

Lesson 11 – Creating a Relative Risk Assessment

Estimated time to complete: 30 minutes

In this lesson, you will create a Relative Risk Assessment.

About Relative Risk

The Wildland Fire Relative Risk Assessment is required before publishing a decision for an incident. Its purpose is to assist you in planning for, assessing, and managing your incidents. The Assessment provides the Agency Administrator a quick but comprehensive assessment of the relative risk of the fire. This is a qualitative process that can be completed in less time than a quantitative long-term risk assessment.

Incident owners and editors can perform the assessment. Dispatchers can calculate relative risk for incidents in their geographic area if no incident owner has been assigned. Once an incident owner is assigned, only the incident owner and incident editors can calculate relative risk.

Note: You can't recalculate relative risk if a decision is being reviewed, or after the incident is declared out.

Relative risk is comprised of three aspects:

- Hazards. Users must complete a Hazard Assessment.
- Values. Users must complete a Values Assessment.
- Probability. Users must complete a Probability Assessment.

Each aspect requires consideration and attention when you develop a Relative Risk assessment. Using the information you gathered in Lessons 8, 9, and 10, as well as your own knowledge about the fire area gained from field visits and conversations with local fire managers, you will develop an assessment for each of these aspects in WFDSS that will help you calculate the overall Relative Risk for your incident.

Hazard Assessment

The hazard in wildland fire is composed of the following:

- Conditions under which the fire occurs and exists
- Ability of the fire to spread and circulate
- Intensity and severity the fire may present
- Spatial extent of the fire

To complete the Hazard Assessment, you determine inputs to address:

- Departure from Historic Conditions
- Fire Behavior
- Potential Fire Size

Values Assessment

Values are those ecologic, social, and economic resources that could be lost or damaged because of a fire. Ecologic values consist of the following:

- Vegetation
- Wildlife species and their habitat
- Air and water quality
- Soil productivity
- Other ecologic functions

Social effects can include the following:

- Life, cultural and historical resources
- Natural resources
- Artifacts
- Sacred sites

Economic values can include the following:

- Property and infrastructure
- Economically valuable natural and cultural resources
- Recreation
- Tourism opportunities

The values assessment allows opportunity for the local Agency Administrator to identify particular local concerns. These concerns may be identified in the Fire Management Plan or other planning documents.

To complete the Values Assessment, you determine inputs to address:

- Natural/Cultural Resource and Infrastructure Values
- Location of Fire to Values
- Social/Political Concerns

Probability Assessment

Probability refers to the likelihood of a fire becoming an active event with potential to adversely affect values.

To complete the Probability Assessment, you will have to determine inputs to address:

- Current Time of Season
- Barriers to Fire Spread
- Seasonal Severity

Considerations

- The breakdown of each aspect is not all inclusive and items on the list can vary by place and time.
- Users are expected to exercise their judgment in determining the ratings; information is intended to provide both guidance in completion and flexibility in determining exactly what the descriptions mean.

- Local information can and should be amended to the lists to better reflect site-specific situations.
- Local, site-specific information concerning air quality and smoke management must be amended into the Wildland Fire Relative Risk Assessment to reflect variances in situations and local values and regulatory concerns.
- Air-quality criteria should be reflected in the values assessment portion, smoke production can be incorporated into the hazard descriptive list, and descriptive information related to the probability of adverse smoke events, if available, can be addressed as part of the probability assessment.

Calculating Relative Risk

Calculating Relative Risk in WFDSS can be done from the Relative Risk Menu Option, available from the left side of the screen in the incident view, or from the menu sub tab from a map display. You can also access Relative Risk by clicking the Assess Relative Risk button from the Objectives tab. To calculate Relative Risk using the tools in WFDSS, you need to:

- Develop inputs for the Values, Hazards, and Probability rating charts and document your rationale for each selection in the associated Notes fields.
- Estimate the potential fire duration from today.

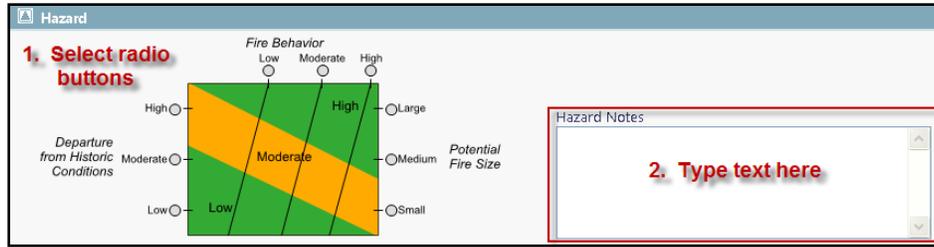
Outcomes from the values, hazards, and probability assessments auto-fill in the Relative Risk rating chart at the top of the page. If you do not agree with the Relative Risk results, you can go back and modify your rating chart inputs. When you are satisfied with your inputs (and have documented the reason for your selections in the Notes fields), and selected a potential fire duration, WFDSS generates Relative Risk Advice based on the Relative Risk results and the potential fire duration you selected.

The following exercises contain information found in the WFDSS online help. You can access the help topics themselves from the Relative Risk page in WFDSS by clicking the help icon beside each rating chart, or in the upper right hand corner of the page beside the feedback link.

Note: The overall Relative Risk rating, Potential Fire Duration, and the Notes within each category automatically carry over into the decision content, and ultimately, the published decision. The Hazards, Values, Probability and Relative Risk Assessment rating graphs do NOT carry over, but are available in the incident content for you to add to your decision if you choose. .

To create a Hazards Assessment:

1. From the Incident List, select the incident for which you would like to calculate Relative Risk.
2. Click **View Information**. The Incident Information page appears.
3. Select **Relative Risk** from the list of menu options on the left. The Relative Risk page opens and four rating charts are displayed; the primary Relative Risk chart is at the top of the page and the secondary Hazards, Values and Probability rating charts are beneath it. You will develop inputs for the secondary rating charts and you'll begin with Hazards.
4. Locate the **Hazards** rating chart.



5. Select a radio button beside **Low, Mod** or **High** to represent *Departure from Historic Conditions* for the fire area. When making your selection, consider the following:

Departure from Historic Conditions

A measure of ecological functions at risk, based on changes in vegetation.

| Low | Moderate | High |
|---|--|--|
| Vegetative composition and structure are resilient, similar to historic conditions, and key components are at low risk of loss. | Both the composition and structure of vegetation has shifted from historic conditions towards conditions that are less resilient and more at risk of loss. | Vegetation composition and structure are highly altered and predisposes the landscape to fire effects well outside the range of historic variability, potentially producing changed fire environments never before measured. |

6. Select a radio button beside **Low, Mod** or **High** to represent *Current Fire Behavior* for the fire area. When making your selection, consider the following:

Current Fire Behavior

The current fire behavior or the most recently observed behavior. Changing fire behavior is addressed completing the Periodic Fire Assessment.

| Low | Moderate | High |
|--|--|---|
| <ul style="list-style-type: none"> ▪ Short duration flaming front with occasional torching. ▪ Fuels are uniform and fire behavior can be easily predicted and tactics implemented. | <ul style="list-style-type: none"> ▪ Short range spotting occurring. ▪ Moderate rates of spread are expected with mainly surface fire and torching. ▪ Fuels and terrain are varied, but don't pose significant problems in holding actions. | <ul style="list-style-type: none"> ▪ Long range spotting > ¼ mile. ▪ Extreme rates of spread, and <u>crown fire activity</u> are possible. ▪ Fuels, elevation, and topography vary throughout the fire area, creating high resistance to control. |

7. Select a radio button beside **Small, Medium** or **Large** to represent the *Potential Fire Size* for the incident. When making your selection, consider the following:

Potential Fire Size

The potential fire size by the end of the season, in comparison to historical fire occurrence.

| Small | Medium | Large |
|--|---|--|
| Fire size is expected to be small for the dominant fuel type involved. | Fire size is expected to be in the mid-range for the dominant fuel type involved. | Fire size is expected to be large for the dominant fuel type involved. |

- Document your reasons for selecting each input in the Hazards Notes text box. An example of the type of notes you would include is below:

Hazards Notes Example: Fire has exhibited rapid rates of spread and has spotted across a 4 lane interstate and a 2 lane state highway in the first two operational periods. Fire has potential to reach 30,000 acres plus. Area of ignition hasn't been burned for 20 plus years.

- Locate the red circle in the Hazards rating chart and notice if it falls into the Low, Moderate, or High category. The outcome for Hazards carries over to the Relative Risk rating chart at the top of the page.
- Click **Save**.

To Create a Values Assessment:

- Locate the **Values** rating chart (if you need help locating it, refer to steps 1-3 in the previous exercise).
- Select a radio button beside **Low, Mod** or **High** to represent *Natural/Cultural Resource and Infrastructure Values* for the fire area. When making your selection, consider the following:

Natural/Cultural Resource Concerns

Examples include, but are not limited to, habitat or populations of threatened, endangered, or sensitive species, water quality, erosion concerns, and invasive species.

| Low | Moderate | High |
|---|---|--|
| Resource concerns are few and generally do not conflict with management of the fire. Mitigation measures are effective. | Significant resource concerns exist, but there is little conflict with management of the fire. Mitigation measures are generally effective. | Multiple resource concerns exist, some of which may conflict with management of the fire. The effectiveness of needed mitigation measures is not well established. |

- Select a radio button beside **Distant, Mod** or **Adjacent** to represent *Location of Fire to Values*. When making your selection, consider the following:

Location of Fire to Values

| Distant | Moderate | Adjacent |
|--|---|---|
| Fire location is not near values to be protected, or fire is located where it is highly unlikely that it would reach the values. | Fire location is moderately near to values. Location is such that, based on historical data, fire could potentially reach the values, but will take multiple burning periods and sustained fire activity to reach the values. | Fire location is close to values. Without mitigation actions, fire is expected to reach the values. |

- Select a radio button beside **Low, Mod** or **High** to represent *Social/Political Concerns* in the fire area. When making your selection, consider the following:

Social/Economic Concerns

The risk of the fire, or effects of the fire, impacting the social or economic concerns of an individual, business, community, or other stakeholder involved with or affected by the fire.

Social concerns may include degree of support for the wildland fire use program or resulting fire effects, potential consequences to other fire management jurisdictions, impacts to tribal subsistence or gathering of natural resources, air quality regulatory requirements and public tolerance of smoke.

Economic concerns may include potential financial impacts to property, business, or infrastructure. Infrastructure impacts may be costs to repair or replace sediment catchments, wildlife guzzlers, corrals, roads, culverts, power lines, domestic water supply intakes, and similar items.

| Low | Moderate | High |
|--|---|--|
| <ul style="list-style-type: none"> ▪ Local support for wildland fire use is high. ▪ The fire should have little or no impact on subsistence or Tribal activities involving treaty rights. ▪ The fire is expected to remain within a single jurisdiction or agreements are in place to allow the fire to move across several jurisdictions. ▪ Media coverage is favorable. ▪ Few structures or business ventures are potentially affected by the fire. ▪ There are few impacts to recreation and tourism. | <ul style="list-style-type: none"> ▪ Local support of wildland fire use is clearly divided between supporters and opponents. ▪ The fire will have some impacts on subsistence or Tribal activities involving treaty rights. ▪ The fire is expected to involve more than one jurisdiction, cooperator, or special interest group and agreements need to be developed. ▪ Media coverage tends to be a mix of favorable and unfavorable views. ▪ Some structures may be threatened by the fire or some business ventures may be affected by the fire. | <ul style="list-style-type: none"> ▪ Local support for wildland fire use is low. ▪ The fire will have significant impacts on subsistence activities or Tribal activities involving treaty rights. ▪ Smoke impacts may become a concern for higher level air quality regulatory agencies. ▪ The fire is expected to involve several jurisdictions, cooperators, and special interest groups and agreements requiring significant negotiation need to be developed. ▪ Media coverage tends to be unfavorable. ▪ Many structures or private properties could be threatened. |

5. Document your reasons for selecting each input in the Values Notes text box. An example of the type of information you would include is below:

Values Notes Example: Fire is located on both sides of interstate 75, which is the major corridor for travel across the southern Florida peninsula. Florida Panther Refuge facilities are in the direct path of the fire spread. Political and social concerns include impacts on commerce if I-75 is closed due to smoke. Natural resource values could be impacted (hardwood hammocks and cypress), but impacts would not be out of the normal range of variation.

6. Locate the red circle in the Values rating chart and notice if it falls into the Low, Moderate, or High category. The outcome for Values carries over to the Relative Risk rating chart at the top of the page.
7. Click **Save**.

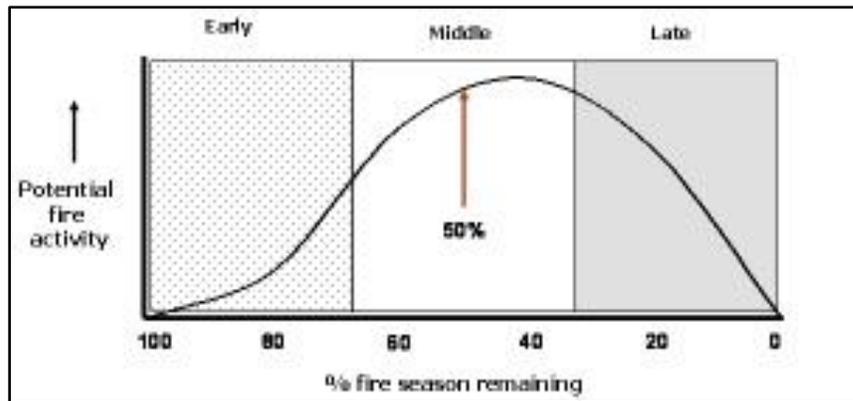
To Create a Probability Assessment:

1. Locate the **Probability** rating chart (if you need help locating it, refer to steps 1-3 in the *To create a Hazards Assessment* exercise).

2. Select a radio button beside **Early, Middle** or **Late** to represent *Current Time of Season* for the fire area. When making your selection, consider the following:

Time of Season

The current time in relationship to the historical fire season. The graph reinforces the importance of time of season. During the early part of the fire season, the peak of burning activity is still to come, thus the fire could present substantial variation in behavior and activity. In the middle of the season, the peak of burning activity may or may not have occurred, while in the late part of the season, the peak of fire activity generally has already occurred and managers can reasonably expect diminishing fire activity and behavior as time progresses. As the amount of fire season remaining decreases, or as the time of season progresses from early to late, management concerns and issues associated with potential fire activity decrease.



| Early | Middle | Late |
|---|---|---|
| <ul style="list-style-type: none"> ▪ The current date is in the early portion of the historic fire season. ▪ At least 2/3 of the established fire season remains. ▪ The peak of burning activity is still to come. | <ul style="list-style-type: none"> ▪ The current date is in the middle of the historic fire season ▪ At least 1/3 of that period has passed and no less than 1/3 remains. ▪ The peak burning activity period either has occurred, is occurring now, or will occur very soon. | <ul style="list-style-type: none"> ▪ The current date is in the latter part of the historic fire season. ▪ At least 2/3 of the historic period has passed ▪ The peak burning activity period has occurred. ▪ The probability of a season-ending or fire-ending event is increasing quickly. |

3. Select a radio button beside **Numerous, Moderate** or **Few** to represent *Barriers to Fire Spread* in the fire area. When making your selection, consider the following:

Barriers to Fire Spread

A measure of the natural defensibility of the fire location and an indication of degree of potential mitigation actions needed.

| Numerous | Moderate | Few |
|---|---|---|
| <ul style="list-style-type: none"> ▪ The location of the fire and presence of natural barriers and fuel breaks | <ul style="list-style-type: none"> ▪ The location of the fire and presence of some natural barriers and fuel breaks limit the horizontal | <ul style="list-style-type: none"> ▪ The location of the fire and presence of only limited natural barriers and fuel breaks will |

| Numerous | Moderate | Few |
|---|--|---|
| limit the horizontal fuel continuity. ▪ Minimal mitigation actions on-the-ground will be needed. | fuel continuity on some, but not all fire flanks ▪ Some mitigation actions on-the-ground will be needed to protect threats to boundaries and sensitive areas. | permit fire spread across continuous fuels. ▪ Mitigation actions on-the-ground will be needed, but are expected to be effective. |

4. Select a radio button beside **Low, Mod, High, Very High** or **Extreme** to represent *Seasonal Severity* in the fire area. When making your selection, consider the following:

Seasonal Severity

Measures the current potential burning conditions as expressed by indices such as:

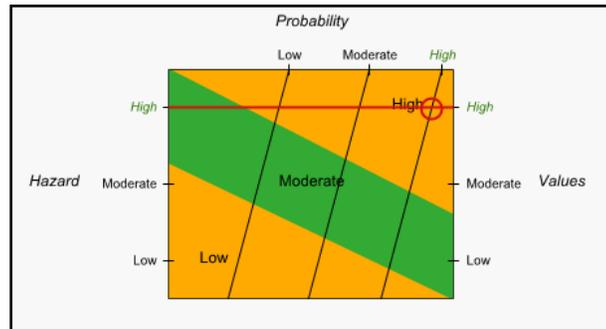
- Energy release component (ERC)
- Drought status
- Live fuel moistures
- Dead fuels moistures
- Soil moisture
- Stream discharge
- Similar types of drought measurements

| Low | Moderate | High | Very High | Extreme |
|--|--|---|--|--|
| ▪ Measures are below seasonal averages. ▪ Drought status is within seasonal norms with no long-term drought present | ▪ Measures are approximately at seasonal averages. | ▪ Measures are above seasonal averages, but below the 90th percentile. ▪ The area may be experiencing a short-term seasonal drought, but is not considered to be in long-term drought. | ▪ Measures are above the 90th percentile. ▪ The area is considered in a drought situation for more than one year. | ▪ Measures are above the 97th percentile or setting new records. ▪ The area is considered to be in long-term drought (3 or more years). |

5. Document your reasons for selecting each input in the Probability Notes text box. An example of the type of information you would include is below:

Probability Notes: Barriers to fire spread are moderate and could be effective with successful burnout operations. Direct attack is limited due to inaccessible terrain. Few natural barriers exist due to drought conditions - all fuels are readily available to burn and we are in the middle of fire season. Fire Danger indices are reaching and have exceeded the 97th percentile in recent weeks.

6. Locate the red circle in the *Probability* rating chart and notice if it falls into the Low, Moderate, or High category. The outcome for Probability carries over to the Relative Risk rating chart at the top of the page. At this point, the inputs for the Relative Risk rating chart are complete and the chart at the top of the page will look comparable to this:



7. Select a Potential Fire Duration (**Short, Medium or Long**), after you have completed the Hazards, Values and Probability Assessments.

Note: The potential fire duration should be based on the current date, not the date of discovery. For example, if you are 30 days into a large fire that is now 80% contained and is anticipated to be fully controlled within 10 days, you would use the 10 days as your estimated duration, and would select Medium.

8. Click **Save**.

Completing the Relative Risk Assessment:

1. In the Relative Risk Notes box, document why you agree with the final Relative Risk results. Remember, only the overall Relative Risk rating, Potential Fire Duration and the Notes within each category carry over into a published decision. The Rating Graphs do not, as they are just a tool used to arrive at the final Relative Risk Rating. An example of the type of information you would include is below:

Relative Risk Notes Example: Overall risk is high primarily due to the proximity of the interstate and refuge structures. Potential fire size is large and potential strategies include extensive burn out operations in order to contain fire on existing roads and trails.

2. Click **Save**.
3. Read the Relative Risk advice. Use the advice to guide your decision making and inform your inputs throughout the remainder of the Lessons. Select **Back** to make additional edits.
4. When you are happy with your inputs, click **Save**.

Viewing the Relative Risk for an Incident

Relative Risk Assessment is accessible in several locations within WFDSS. Once you save a Relative Risk Assessment, all WFDSS users can view the assessment. The Relative Risk Assessment can be viewed three different ways. Users can:

- View the Current Relative Risk Assessment from the Relative Risk menu option.

- View the Relative Risk Assessments associated with published decisions.
- View the Relative Risk Assessments associated with periodic assessments.

To view the current Relative Risk Assessment:

1. From the Incident list, select the incident > click View Information. The Edit Information page appears.
2. From the left hand menu, choose Relative Risk. The Relative Risk page appears and displays the current relative risk. You can view the currency date in the box in the upper right-hand corner.
3. Click  to expand and view the inputs for Hazards, Values, and Probability.

To view relative risk assessment associated with a decision:

1. From the Incident list, select the incident > click View Information. The Edit Information page appears.
2. Click the Decisions tab. The Decision List page appears.
3. In the Decision List, click the relative risk to view from the right-hand column of the decision list. The relative risk assessment associated with the selected decision appears. You can view the currency date in the upper right-hand corner of the page.

Note: A relative risk assessment is archived with each published decision. This archive documents the risk as it changes throughout an incident.

4. Click  to expand and view the inputs for Hazards, Values, and Probability.

To view relative risk assessment associated with a periodic assessment:

1. From the Incident list, select the incident > click View Information. The Edit Information page appears.
2. Click the Periodic Assessment tab.
3. In the Periodic Assessment List, click the relative risk to view from the right-hand column of the periodic assessment list. The relative risk assessment associated with the selected decision appears. You can view the currency date in the upper right-hand corner of the Relative Risk page.

Note: A relative risk assessment is archived with each published decision. This archive documents the risk as it changes throughout an incident.

4. Click  to expand and view the inputs for Hazards, Values, and Probability.

Search for these related topics in the Help

- [Wildland Fire Relative Risk Assessment](#) (for more formation about the policy.)
- [About Relative Risk](#)
- [Calculating Relative Risk](#)
- [Viewing the Relative Risk for an Incident](#)
- [Interpreting Relative Risk Advice](#)