Some wildfire talking points, July 2012

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Wildfires are not always, and not entirely, destructive:

- Wildfires can produce many benefits to natural ecological resources, especially in fire-adapted ecosystems. Over time, fires create a diverse mixture of habitats upon which many species depend.
- Although ecological benefits are more difficult to quantify than the monetary value of property threatened, they can be substantial (Davis and Miller 2010).
- The burned area from a wildfire can be of benefit to managers of other wildfires in the future.

Wildfires can be effective fuel treatments:

- Wildfires consume fuel and alter vegetation structure and have great potential to serve as fuel treatments in much the same way as more traditional means (e.g., mechanical or prescribed fire).
- Wildfires treat more area on our public lands (3.6 million acres of wildfire/year avg.) (NIFC 2010) than traditional mechanical and prescribed fire treatment strategies combined (2.1 million acres/year avg.) (USDA Forest Service 2003).
- The land area treated by wildfire is expected to increase along with increases in wildfire frequency associated with climate warming (Krawchuk et al. 2009) and recent revisions to federal fire policy that allow the management of fire for multiple objectives.

There are at least three ways wildfires can serve as fuel treatments:

- First, a *wildfire may limit the occurrence of subsequent fires*; that is, the consumption of flammable fuels by the wildfire may leave the resulting burned area with insufficient fuels to support an ignition. Reduced wildfire occurrence lessens the need for initial attack resources and continued suppression operations, leading to cost savings and lower exposure to risk in subsequent years.
- Second, the burned area created by a *wildfire may act as a fuel break* that limits the progression, and therefore the extent, of subsequent fires. The fuel break effect can help to limit the extent of subsequent fires, and fire managers can opportunistically use these previously burned areas (aka "fire scars") as fuel breaks in the safe and effective management of subsequent fires.
- Third, the burned area created by a *wildfire treatment may temper the burn severity* of a subsequent fire. Areas that reburn with reduced severity may require less post-fire rehabilitation and in some cases may even serve to restore landscapes that are resilient to frequent, low-severity wildfires.

Empirical evidence for these fuel treatment effects from wildfires is starting to accumulate:

- Collins et al. (2009) studied an upper mixed-conifer forest in the Sierra Nevada, California and found that wildfire affected the size and severity of subsequent fires. This treatment effect was evident when the time between the fires was short (<9 years). The treatment effect was diminished, however, when fire weather conditions for the second fire were extreme.
- Holden et al. (2010) studied burn severity across a range of vegetation types on the Gila National Forest in New Mexico and found that, in areas burned twice by wildfire, the second fire tended to burn at lower severity than the initial fire.
- Recent work by Parks et al. (unpublished data) in the Frank Church-River of No Return and Gila-Aldo Leopold Wildernesses shows that the moderating effect on the severity of reburn can last more than 20 years.

- These empirical studies complement simulation modeling that has illustrated the effectiveness of wildfires as a fuel treatment, whereby the number of subsequent ignitions, and the potential severity and extent of future fire events are reduced (Miller 2012).

Determining the appropriate management response to a wildfire requires an assessment of potential consequences that may occur over the short and long term:

- The risks and benefits of allowing a fire to burn need to be assessed relative to the risks and benefits of suppression.
- When an ignition is aggressively suppressed, potential ecological benefits from fire are foregone and the deferred fire risk is likely to increase over time.
- Decision support tools can map the likely progression of a fire and the values at risk (e.g., WFDSS).
- Methods are also available to identify locations on the landscape where fire can have beneficial effects and locations where it can be detrimental (Black and Opperman 2005).
- Simulation modeling can be used to evaluate how much burning is necessary—and how much burning may be too much—to achieve long term management objectives (Miller 2007; Keane and Karau 2010).

Fire and Wilderness:

- Fire suppression has been, and continues to be, the dominant fire management strategy in Wilderness.
- In many areas, fire suppression has contributed to increasing hazardous fuel accumulations, increasing probability of extreme wildfire occurrence, and altered ecosystem structure and function; all results that run counter to wilderness management goals.
- Fire suppression activities substantially trammel wilderness, counter to wilderness management goals.
- Internal agency perceptions about the use of fire are important. For example, line officers who perceive there is value in the benefits of fire are more likely to authorize its use in Wilderness (Williamson 2005; Black et al. 2008).
- Trends in attitudes of Wilderness visitors indicate increasing support for the use of fire in Wilderness (Knotek 2006).
- 40 years of observations of managing fires for their resource benefits in certain Wilderness areas have demonstrated the long term benefits of fire and how we might effectively use wildfire as a tool for land management elsewhere.

Literature cited

Black A, Opperman T (2005) *Fire effects planning framework: a user's guide*. USDA Forest Service, Rocky Mountain Research Station Gen. Tech. Rep.GTR-RMRS-163WWW (Fort Collins, CO)

Black A, Williamson M, Doane D (2008) Wildland Fire Use Barriers and Facilitators. *Fire Management Today*. 68(1):10-14.

Collins BM, Miller JD, Thode AE, Kelly M, van Wagtendonk JW, Stephens SL (2009) Interactions among wildland fires in a long-established Sierra Nevada natural fire area. *Ecosystems* **12:** 114-128.

Davis BH, Miller C (2010) What if we didn't suppress fire?. *In*: Weber, Samantha, ed. Rethinking Protected Areas in a Changing World: Proceedings of the 2009 GWS Biennial Conference on Parks,

Protected Areas, and Cultural Sites; 2009 March 1-6; Portland, OR. Proc. Hancock, Michigan: The George Wright Society: 131-134.

Holden ZA, Morgan P, Hudak AT (2010) Burn severity of areas reburned by wildfires in the Gila National Forest, New Mexico, USA. *Fire Ecology* **6**(3)**:** 77-85.

Keane RE, Karau E (2010) Evaluating the ecological benefits of wildfire by integrating fire and ecosystem simulation models. *Ecological Modelling* **221:** 1162-1172.

Knotek K (2006) DVD. Trends in public attitudes towards the use of wildland fire. Third International Fire Ecology & Management Congress proceedings. 2006.

Krawchuk MA, Moritz MA, Parisien M-A, Van Dorn J, Hayhoe K (2009) Global pyrogeography: the current and future distribution of wildfire. *PLoS ONE* **4**(4)**:** e5102.

Miller C (2007) Simulation of the consequences of different fire regimes to support wildland fire use decisions. *Fire Ecology* **3**(2)**:** 83-102.

Miller C (2012) The hidden consequences of fire suppression. *Park Science* **28**(3): 75-80.

NIFC (2010) National Interagency Fire Center Statistics. Available at: http://www.nifc.gov/fireInfo/fireInfo_statistics.html

USDA Forest Service (2003) Healthy Forest Initiative: Fuels accomplishments. Available at: http://www.fs.fed.us/projects/hfi/May-2003/hfi-fuels-treatment-graphs.shtml.

Williamson M (2005) Influences on Forest Service district rangers' decision to authorize wildland fire use. In: Andrews, P.L.; Butler, B.W., comps. 2006. Fuels Management—How to Measure Success: Conference Proceedings. RMRS-P-41. Fort Collins, CO: USDA Forest Service, Rocky Mountain Research Station. 67–77.