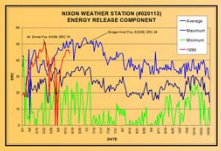
This refresher information is based on the Wildland Fire Decision Support System (WFDSS) lessons taught at various Fire Management Leadership training courses. It is assumed that there is a basic understanding of WFDSS and does not go through the WFDSS tabs and basic processes. It is intended to review the risk processes, the areas in the application where Line Officers should spend time understanding or addressing the information, and how the tools can assist in decision making.

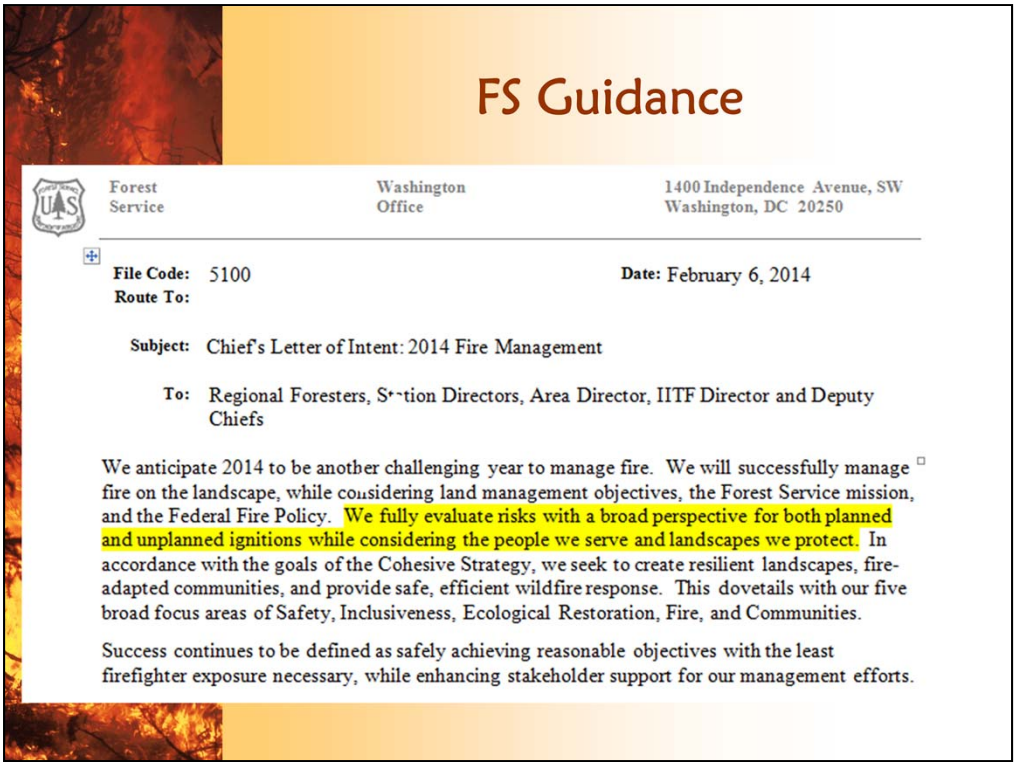


Objectives

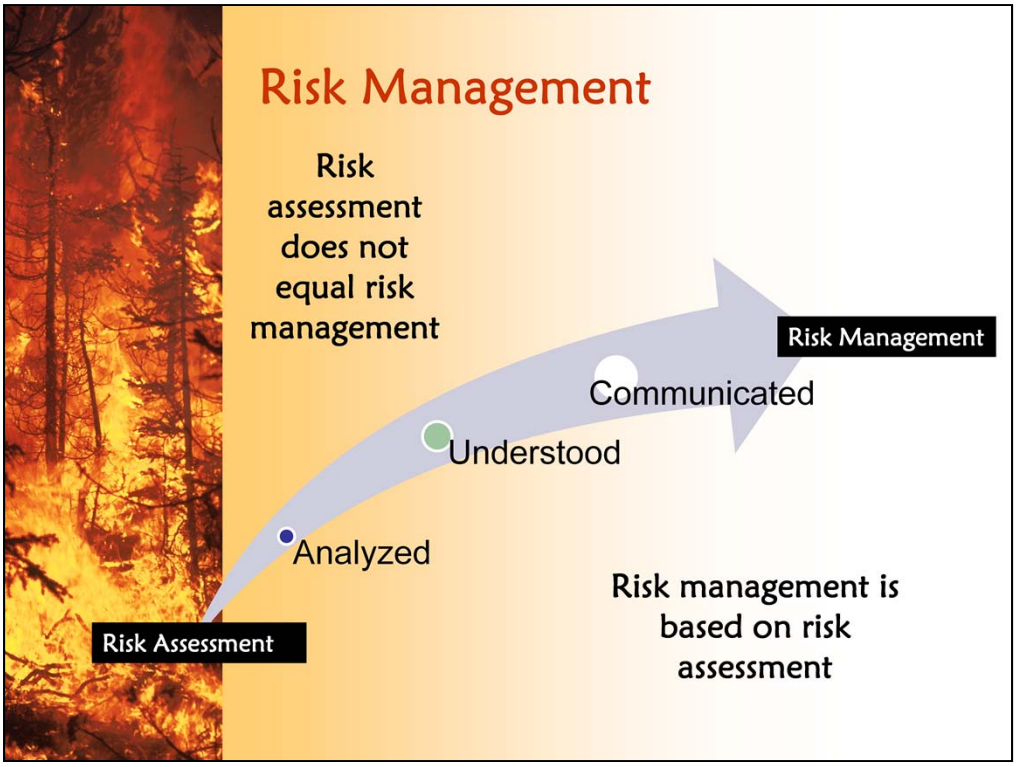
- Briefly review the risk management process and WFDSS.
- Discuss the most important aspects for Line Officers to be familiar.
- Discuss the decision support tools and how they can help inform decisions.
- Open forum – question & answer.

Policy Guiding Principles

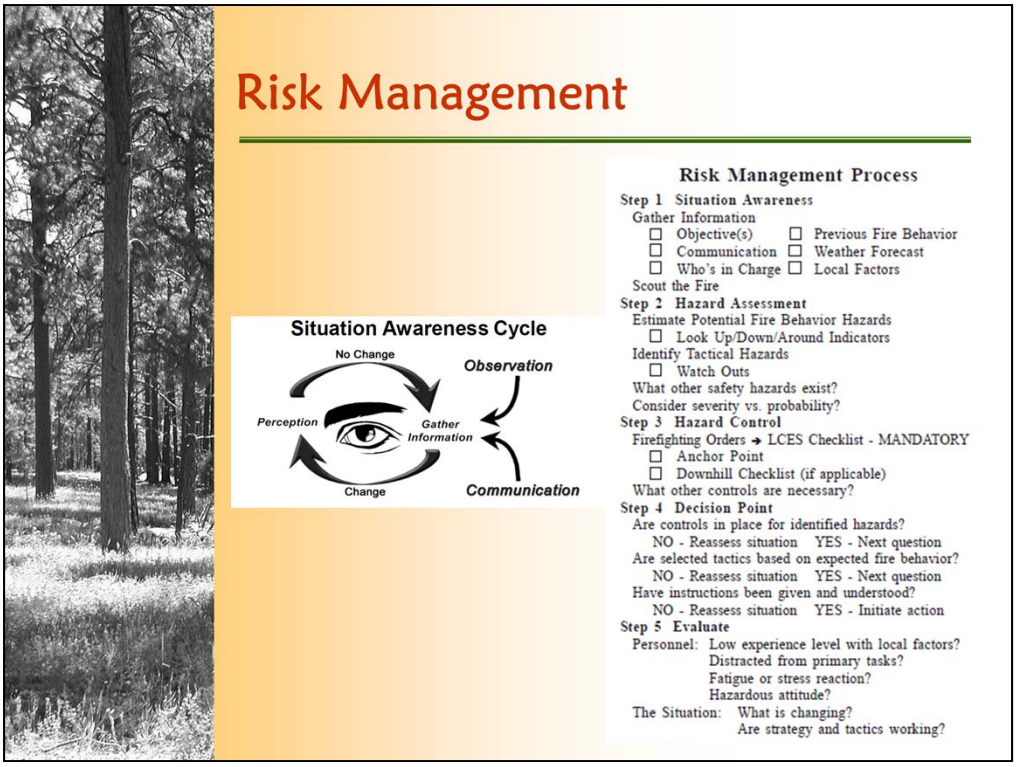
Sound risk management is a foundation for all fire management activities.



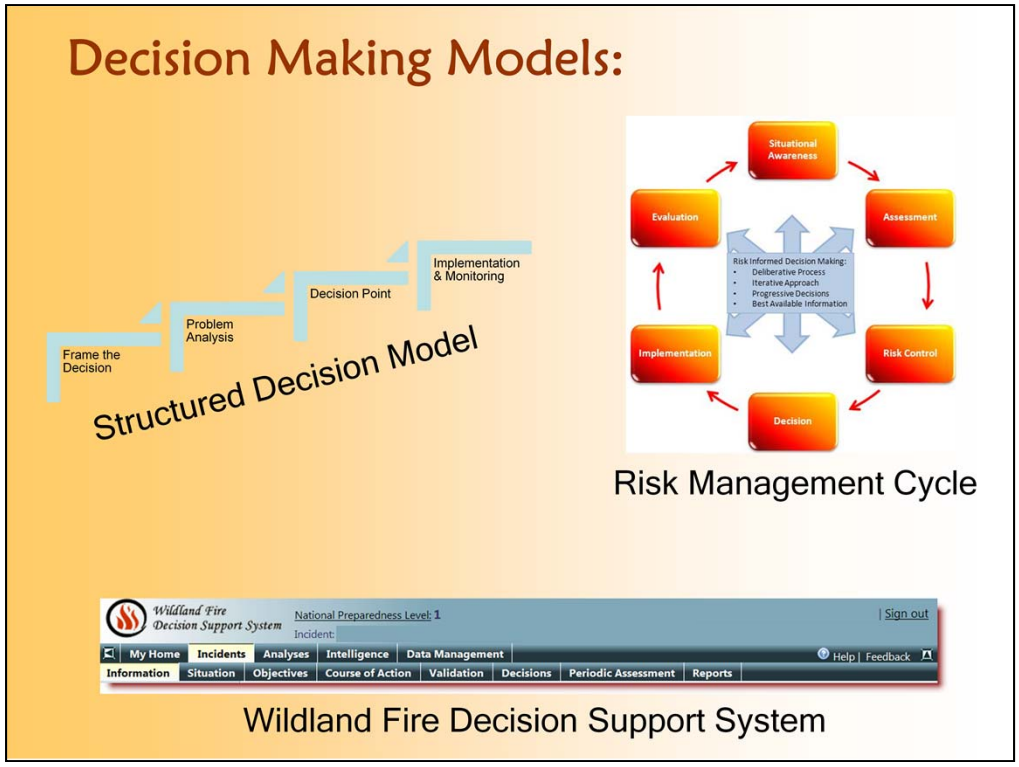
The Forest Service has emphasized risk management for planned and unplanned ignitions with the Chief's Letter of Intent for 2014. The Interior Bureaus have similar direction that aligns with our guiding principles and is emphasized.



Risk assessment does not equal risk management. One must assess the values, hazards and probabilities to determine the risks of the fire affecting the values. From this analysis and understanding the risks can be mitigated or managed.



Risk management is occurring continually at all levels. Field personnel maintain situation awareness that provides input to their risk management process. Just as it is not a one time process for fire personnel, it is not a one time process for managing fires or at the strategic level.



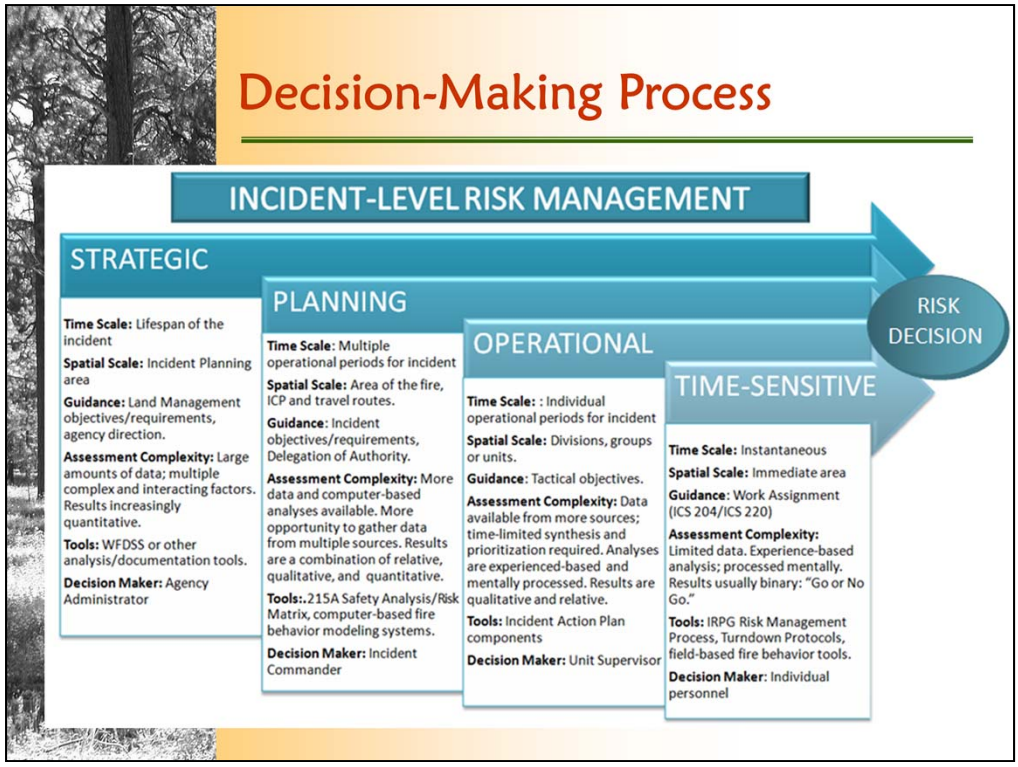
There are three different decision making models shown - the Basic Structured Decision Model, the Risk Management Cycle, or the Wildland Fire Decision Support System. They are all using very similar processes, just utilizing different steps in evaluating and managing the risks and benefits. Essentially in all of them you identify a problem, analyze and assess that problem, develop mitigations or identify benefits, make a decision and document that decision. Then continually re-evaluate that decision and adjust utilizing the feedback. This again, is similar to the processes used by firefighters in their risk management process.

The Structured Decision Model is a basic model for decision making. Although similar to the other two models shown here this defines the process very simply with only four steps. Typically in wildland fire management we see the steps broken out further such as with the Risk Management Process firefighters use or the Risk Management Cycle and WFDSS.

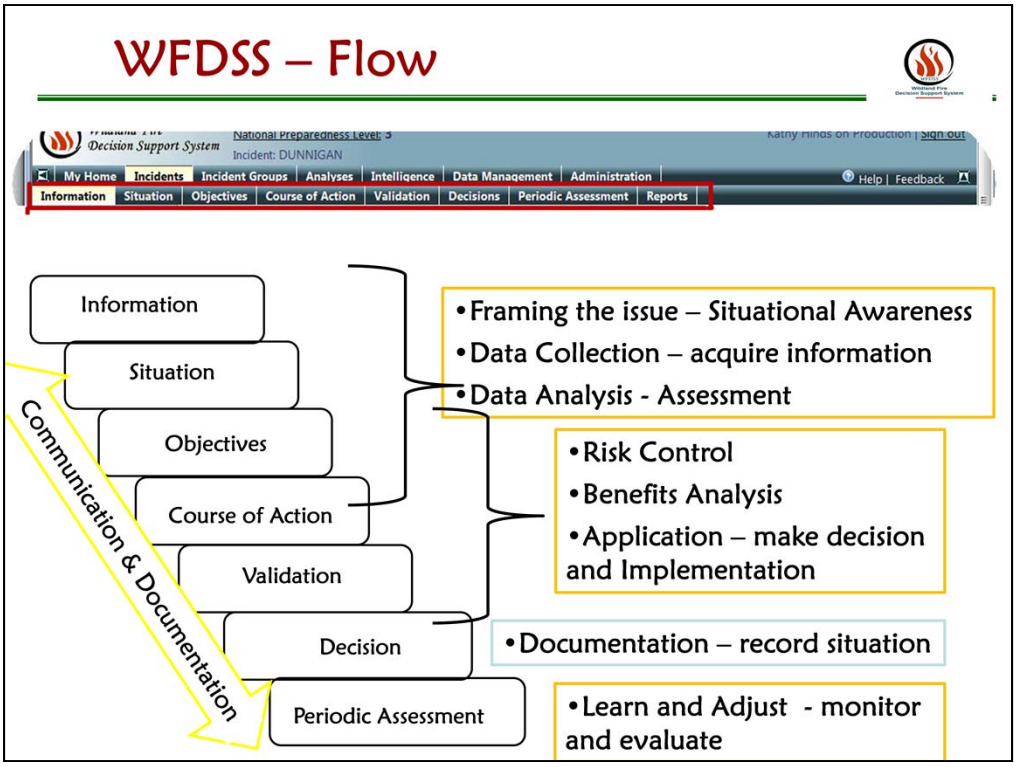
This risk management cycle is defined in the *Decision Making for Wildfire: A Guide for Applying a Risk Management Process at the Incident Level* (RMRS-GTR-298). It defines a circular process - identify the incident or issue (situation awareness), assessing that hazard or risk by determining the values, the potential hazard/risks threatening those values, and the probability of the values being affected. Identify the benefits of the fire. (Assessment). Determining the risk management needed to

mitigate and control the risks (risk control). Make a decision and implement (Decision & Implementation). Then evaluate if that decision is working or not (Evaluation). Although this process is defined circularly, many of these steps are occurring concurrently and continually.

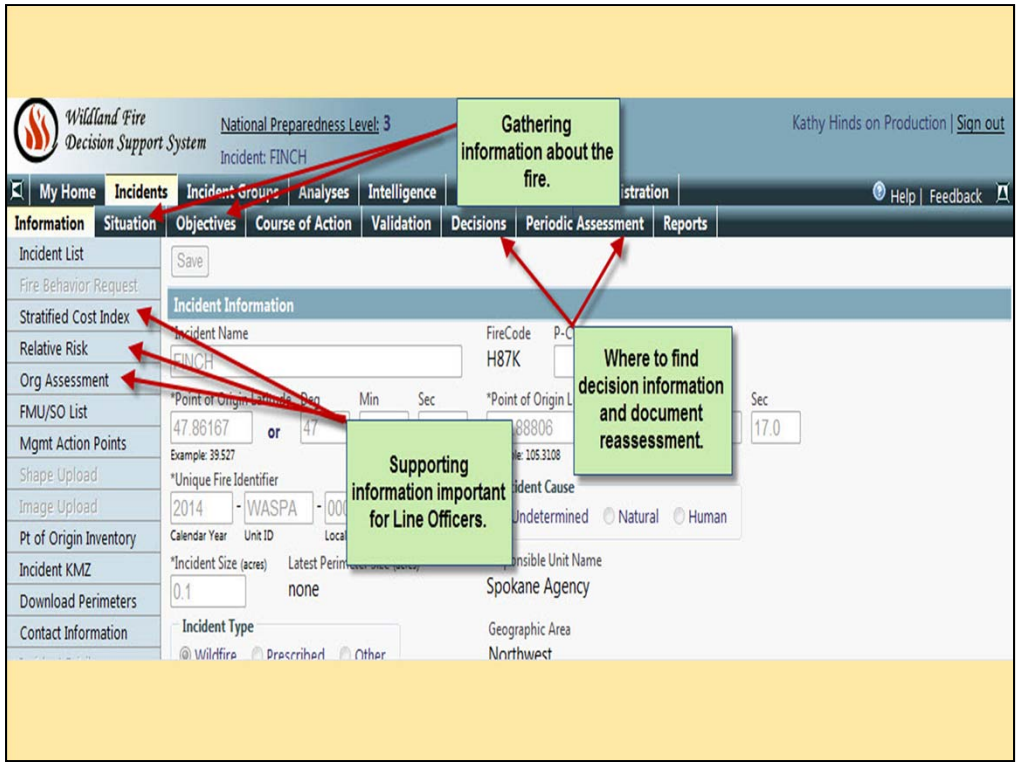
The Wildland Fire Decision Support System is utilizing a similar process as defined in the Risk Management Cycle but described them linearly across the tabs. You identify the incident (Information), asses the situation, gain situation awareness, and assess the risks and benefits (Situation / Objectives / Course of Action). Formulate a decision (Objectives, Course of Action, Validation, Decision). And evaluate your decision (Periodic Assessment). Similar to the Risk Management Cycle, many of these steps are occurring concurrently.



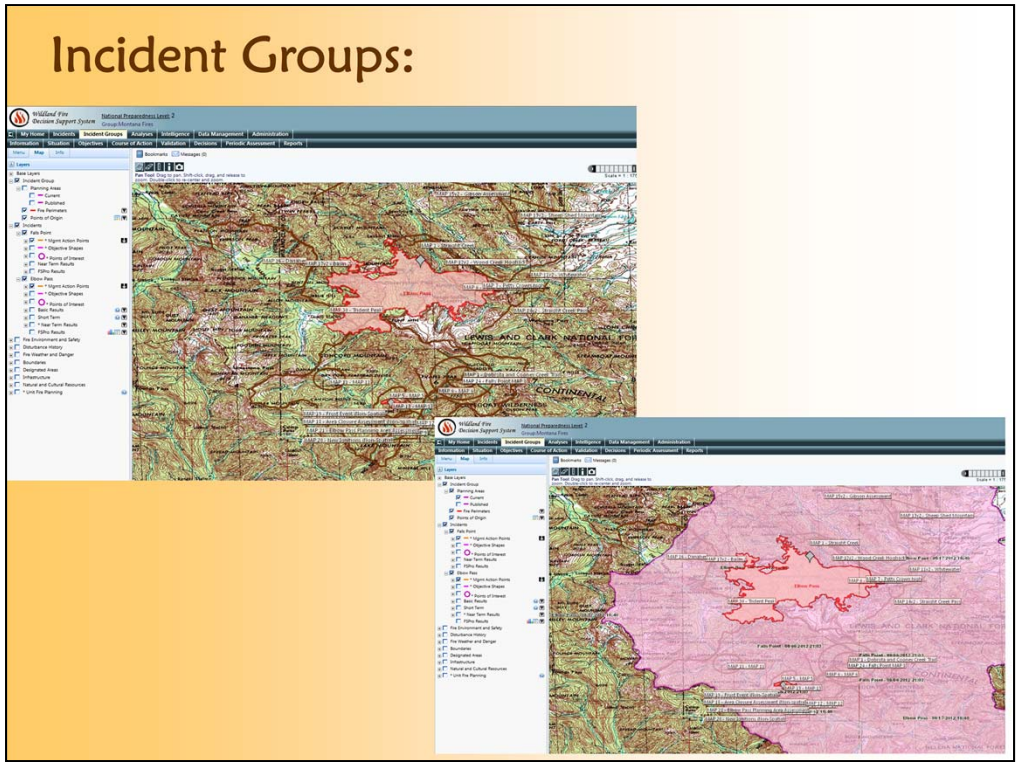
This slide depicts the processes being completed at all levels of the organization. It is important to realize the connectedness of these processes and that one influences the next. In other words, a decision made at the strategic level in WFDSS should feed incident objectives, incident requirements, and course of action down to the planning and operational levels which in turn will be evaluated at a time sensitive level in the field.



WFDSS has 7 sub tabs to develop and document a **risk-informed decision** through analysis and deliberation. The brackets on the right show a closer tie to the risk processes described above.

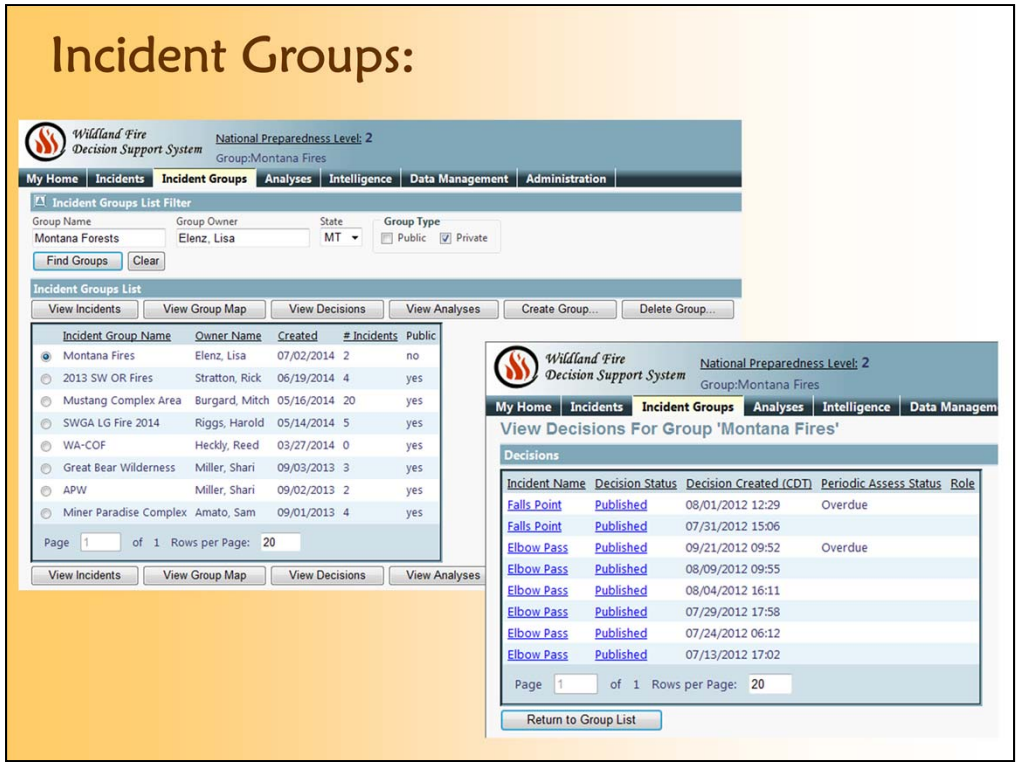


These call out boxes show where a Line Officer should be focusing their energy in evaluating the incident, formulating their decision and then articulating their decision and leader's intent. The following slides will spend a bit more time in these areas.

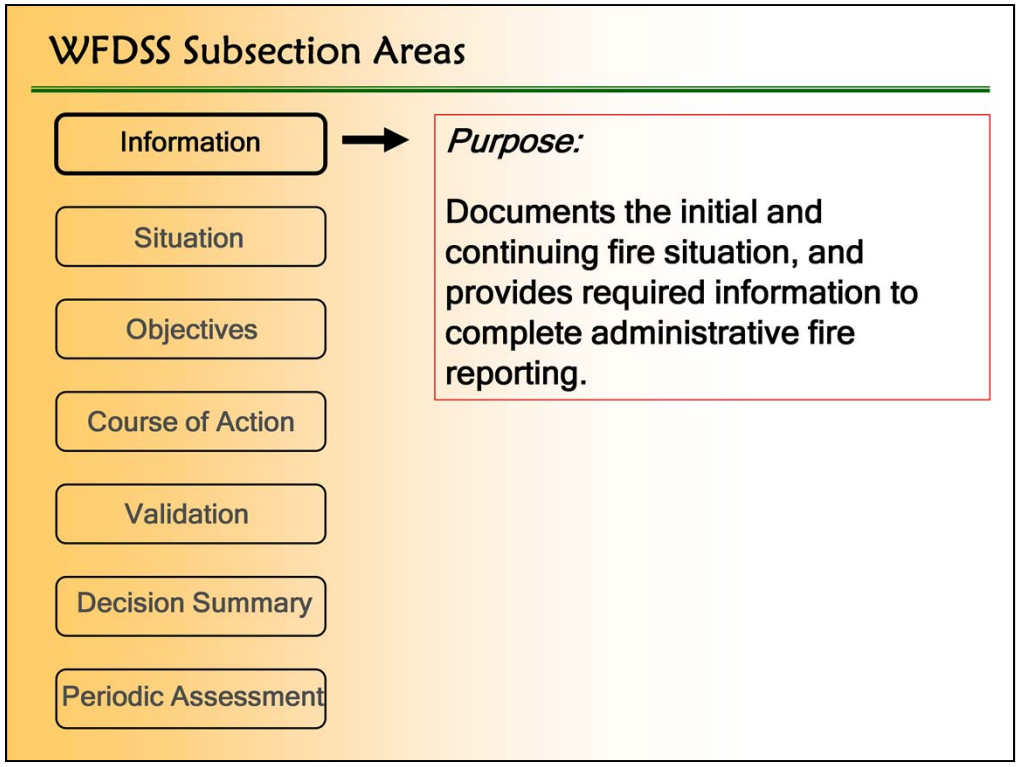


The Incident Groups tab – located at the top – is available for users to look at more than one fire in their area. Often units are dealing with multiple fires and had to previously view or approve one at a time. This feature allows users to view not only fires on their unit but adjacent units. This example shows several fires in the Northern Rockies burning on two different forests. In the upper left image several management action points (MAPs) for each fire are being planned and cross each other while the lower left image shows both planning areas intersecting. As a Line Officer on either unit it would be valuable to know about each incident, what is being planned, and determine how one fire might influence the other.

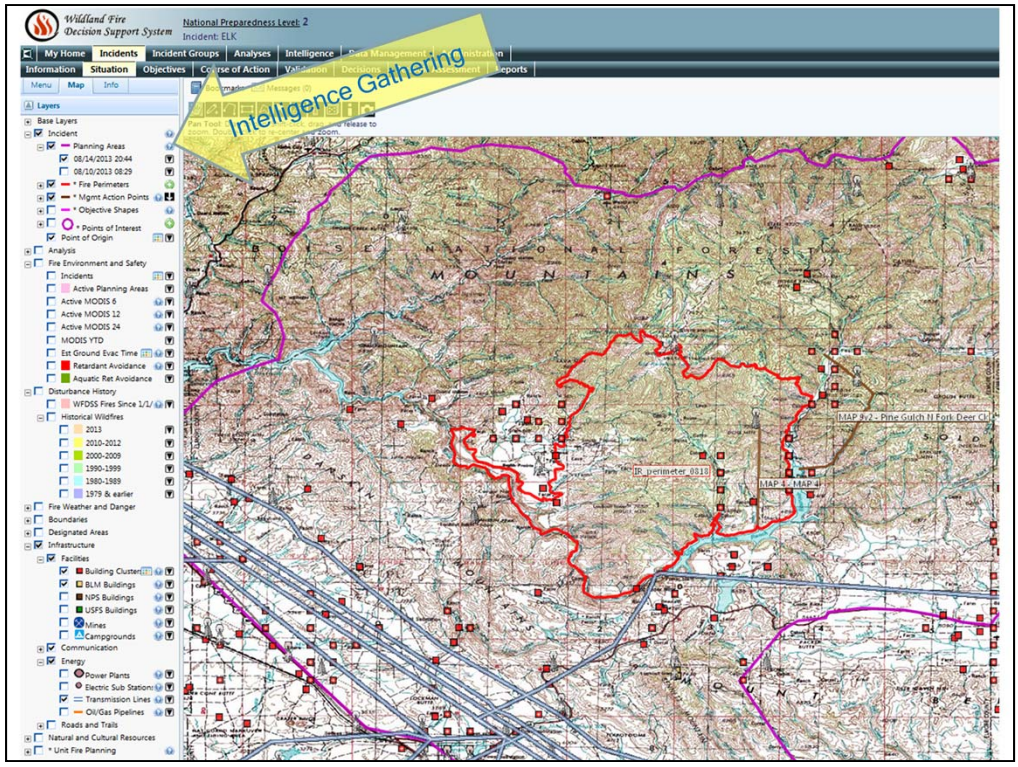
Incident Groups:



Additionally, after a group is established, it is easier to view the decision information.

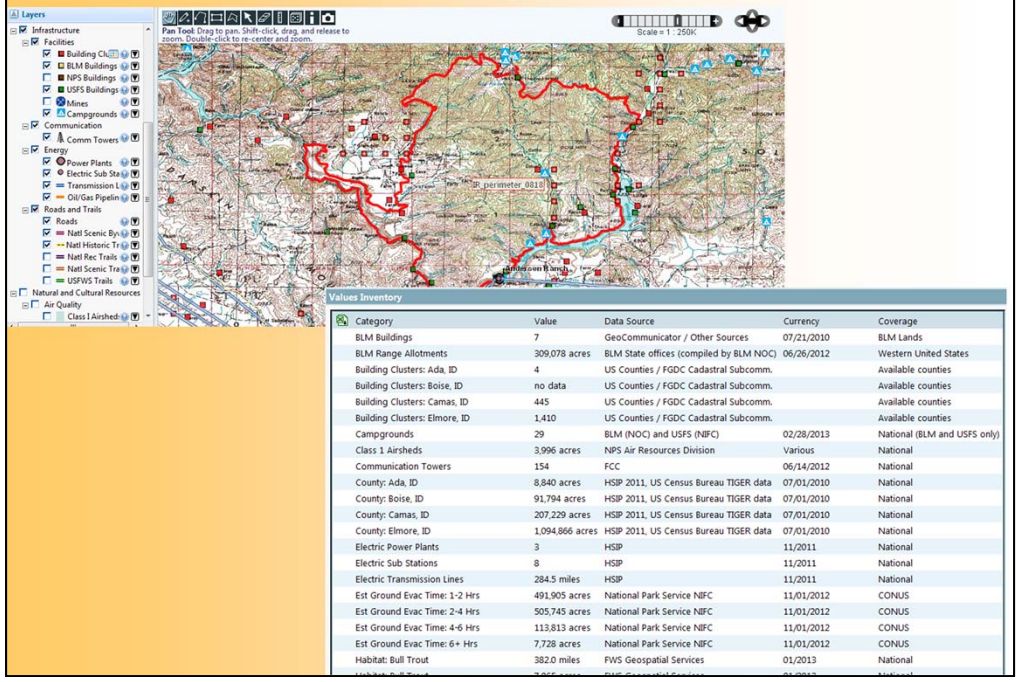


Basic fire information can be found on the information tab. This second tier of tabs are all incident specific information.



The situation tab has a wealth of information that can be viewed spatially. Taking time to view the various layers is important to gather intelligence about the fire, evaluate the risks and benefits, and make an informed decision. There are several layers that have been recently been added to assist managers in making decisions about their incident.

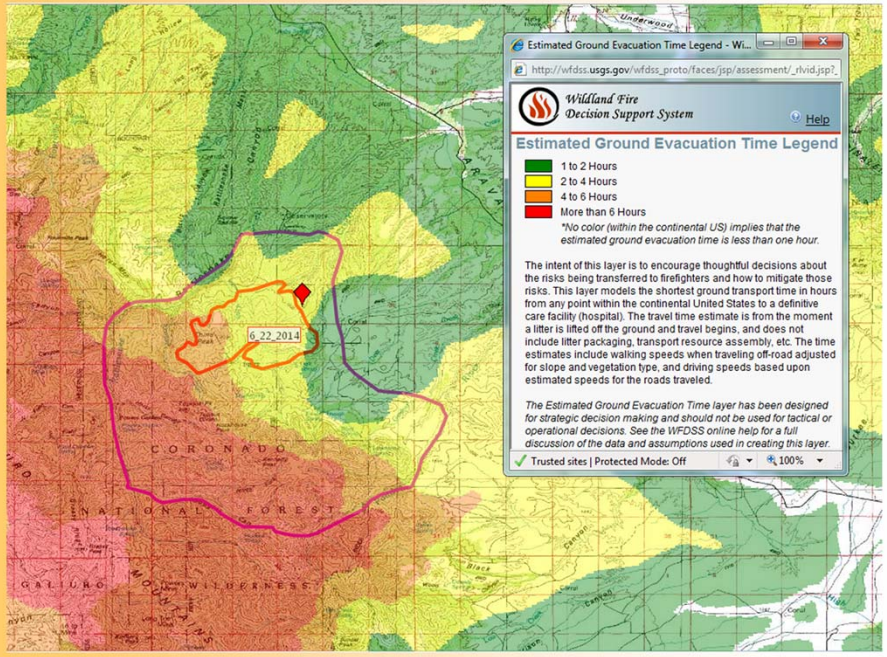
Values in the Planning Area:



Category	Value	Data Source	Currency	Coverage
BLM Buildings	7	GeoCommunicator / Other Sources	07/21/2010	BLM Lands
BLM Range Allotments	309,078 acres	BLM State offices (compiled by BLM NOC)	06/26/2012	Western United States
Building Clusters: Ada, ID	4	US Counties / FGDC Cadastral Subcomm.		Available counties
Building Clusters: Boise, ID	no data	US Counties / FGDC Cadastral Subcomm.		Available counties
Building Clusters: Camas, ID	445	US Counties / FGDC Cadastral Subcomm.		Available counties
Building Clusters: Elmore, ID	1,410	US Counties / FGDC Cadastral Subcomm.		Available counties
Campgrounds	29	BLM (NOC) and USFS (NIFC)	02/28/2013	National (BLM and USFS only)
Class 1 Airsheds	3,996 acres	NPS Air Resources Division	Various	National
Communication Towers	154	FCC	06/14/2012	National
County: Ada, ID	8,840 acres	HSIP 2011, US Census Bureau TIGER data	07/01/2010	National
County: Boise, ID	91,794 acres	HSIP 2011, US Census Bureau TIGER data	07/01/2010	National
County: Camas, ID	207,229 acres	HSIP 2011, US Census Bureau TIGER data	07/01/2010	National
County: Elmore, ID	1,094,866 acres	HSIP 2011, US Census Bureau TIGER data	07/01/2010	National
Electric Power Plants	3	HSIP	11/2011	National
Electric Sub Stations	8	HSIP	11/2011	National
Electric Transmission Lines	284.5 miles	HSIP	11/2011	National
Est Ground Evac Time: 1-2 Hrs	491,905 acres	National Park Service NIFC	11/01/2012	CONUS
Est Ground Evac Time: 2-4 Hrs	505,745 acres	National Park Service NIFC	11/01/2012	CONUS
Est Ground Evac Time: 4-6 Hrs	113,813 acres	National Park Service NIFC	11/01/2012	CONUS
Est Ground Evac Time: 6+ Hrs	7,728 acres	National Park Service NIFC	11/01/2012	CONUS
Habitat: Bull Trout	382.0 miles	FWS Geospatial Services	01/2013	National

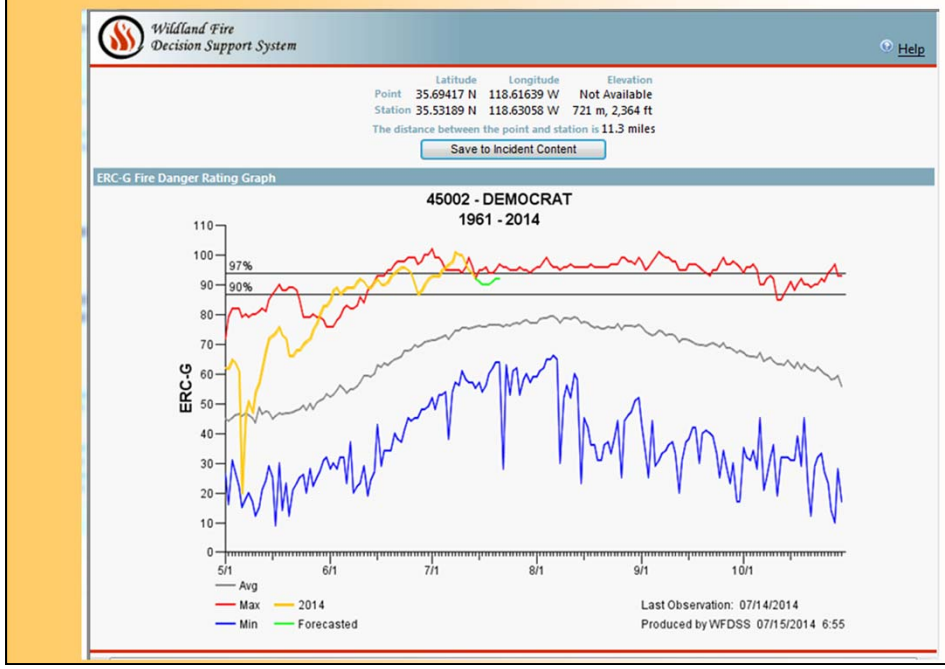
Values information can be obtained for your fire based on the planning area drawn. This information is obtained from the layers shown in the previous slide.

Estimated Ground Evacuation Time



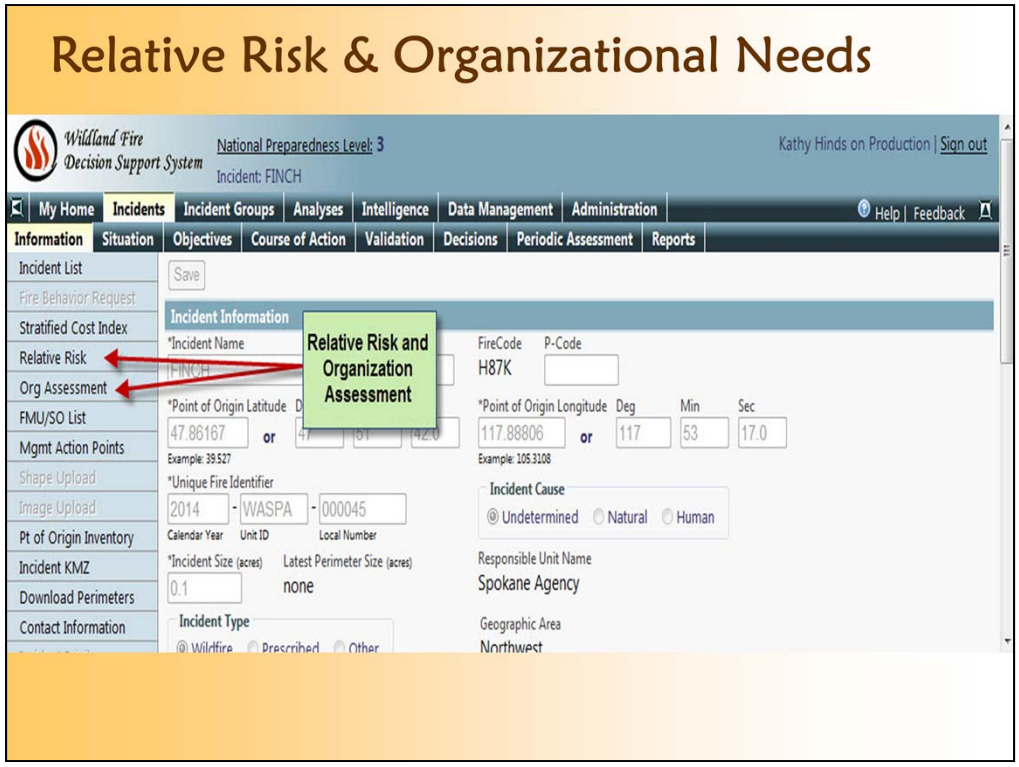
The Estimated Ground Evacuation Time layer was added last season as another tool to assist managers in considering actions to take on the fire versus exposure to firefighters. It provides perspective on how difficult it will be to evacuate a firefighter if injured which can help decision makers evaluate if the firefighting effort to limit fire spread is worth the exposure to the firefighter.

Fire Danger Graphs:



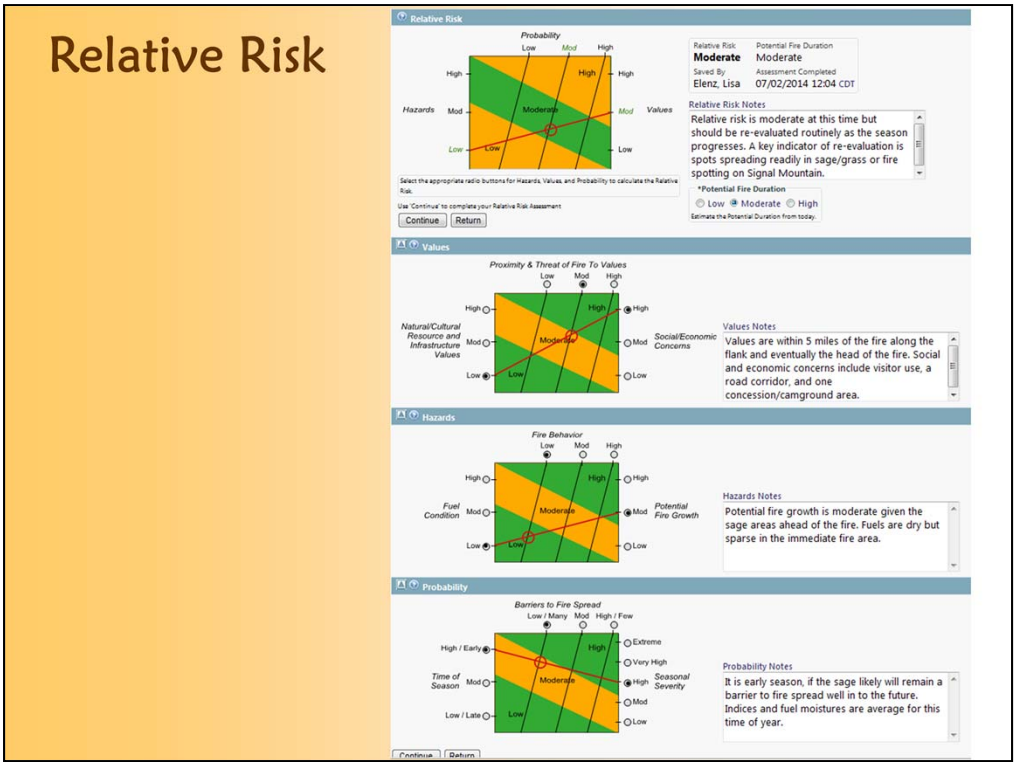
Fire danger indices can be reviewed easily on the Situation tab. This information assists managers in determining the severity of their fire season compared to historic information.

Relative Risk & Organizational Needs



After completing the situation assessment, managers should evaluate the relative risk and organizational needs based on their findings.

Relative Risk



The relative risk assessment is a decision support tool that can be used to produce a chart, with notations, that provides a level of qualitative risk (low, moderate, or high) for the incident and characterizes the general magnitude of risks associated with the fire itself at a specific point in time and in comparison to local historic conditions and fires. It assesses the three core elements of risk—values, hazards, and probabilities—to determine the relative risk for the incident.

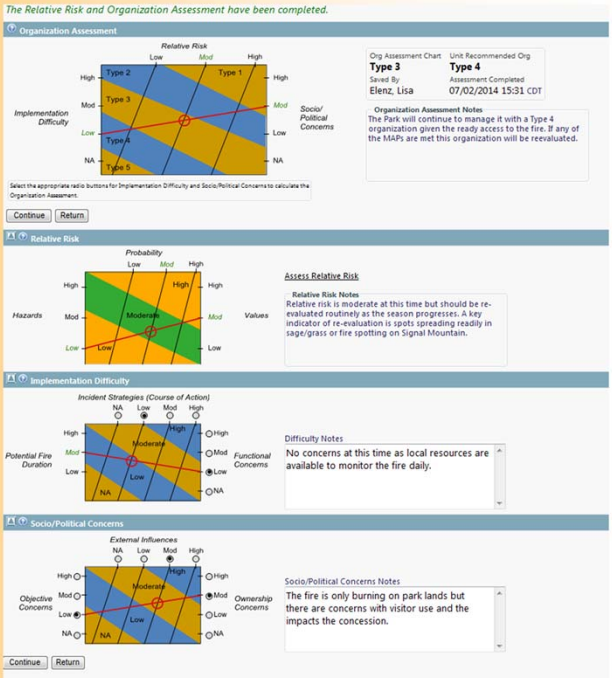
The purpose of an Relative Risk is to provide the Line Officer and other decision makers with a level of risk for an incident at a specific point in time and is a quick assessment of the relative risk of the wildfire in comparison to past fires in the local area. It is primarily a communication, planning, and assessment tool to inform decision makers about the relative risk associated with the incident and provides a baseline for understanding the core elements (values, hazards, and probabilities) of risk and how those elements change over time.

Initially, the best available information for a qualitative assessment is based on the decision makers' and local specialists' professional judgment and experience combined with any preexisting planning information applicable to the situation. Information from the WFDSS Situation tab for the incident (Zone Weather Forecast, Fire Danger Rating graph, Designated Areas, Infrastructure, etc.) can be useful here.

A critical component is the documentation of the methods and considerations that led to each of the ratings. Annotations should be added to capture the logic and basis for choosing each qualitative rating. For example; if you looked at the Fire Danger Rating graph and used it as the basis for your rating of “Extreme” for the “Seasonal Severity” element, document that in the “Notes” section for the “Probability” chart. Later in this presentation fire behavior models, that could be utilized to support the risk assessment, will be reviewed.

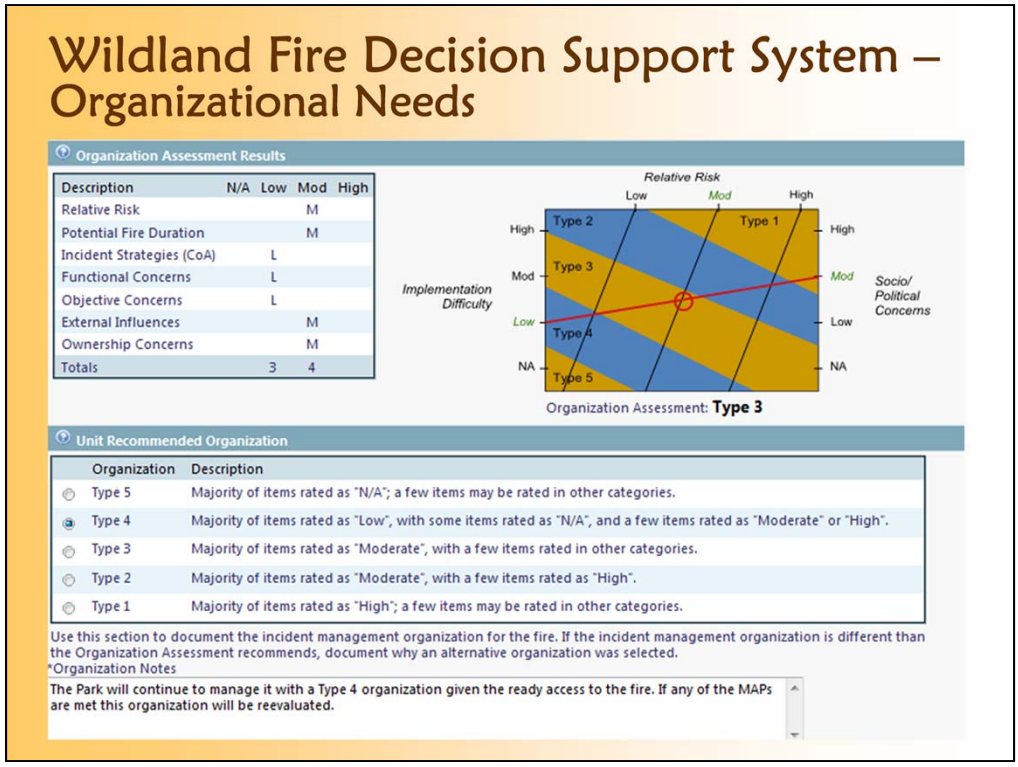
This risk assessment is the same information that the field is utilizing to complete the Risk and Complexity Analysis and can be input directly from their assessment.

Organizational Needs Assessment



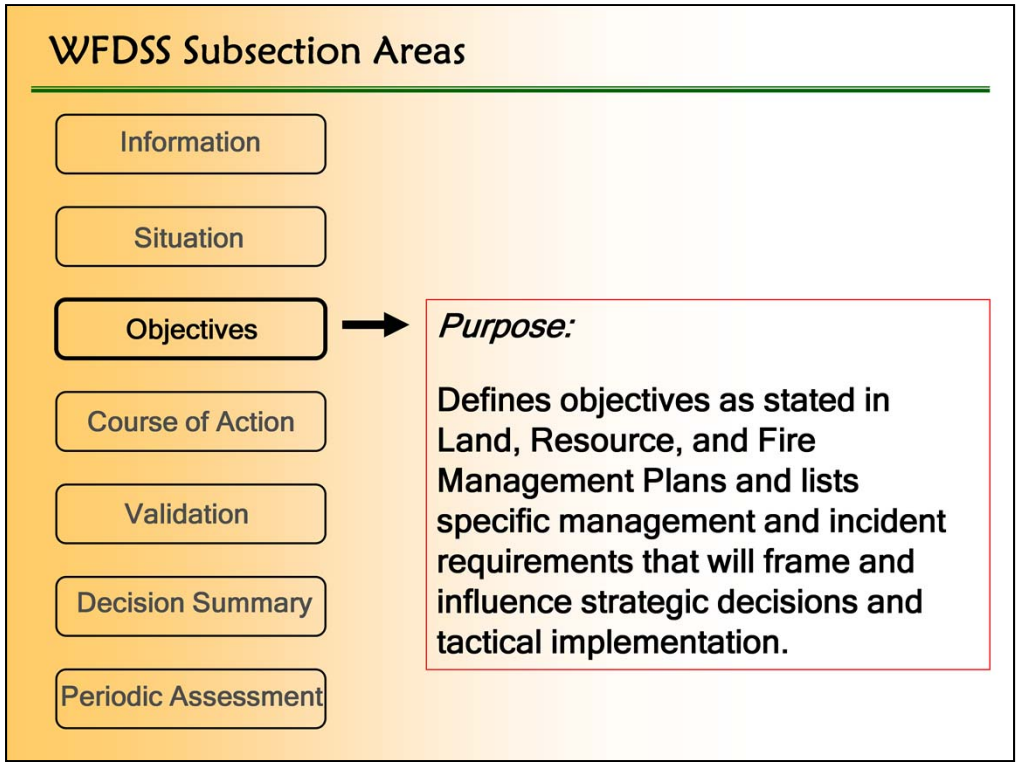
The Organization Assessment is completed utilizing the relative risk as well as considering the Implementation Difficulty and the Social/Political Concerns. Although there are some N/A selections while evaluating the needs for an incident, it is understood that if firefighters are being utilized or air resources are committed, there is a strategy/course of action being implored or objectives being implemented. This option is there for non-complex fires or where minimal staffing is required.

Wildland Fire Decision Support System – Organizational Needs

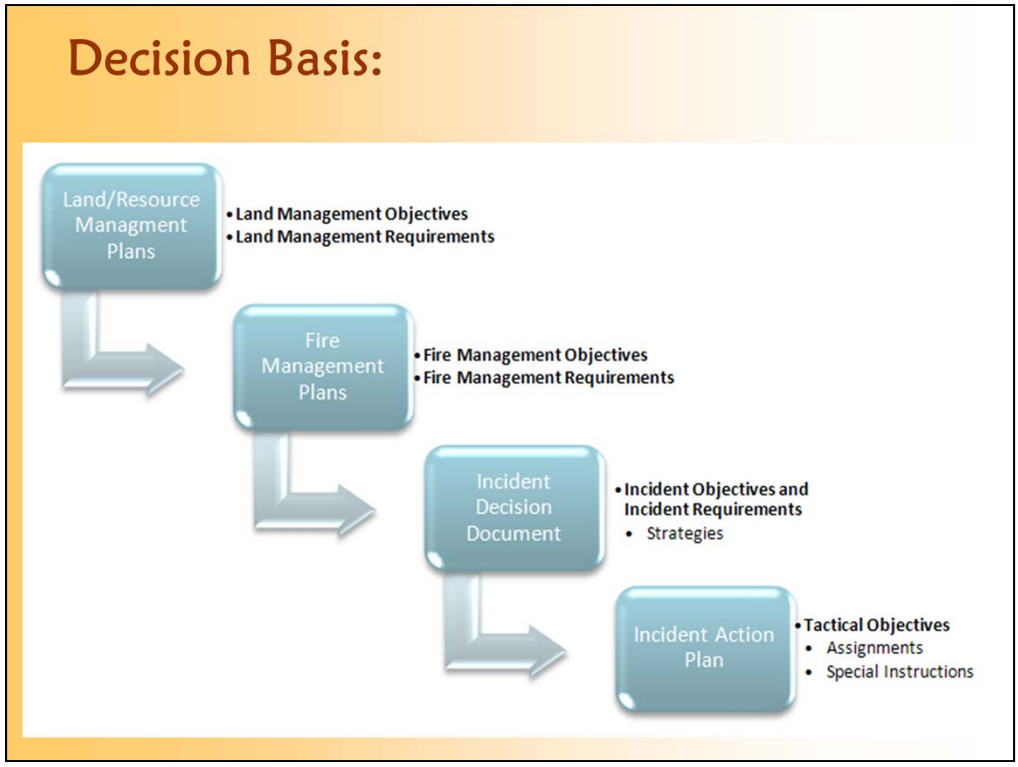


When the Relative Risk and Organizational Needs are complete, the Line Officer makes the decision for what type of Incident Management Team to utilize. As seen in this example, the unit can choose to select a team other than what is recommended and should document that in the notes section.

As can be seen in this example, the Relative Risk and Organizational Needs can be revised at any time.

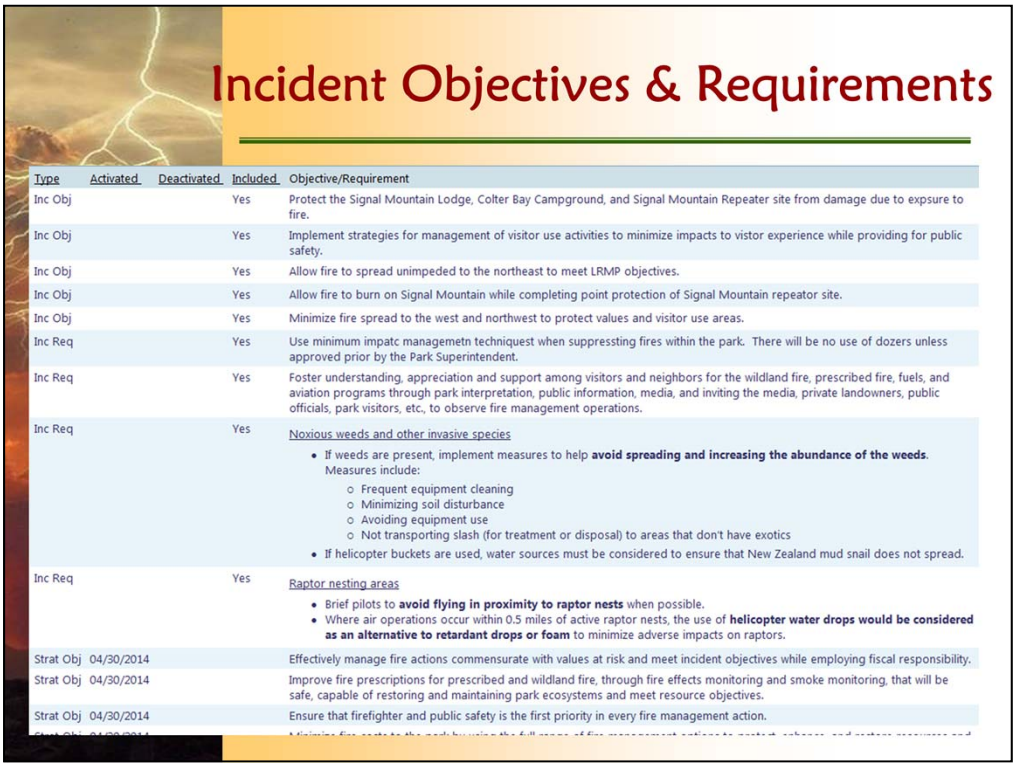


The Line Officer defines the objectives and requirements for the fire considering the Land and Resource Management Plan Strategic Objectives and Requirements as well as the assessment completed. These objectives and requirements should define the leader's intent.



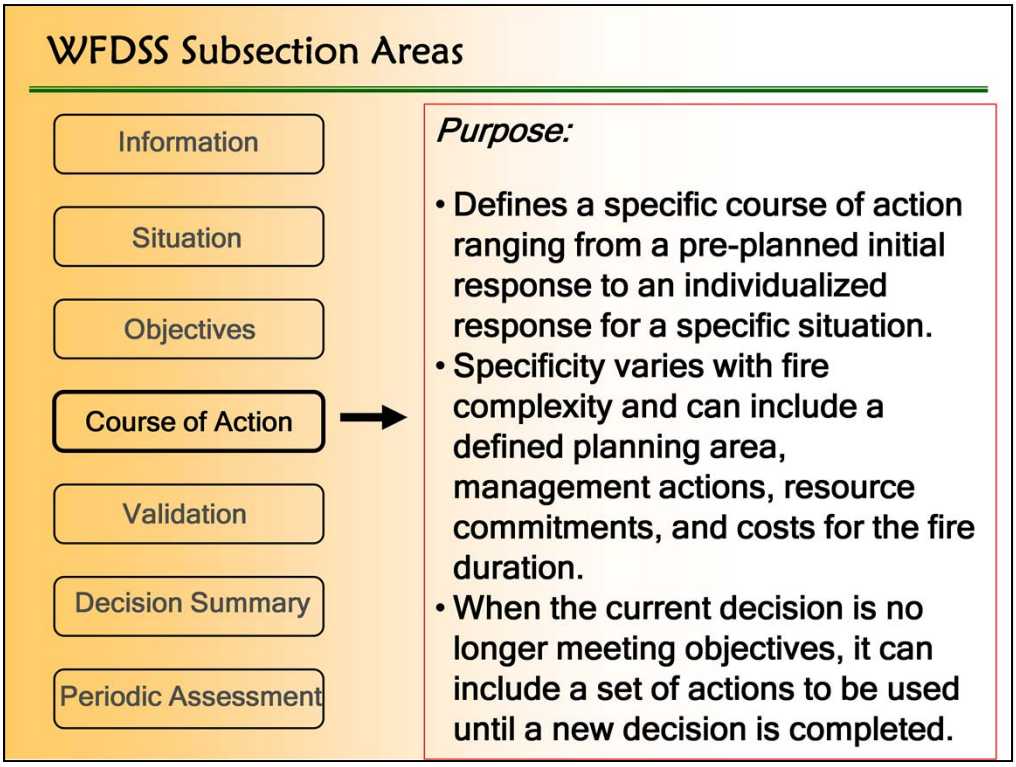
This depiction shows how the Land and Resource Management Plan Objectives are used in formulating F ire Management Plan Objectives and Requirements both of which are brought in to WFDSS as Strategic Objectives and Management Requirements. These are considered when writing the Incident Objectives and Requirements as well as the Course of Action. These Incident Objectives and Requirements will the drive the Delegation of Authority and what is relayed to the team which in turn are what should be in the Incident Action Plan (IAP) as it is developed and relayed to crews on the ground.

And example of Strategic Objectives and Management Requirements.



An example of Incident Objectives and Incident Requirements.

Of note: The Incident Objectives and Requirements are considered of equal value. Often the objectives are derived to show leader's intent while requirements are often law or regulation based.



The Course of Action is the overall plan describing the selected strategies and management action points intended to meet incident objectives and requirements based on current and expected conditions. In incident-level decision making, the course of action is comprised of selected strategies and specific actions to achieve the incident objectives while complying with incident requirements. The purpose of the course of action is to adequately mitigate or control the risk to values to be protected, and identify where ire may contribute to meeting land management objectives in those areas where risk can be mitigated to an acceptable level.

It is important that the course of action does not define tactics but instead further clarifies leader's intent. An example would be if the is a need to keep fire out of an area of bug kill, define what that would look like. In other words if fire does spot in to the bug killed area is there an intent to put it out at all costs and increase fire fighter exposure or should it be defined differently. Keep fire out of the bug killed timber but if fire cannot be contained, allow it to burn until fire spread can be stopped safely.

Course of Action

Create Action Item

	Activated	Deactivated	Included	Item Description
○	05/14/2014		Yes	Monitor fire activity along the Snake River to assess river closures.
○			Yes	Prepare a fire information update that is sent to all employees, external agencies, cooperating agencies, media, legislative outlets, local communities, adjacent land owners and other interested parties on a regular basis. The update will include the past 24 hour status, anticipated planned actions, and other pertinent information regarding such things as smoke management, structure protection, or closures.
○			Yes	Minimize fire spread in to bug kill areas where feasible. If established in bug kill determine the next possible location for containment to limit firefighter exposure in snag prone areas.
○			Yes	Coordinate road closures with Park law enforcement officials. • Ensure appropriate signage is posted. • Utilize pilot cars as needed.

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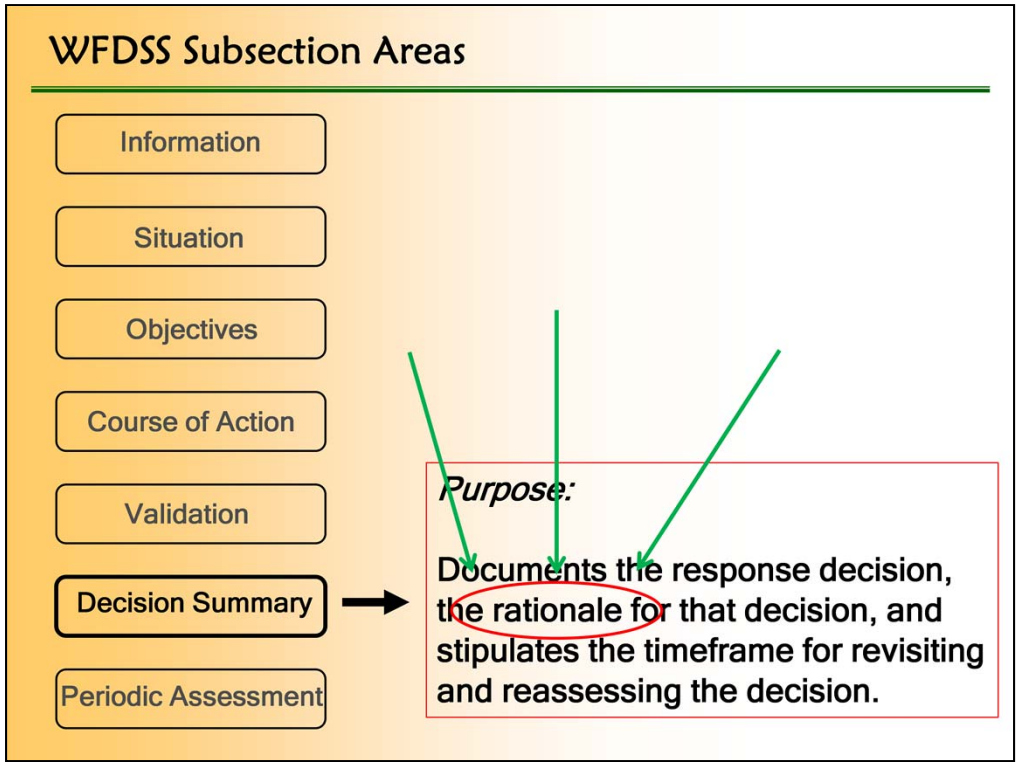
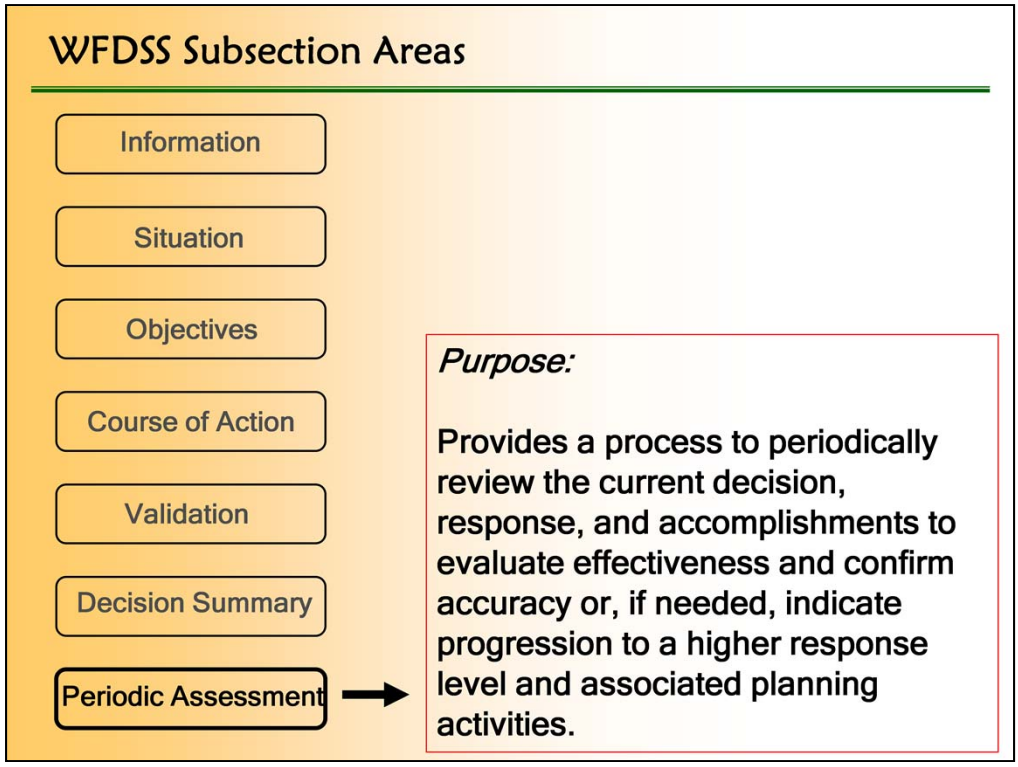


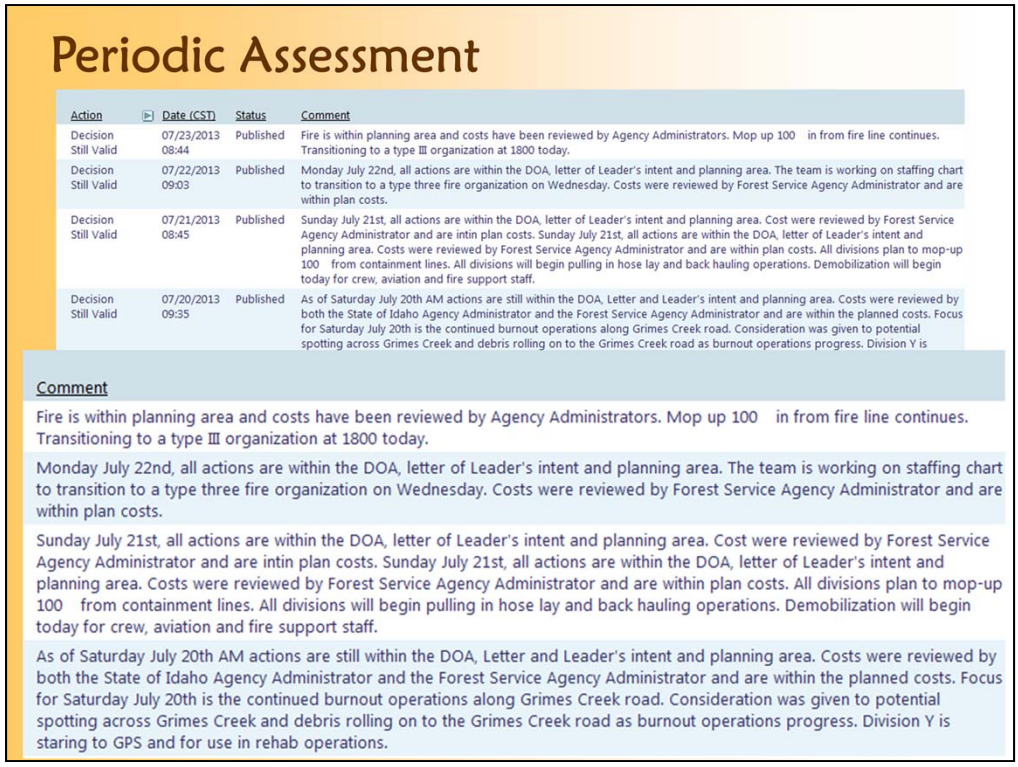
The Decision tab contains all the information that WFDSS populates and the information added by the Line Officer and their team of experts. Much of the information is what you have developed working through the incident tabs (objectives, course of action, relative risk, etc.) but additional assessment information can be added to support and document the decision. What is important for the Line Officer to complete is the Rationale for the incident. It is the Line Officer's responsibility to take time here to "tell the story". It is even worth considering starting the rationale with "My decision is…." . This is your executive summary of what you considered, what your decision is and what might trigger a new decision.

Forest Service employees are asked to utilize the 10 questions from the risk management protocols to frame the rationale. There is a document that shows how that can be completed and where to find the information for those questions in WFDSS on the training site.

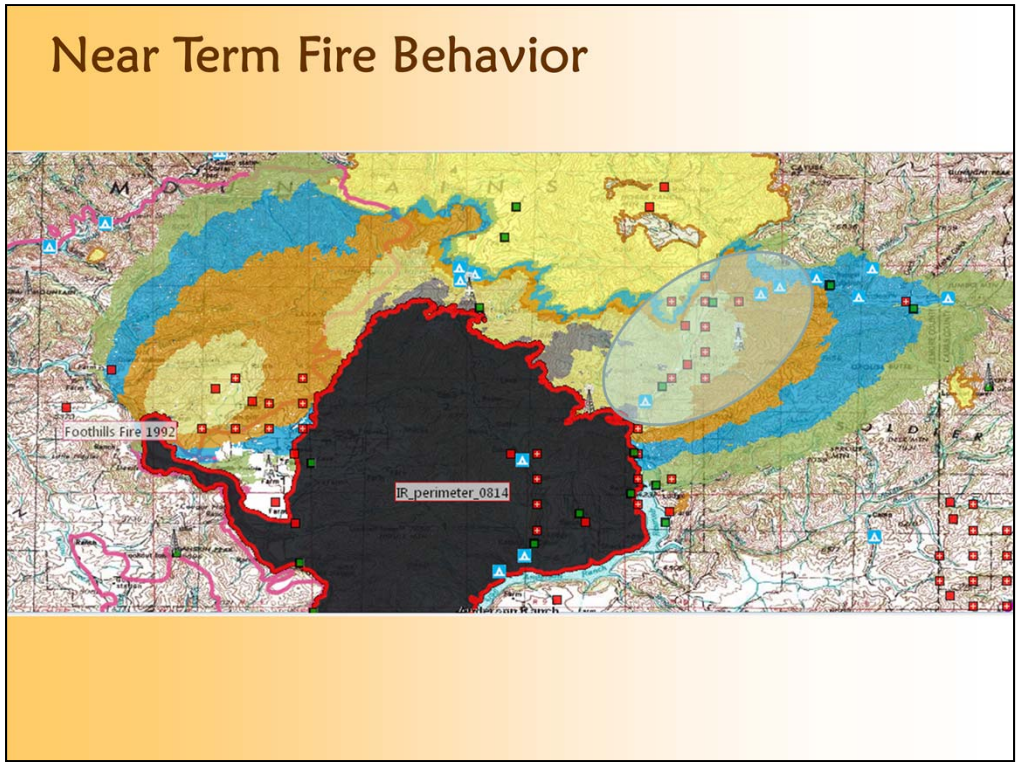
USFS Fire Response Protocol's 7 Standards for Managing Incident Risk & WFDSS located at http://wfdss.usgs.gov/wfdss/pdfs/USFS_Protocol_WFDSS.pdf



The Periodic Assessment is completed routinely as an opportunity for the Line Officer to review the current fire situation to evaluate if the effectiveness of the chosen course of actin is meeting the incident objectives. The process documents and ensures management accountability throughout the duration of the incident. The number of days between periodic assessments is set according to Line Officer comfort level with the fire and their decision. It is recommended that if it is an active fire that is changing daily that a daily periodic assessment is completed.



There is a section for Line Officers to add notes when completing the periodic assessment. The examples above show information documented on fires that are in WFDSS. As you can see, there was time taken to document what was being considered when evaluating the fire, course of action, and objectives.



As discussed earlier, fire behavior modeling can be completed to assist managers in making decisions on fires. These models not only add quantitative information for completing a risk assessment but can also assist Line Officers in evaluating concerns they have.

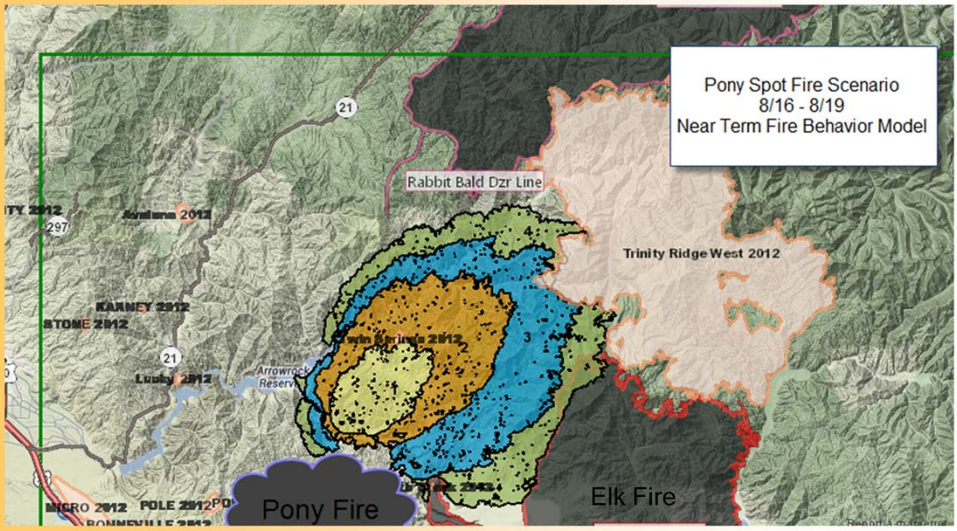
Near Term Fire Behavior (NTFB) models fire growth in the form of a fire progression. Unlike Short-Term Fire Behavior, NTFB models fire behavior using inputs for weather and wind that change over the duration of the simulation. NTFB can model fire growth for up to 7 days, however caution should be used when projecting beyond reliable weather forecast timeframes. Near Term Fire Behavior simulates where and when a fire may grow, and also predicts fire behavior characteristics on the landscape where it does burn. In this example of NTFB output below each color represents a 3-hour interval; the black lines represent daily burn periods.

This model was utilized by the Line officer to discuss evacuations with the land owners ahead of this fire. (identified within the ellipse on the map) She could show that over the next four days, if weather continued as anticipated and suppression actions were unsuccessful, the fire would burn through the area where their homes were. This could also be discussed in the context of whether fire personnel should be dealing with evacuations on a one way in/out road or fighting the fire.

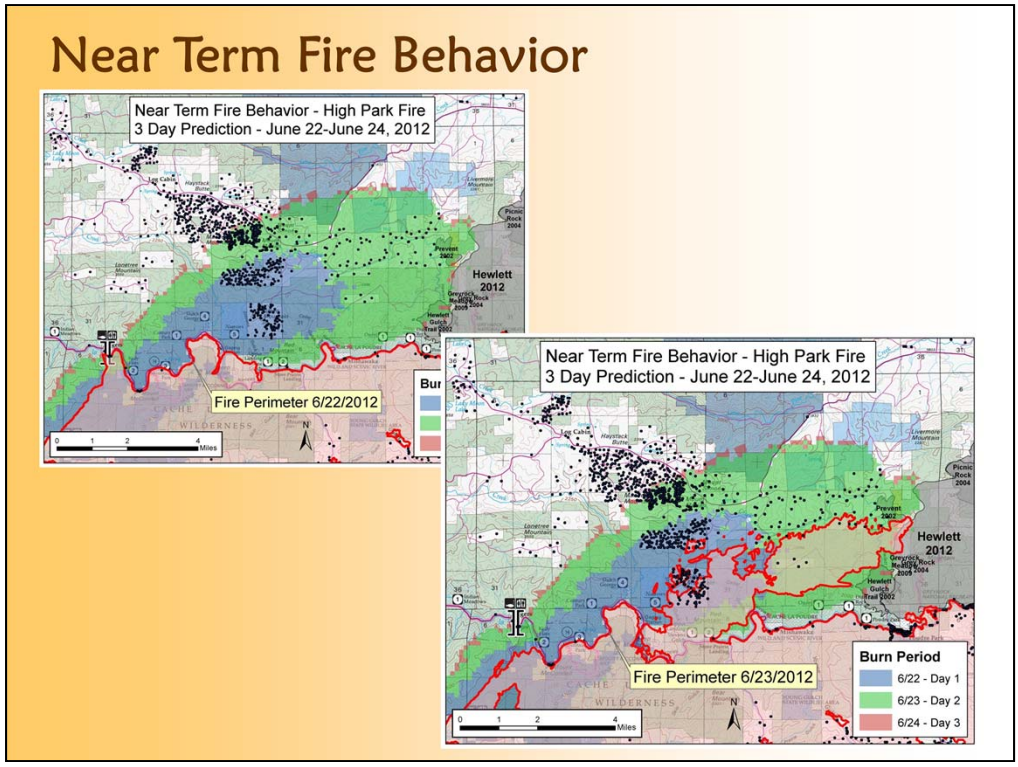
NTFB can be utilized to answer Line Officer concerns such as –

- The district ranger is concerned about a thermal trough pushing the fire; what might that look like?
- Given the changing winds and weather, when do you think the fire will reach the containment line?
- We are doing a large burn-out operation; if we get a spot across the line, what size will the fire be with and without a frontal passage?
- What fire behavior (e.g. flame length, rates of spread, spotting) is expected with known weather and fuel conditions?
- Can you reconstruct the growth of this fire if we provide you an ignition and the final fire perimeter?
- If a fire reaches a point of concern, what fire behavior can I expect at that location?

Planning – Spot Fires

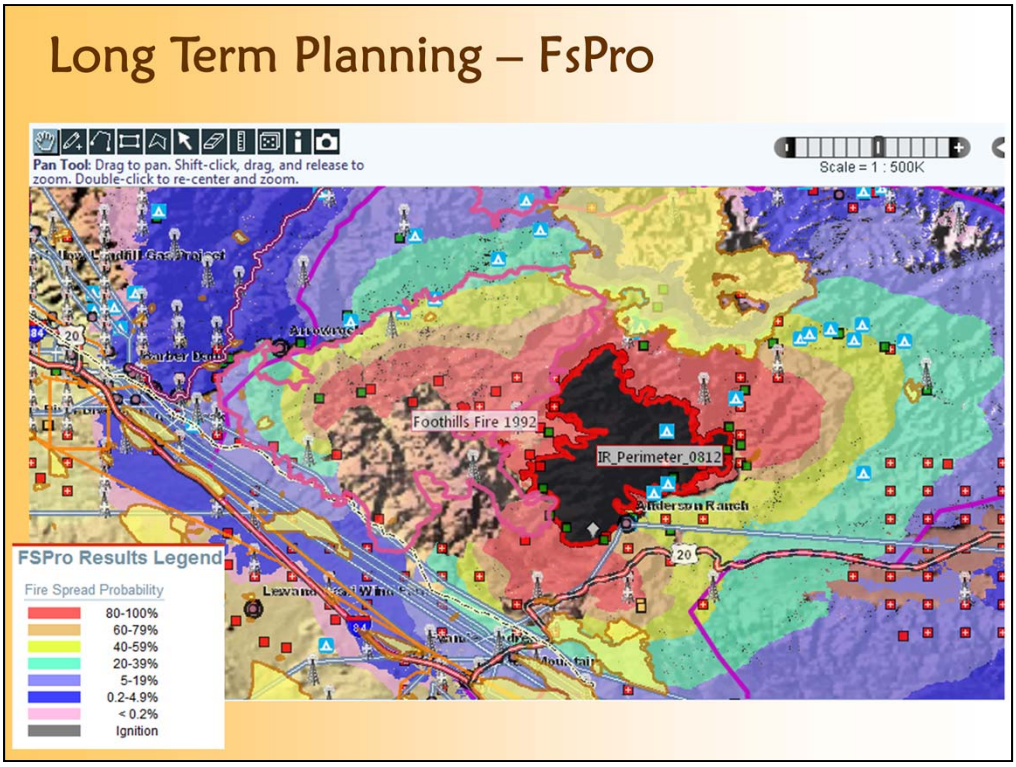


This is another example of how NTFB was utilized on this fire. At the time, the Pony Fire, seen in the lower area of the map was burning readily. The Line Officer was interested in understanding what the consequences might be with the current weather if the Pony Fire spotted across the river toward the Elk fire. At that time personnel were working on the Eastern perimeter of the Elk Fire and there were values in the unburned area. This indicated that under the current weather, it could pose a threat to both the values and the firefighters working to contain the Elk Fire.



On the High Park incident, the fire spotted to the north and were challenging crews to suppress all of them. With a high wind forecast a few days out, the Near Term Fire Behavior model was run to project what the fire might do under these wind conditions. (upper left). Because of this projection the structures (black dots) were evacuated ahead of the wind event. The lower right image shows the actual fire perimeter as compared to the model's projection. Although not perfect, the analysis does show that this was a concern, did help the Line Officer make the decision in advance, and put fewer public and firefighters at risk.

Long Term Planning – FsPro



When determining what potential outcomes there are with a fire burning longer term on the landscape, the Fire Spread Probability (FSPro) model can be used. FSPro is a geospatial probabilistic model that predicts fire growth, and is designed to support long-term decision-making (more than 5 days). FSPro addresses fire growth beyond the timeframes of reliable weather forecasts by using historic climatological data. FSPro calculates and maps the probability that fire will visit each pixel on the landscape of interest during the specified period of time, in the absence of suppression, based on the current fire perimeter or ignition point.

The results do not predict actual fire perimeters, but instead show the probability that each cell will burn. Based on the historical data FSPro produces many weather scenarios for the selected time period. Each weather scenario is used to model an individual fire, (normally 1,000 to 4,000 fires), that are overlaid to produce a map with the probabilities. The FSPro output map produced is often misinterpreted as a perimeter map. The red area represents a 80-100% probability of being burned. The orange are represents 60-79%, the yellow area 40-59%, the green area 20-39%, the light purple 5-19%, the dark purple .2-4.9%, and the pink < .2 % change of burning in the 7 day period under the modeled conditions.

FSPro can be utilized to answer Line Officer Concerns such as –

- What is the probability the fire will reach the Interstate?

- The fire has hung in the higher elevations and the season is coming to a close, what is the likelihood the fire will run again and threaten the communities in the valley?
- There are fires all over the place; what is the chance these fires will merge in the next week or two?

Long Term Planning – Values at Risk

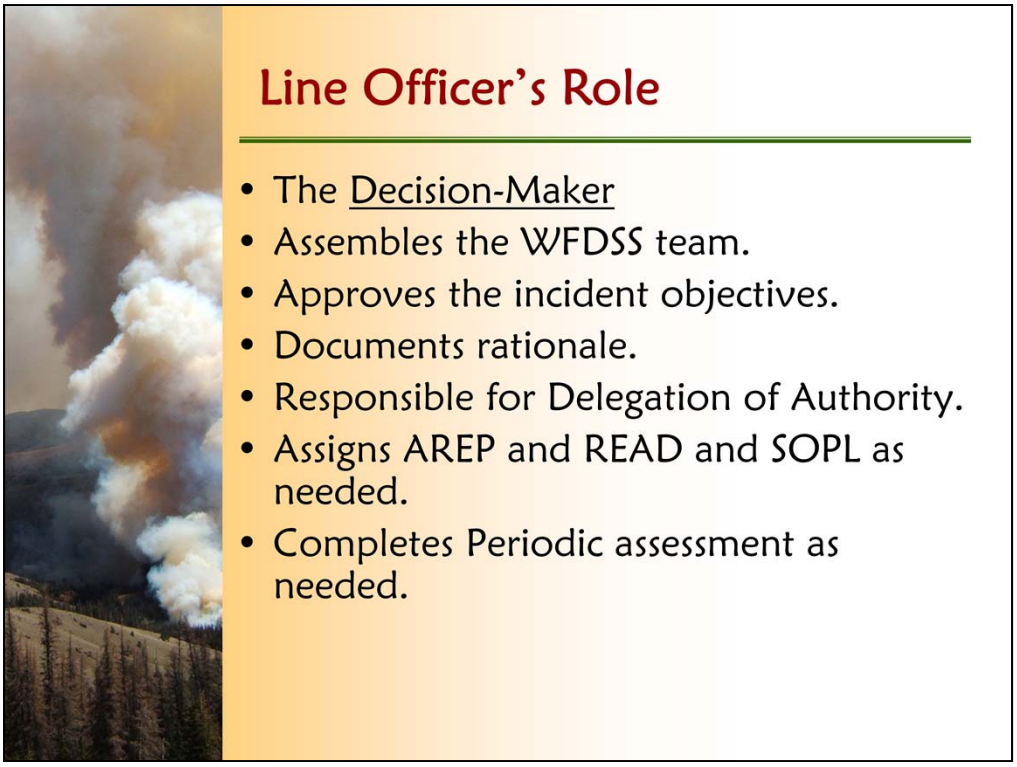
Values at Risk

NAME	VALUE
Incident Name	ELK
Analysis Name	7day_8_12_1000f
Author	Multiple
Analyst	Pence, Dusty
Latitude	43.33444
Longitude	115.49667
Geographical Area	Eastern Great Basin

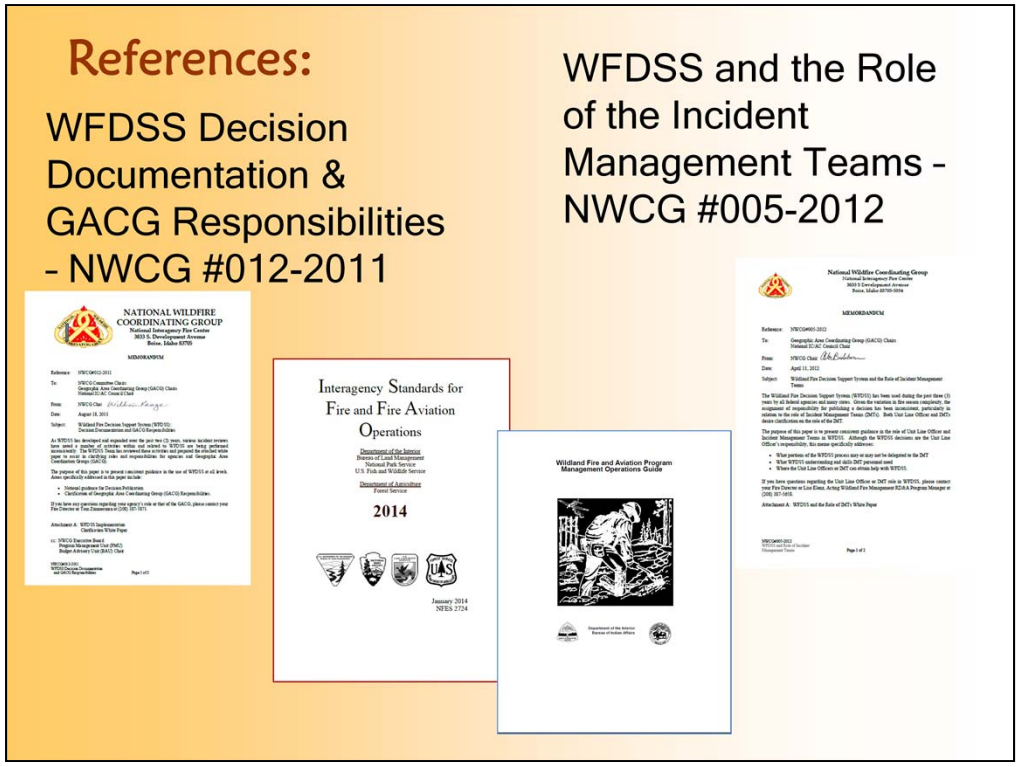
Values List

Category	80-100%	60-79%	40-59%	20-39%	5-19%	0.2-4.9%	<0.2%	Expected Value
BLM Buildings	3	4	0	0	0	3	6	5.58
BLM Range Allotments	29,041 acres	10,190 acres	17,123 acres	86,499 acres	158,861 acres	335,670 acres	110,242 acres	96,476 acres
Building Clusters: Ada, ID	0	0	0	0	12	1,092	293	30.2
Building Clusters: Blaine, ID	0	0	0	0	0	650	1,384	18.3
Building Clusters: Boise, ID	no data	no data	no data	no data	no data	no data	no data	no data
Building Clusters: Camas, ID	0	0	0	28	798	431	520	119
Building Clusters: Elmore, ID	349	84	124	25	117	824	51	478
Building Clusters: Gooding, ID	no data	no data	no data	no data	no data	no data	no data	no data
Building Clusters: Lincoln, ID	no data	no data	no data	no data	no data	no data	no data	no data
Campgrounds	2	1	9	5	8	15	18	9.91
Class 1 Airsheds	0 acres	0 acres	0 acres	0 acres	0 acres	16,111 acres	5,034 acres	424 acres
Communication Towers	70	2	1	28	72	454	226	94.3
County: Ada, ID	0 acres	0 acres	0 acres	0 acres	15,248 acres	85,588 acres	20,763 acres	4,152 acres
County: Blaine, ID	0 acres	0 acres	0 acres	0 acres	0 acres	194,049 acres	118,094 acres	5,163 acres

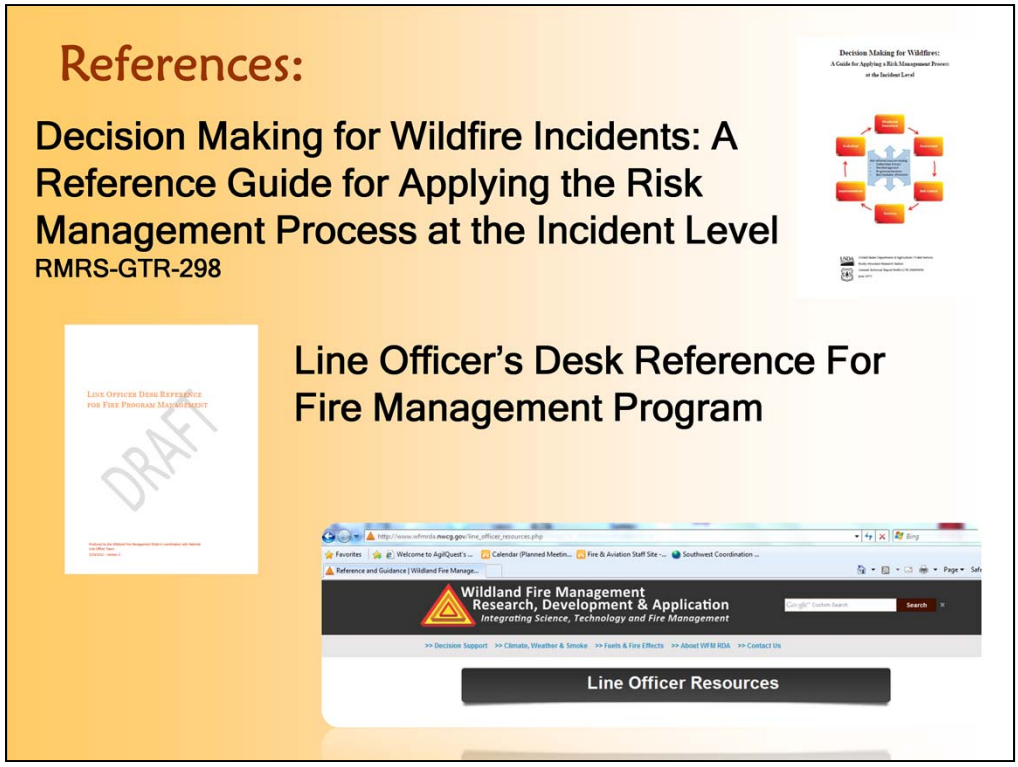
WFDSS Values at Risk (VAR) combines FSPro output with national and preloaded local value data to quantify the specific values within each probability contour (acres, miles, count, etc.). Similar to Values Inventory, VAR provides the values information in a table, and a map of the inventory area is available from the Situation map. The map capture feature can be used to add an image to the incident and decision content. Like Values Inventory, VAR is also intended as a strategic planning tool and provides a quick method to quantify values within an FSPro projection area.



A review of the Line Officer's Role in WFDSS

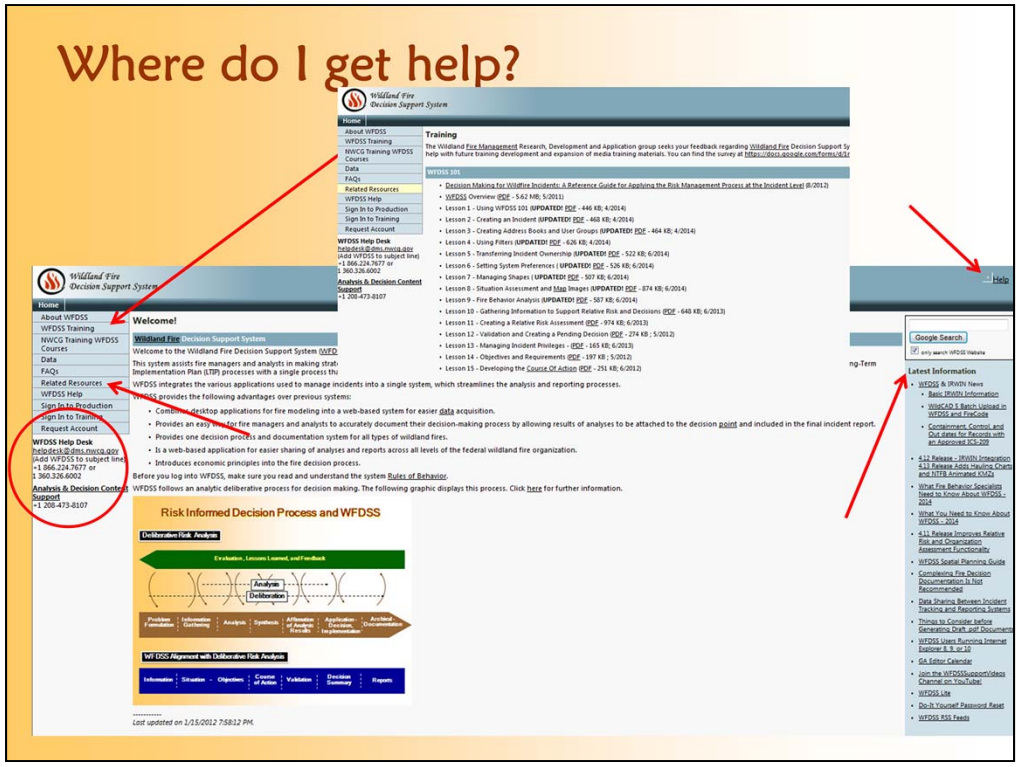


There are several references that can be utilized to determine when a decision should be made in WFDSS and who is responsible for the decision. NWCG #012-2011 discusses the timing of a decision and supporting information as well as the role of the Geographic Area Editor. The information about timing of decision making can also be found in the Interagency Standards for Fire and Fire Aviation Operations (Red Book) and the Wildland Fire and Aviation Program Management Operations Guide (blue book). NWCG #005-2012 discusses the Agency Administrator role in decision making versus what an IMT is expected to do. Historically the team helped the local unit with their Wildland Fire Situation Analysis and often completed it. It is the expectation that the home unit owns the decision and WFDSS documentation although many teams will assist as needed. Often the local unit can bring in an agency representative or strategic operational planner to assist with the WFDSS decision documentation if local staff are not available.



There are many great references to help people understand both the decision making process and WFDSS. The Decision Making GTR was referenced earlier and was written to help people understand the decision making process, rather than the WFDSS process. The Line Officer's Desk Reference has been developed for Forest Service Line officers to provide them with one place to find fire related information.

The Wildland Fire Management RD&A is setting up a location on their website, working with the FS National Line Officer's Team, to host information in one place for Line Officers. Although the FS Line Officer's Desk Reference is hosted here, there are many other documents of interest to interagency Line Officers available here too.



This is a screen capture of the WFDSS Home Page.

On the left menu you will find training material and related resources. This screen shot shows the training menu expanded listing some of the WFDSS 101 lessons. These lessons have been broken down in to smaller units for people to better find the specific training they are looking for. Documents added to the training tab are dated so you know if you have the latest version.

Obtaining help with WFDSS is also found in the left menu of the home page. The top number is utilized for generic help such as resetting passwords or basic assistance. If more complex assistance is needed with the decision process, finding key information or analysis utilize the Analysis and Decision Support number 208-473-8107.

On the left side of the home page you will find the help icon and google search features. Or the latest information related to releases and documents. as well as key in to the latest information found on the right. As new releases are posted, this will be a key place to look for information.

Thank you for reviewing this presentation. Please do not hesitate to provide feedback to Lisa Elenz, at 208-397-5658 or lelenz@fs.fed.us