of rain or rainy season, fire breaks, plant and animal phenology and 62 other elements of TFK, when making decisions about using fire. There were very few TFK elements that appeared to be regionally specific. Out of 69 total elements of fire knowledge that Huffman compiled, 67 percent of those were found across four continents. This indicates that despite differences in location, latitude, and culture, fire dependent societies use many of the same TFK elements. Huffman also acknowledged that TFK was multifaceted with many cultures considering interactions between fire, fire elements and the environment.

There may be more comparisons in TFK across the studies than Huffman discovered in her 35 studies. However, extent of information depends on a researchers’ knowledge and scope of study, availability of historical records, and willingness of the people interviewed to share with outsiders.

Once Huffman determined that different cultures used similar specific fire knowledge, she organized the fire systems into three typology classifications. Agro-ecological class includes burning systems associated with agriculture. Within that class, Huffman proposed four fire knowledge types. The first, swidden (also known as slash and burn), refers to burning forested areas to create open space for cultivation. The second, arborist type, incorporates burning undergrowth to stimulate tree growth or fruit production. The third, tame pasture, uses fire to improve land for increasing forage and subsequent animal production. The final type uses fire to open native vegetation for a great range of uses, such as hunting, gathering, nomadic pastoralism or travel.

The second typology groups fire systems temporally into two divisions: pre-industrial and post-industrial. The pre-industrial group refers to traditional fire systems prominent prior to the industrial revolution, while the post-industrial type describes fire management, mostly consisting of fire suppression, as practiced after the industrial revolution.

The third typology Huffman identified categorizes current fire systems by their viability and stability.

- **Robust** — fire systems that have persisted in the culture and continue evolving. Aboriginal people in Australia provide a good example of this system, as they continue to use fire to manage land, and some of their methods are being incorporated into government policies.
- **Decline** — fire systems in which practitioners still use fire, but other forces are causing reduction of fire use.
- **Rejuvenation** — fire systems actively being recovered and shared.
- **Historical** — fire systems in which the TFK is preserved in written, graphical or anecdotal accounts.

Any of these categories can be described as narrowed or interrupted. For example, if a fire system begins to reassert itself after a period of cessation, it could be described as undergoing interrupted rejuvenation.

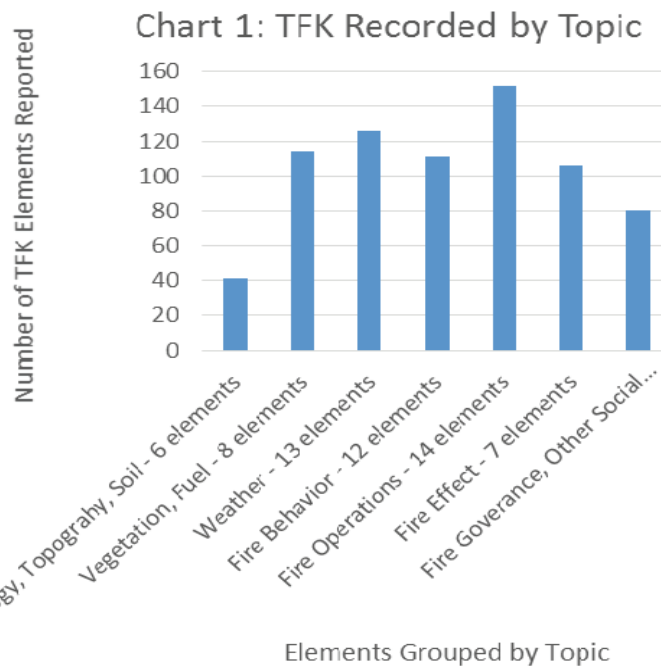
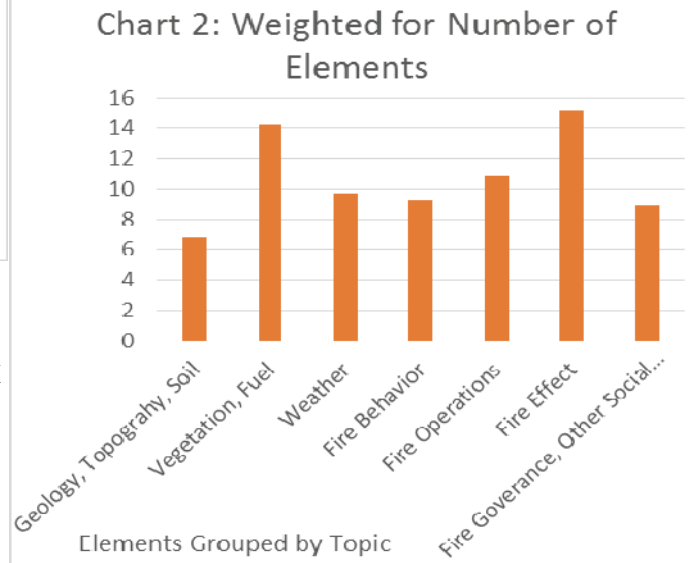


Chart 1 summarizes TFK from 35 studies with elements aggregated by topic. For example, Geology, Topography, Soil includes six elements: soil type/moisture, slope, geologic substrate/landform, elevation, aspect and soil temperature/frozen or thawed; these elements are recorded 41 times over the 35 studies. Although the three singular elements most commonly recorded are Fire Effects on Vegetation (33 studies), Season of the Year (32 studies) and Fire Effects on Animals (29 studies), the Fire Operations aggregate with its 14 elements appeared to receive the most attention. This is an artifact of the number of elements in Fire Operations.



Therefore, Chart 2 shows topics with the number of times each topic received attention in the studies as weighted by the number of elements within the topic. This demonstrates overall TFK frequency by general topic. Clearly, Fire Effects and Vegetation, Fuel are two topics with significant traditional fire knowledge. This is consistent with Fire Effects on Vegetation and Fire Effects on Animals being in the top three elements recorded. Season was an element aggregated into the Weather topic.

CONCLUSIONS

Huffman's synthesis offers a start at examining the multifaceted ways in which traditional practitioners manipulate variables to achieve their goals. Further study could address these strategies. Additional research might also address endemic aspects of TFK, how TFK evolves or co-evolves over time and the universality of TFK combinations. Finally, we need to understand the resilience of TFK systems, where climate change will influence the environment. Traditional peoples may find that the outcomes of historically used TFK differs as climate conditions change. When results differ from fire use goals, a clash of fire practitioners and government regulators may occur.

Adopting TFK elements could help reduce wildfire disasters especially in places where experts predict climate change to increase wildfire likelihood. Also, many countries try to use

modern technologies to control fire-dependent landscapes, but these attempts often do not address the source of the management problems, only the symptoms.

The Great Plains Fire Science Exchange has resources on fire knowledge at <http://GPFireScience.org>. We can also locate experts to address your questions.

REFERENCES

Huffman, M. R. 2013. The many elements of traditional fire knowledge: synthesis, classification, and aids to cross-cultural problem solving in fire-dependent systems around the world. *Ecology and Society* 18(4): 3.

For more information:

Web Address: <http://www.GPFireScience.org>