

Fire Preparedness Management Perspective Paper

Wildland Fire Management Science and Technology Coordination Workshop

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Overview of the Wildland Fire Preparedness:

Wildland fire preparedness includes all actions taken prior to wildland fire incidents to ensure that the fire response is adequate to meet an organization's response objectives. It means having the right resources in the right places at the right time to respond to a reported fire and then manage it within the constraints of the land management plan in order to achieve the desired resource objectives whether those are for resource protection or benefit. The current wildland fire preparedness policy began with the advent of the *1995 Federal Wildland Fire Policy*, continued to be refined with updates to and implementation guidance found in the *National Fire Plan*, the *10 Year Comprehensive Strategy*, and is maturing in the *National Cohesive Wildland Fire Management Strategy*, commonly known as *The Cohesive Strategy (CS)*. Wildland fire preparedness can now be described as a component of all three objectives of this strategy. Those three unified objectives are: Creating and maintaining resilient landscapes, creating fire adapted communities, and providing safe and effective response to wildland fires.

Wildland fire preparedness includes a variety of functions and components and all organizations with the need or capability to respond to wildland fires. Some examples of organizations that maintain wildland fire preparedness capability include; counties, cities, tribes, states, federal land management agencies, and the Department of Defense.

Some examples of components to wildland fire preparedness include: Tactical personnel, infrastructure, and equipment. Other preparedness components include preparedness plans, response plans, communications plans, fire management and land use plans, operating plans, operating agreements, cost share agreements, and partnership agreements. Training, qualifications, and mobilization standards exist in all preparedness organizations. Over time, these standards and elements of preparedness become more consistent and uniform. Various formal and informal coalitions of wildland fire response organizations at local, regional, and national levels function under established processes to maximize wildland fire preparedness effectiveness. An additional component of preparedness and supporting firefighters in wildfire response is the reduction of vegetation buildup through hazardous fuels treatment and vegetation management. Activities in fuels and vegetation management, unwanted fire prevention, and hazard mitigation all contribute to meeting the three goals of the Cohesive Strategy.

Another common theme emerging within the federal and state fire management organizations is the focus on human factors and the decision making characteristics of wildland fire responders. Although we have developed more focus on leadership and followership, overall health and fitness, we still have numerous gaps in understanding why people make the decisions they make. We do not always recognize how to best use available technology and science, frankly because so much of it exists and we do not seem to be able to inventory and strategically apply the technology or science as nimbly as we might hope. This Sub Committee on Disaster Reduction effort should assist us in organizing and applying more of our opportunities in science and technology development and application for the improvement of our wildland fire efforts.

Capabilities:

The federal land management agencies including the USDA Forest Service, and USDOJ Bureau of Land Management (BLM), the Bureau of Indian Affairs (BIA), the National Park Service (NPS), and the Fish and Wildlife Service (FWS) all have mature wildland fire preparedness programs. These programs are annually authorized funds from the Congress in the Interior and related Agencies Appropriations Acts. These preparedness organizations are structured at the local, regional, and national level and many are interagency in nature. Additionally, with the advent of the National Fire Plan, an expanded fuels management component was incorporated along with the response component. Typically the functions of wildland fire preparedness include:

- Budgeting for and hiring adequate numbers of personnel
- Training, qualifying, and maintaining tactical readiness of resources
- Contracting and acquisition of critical resources
- Maintaining adequate -infrastructure and facilities

The typical capacity of the USFS and DOI can be illustrated by the projected FY 2014 available resources which include “call when needed” are:

- 56 Incident Management Teams (IMTs)
- 460-20 person handcrews
- 460 smokejumpers
- 668 helicopters
- 101 airtankers including MAFFS
- 1,645 fire engines
- 416 other heavy equipment, and a total of over 13,947 firefighting personnel

These resources are managed throughout the nation at a local unit level and are mobilized by a national three tiered dispatch system. This system is designed with the first tier being the local dispatch unit. When situations exceed the capability of this local unit they are supported by the second tier Geographic Coordination Center (GACC) which can supplement resources from a regional perspective. There are total of 10 GACCs, if one GACC exceeds its capabilities it can

request assistance from other bordering GACCs. As activity increases all coordination is managed by the third tier coordination level by the National Interagency Coordination Center (NICC) in Boise, Idaho.

In addition to mobilizing personnel, local dispatch and GACCs manage a complex logistics system for the support of resources and wildland fire management. This requires intricate tracking and communications systems, reporting capabilities, a great deal of contracting, process structure, and maintenance.

The fire caches and warehousing systems are key components of this logistics machine. Caches are strategically placed to support the response activity. These caches supply everything from meals, to chainsaw kits, portable pumps, hand tools, complex radio kits, and weather and smoke monitoring stations. Other logistical items are provided by a standing, dynamic contracting system such as mobile food units, shower facilities, fire retardant, and even firefighting equipment and personnel. The status and ordering of all of these assets utilizes a system called ROSS (Resource Ordering Status System) that serves as a hub for the wildland fire mobilization system. This system is also linked to the IQCS (Incident Qualifications and Certification System) which serves the federal, tribal, and many of the states needs for incident qualifications validation.

Reporting and data management is another critical facet of all dispatch and coordination centers. Intelligence and predictive service capabilities and functions are present in all areas but vary in their effectiveness and are constrained by limited quantitative data available in a timely manner.

Successful wildland fire preparedness requires interoperability as well as interagency cooperation and collaboration. In order to achieve this goal, the National Wildfire Coordinating Group (NWCG) was formed. It is NWCGs direction to provide recommendations for a common set of guidelines which all members would adopt in order to provide a common management structure, consistent operational standards, common equipment typing, and equal training and qualifications for personnel. This group includes all the federal fire agencies as well as representation from the States and other partners with fire management responsibilities. It is a long standing partnership between the Department of the Interior, Forest Service, and State agencies to provide for the level of interoperability and coordination necessary for preparedness and response activities across the Nation. The NWCG develops, proposes and maintains approved standards, guidelines, training, and certification for interagency wildland fire operations.

While the wildland fire management effort is one that is shared well beyond the federal land management agencies, the variety of approaches to risk management, training, qualifications, mobilization, funding and other factors, the consistency of processes and solutions is much more

difficult outside of the federal land management agency arena. The basic missions and rule sets are often different. For the purposes of the SDR we must recognize that the evolution of the NWCG processes and standards are a work in progress. While increased alignment and integration of response capacity between, local, state, and federal responders is desired, many organizations do not feel empowered to compromise existing standards or values. That said, the vast capacity that exists between local, municipal, volunteer, state, and contracted response capacity is enormous but we've yet to successfully develop a model that informs where the wildland fire community should invest and allocate its limited resources. This capacity when coupled with the federal land management agency capacity is largely why we are as effective as we are with our response actions.

For Discussion: Gap Analysis

While significant energy and research has gone into wildland fire cause determination and the prevention of human caused fires, effective human caused ignition reduction has eluded us. While this portion of the workload does not cause most of our acreage or damage, it is the portion of the occurrence workload and risk that we can influence. It is recognized that reducing human caused ignitions can be done following three strategies (education, enforcement, and engineering) or combinations thereof or accept that response is the cost effective way to deal with them. It would be beneficial to assess the historical occurrence of human caused fires to evaluate the appropriate strategies to apply and examine a business model to include a return on investment consideration in modeling future response to human caused ignitions. The least understood strategy in reducing human caused fires is education and the associated social science and cultures that could help improve our success in this area.

For several decades the NWCG partners have found it necessary to host and manage weather data collection systems and weather data management systems for planning, fire danger and fire behavior predictions, and various other aspects of wildland fire program management. Currently, the federal land management agencies as well as the state foresters are maintaining networks of Remote Automated Weather Stations (RAWS) and subordinate data systems for a variety of reasons but largely to support the National Fire Danger Rating Systems (NFDRS) components and short and long term fire behavior predictions. With the awareness of recent scientific and technological advances such as gridded weather prediction capability, and the overall increases in weather impact awareness we might be closer to a time where the National Weather Council might have some consolidated approaches to weather data collection, modeling, forecasting and validation. We may be closer to a point where the wildland fire community becomes a principle customer of these products and not necessarily a host/supplier, this would allow us to focus in business areas where we do have the greater expertise.

For the past decade or so, the different branches of the military have been spending more energy on what can be described as human factors for various warfighting functions. These efforts are largely being taken to more effectively prepare the service member for the conditions and environment that they must contend with. We have come to a point in time where our exploration of leadership training and other human conditions, limitations, and factors are being recognized as a key component on how and why tactical choices are made in wildland fire response. Science and again possibly social science may help us more fully understand how the wildland firefighting culture and conditions affect decision making, stress, and employee safety.

There are numerous technological advances that have been applied to wildland firefighting, items from GPS tracking to wireless communications and information technology. Kevlar has helped protect our employees, and a better fire shelter has been developed and given recent shelter deployment events is being evaluated again. From vehicles, to personal protective gear, to the basics of providing food, water, and first aid, technology has improved our field conditions and functionality. Our gaps in the technology arena are only limited by what we don't know but constrained by the distribution of wildland fire resource across various jurisdictional entities with varying funding sources and the rapid deployment and demobilization of wildland fire resources as compared to other emergency and warfighting events. A synthesis of current wildland firefighting requirements and technology in use today may possibly be a logical next step.

Communications and information interoperability between local, tribal, state, and federal responders is still a work in progress and significant technological and process gaps exist.

Preparedness related decision support tools are abundant; most of them have a high degree of logic, have very useful functionality, and provide decision makers with excellent options. Although we can continuously improve on these tools, they do not replace the decision maker's need to make hard choices. Again potentially, the human factors exploration may yield insights in this area and how they balance environmental, social-political and economic considerations when making decisions. How do we help decision makers get to the best answer in preparedness program options in an agile and supportable way? One example is a decision support tool for agency administrators that coaches the preparedness and fire management decisions can be found in "*Decision making for wildfires: A guide for applying a risk management process at the incident level*"¹, published in the last year. The area of agency administrator decision making for wildland fire preparedness can use more emphasis including capturing key decisions along with the rationale to identify information gaps.

¹ Taber, Mary A.; Elenz, Lisa M.; Langowski, Paul G. 2013. Decision making for wildfires: A guide for applying a risk management process at the incident level. Gen. Tech. Rep. RMRS-GTR-298WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 59 p.

Challenges:

The wildland fire management relationships and processes are dynamic and continuously evolving. Several of the key challenges have developed when attempting to fully integrate all wildland fire response capability. A couple of those challenges include varying perception of acceptable risk versus values to be protected, fiscal limitations, an organization's basic mission, and an organization's priorities. Several key areas for solution to some of these challenges rest with the common support on a few basic principles such as "increased integration of local and municipal wildland fire response with tribal, state, and federal capability is desirable", "the transfer of wildland fire risk from one jurisdiction to another without clear and complete coordination is not acceptable", "land owners and land managers are responsible for reducing wildland fire risk on the property they own or manage to include hazardous fuels management, human caused fire prevention, and wildland fire hazard mitigation", "The protection of responder and human life is the number one priority in wildland fire response".

Key Challenge Areas Identified In the Cohesive Strategy National Action Plan:

Continued Expansion of the Wildland Urban Interface (WUI) in all Vegetation Types

Expansion of the WUI and all it entails – homes, citizens, transportation and power corridors and local economies -- continues to present a variety of challenges for all stakeholders, including land owners, business and commerce leaders, fire managers, tribes, and governments, in all three goal areas. Leaders must continually focus on making investments to protect life and property; but reducing risks to both WUI values and responders often comes at the expense of other values.

Changing Climate and the Effects on Wildland Fire Extent and Seasonality

Climate contributes to shaping vegetation/fuels regimes and, through weather, influences fire behavior. We are clearly seeing the impacts of a changing climate in the form of extended drought periods, longer fire seasons, vegetation more susceptible to insect infestation and mortality, all of which contribute to faster spreading, larger and more complex and costly incidents. Less clear are shifts in ignition probability, both through vegetation condition and potential changes in lightning and storm patterns.

Together, these impacts are challenging the fire community to provide increased annual coverage and response capability for a longer period of time, to maintain high initial attack success rate on faster growing fires, all while managing incidents of unprecedented size, duration and complexity. Understanding and anticipating trends in, and impacts from, climate change is necessary in order to most effectively manage changes in vegetation/fuels regimes and fire behavior and meet all three goals of the cohesive strategy.

Vegetation Stressed by Insects, Drought, Disease, Invasive Species and Legacy Management

Many of our nation's forests and rangelands have been adversely affected by a variety of factors, such as fire exclusion, droughts, insect infestations, invasive species and accumulations of hazardous vegetative fuels, resulting in stressed vegetation that is more susceptible to fire-induced mortality and less likely to regenerate in its previous form. Stand dynamics such as diversity, composition, age distribution and structure influence fire behavior, as well as the risk of other stressors.

All of these stressors are interconnected and influence each other, and all are influenced by climate and other factors. Drought influences disease and is influenced by climate; legacy management influences invasive species which can then influence insect infestation, all while being influenced by climate. Understanding stressors and the interactions among them, and managing to minimize their impacts, is necessary to effectively achieve desired healthy vegetation and wildlife habitat.

Species of Management Concern that are Disturbance Sensitive

Many species of concern are sensitive to fire-related disturbance. Managing fire's contribution to deteriorating habitat requires an understanding of species and habitat requirements and how these disturbances interact to affect them. Each species requires a uniquely tailored approach in order to improve their status.

Landowners, tribes, and managers are increasingly faced with more complex and wide-ranging species of concern, such as the Greater Sage-grouse. The imminent threat to the species in the Great Basin comes from fire which precipitates invasive species encroachment. This in turn results in a repeating and shortened cycle of fire occurrence and further enhances the spread of invasive species. To avoid further habitat degradation, action must be taken to change land use, effectively suppress fire as well as actively manage vegetation to include fuels treatment, post-fire stabilization, and habitat restoration actions. With continued development, changing climate, and other widespread stressors, other species of concern will require special management consideration on a multi-regional scale.