# **Testimony**:

**Dr. Thomas Zimmerman**
President, International Association of Wildland Fire
Kuna, Idaho

**U.S. Senate Committee on Energy and Natural Resources**
**Hearing:** Opportunities to Improve the Organizational Response of the Federal Agencies in the Management of Wildland Fires
Seattle, Washington
August 27, 2015

Good Morning, I would like to thank Senators Cantwell and Barrasso and the Committee for the opportunity to appear here today and provide input to its Hearing on *Opportunities to Improve the Organizational Response of the Federal Agencies in the Management of Wildland Fires*.

My name is Thomas Zimmerman and I am here in the capacity of President and Chairman of the Board of the International Association of Wildland Fire (IAWF). I am also a member of the Association for Fire Ecology and the Society of American Foresters. I served in a variety of wildland fire management positions with the Bureau of Land Management, National Park Service, and most recently, the U.S Forest Service until 2012. Since retirement, I have been involved in natural resource consulting. My career spanned 40 years and included positions throughout the organization at all levels and in leadership positions at the field, state, regional, and national levels. I have also earned a Ph.D. Fire Science.

The topic of today's hearing is perfectly aligned with the vision and purpose of the IAWF and very important to both myself, and our membership. We are a non-profit, professional association representing members of the global wildland fire community. We were established 25 years ago and strive to:

- Facilitate communication and provide leadership for the wildland fire community.
- Promote a better understanding of wildland fire,
- Facilitate wildland fire management knowledge and education,
- Advance science and technology,
- *And build on the belief that an understanding of his dynamic force is vital for natural resource management, for firefighter safety, and for harmonious interaction between people and their environment.*

The unfolding of events during this year's fire season have bee truly unfortunate and tragic. It is with great sadness that we proceed knowing that all the firefighters that started this season will not be able to finish it. The heartbreaking loss of life we have recently witnessed brings emotions that are beyond description. Our hearts and prayers go out to all the families and friends of our fallen colleagues.

As the field of wildland fire management moves forward, it seems that the interrelated factors influencing it continue to add complexity. Fire occurrence and response now constitute a year-round activity; fire numbers are increasing; seasonal burning periods are extending; and response capabilities are heavily taxed. Whether it is fire environment properties or social, political, and ecological elements, the challenges of the fire management program continue to mount.

But on a number of fronts, we should consider ourselves well positioned to move into the future. Wildland fire management as a professional land management program has progressed greatly over the last century. Our knowledge of certain fire management areas such as the natural role of fire; fire behavior and fire effects; science, technology, and operational capabilities; policy dynamics; and management strategies and tactics has never been greater. We know that:

- Fire influences and initiates ecological and social processes,
- Fires will occur with differential fire behavior and differential patterns and cause differential effects,
- Vegetation and fuel complexes are changing,
- Human management of fire, regardless of objectives, has both intended and unintended influences on ecosystems,
- Climate change is and will continue to affect fire and ecosystem dynamics,
- Wildland–urban interface areas are enlarging,
- Social dynamics are having an increasing influence on fire management activities,
- Smoke management has become an important decision consideration,
- Managing resource values and sustaining fire dependent ecosystems is a critical goal, and
- Collaboration and communication are vital to planning and implementation.

Even so, the future of wildland fire management cannot be predicted with a high degree of reliability and there is little doubt that we have entered a very transformative time. The 2015 wildfire season is one of the most severe in recent years and serves as a case in point. To date, wildfires have burned more than 7.5 million acres -- more than double the number of acres burned last fire season -- destroying lives, homes and precious natural and cultural resources. In the face of this natural disaster, the Federal Government, working with states and local communities, and with international assistance, is mounting a full-force response. Unfortunately, wildfires continue to burn in the West, with little to no relief in sight for the immediate future, and the season is far from over.

The National Preparedness level remains at its highest state, and the National Multi-Agency Coordinating (NMAC) group is deploying a record number of Federal firefighting resources. In addition, two hundred soldiers from Fort Lewis, Washington, and international air and ground resources from Australia, Canada and New Zealand are bolstering our wildland firefighting resources.

It is easy for managers to highlight program elements where needs seem logical. Frequently identified areas include strategic thinking, budget levels, staffing and equipment levels, technology, information management, research, training, decision-making, management focus, and predicting the future. However, determining innovative solutions is difficult; resistance to change is hard to overcome, and precedence tends to push us to familiar ways of doing business. To meet future challenges, problems must be clearly defined, understood, and parceled into achievable divisions.

**Guiding Framework for Wildland Fire Management:** The framework of information, representing policy, strategic plans, and program reviews provides in-depth information and guidance to the wildland fire management program. This information frames program planning and implementation and carries far greater value than ever before. It allows for greater flexibility, keeps pace with a dynamic situation, and embodies the state of the knowledge, the state of the art, and latest science and technology.

- ***Wildland fire management policy.*** Fire policy has been quite responsive to changing situational dynamics. It has progressed to a point where decision-makers have more flexibility than at any previous time. Accepted strategies are more sophisticated and comprehensive and tactical spectrums fully support a wider range and multiple objectives. The current policy is adequate and remains consistent with the growing awareness that future program needs cannot be accomplished solely by a passive approach that places an over-reliance on past practices, processes, and applications.

  Two source documents describe the federal wildland fire management policy. These are:

  - 1995 Federal Wildland Fire Management Policy and Program Review: http://www.forestsandrangelands.gov/strategy/documents/foundational/1995_fed_wildland_fire_policy_program_report.pdf , and

  - 2009 Guidance for Implementation of Federal Wildland Fire Management Policy: https://www.nifc.gov/policies/policies_documents/GIFWFMP.pdf

  The 1995 policy document created a foundation still valid today and presents nine guiding principles, which include:

  - Firefighter and public safety is the first priority in every fire management activity.
  - The role of wildland fire as an essential ecological process and natural change agent will be incorporated into the planning process. Federal agency land and resource management plans set the objectives for the use and desired future condition of the various public lands.
  - Fire management plans; programs, and activities support land and resource management plans and their implementation.
  - Sound risk management is a foundation for all fire management activities. Risks and uncertainties relating to fire management activities must be understood, analyzed, communicated, and managed as they relate to the cost of either doing or not doing an activity. Net gains to the public benefit will be an important component of decisions.
  - Fire management program and activities are economically viable, based upon values to be protected, costs, and land and resource management objectives. Federal agency administrators are adjusting and reorganizing programs to reduce costs and increase efficiencies. As part of this process, investments in fire management activities must be evaluated against other agency programs in order to effectively accomplish the overall mission, set short- and long-term priorities, and clarify management accountability.
  - Fire management plans and activities-are based upon the best available science. Knowledge and experience are developed among all wildland fire management agencies. An active fire research program combined with interagency collaboration provides the means to make this available to all fire managers.
  - Fire management plans and activities incorporate public health and environmental quality considerations.
  - Federal, State, Tribal, and local interagency coordination and cooperation are essential. Increasing costs and smaller work forces require that public agencies pool their human resources to successfully deal with the ever-increasing and more complex fire management tasks. Full collaboration among Federal agencies and between the Federal agencies and State, local, and private entities results in a mobile fire management work force available to the full range of public needs.
  - Standardization of policies and procedures among Federal agencies is an ongoing objective. Consistency of plans and operations provides the fundamental platform upon which Federal

agencies can cooperate and integrate fire activities across agency boundaries and provide leadership for cooperation with State and local fire management organizations.
  - Good data and statistics are needed to support fire management decisions. Agencies must jointly establish an accurate, compatible, and accessible database of fire- and ecosystem-related data.

The 2009 fire policy document continued, expanded, and clarified the 1995 guiding principles.

- ***National Strategic Planning:*** National level strategic planning for wildland fire management has been intensively pursued over recent years. The National Cohesive Wildland Fire Management Strategy, completed in April 2014, (http://www.forestsandrangelands.gov/strategy/), accomplishes several important tasks. It establishes a national vision for wildland fire management, defines three national goals, describes the wildland fire challenges, identifies opportunities to reduce wildfire risks, and establishes national priorities focused on achieving the national goals.

  The Cohesive Strategy recognizes and accepts fire as a natural process necessary for the maintenance of many ecosystems, and endeavors to reduce conflicts between fire-prone landscapes and people. By considering the role of fire in the landscape, the ability of humans to plan for and adapt to living with fire, and the need to be prepared to respond to fire when it occurs, the Cohesive Strategy takes a holistic approach to the future of wildland fire management.

  The Cohesive Strategy presents a vision adopted by the Wildland Fire Leadership Council (WFLC) for the next century: ***To safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire.***

  To achieve this vision, the Cohesive Strategy identifies the necessary goals identified to be:

  - Restore and maintain landscapes:
  - Landscapes across all jurisdictions are resilient to fire related disturbances in accordance with management objectives.
  - Fire-adapted communities: Human populations and infrastructure can withstand a wildfire without loss of life and property.
  - Wildfire response: All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

  Early in the planning process, stakeholders collaboratively established the following guiding principles and core values for wildland fire management to guide fire and land management activities:

  - Reducing risk to firefighters and the public is the first priority in every fire management activity.
  - Sound risk management is the foundation for all management activities.
  - Actively manage the land to make it more resilient to disturbance, in accordance with management objectives.
  - Improve and sustain both community and individual responsibilities to prepare for, respond to, and recover from wildfire through capacity-building activities.
  - Rigorous wildfire prevention programs are supported across all jurisdictions.

- Wildland fire, as an essential ecological process and natural change agent, may be incorporated into the planning process and wildfire response.
- Fire management decisions are based on the best available science, knowledge, and experience, and used to evaluate risk versus gain.
- Local, state, tribal, and Federal agencies support one another with wildfire response, including engagement in collaborative planning and the decision-making processes that take into account all lands and recognize the interdependence and statutory responsibilities among jurisdictions.
- Where land and resource management objectives differ, prudent and safe actions must be taken through collaborative fire planning and suppression response to keep unwanted wildfires from spreading to adjacent jurisdictions.
- Safe aggressive initial attack is often the best suppression strategy to keep unwanted wildfires small and costs down.
- Fire management programs and activities are economically viable and commensurate with values to be protected, land and resource management objectives, and social and environmental quality considerations.

- ***National Wildland Fire Management Program Review and Strategic Risk Assessment:*** The 2014 Quadrennial Fire Review (QFR) (http://forestsandrangelands.gov/QFR/reports.shtml) Is the third iteration of a strategic risk assessment process initiated by the United States Department of Agriculture (USDA) and the Department of the Interior (DOI). It is a joint effort of the USDA Forest Service Fire & Aviation Management (FS-FAM) and the DOI Office of Wildland Fire (OWF), which coordinates the wildland fire management efforts of four DOI bureaus: the Bureau of Land Management (BLM), the National Park Service (NPS), the US Fish and Wildlife Service (FWS), and the Bureau of Indian Affairs (BIA).

  The 2014 QFR sought to identify and explore key wildland fire management issues in the United States; assess the efficacy of current policy, strategy, and programs in expected future environments; and present a set of related actions for consideration by federal wildland fire leaders at the FS and the DOI. A future-oriented mindset was integral to the process; a central aim of the QFR was to offer wildland fire leaders the opportunity to methodically analyze a set of alternative futures that could emerge over the next 10 to 20 years. The QFR links closely with the National Cohesive Wildland Fire Management Strategy Cohesive Strategy process. Whereas the Cohesive Strategy assesses the current situation and outlines actions to improve near-term effectiveness, the QFR looks 10 to 20 years forward to explore a range of plausible alternative futures, offers an analytical underpinning for the next Cohesive Strategy, and encourages present-day preparation for emerging change. The 2014 QFR process included a "baseline assessment" focused on four key issue areas (changing climatic conditions, risk management, workforce, and operational capabilities), development of four plausible alternative futures set in 2034 and related insights, and distillation of eight strategic-level conclusions and actions for consideration by fire leaders.

The current fire policy is far and away the most comprehensive and applicable policy fire management has ever had. The National Cohesive Strategy represents the single best strategic assessment completed for fire management, corresponds closely with the federal fire policy, and frames program needs perfectly described for this transformative time in program the fire environment evolution. The QFR provides a strategic look at program trajectory and offers a longer-term viewpoint framed in several different options. Several key commonalities are found in these framework documents. The importance of these areas is reflected in their continued

presence in guiding documents. They all speak to safety of firefighters and the public; sound risk management, the importance of science, a need to restore and maintain landscapes, and improving wildfire response.

**Risk Management:** Risk management is emerging as a prominent wildland fire management subject. The Federal Fire Policy and the National Cohesive Wildland Fire Management Strategy emphasize the value of risk management, and the US Forest Service has made clear its goal to become a risk management organization. Land and fire managers are increasingly asked to adopt risk management principles, to analyze and communicate risks, and to make risk-informed decisions. In addition, an improved understanding of human behavior - at individual, group and organizational levels – is vital to making fire management safer, more active, progressive, and adaptable. These are far-reaching topical areas that include, but are not limited to, firefighter and public safety, best practices in safety training and operations, safety related research, new approaches to safety, fire response, safety issues in wildland urban interfaces, training, equipment and technology, risk assessment, risk informed decision-making, high reliability organizations, sense-making, shared responsibility, preparedness, organizational discipline, organizational performance, organizational breakdown, decision making, communications, resilience, risk, decision support, community and homeowner fire protection and hazard mitigation, fire education, and social, economic, and political effects of fires.

The United States Forest Service, the largest wildland fire management organization in the United States, is progressively expanding its perspective that development and implementation of strategies to manage wildland fire that avoid ecosystem degradation and better account for firefighter and public safety in both the short term and the long term are critically important. Wildland fire management has expanded from a limited tactical and physical perspective to a more all-inclusive approach that includes attention to risk management, human dimensions, and decision making that support and improve organizational performance, safety, and accomplishment of social, political, and ecological objectives.

Risk is not only associated with the human factors but also with ecological concerns. Many wildland ecosystems are at risk of damaging wildfire, invasive species, habitat fragmentation, and other disturbance agents. The long-term risk of short-term inaction is high and mitigation is necessary in the form of fuel treatment, vegetation management, prescribed fire, and the use of wildland fire.

Risk assessment tools useful for decision support are increasing. Science and technology products are emerging at much faster rates than ever before and incorporation of new tools is rapidly expanding management capabilities. The 2009 federal fire policy implementation guidance recommended the incorporation of science and technology and specifically advocated for advanced decision support products. One such product, the Wildland Fire Decision Support System, has been adopted and used for decision support and documentation on thousands of fires (see attached briefing paper).

**August 25, 2015**

## Wildland Fire Decision Support System (WFDSS)

**Background:** The Wildland Fire Decision Support System (WFDSS) system was developed to assist line officers, fire managers and analysts in managing wildland fire incidents. It is intended to streamline and improve wildland fire decision-making.

WFDSS supports risk-informed decision-making by providing access to data and incorporating improvements in technology, fire modeling capability, and geospatial analysis into a web based scalable system. This system provides a location to document decisions, supports analysis, and facilitates completion of operational plans. It utilizes fire behavior modeling, fire weather information, economic principles, and information technology to support effective wildland fire decisions consistent with Land and Resource Management Plans and Fire Management Plans.

Advantages of WFDSS over previous systems include:

- Use of fire management strategic objectives from land, resource, and fire management plans and intelligence such as fuel conditions, fire danger and weather analysis, fire history, fire behavior projections, probability of fire reaching a point of interest, inventory of values to be protected, stratified cost index, relative risk and organization assessment.
- It is linear, scalable, progressive, and responsive to fire complexity.
- It is spatially oriented, graphically displayed, with no reliance on large text input requirements.

Characteristics of WFDSS:

- Managers begin the decision process at fire discovery.
- Managers can view land management objectives tied to geospatial references and utilize risk assessment outputs accessible to all interested parties through a web-based system.
- Risk assessment information includes weather data and forecasts, fire danger information, fire behavior predictive and smoke modeling tools, economic assessments, relative risk rating, and landscape value inventories.
- A wide variety of spatial information products and models have been integrated into WFDSS with a map based user interface, and include:
  - LANDFIRE spatial fuels data,
  - National Weather Service forecasts and outlooks, along with climate and fire danger from the Weather Information Management System,
  - USGS and Google Map products,
  - Fire Spread Probability (FSPro) spread simulation probability and fire behavior products
  - Basic, Short Term, and Near Term fire behavior models
  - Stratified Cost Index (SCI)
  - Values Information & Values at Risk products,
  - Natural resource management spatial themes,
  - Local unit spatial fire planning spatial data,
  - Estimated ground evacuation spatial data.

Development for FY2015 incorporated input from a user centered design review that resulted in an intuitive simple decision editor. There was also security maintenance, hardware migrations and continued focus on system reliability relating to spatial and data aspects which made the application more robust.

Although future improvements to the system are uncertain, routine maintenance and system reliability fixes will take place over time. Potential development includes increased information for use in risk assessment and firefighter exposure determinations, updates to the fire behavior models, and automation of reporting requirements. These improvements are not all-inclusive or approved but are being considered at this time.

**Use of WFDSS:** Since WFDSS delivery in April of 2009 there have been 90,763 wildland fire incidents entered into the system while calendar year 2015 has seen 14,792 incidents entered as of August 25, 2015. All five Federal wildland fire management agencies, State organizations, Tribes, and Alaska Native Corporations are represented in these figures. WFDSS is now integrated with iRWIn (Integrated Reporting of Wildland-Fire Information). WFDSS sends and receives data through iRWIn, reducing duplicative data entry for field users. Sharing data amongst fire applications is improving the accuracy and quality of the data.

**Management Implications:** This decision support system increases access to information which leads to improved science based and risk informed decision-making. It presents a consistent decision documentation and analysis system that allows managers of all agencies to work through an identical process, it is useful across jurisdictional boundaries, and is supportive of individual agency objectives and needs. Its scalability and flexibility allows decision documentation, planning, and analysis activities to match incident complexity and duration. These features may improve natural and community resource protection, management response effectiveness, use of firefighting resources, and potentially reduce firefighter exposure and suppression costs.

**Websites for Additional Information**
WFM RD&A Website – www.wfmrda.nwcg.gov
WFDSS Website – https://wfdss.usgs.gov
WFDSS Overview - http://wfdss.usgs.gov/wfdss/pdfs/wfdss_overview%2002_02_15.pdf

**Budget:** The IAWF enthusiastically surges the Committee to work across party lines to reform how the nation budgets for wildfires. Each year continues to bear out that complexity of the social, political and ecological factors influencing the fire environment, fire planning, and operational activities is increasing. To meet the requirements and needs of all of these elements, it is bluntly obvious that the cost of business is increasing. As fire managers in the field face the complexities of managing wildland fire, the Department of the Interior and U.S. Forest Service continue to struggle with the existing budget process used by Congress to fund fire suppression activities. Currently, the budget for wildland fire uses a ten-year average of fire suppression costs. In a peak fire season with catastrophic fires, if the available suppression funding falls short, the agencies are forced to move funds from other programs ("fire borrowing") to meet the increased wildfire suppression costs. This undermines other important programs, including critically important forest and rangeland management and fire risk reduction activities.

We support a budget process that will solve the fire budget problem and provide additional capacity for the agencies to invest in forest and rangeland restoration making landscapes less vulnerable and more resilient to fire. We have actively supported earlier efforts for wildfire disaster funding and believe that such funding should initiate before 100 percent of the 10-year average suppression costs are spent. This will permit more flexibility and minimize adverse impacts of fire transfers on the budgets of other fire and non-fire programs. A budget neutral process is needed that would allow natural resource management agencies to budget for wildfires in the same manner as other natural disasters.

Opportunities to enhance fuels management and restoration work make lands more resilient to fire, reduce the risks to the public and firefighters, and can support long-term reductions in suppression costs. Fire resilient lands and communities mean that both can withstand the effects of the fire without significant loss of life, property or ecosystems. Fuel treatment, vegetation management, and restoration activities remain a significant need and accomplishments must be increased.

To summarize, while we believe that much time could be devoted to advocating for budget increases, we appreciate the reality of budgetary increases. So, other ways to capitalize on opportunities to improve the organizational response of the federal agencies to the management of wildland fires must be pursued. As stated above, policy and guiding documentation is at its best level and affords the agencies strong opportunities. Agencies must be supported and allowed to implement the program within these guidelines. Risk management, as identified throughout the fire policy, National Cohesive Strategy, and QFR, should be adopted as a principal component of base fire management. Risk-based decision-making can reduce firefighter and equipment exposure, support response activities, and serve the greater good over the long-term. It was recently stated that what is viewed as the current fire problem is, in reality, a land management problem. We have long-term needs to reduce fuels, re-introduce fire into ecosystems, harden communities, strengthen response capabilities, and realize the full spectrum of opportunities afforded by the guiding framework, a risk management approach, and complementary rather than restrictive budget processes. A well-planned course can make substantial and well-needed differences in the fire situation. Short-term fixes are unlikely and long-term patience and commitment is necessary from society in order to effect needed changes.

Thank you again for this opportunity and your time today.