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Response to Wildland Fire Perspective Paper
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Overview of Wildland Fire Response:

The Department of the Interior[1] (DOI) and US Forest Service (USFS) wildland fire response is the application of preparedness efforts to comply with and support interagency federal fire policy including the *National Cohesive Wildland Fire Management Strategy* and other existing federal policy[2] as applied by respective fire and aviation program management and direction.

Response to wildland fires is based on ecological, social, and legal consequences of the fire outlined in a land/resource management plan (L/RMP). Each administrative unit – or – Fire Management Units (FMU) has unique characteristics and values-at-risk. The wildfire decisions made by agency administrators can affect human life, property, and values far outside the boundaries of their FMU in addition to the land base they manage. Each FMU operates under a L/RMP that provides direction to fire personnel so they can determine the best management response to an unplanned ignition. This includes ensuring when wildland fire fulfills its natural role of having beneficial outcomes in some pre-determined areas, and is suppressed in other areas where life, property and other values need to be protected.

The circumstances under which a fire occurs, the likely consequences on firefighter and public safety and welfare, the natural and cultural resources, and the values to be protected are all evaluated in order to determine the appropriate response to fire. The appropriate response is intended to safely manage wildland fires consistent with land and resource management objectives, community or economic factors and fire management direction while providing for public and firefighter safety. From the Cohesive Strategy: "Safe aggressive initial attack is often the best suppression strategy to keep unwanted wildfires small and costs down." The FMP will implement this strategy as part of a planned response to a wildfire, given the wildfire's potential behavior and values at risk.

Risk management is applied at all levels of wildfire decision making, from the tactical where individual firefighters on the ground face changing environmental conditions, to the strategic where national program leaders of the fire management agencies weigh limited budgets against

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[1] DOI fire response is managed by land management bureaus including Bureau of Indian Affairs (BIA), Bureau of Land Management (BLM), U.S. Fish and Wildlife Service (FWS), and National Park Service (NPS) managers. The Office of Wildland Fire (OWF) coordinates the Department's wildland fire program with other Federal and non-federal partners to establish policies and budgets that are consistent and within the bureaus' statutory authorities and constraints.

[2] Such as the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288, as amended), the Homeland Security Act of 2002 (Public Law 107-296), Homeland Security Presidential Directive (HSPD-5), Management of Domestic 15 Incidents, February 28, 2003, the National Response Framework (NRF), Presidential Policy Directive -8 (PPD-8), National Preparedness, March 30, 2011.

increasingly active fire seasons. The tools and processes used at each level differ in order to address variations in focus and scope, but the overarching processes and results reflect a unified approach to controlling and accepting risk for the purpose of meeting stated objectives. Emerging direction in the human safety community of wildland fire management describes risk management processes applicable at the tactical implementation (or Time-Sensitive) level through an Operational level, reflecting the incident organization and supervisory levels, up to the Planning level, which occurs during the daily incident planning cycle.

The National Incident Management System[3] (NIMS) identifies concepts and principles that standardize how to manage emergencies from preparedness to recovery regardless of their cause, size, location or complexity. This system was developed by wildland fire and has been adopted nationally at all levels of government for all kinds of incident management.

NIMS Resource Management[4] prescribes standardization of typing, inventorying, organizing, and tracking of resources[5]; Allows for effective sharing and integration of critical resources across jurisdictions; and Activating, Dispatching, and Deactivating those systems prior to, during, and after an incident. NIMS Command and Management enables effective and efficient incident management and coordination by providing a flexible, standardized incident management structure. This structure integrates three key organizational constructs Incident Command System (ICS), Multi-Agency Coordination System (MACS), and Public Information Systems (PIS). While all three provide standardization, ICS provides the organizational structure for how response (command) occurs, while MACS provides the organizational structure for how support (coordination) for response occurs. The PIS provides the processes, procedures, and a system for communicating timely, accurate, and accessible information related to an incident and typically transects command and coordination.

Capabilities:

Wildland Fire Response serves as a test of Wildland Fire Preparedness. A response typically occurs with Initial Attack as an authorized person (e.g., the duty officer, the Fire Management Officer (FMO) from the field, etc.) examines where the pre-identified values to be protected are at the greatest risk and makes the command decision to move suppression resources by placing requests for resources to a local initial attack Dispatch Center. The agency's fire management objectives, values at risk, and management response to wildland fires dictate the implementation

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[3] NIMS focuses on five key areas, or components: Preparedness, Communications and Information Management , Resource Management, Command and Management, Ongoing Management and Maintenance. NIMS Communications and Information Management builds on concepts of Common Operating Picture; Interoperability; and Reliability, Scalability, and Portability. o f response. Key NIMS Response areas are Communications and Information Management, Resource Management, Command and Management.

[4] In NIMS, Resource Management is the facilitative process of planning and communication to mobilize resources in an efficient and cost effective manner. During an incident, Resource Management is a finite process with a distinct beginning and ending specific to the needs of the particular incident.

[5] Resources in this context are firefighting resources (i.e., Crew, Engines, Aircraft, Personnel, Equipment, etc.)

of this process. Resource Management occurs at multiple levels of the dispatch and fire management function at the local, geographic, national levels[6].

Fire managers use the Wildland Fire Decision Support System (WFDSS) as part of a documentation process to evaluate management responses to wildfires that have exceeded Initial Attack, exceeded planned management capability, and are managed to achieve resource management objectives. A complexity analysis[7] is completed as part of the fire management process to determine the management level (Type) for the incident. ICS organizations are applied based on the size or complexity of the incident and/or based on the hazard environment created by the incident. If a fire escalates or deescalates in complexity, the modular capability of the ICS is adjusted in order ensure command personnel's qualifications are appropriate for that fire's complexity.

For Discussion: Gap Analysis:

Wildland fire response has not done a formal gap analysis with the exception of the Evolving Incident Management (EIM) and Management Efficiency Assessment of the Interagency Wildland Fire Dispatch and Related Services efforts.

Fire fighting has many risk factors associated with it such as the dynamic variability of climate, terrain, fuels and weather which often when coupled with human decision making results in injury or death. The formal decision making process for fire managers, resource specialists, and agency administrators in developing and communicating timely and sound risk management-based decisions for managing wildfires has been improved. At a tactical level however, the inability to establish a real-time Common Operating Picture continues to be a relevant breakdown in the human factors inherent in decision-making, situational awareness and leadership that sometimes result in firefighter injury or death.

Smoke exposure can jeopardize firefighter safety by directly impairing tactical and logistical activities as well as cognitive decision-making abilities. Smoke safety risks are not only posed to those directly fighting the fire but also overhead, support staff and base camp personnel and the

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[6] The National Wildfire Coordinating Group (NWCG) is a national group whose function is to provide leadership and establish, implement, maintain and communicate policy, standards, guidelines, and qualifications for wildland fire program management and support the National Incident Management System (NIMS) which establishes a single, comprehensive framework for the management of domestic incidents. The NWCG is made up of the USFS, BIA, BLM, FWS, and NPS; Intertribal Timber Council; This includes membership on the NMAC, determining national priorities, and allocating/reallocating incident resources; and wildland fire is the primary focus of the group however, the NWCG has established guidelines to define NWCG's role in the preparedness for, coordination of, and support to all-hazards incidents. U.S. Fire Administration (USFA); state forestry agencies through the National Association of State Foresters (NASF); and the International Association of Fire Chiefs. The, BLM, BIA, BLM, NPS, FWS, USFS NASF, and FEMA Directors at NIFC have written delegated authority from their respective agency heads to: Represent their agency on all matters related to wildland fire operations.

[7] "Incident complexity" is a characterization used to describe the level of difficulty, severity, or overall resistance that incident management personnel face while trying to manage an incident to a successful conclusion, or to manage one kind of incident compared to another kind. Determining Incident Complexity is a subjective process based on examining a combination of indicators, or factors. Common indicators may include the area (location) involved; threat to life, environment and property; political sensitivity, organizational complexity, jurisdictional boundaries, values at risk, and weather. Most indicators are common to all incidents, but some may be unique to a particular type of incident.

public downwind of the fire are also affected by fine particles and smoke. The only programmatic solution to mitigate this risk is communication and avoidance the latter of which is not always possible.

The ability to communicate among all parties – known as interoperability – is essential but is hampered because different public safety agencies operate on different radio frequencies or use incompatible communications equipment. The role technology plays in improving firefighting agencies' ability to communicate during wildland fires remains a problem.

The interagency fire management community has recognized challenges in the current model to recruit and retain personnel within the firefighter to fire manager spectrum. It is a widely held educated opinion that the current status quo is not sustainable given fire fighter demographics and numbers of qualified personnel. This includes the staffing of National Type 1 and Type 2 incident management teams. Preseason efforts provide medical screening and fitness testing for fire personnel, but there is no systematic approach to health monitoring during the fire season.

Challenges:

The physical environment in which wildland firefighting occurs is typically hot, smoky, dusty and steep.

Firefighters wear hardhats, fire-resistant clothing, gloves and heavy boots and carry 25-45 pounds of gear while they work 12-16 hour shifts. How do we train and provide experience to firefighters to make good decisions on fires? How do we transfer technology to the field in a simple way?

The application of boots-on-the-ground technology (GPS resource tracking, tactical UAS, airway filters, etc.) has potential to improve situational awareness or mitigate the impacts of the physical environment, however there is potential to increase the weight that a firefighter carries or add to the already stretched fire training workload

The ability to adjust response profiles based on current and prediction conditions does not exist today due to the length of time required to acquire real-time and forecasted environmental conditions (vegetation/fuels and weather). In addition, the most sensitive variable in the fire behavior model, wind, has the poorest models because of local terrain variation.

The balance that an agency administrator, fire management officer, or Incident Commander must make is between "doing all that they can" and cost controls while providing for the safety of firefighters and the public. For example, large flames from a fast moving wildfire are burning in the urban interface with many homes already in flames. It is politically incorrect for an air tanker to sit at the air base even though everyone in the decision loop knows the retardant will not be effective. Likely the decision, based on social and political considerations will be for the show that we're doing something and launch the air tankers to drop retardant, but not only does this expose pilots to unneeded and excessive risks, it wastes millions of dollars.

Widespread drought, fuels accumulation, cost containment, and resource availability limit the probability of success even in those situations where full suppression may be the desired strategy. This creates long-duration incidents in spite of the best efforts of fire managers.

Refer also the Key Challenge Areas in the Cohesive Strategy Action Plan
- Continued Expansion of the Wildland Urban Interface (WUI) and critical infrastructure (electric, gas and water transmission and transportation corridors but local and regional) supporting human habitation in all Vegetation Types
- Changing Climate and the Effects on Wildland Fire Extent and Seasonality
- Vegetation Stressed by Insects, Drought, Disease, Invasive Species and Legacy Management
- Species of Management Concern that are Disturbance Sensitive