

Integrating Resource Management in the Lifecycle of Wildland Fire Decision-making

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Introduction

This paper reflects my experience of fifteen years working as a biologist in various National Park Service (NPS) units. Since 2003 I have worked as a member of resource management staff where I had responsibilities for fire management plans and updates, coordinating fire incident resource advising activities, and preparing and implementing burned area emergency response plans. Most of this work has been focused in the Mojave Desert, an environment that has experienced a dramatic increase in fire frequency and fire size in recent years (Brooks and Matchett 2006), with more than one million acres burned since 2005. This escalation of fire activity has provided many opportunities for learning, including both confirming what we thought we knew and overturning some previously held beliefs about the impacts of fire and fire management activities. This dynamic fire setting highlights the need for resource professionals to continuously engage in wildland fire management. The following observations reflect my lessons learned regarding the opportunities and challenges for engaging resource managers in the life cycle of wildland fire decision-making.

Fire management plan

The development of a fire management plan (FMP) provides an opportunity to proactively engage resource management professionals with fire management professionals to determine the long-term future of fire and vegetation in a protected-area landscape. NPS policy requires that all parks with burnable vegetation must have an approved FMP and the accompanying National Environmental Policy Act compliance (NPS 2008). Specifically, the FMP needs to identify resource values at risk from either fire effects or fire suppression effects, identify resources that benefit from fire to determine the need for prescribed fire or opportunities to use wildland fire for resource benefit, and to identify altered fire regimes and the steps required to restore them. This is a prime opportunity to inventory fire-related resources. This is also a great opportunity to make use of the many recent tools and datasets available from the National Wildland Fire Coordinating Group and the National Interagency Fire Center. Datasets such as the Landscape Fire and Resource Management Planning Tools Project (aka LANDFIRE, www.landfire.gov) and Monitoring Trends in Burn Severity (<http://mtbs.gov>) increase our collective understanding of fire dynamics by providing consistent data on past fire frequency and severity as well as current vegetation, fuels, and fire regimes. To increase the effectiveness of the collaboration between resource managers and fire managers, it is important that resource managers be involved in the development of the full scope of the FMP, not just its environmental compliance document. For example, relevant appendices to the FMP may include a resource advisors guide and fire effects monitoring and research plan. This is also an opportunity for resource managers to work with fire managers

to develop local operational guidelines to address resource concerns, such as decontamination protocols to prevent the spread of terrestrial and aquatic invasive species.

Planned activities identified in the FMP, such as mechanical fuel treatments or prescribed fires, provide many opportunities for collaboration between resource managers and fire managers, such as developing project objectives, monitoring strategies, and mitigation measures for any negative impacts on resource values. The remainder of this paper will focus on unplanned ignitions, where decision making and opportunities for collaboration occur within a compressed timeframe and in the presence of uncertainty and risk.

Fire incidents

For resource managers to engage in wildland fire incidents as resource advisors, known as READs (NWCG 2004), they must first be trained and equipped to serve in that capacity. Ideally a range of resource disciplines should be trained and available, including both natural and cultural resource disciplines. There should also be some planning to determine what actions trigger consultation and who will do the required emergency consultations with the US Fish and Wildlife Service and the state or tribal historic preservation officer. A call-out procedure and schedule should be developed in consultation with the local fire management officer to assure that qualified resource advisors are available whenever needed. It can be a challenge to get resource managers used to operating in an emergency response mode, where they must be reachable after hours and on weekends when many unplanned ignitions occur. Without this preparation, delays in READ availability are both a frustration to the duty officer and a threat to the resources because the fire burns and management actions occur with or without READ presence. Outside of fire season (pre-season) is also the best time to compile all of the relevant documents and geospatial data into portable media to be made immediately available for resource protection during fire incidents. External hard drives are a good tool for this use, and in protected areas with a dispersed staffing configuration, it may be necessary to have several identically loaded hard-drives staged at strategic locations for access by resource advisors, agency representatives, incident commanders, etc. Pre-season is also the time to work with local fire personnel to load resource constraints and other information in the Wildland Fire Decision Support System (2009).

During any fire incident, one of the ongoing tasks for the READ will be making recommendations regarding location of incident operations: incident command post, base camp, spike camps, staging areas, fueling areas, helibase and constructed helispots, retardant mix plant, and dip/draft locations. One of the biggest challenges for resource advisors is understanding the on-the-ground spatial needs of fire incident operations, and finding suitable locations that minimize new ground disturbance, without spreading the invasive plants that often grow in existing disturbed areas. In some landscapes it may be possible to plan where such operations may be located, and proactively remove exotic plants from those areas prior to the anticipated use. When a fire incident transitions to an incident management team and the number of incident personnel increases rapidly, it is critical that a resource advisor be available when and where these types of decisions are made.

During initial action, it is important that the READ be engaged, available, and useful to the incident commander. The presence of mobile geographic information system (GIS)

capability and the having values-at-risk geospatial data on scene is critical to help inform the tactical decisions made by the incident commander. The on-scene availability of local guidelines and maps can be helpful in briefing incoming firefighting resources. One of the biggest challenges for a READ during initial action on an active fire is keeping up with a highly mobile work force. The dynamic situation of initial action on a rapidly growing wildland fire may result in incomplete incident documentation where critical incident operational areas or even constructed line may not be fully or accurately recorded and may be obscured by the advancing fire perimeter. For this reason, resource advisors should try to keep an annotated map of activities and locations that may warrant follow-up monitoring.

During extended attack, there will likely be the need for multiple resource advisors, possibly including fireline qualified READs on each division and a lead READ at the incident command post to participate in every briefing and planning meeting. For incidents running a 24 hour operation in two shifts, it will be necessary to have two lead READs in order to be at all of the required decision making meetings without violating the work/rest standards. Extended attack incidents are also an opportunity for local resource managers to get involved in wildland fire in ways other than resource advising, including technical specialists, GIS specialists, and information officers. The effectiveness of resource managers in meeting these incident needs will be dependent upon the amount of fire training and experience they have. At a minimum, completing the on-line I-100 introduction to incident command system training course enables all assigned personnel to understand the basics of the incident command system used to manage fires. To be qualified for other positions, resource managers will also have to meet the training and experience requirements as outlined in the current Wildland Fire Qualification System Guide (NWCG 2008).

Throughout any fire incident, local resource managers should pay attention to the type of fuel carrying the fire. Is it primarily carried in native or non-native fuels? Such observations may indicate how “natural” the fire effects are likely to be and help determine the need for post-fire actions. Also, fire incident information should be compiled daily, ideally in an annotated incident action plan and map book, and the lead READ should maintain frequent communication with the situation unit to develop complete documentation of fire management activities and impacts. Air operations may warrant special attention due to the potential for spreading exotic species and impacting aquatic habitats. It can be challenging to collect accurate information about air operations, but some questions to pursue include: From what source was raw water drafted/dipped and then where was it delivered? What type(s) of retardant was used, where was it loaded, and where was it delivered?

Post-fire response

During suppression repair, up to 90 days after the date of containment, resource managers should help identify and communicate suppression impacts to the incident commander or local fire management officer, depending on whether the incident has been turned back to the local unit. Such impacts may include cut fences, compacted soil around incident operation areas, and possible weed introduction or spread. Ideally, a resource advisor should be assigned to the suppression repair effort to assure that identified needs are adequately addressed and that no further impacts occur during this time frame, as such work is usually

performed by less experienced crews and oversight is often provided by someone who is not on scene.

During emergency stabilization (ES), the focus is on the immediate protection of human life or critical natural and cultural resources from post-fire effects (USDI 2004), most commonly watershed effects. Typical treatments might include installation of structures or other efforts to stabilize soil and/or slow water movement. Treatments must be completed in one year and may be monitored and maintained for up to three years after the date of containment. Local resource managers must be involved in preparing the emergency stabilization plan, either in-house, or with the help of a regional or national burned area emergency response team. It is likely that local resource managers will be responsible for implementation of the approved treatments and/or activities, thus they need to understand the purpose of the treatment and be prepared to monitor its effectiveness and make adjustments as necessary throughout the implementation period.

During non-emergency burned area rehabilitation (BAR), the priorities are to repair or improve lands damaged directly by a fire and to rehabilitate or establish healthy, stable ecosystems in the burned area (USDI 2004). Typical treatments on protected lands managed by the Department of the Interior include repair or replacement of minor facilities damaged by fire, control of invasive plants, habitat restoration, or reforestation. These projects are competitively funded for up to three years post-fire. Plans are usually prepared and implemented in-house by resource managers from the local managing agency.

Finally, beyond ES and BAR treatments, it is incumbent upon resource managers to make sound recommendations to agency administrators to allow for recovery of the burned area. Such recommendations might include reconsideration of visitor use management decisions, such as area closures, use reductions, or restrictions on activities that could increase ground disturbance. The agency might also need to reconsider its own activities in a burned landscape, including deferral of livestock grazing and removal of feral animals (e.g. wild horses and burros) that would interfere with natural regeneration.

Conclusions

The experiences gained from a fire incident or post-fire response need to be used by both resource managers and fire managers to prepare for the next fire or next fire season. Such learning actions might include the following:

- Participate in the after action review.
- Implement fire effects monitoring strategy and analyze data.
- Invite fire effects research and incorporate findings.
- Use fire management plan annual updates to refine local guidelines and environmental protection measures.
- Use five-year fuel plan updates to incorporate new knowledge of fire and fuel dynamics.
- Update READ guide and datasets.

Wildland fire management is becoming increasingly technical and the outcomes of decisions made in fire management plans, fire incidents, and post-fire response have long-term impli-

cations for natural and cultural resources. Resource managers have the opportunity to bring their knowledge and skills to bear on these critical decisions. Both resource managers and fire managers have the opportunity to improve the outcomes of decisions through collaboration.

References

- Brooks, M.L., and J.R. Matchett. 2006. Spatial and temporal patterns of wildfires in the Mojave Desert, 1980–2004. *Journal of Arid Environments* 67, 148–164.
- NPS [National Park Service]. 2008. *Reference Manual 18: Wildland Fire Management*. On-line at www.nps.gov/fire/fire/fir_wil_do18.cfm. Accessed 28 March 2009.
- NWCG [National Wildfire Coordinating Group]. 2004. Resource advisor's guide for wildland fire. On-line at www.nwcg.gov/pms/pubs/pubs.htm.
- NWCG. 2008. Wildland fire qualification system guide PMS 310-1. National interagency incident management system. On-line at www.nwcg.gov/pms/docs/pms310-1.pdf. Accessed 28 March 2009.
- USDI [U.S. Department of the Interior]. 2004. Departmental Manual 620 DM 3: *Wildland Fire Management, Burned Area Emergency Stabilization and Rehabilitation*. On-line at http://elips.doi.gov/app_DM/act_getfiles.cfm?relnum=3610.
- WFDSS [Wildland Fire Decision Support System]. 2009. On-line manual and software. On-line at https://wfdss.usgs.gov/wfdss/WFDSS_About.shtml. Accessed 28 March 2009.