Joint Fire Science Program
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RESEARCH SUPPORTING SOUND DECISIONS
Manager's Viewpoint
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Embracing "New information": A Manager's Perspective

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Purpose of this opinion piece

Manager's Viewpoint is an opinion written by a fire or land manager based on information in a JFSP final report and other supporting documents. This is our way of helping managers interpret science findings. If readers have differing viewpoints, we encourage further dialog through additional opinions. Please contact Tim Swedberg to submit additional viewpoints (timothy_swedberg@nifc.blm.gov). Our intent is to start conversations about what works and what doesn't.

Background

Scott Stephens reports on the early findings from the central Sierra Nevada Fire and Fire Surrogate Study (FFS) comparing three initial treatments against a control. This Manager's Viewpoint will focus around a discussion of the initial findings and management implications from this project and the challenges of incorporating new science findings like this into management evaluations and decisions.

Familiar Story

As Dr. Stephens writes, "the story is familiar by now." The key findings from the Blodgett FFS are consistent with findings from other FFS sites and match the observations from on-the-ground experience by forest managers who have been implementing similar practices for the last decade. In addition to modeled expected changes in fire behavior, we are beginning to gather data from real fires burning into treated areas. In California, the best example comes from a similar experiment on the Blacks Mountain Experimental Forest which burned in the Cone Fire in 2002 (See Fire Science Brief, Issue 4, January 2008). Similar experiences are being documented in other areas of the country (See Science Brief, Issue 1, October 2007 and Success Stories at http://www.forestsandrangelands.gov/success/index.cfm).

New Information and Unanswered Questions

There is a rich and building body of publications coming from the Blodgett FFS site examining the effects of the study treatments on soils, leaf litter invertebrates, insects and disease, fire and fuels, silviculture, and wildlife. Managers need new science findings to help review and adjust their assumptions (adaptive changes) and feel confident in making decisions to move forward in planning and implementing actions. Yet often new science findings have the opposite effect. They are less than definitive and raise many new questions or uncertainties. So, despite this "familiar story", there remains huge scientific and social uncertainty about how to reduce fuels and manage vegetation in forested systems.

These uncertainties arise in questions such as:

- How much vegetation and fuels do I need to remove to change fire behavior?
- How does removing vegetation and fuels affect other resources like wildlife and plants?
- What are the on-the-ground effects of removing vegetation and fuels to soils and water?
- What are the costs of doing this work and how do I identify priority areas to treat?
- How do I compare the effects of treatment with the probability and effects of wildfire or other disturbance?

Scope and Scale of Treatments and Effects

Since the FFS study was designed to answer most of these questions, it would seem that we are well on our way to finally putting some of these questions to rest. For some situations, we are very close. The method of assessing predicted wildfire behavior presented by Dr. Stephens can be used to reduce uncertainty when the objective is to protect values within the treated unit. However, as Dr. Stephens appropriately points out, the FFS study was not designed to address landscape questions about treatment placement or landscape effects. Unfortunately, these are the scale of questions that managers struggle the most with when planning projects or developing strategic out-year programs of work. Fortunately, other efforts, some sponsored by the JFSP, are tackling these issues, including the Stewardship and Fireshed Assessment effort I'm currently involved with (Bahro et. al. 2007).

So here's the rub, science findings are best extracted from studies of small areas where confounding conditions like natural variations in the landscape can be controlled or explained, yet managers must apply these findings back over a landscape that includes the very natural variation that was excluded from the finding. This contradictory and illogical application of science findings are driven from both ends. The scientist is driven to exclude variation in order to find statistically significant relationships. The manager is driven to use these new science findings and, without other information about the areas not studied, is pressured to overextend it, often under the misplaced notion of using "the best available science".

Integrating Science and Management: The Role of Science Briefs and Manager's Views

The JFSP can play a critical role in working through this conundrum through these Science Briefs and Manager's Views. These are opportunities for scientists to explain their findings and work with managers to ensure the information is appropriately applied and considered. I'll provide two examples from the Blodgett FFS Science Brief of how I see this working.

Modeling Fire Behavior to Determine Treatment Effectiveness

The Fire Science Brief describes a pretreatment assessment process to use the fire model tool FMAPlus® to assess how alternative treatments of different fuel layers affect the level of fire hazard so that the fire effects of different intensities of treatments can be calculated. This seemingly simple description of a method to assess hazard reduction from different treatment prescriptions can be overextended by managers to a pseudo-requirement that it be used on all treatment units when evaluating projects. Their rationale (or the rationale provided to them in public comments) may be on the lines of "it's a method that's been suggested by scientists, it's readily available, and doing anything less appears arbitrary." The problem isn't that the additional information on fire hazards and effects cannot be calculated for each treatment unit (at some cost and effort), but how does the manager trade off a quantified fire risk with habitat values for a species? Is a 5% reduction in fire hazard an acceptable trade for a 50 acre change (reduction in some unquantified amount) in habitat quality?

A discussion that bridges the gap between science and management might go like this: “The pretreatment assessment process is a useful tool to explore likely fire outcomes for different treatments in novel or unique vegetation and fuels conditions. It’s also a useful communication tool to explain fire behavior in relation to the fire environment and management, especially with non-technical stakeholders. It is also a useful process when point protection is the primary objective but should not be necessary to run on every treatment unit in a landscape project or for very similar projects where the outcomes can reasonably be predicted without the model.”

Addressing the Risk of Invasive Plants in Treated Areas

The Fire Science Brief identifies a Management Implication that treatments that change forest structure substantially may contribute to an increased risk of spreading invasive plants. In this case, bull thistle is identified as having a “small, but statistically significant, increase” in the mechanical-plus-fire treatment which changed the forest structure most substantially. This finding is not new, field practitioners and botanists have noted similar situations. For most, this finding will only reinforce the need to do a thoughtful invasive plant/noxious weed assessment as part of project planning and incorporate appropriate prudent mitigation and control measures into the project design. For others, however, this finding could lead to pressure on managers to treat less intensively in general in order to lower the risk of invasive plant spread. The problem isn’t that managers desire to spread noxious weeds, but it may be an unfortunate, unavoidable consequence of doing a treatment for some other priority objective, like reducing the risk of large, high severity wildfires. Again, although we may be able to quantify the risk of invasive plant spread, how do we trade off that risk score with a fire hazard risk score?

As with the previous example, an integrated scientist/manager approach to Management Implications might sound like: “Activities that have a moderate or high level of soil disturbance coupled with increased sunlight at the forest floor could favor the spread of invasive plant species. The characteristics of the particular invasive species should dictate the level of concern and offer clues to alternative or mitigating measures. For example, bull thistle, is prevalent in many landscapes and appears less invasive and persistent than other species like cheatgrass. It is hypothesized that treatments that reduce the extent of moderate and high severity fire effects are likely to result in less bull thistle across the landscape over time, and this hypothesis can be evaluated by examining treated areas and burned areas over time.”

Manager’s Dilemma

The manager’s dilemma is how to make decisions in the face of uncertainty. Decisions on managing natural resources have been termed “wicked problems” (Rittel and Webber 1973, USDA Forest Service 2004) because they involve tough social decisions that must be made where there are tradeoffs between positive benefits to some and negative consequences to others, no agreed process to choose exists, and there is no “correct” answer.

I believe it is necessary for scientists to work closely with managers when there are emerging issues that suggests a “go slow” approach to understand the risk of unacceptable adverse outcomes and to develop expectations on how further learning can clarify the risk and suggest options for change. It is equally necessary for scientists to work with managers when emerging issues are not quite “ripe” yet for drastic changes in management direction or activities. Only by working closely together can scientists and managers develop an adaptive management framework that allows continued management of resources while we learn how to manage these risks. I also believe that such efforts will help focus research on the “right questions at the right scales” and contribute to greater collaborative learning (Bahro et al. 2007).

References
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Manager Profile

DON YASUDA is a biological scientist for the USDA Forest Service, Pacific Southwest Region. He is part of the regional Stewardship and Fireshed Assessment Cadre, providing strategic decision support to national forests and their stakeholders on planning and implementing strategic programs of work to address threats to resource values. He is interested in adaptive collaborative management of natural resources in forest systems. He works closely with fire and fuels specialists and silviculturists assessing opportunities and effects of fuels and vegetation management. He has contributed to the recent JFSP Biomass and Risk Roundtables.