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**INSTRUCTOR:**

**LESSON:** 9 - Wildland Fire Decision Support System Overview

**COURSE:** S-590 – Advanced Fire Behavior Interpretation

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**Emphasis: introduce concepts of WFDSS decision support and available models and tools that could assist in informing managers of risk associated with various decisions.**

**OBJECTIVES:**

Upon completion of this lesson, participants will be able to:

1. Describe the Wildland Fire Decision Support System (WFDSS).
2. Identify the support tools and when they might be used in developing decisions and implementation actions.
3. Identify the student role in providing information for WFDSS and how it will be documented.

**I. INTRODUCTION**

WFDSS is designed to establish a process for documenting strategic decisions, provides decision support, and facilitating developing of short and long-term management plans. The WFDSS process is linear, scalable, and progressively responsive to changing fire complexity and provides a consistent decision analysis and documentation process for all types of wildland fires. WFDSS provides a platform for risk-informed decision-making.

Documentation and analysis of wildland fire management decisions has been required by federal agency policy for nearly 30 years. The 2009 Policy Implementation Guidance requires-

“Managers will use a decision support process to guide and document wildfire decisions. The process will provide situational assessment, analyze hazards and risk, define implementation actions, and document decisions and rationale for those decisions.”

The Wildland Fire Decision Support System (WFDSS) has been developed to meet this need. The Forest Service (FS), Fish and Wildlife Service (FWS), and Bureau of Indian Affairs (BIA) enter all fires into WFDSS, regardless of size. National Park Service (NPS) and Bureau of Land Management (BLM) enter fires into WFDSS only when it escapes initial attack. At 98% initial attack success, there may not be a lot of need for analysis to inform decisions. However as incidents escape initial attack or are managed for multiple objectives more analysis is needed to inform the decision.

Decision making is best accomplished when the maximum amount of information is available regarding the decision and its implications. While there are different approaches to decision making, there are also different types of decision support information. Decision support can be multi-dimensional, subjective or objective, qualitative or quantitative.

Decision-making associated with managing wildland fire can have critical impacts. It is important to make the highest quality informed decisions possible. Decision-making is facilitated by factual information and prediction of the range of outcomes and associated consequences of the decision.

## II. WHAT IS WFDSS?

WFDSS is designed to be consistent with accepted models of risk-informed decision making and to present a risk characterization to support decision making for wildland fire management. The goal of risk characterization is to describe risk, in terms of values, hazards, and probability in a decision-relevant manner, addressing the most significant concerns surrounding the incident, and making this information as intuitive, logical, relevant, understandable, and accessible as possible. To accomplish this, WFDSS maximizes the use of appropriately-based deliberation as well as analysis. It is an iterative, information-goal directed process.

- **Risk-informed decision making** - requires two distinct but linked processes:
  - **Analysis:**
    - Rigorous, replicable methods to provide information about factual questions.
    - Brings new information into the process – **informs deliberation.**
  - **Deliberation:**
    - Discussion, reflection, and persuasion to communicate, raise, and collectively consider issues, increase understanding, and facilitate substantive decisions.
    - Brings new insights, questions, and problem formulations – **frames analysis.**

Examples of decision making at this level involve developing a strategic alternative and objectives for a wildfire incident; consider a range of values, hazards and probabilities and focus on longer time periods. They are usually completed at least once, but may require revision, adjustment or a completely new decision as the incident evolves and conditions change.

### III. WILDLAND FIRE DECISION SUPPORT TOOLS

WFDSS is designed to include models and tools to analyze and assess the incident. The outputs can then be used to support the WFDSS decision.

#### Models in WFDSS

- Automated Basic (BASIC\*)
- Automated Short Term Fire Behavior (STFB\*)
- Analyst Assisted Basic (BASIC)
- Analyst Assisted Short Term Fire Behavior (STFB)
- Near Term Fire Behavior (NTFB)
- Fire Spread Probability (FSPro)
- Stratified Cost Index (SCI)
- Wildland Fire Air Quality Tools Smoke Models\*\*

Models in WFDSS automatically pull in weather, landscape and fuel moisture data. The modeler can calibrate the LANDFIRE data for all models, except the Automated BASIC and Automated STFB. An overview of the spatial fire behavior tools and how they can be used can be found in handout 1 (HO-1-9 FB Tool) As a FBAN/LTAN you may be asked to run or verify the inputs for the various models within WFDSS. These models should be used to support decision making and are often incorporated in to the decision documentation.

\*\*Review Handout HO-02-9 for more information on various smoke models available at Wildland Fire Air Quality Tools: <http://firesmoke.us/wfdss/>

#### Tools in WFDSS

- Wildland Fire Risk & Complexity Assessment
- Values Inventory
- KMZ downloads
  - Incident KMZ
  - Analysis KMZ
  - Pending Incident KMZ
- Map Capture
- Fire Danger Graphs
- Weather forecasts

You may also be asked to complete or verify inputs for the various tools such as the Relative Risk and Operational Needs Assessment.

## Map Pages: Situation & Analysis

WFDSS has a Situation map and an Analysis map which function similarly. Things you can do:

- Download shapefiles for modeling\*\*\*
- Upload shapes for modeling-ignition, barrier, landscape mask\*\*\*
- Draw shapes for modeling- ignition, barrier, landscape mask \*\*\*
- Draw an Extent for your analysis
- Query underlying LANDFIRE data
- View values
- View Fire Danger Rating Graphs
- View Fire Weather Forecasts
- View Smoke Dispersion
- Map Capture for decision support

Situation Map only:

- Run Automated BASIC and Automated STFB models

Analysis tab only:

- View Landscape
- Edit Landscape

\*\*\*See "[About Shapes](http://wfdss.usgs.gov/wfdss_help/WFDSSHelp_About_Shapes.html)" in WFDSS help for more detail about drawing, uploading and downloading shapes: [http://wfdss.usgs.gov/wfdss\\_help/WFDSSHelp\\_About\\_Shapes.html](http://wfdss.usgs.gov/wfdss_help/WFDSSHelp_About_Shapes.html)

## IV. YOUR ROLE IN WFDSS

As an FBAN or LTAN you may be asked to use any of the models and tools listed above to support the decision process. Knowledge and understanding of these models will be critical. Continual growth and learning throughout your career to stay abreast of how tools have changed, how they are interfacing with WFDSS, and how your products might be incorporated in decision documents will be a necessity.

### Roles in WFDSS:

Various user roles have been established in WFDSS to clarify responsibilities, set levels of operability, and maintain order amongst a vast multitude of users. Go to the [WFDSS website](#) to determine all roles available. These roles are applicable to you and your training.

#### Fire Behavior Specialist:

- Formerly the FSPro Analyst role, but the name change reflects additional fire behavior tools available in WFDSS. Users requesting this role should have previous fire behavior modeling experience, including evaluating and modifying landscape files, historic climate, and forecasted weather.
- Conduct "supervised" fire behavior analyses and modify inputs as needed.
- Accept (or reject) the results of the fire behavior analyses.
- Grant privileges to other specialists for analyses they have created.
- Interpret fire behavior analyses for other users.

**Super Analyst:**

- Has maximum analysis authority, provides coaching and training to other analysts.
- Run, edit, and accept all types of analyses.

**What you might be asked to do in support of a WFDSS decision:**

As a practicing FBAN or LTAN you may be asked to assist managers in assessing the following to support the WFDSS process and managing a wildland fire. For recommendations on which tool might be used to answer various fire behavior questions, Review HO-01-9.

- Produce a Fire Behavior Narrative Report to inform/support/include in the WFDSS decision.
- Communicate and inform Agency Administrators (AA) and the Incident Management Team (IMT) of current/predicted fire behavior and growth.
- Answer impromptu inquiries from the IMT and AA.
- Indications of how the fire may burn; predictions of intensity and severity,
- Fuel conditions, moisture conditions, departures from average conditions,
- Fire dynamics - indicators of potential rapid escalation in fire behavior,
- Analysis of fire danger indicators, comparison with historic records,
- Fire history reviews, records of past fires in terms of area burned and type of fires (i.e., low - moderate intensity, surface fire, stand replacement, etc.),
- Probability or timing of the fire reaching a planning area boundary or critical site,
- Probability of a season-ending weather event,
- Indications of where the fire may spread or total area that may be burned,
- How fast the fire will travel,
- Predictions of the range of potential fire effects on natural and cultural resources,
- Projections of values to be protected in the proximity of the fire,
- Identification of primary resource values to be protected and/or at risk by ongoing large fire events.
- Probability of where the fire will spread.

**The following lists are some but not all examples of what you might provide:**

- Fire Behavior Summary
  - Current,
  - Expected
- Fuels (description of what the fire is currently burning in and going to burn),
- Weather Narrative,
- Wind Analysis,
- Season severity assessment,
  - Weather Conditions & Drought: Discussion and Prognosis
- Long Term Risk Assessment,
  - Long-Term Fire Behavior, Fire Weather & Risk Assessment
- Smoke dispersion and effects,
- Probability of Season Ending Event,
- Fire Behavior Narrative addressing above listed questions.

In some cases the LTAN and/or FBAN may work in close contact and in conjunction with a Strategic Operational Planner (SOPL) and other specialists supporting long term fire behavior analyses.

For recommendations for including risk and fire behavior assessment information in a decision, review HO-03-9.

## **V. SUMMARY**

Management of wildland fire represents one of the most complex and highest risk activities in land management. Decision support and its contributions to decision-making are vital to fire management success. Decision support tools range from subjective information to quantitative long-term analysis processes and provide information to decision-makers. These tools and processes incorporate science and technology to permit decision making based on the best available information.

Decision support gives managers the ability to reduce the amount of uncertainty surrounding the fire, understand the amount of difficulty that could be encountered during management and possible outcomes, develop management strategies and operational tactics and provide a common understanding and clearer explanation of the situation.

Your input to and understanding of the in the decision analysis can be key in the success of managing an incident and providing for firefighter safety.

## **VI. REVIEW**

A. Questions

B. Review Objectives and Close