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Authors
Beasley, Mike
Ingalsbee, Timothy

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Peering through the smokescreen of success with ecological fire use:
A pilot study of three USFS Regions' 2018–2019 wildfire seasons

Mike Beasley, *Firefighters United for Safety, Ethics & Ecology (FUSEE)*
Timothy Ingalsbee, *Firefighters United for Safety, Ethics & Ecology (FUSEE)*

Corresponding author
Mike Beasley
Firefighters United for Safety, Ethics & Ecology
2852 Willamette #125
Eugene, OR 97405
fusee@fusee.org

Abstract

This paper explores current levels of Wildland Fire Use (WFU) as a tool for managing wildfires for resource and ecological benefits. In 2009 new policy guidance for the federal Wildland Fire Policy represented a major advance towards a paradigm shift of ecological fire management by allowing wildfires to be managed for both protection and restoration objectives simultaneously. However, at the same time WFU was eliminated as a distinct category of wildfire incident, and since then, a number of abstract, deliberately vague terms have become common surrogates for WFU. We analyzed suppression documents from wildfires managed by the US Forest Service in three USFS Regions during 2018–2019. Results show that in some USFS Regions there may be more WFU for resource/ecological benefits occurring than is officially acknowledged, obscured by the various euphemisms for WFU that are limiting public recognition of ecological fire management success.

Introduction

Ecologists have long been urging land managers to extend the use of fire to restore and maintain resilient fire-adapted landscapes (North et. al 2012). Despite the many benefits of fire use in land management, the barriers to the increased use of prescribed and wildland fire are well known (Black et. al. 2018; Miller et. al. 2020). This paper will focus on the use of fire for resource and ecological benefits through the management of lightning-caused wildfires to re-establish heterogeneous fire-resilient landscapes. It is critical to maintain fire as an ecological process on large swaths of public lands, but the scale of burning needed makes prescribed fire impractical. In certain protected or remote natural areas (e.g., designated wilderness, inventoried roadless areas, research natural areas, etc.), prescribed fire is also difficult to implement. Consequently, the only other available means of restoring fire is the use of fire in the "emergency" context of unplanned wildfire ignitions. This kind of management of naturally ignited wildland fires to accomplish specific prestated resource management objectives in predefined geographic areas is known as Wildland Fire Use (WFU). In this paper when we discuss fires managed for resource benefits we will use the term "WFU."[1]

In the face of climate-enhanced wildfires, the call to enhance protection of rural communities and build resilience into at-risk ecosystems has never been more urgent. There is nothing as effective as fire in reducing surface fuels that most influence fire spread and intensity. Prescribed burning or WFU are the

only ways to get much-needed understory burning done in remote natural areas and rugged terrain where mechanized tools cannot operate (North et. al. 2012). Prescribed burning is a planned management activity, and must comply with the slow pace of National Environmental Policy Act (NEPA) analyses and inadequate funding from annual budgets. The use of suppression firing operations during wildfires (e.g., backfires or burn-outs) are not constrained by these regulations or budgets. This disparity between the two kinds of fire use is not ideal, but both offer opportunities to actively manage fires in ways that mimic natural fire to achieve desired effects that restore or maintain fire-adapted ecosystems. Given that climate change is rapidly altering weather, vegetation, and fuels conditions in ways that are reducing desired prescription burn windows that enable human control over fire behavior, it is critical that managers take advantage of wildfire ignitions to get good fire on the ground at the scale and speed needed before climate change brings environmental conditions that defy our attempts to control fire behavior.

The Federal Wildland Fire Management Policy (1995/2001) gives federal managers unprecedented flexibility and discretion to manage wildfires for resource objectives and restoration goals. In this paper we will investigate how well US Forest Service (USFS) managers in the Southwest Region (USFS Region 3, comprising Arizona and New Mexico), Northern Region (Region 1, comprising Montana, North Dakota, and parts of South Dakota and Idaho) and California Region (Region 5) are using this policy to authorize fire use through the Wildland Fire Decision Support System (WFDSS). WFDSS is an online repository of information about every wildland fire of significance within federal jurisdiction. It replaces old paper-based decision documents that had to be created at the time that a fire escaped initial attack—the Wildland Fire Situation Analysis (WFSA) for wildfire suppression, and the Wildland Fire Implementation Plan (WFIP) for WFU. A WFDSS Decision is maintained and continually revalidated or revised for the duration of a wildfire incident by the responsible agency administrator. It includes all risk analysis components and rationale for operational decisions. The WFDSS provides the best documentary evidence of authorizing and applying fire use strategies.

Flawed metrics of "success" for fire management

Today's wildland fire managers have an array of metrics to determine the efficacy of their respective programs. An example of a metric used by fire officials is the initial attack success rate. Fire management agencies (some of which are mostly fire suppression organizations) routinely boast about achieving a 95% or better rate of "success" in containing fires during initial attack. However, heralding this initial attack success rate as a target may be working contrary to other land management objectives, such as maintaining ecological integrity of fire-adapted ecosystems and preserving biological diversity of fire-dependent species. If we agree that the application of fire is vital for maintaining these ecosystems and species, then we might want to allow some naturally occurring wildfires to burn and function as a restorative process on the landscape. This would reduce the initial attack success rate but achieve more success in other land management goals (Calkin et. al. 2015; Shultz, et. al. 2019).

One of the current barriers to managers authorizing more WFU is the lack of ways to quantitatively measure or qualitatively assess the different kinds of resource or ecosystem benefits gained from fire management actions. Another barrier is that most of the public, elected officials, and the news media enthusiastically support aggressive firefighting efforts but are wary or even antagonistic toward WFU. Consequently, USFS managers who understand the need for beneficial fire have learned how to obscure fire use with a number of abstract, deliberately vague terms (see Figure 1), collectively expressed as "other-than-full-suppression." The combination of internal and external barriers to authorizing WFU results in a bureaucratic system that mainly rewards managers for putting fires out rather than putting fires in.

Policy reforms and paradigm shifts

Within the fire management community there has long been talk of a paradigm shift moving agencies away from suppression-dominant wildfire responses. The ability to authorize fire use in USFS dates back to the 1970s, but actual fire use incidents were rare, confined to just a few lightning-caused fires in designated wilderness areas, while aggressive initial attack and full suppression was the sole wildfire response strategy for human-caused fires and those burning outside of wilderness areas. In those

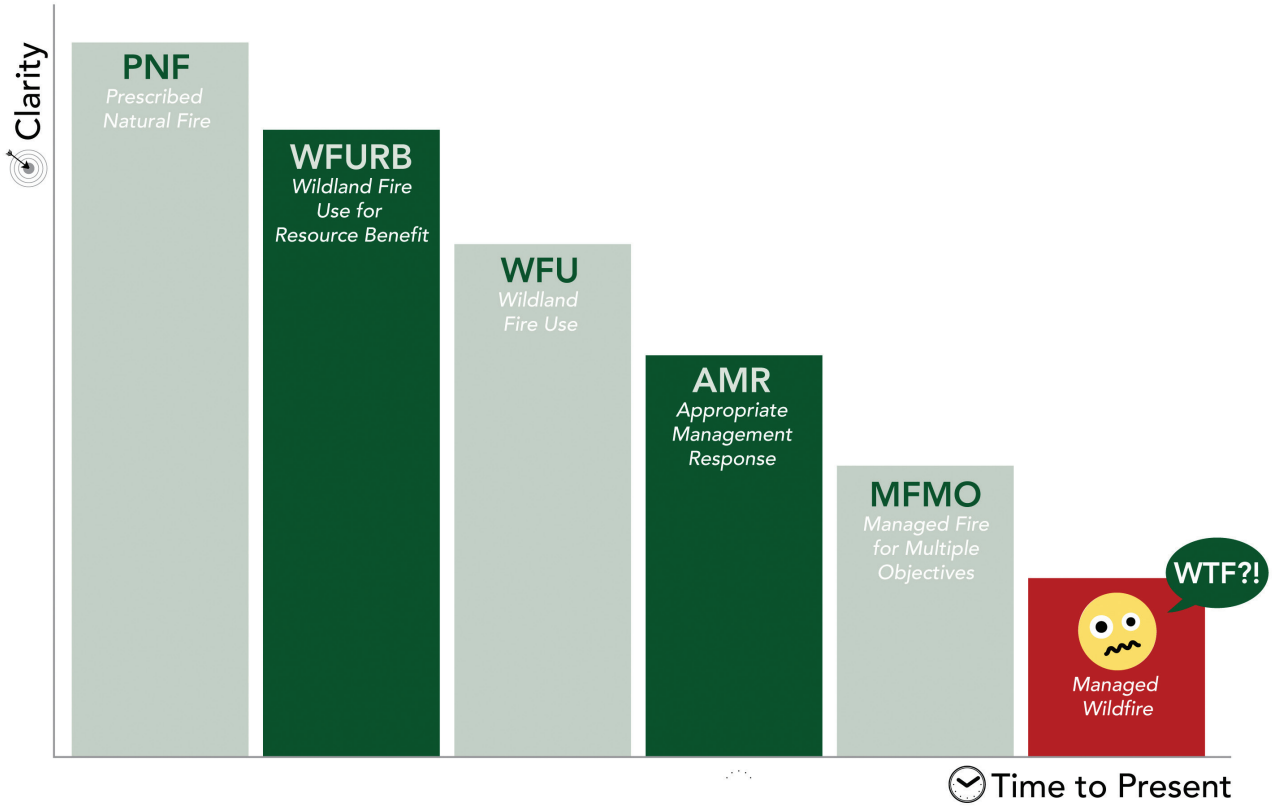


Figure 1. Declining clarity of fire use terminology over time.

few incidents where fire use could be considered, managers had 24 hours to make a firm decision to authorize fire use or adopt full suppression. Their decision had to be one or the other, and if conditions changed in ways that compelled taking significant or expensive management action, then their WFU strategy had to be converted to full suppression. The 2009 *Guidance for Implementation of Federal Wildland Fire Management Policy* (USDI/USDA 2009) was an important policy reform to end this bifurcation of wildfire response strategy. The most significant change involved eliminating WFU as a separate class of fires altogether. Over time, policy interpretations had moved toward allowing more active management in WFU instead of the "let burn" approach of passive monitoring. But now, managers could suppress or simply monitor across space and time for the duration of an incident. Indeed, the reforms instituted by the 2009 policy guidance represented a major advance towards the paradigm shift of ecological fire management.

The new policy guidance divided fire management strategies into two subgroups—protection objectives and resource objectives—and allowed wildfires to be actively managed for both protection and resource objectives simultaneously. Even though federal policy mandates that private property and natural resource values on public lands should be weighted equally in designing response strategies, property protection goals usually far outweigh resource benefit goals. Even in areas where the human values-at-risk are relatively low (e.g., remote, uninhabited areas), and the resource benefits of burning may be high (e.g., fire-dependent ecosystems), protection goals are normally elevated above resource goals and dominate the wildfire response strategy. What is rarely addressed is how fire suppression and fire exclusion for protection goals fail to yield resource benefits, and degrade resource and ecosystem values over time, while also increasing risks to property from future fires that may burn through hazardous fuels in extreme conditions. In contrast, fire use for resource benefit goals combines both ecosystem restoration and community protection goals by improving the health of the land and reducing fuel hazards that may threaten private property.

Documenting decisions for "other-than-full-suppression" strategies

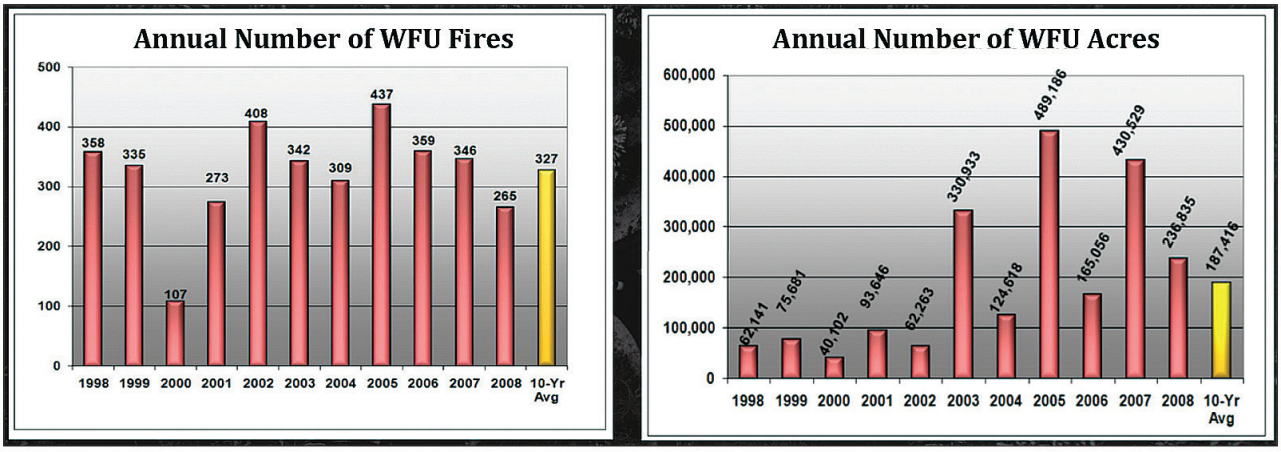
When analyzing in retrospect the management strategy set for an incident, it can be difficult to tease out what may have been the intent of the incident commander (IC) and his/her Incident Management Team (IMT) on a day-to-day basis. One document that offers clues is the ICS-209 incident summary form, where a check box is used twice daily to indicate the management objective, be it full suppression or one of the "other-than-full-suppression" variants. Other sources are the WFDSS Decisions that document which objective(s) will guide the management strategy for wildfire response at any given time. While not completed daily, WFDSS Decisions represent the agency administrator's intent for the incident and require his/her routine validation. Anytime conditions or objectives significantly change on the fire, a new WFDSS Decision is generated, which represents the agency administrator's direction to the IMT that should guide their selection of strategies and tactics for managing the wildfire.

Between 1998 and 2008, when records were kept of WFU fires and acres (Figure 2), the program accounted for, at best, around 400 fires for 500,000 acres burned, on average, in any given year. If we exclude Alaska, where the vast scale and remoteness of the landscape makes direct suppression across all acreage impractical, around 4% of all fires and 23% of total acres burned in the Lower 48 states were the result of lightning-caused fires managed with fire use (see Table 1, below). We will use this 10-year period as a benchmark of WFU accomplishment for comparison with the extent of "wildfire management for resource objectives" over the years 2018 and 2019 (the most recent years statistics are available at the time of this writing). Since the National Wildfire Coordinating Group (NWCG) eliminated the separate category of "wildland fire use" in 2009, the only simple way to measure the use of naturally ignited wildfires managed for resource enhancement has been to document the number and acres of fire being managed under "other-than-full-suppression" strategies.

There are many tactical expressions of an other-than-full-suppression strategy, such as *confine/contain, point protection, monitoring only,* or *managing for multiple objectives* (i.e., managing for protection and resource objectives on the same fire). Regrettably, the latter term is sometimes truncated to simply *managed wildfire* (as if a *full suppression* incident was not also being managed, somehow). This "othering" of fire use is a term of marginalization that marks the exception to the norm, with full suppression remaining the steadfast, dominant default option for wildfire response.

With the USDI/USDA 2009 policy guidance, managers have the ability to mix and match objectives spatially and temporally throughout the duration of a wildfire incident. What remains unclear is whether fire managers are taking advantage of this opportunity to authorize more fire use, or has the disappearance of this class of WFU been taken by the rank and file of wildland firefighters as a sign that suppression is

Figure 2. Number and acreage of WFU fires between 1998 and 2008 (data from the National Interagency Coordination Center).



always the path of least resistance? Now, without any unique identity, the outcomes from this blending of fire use and fire suppression are taking on a new form, such as "box and burn" strategies (Pyne 2015; Thompson et. al 2016; Pyne 2020) that involves large-scale "backburning" (a hybrid of backfiring and burn-out) initiated after a natural ignition, sometimes conducted within the context of a suppressed fire and sometimes with explicit resource objectives. This strategy has emerged primarily in the Southwest but is gaining acceptance elsewhere. This strategy is predicated on the need to limit smoke duration and minimize resource commitment over the course of the incident. Thus crews may be suppressing the fire, but it may also result in additional acres burned. These semi-controlled burns may yield some resource benefits, intended or not.

Many of the best and brightest in fire management were attracted to WFU management when it was a special thing, specifically a "good" fire on the landscape (Sielstad 2015). WFU management teams were created, crafting their own subculture and values to manage fire to benefit the land. With the elimination of WFU as an incident category and the demise of those crews dedicated to it, that tactic has lost its explicit association with ecological goals and objectives. Nowadays, fire use strategies are authorized, begrudgingly, in the face of insufficient suppression resource availability, the remoteness of the fire, or firefighter safety concerns arising from any attempt to apply a full suppression strategy. Some managers have thus become resigned to "suffering" resource benefits from fire use tactics on suppression incidents. On the other hand, some managers who value fire ecology may be surreptitiously achieving resource and restoration goals under the smokescreen of suppression firing operations. For both reasons, resource benefits "by accident" seem to be gaining preference over the explicit written intent of resource objectives from the WFU era, even in landscapes such as designated wilderness areas where this should be optimized. The present study seeks to confirm whether or not wildfires are being managed for resource benefits since the elimination of WFU as a distinct category. Furthermore, we raise the question: could there be unintended consequences of merging WFU with suppression?

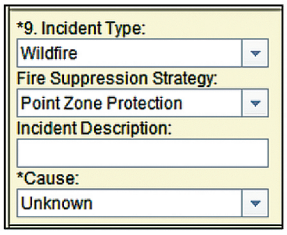


Figure 3. The SIT-209 data input screen implies a suppression objective for all wildfires.

Methodology

In this investigation, we analyzed WFDSS Decisions for all fires greater than 10 acres in three geographic areas: USFS's Southwest Region (Region 3), California (Region 5), and Northern Region (Region 1). We included fires burning on lands under federal jurisdiction with no specificity on point of origin, and so our data should include all fires explicitly managed for resource benefits, since the 2019 Red Book (USDI/USDA 2019) directs managers to complete a WFDSS Decision for all fires that "include both protection and resource management objectives." Other studies have chosen to look at another suppression operational document, the daily ICS-209 data (Bahr 2009), since computer code can be written to analyze thousands of these records at a time, effortlessly.

The problem with the ICS-209 is that explicit resource management objectives cannot be extrapolated from the data. While a researcher could adopt a strategy of searching for and selecting an other-than-full-suppression option, such as confine/contain, that option could be undertaken as part of a suppression-focused protection strategy, rather than being part of a specific resource management objective. In fact, the SIT 209 reporting software for the ICS-209 form has a drop-down menu that forces the user to select a "fire suppression strategy" for all wildfires (Figure 3). So even if you are only monitoring a natural ignition and have solely resource management objectives, the user is still acquiescing to the dominant suppression paradigm.

We looked at two years of WFDSS Decisions: 2018 and 2019. We selected 2018 as a very active year with national suppression resource shortages, while 2019 represented a much quieter firefighting season, largely because of cooler, moister conditions across the country. While the overall number of wildfires was similar, the number of acres burned in 2019 was roughly half that in 2018. Similarly, the National Preparedness Level never reached 4 or 5 (the highest levels) in 2019, while the National Interagency Coordination Center invoked Levels 4 or 5 a total of

47 days in 2018. Our hypothesis was that managers would be more likely to manage fires for resource benefit during a cooler fire season such as 2019 when there was less competition for suppression resources like aircraft, hotshot crews, and so on. For the two-year period we examined 155 WFDSS Decisions from the Southwest Geographic Area, 67 from the Northern Region, and 92 individual WFDSS records from California, combining both its Northern and Southern Areas.

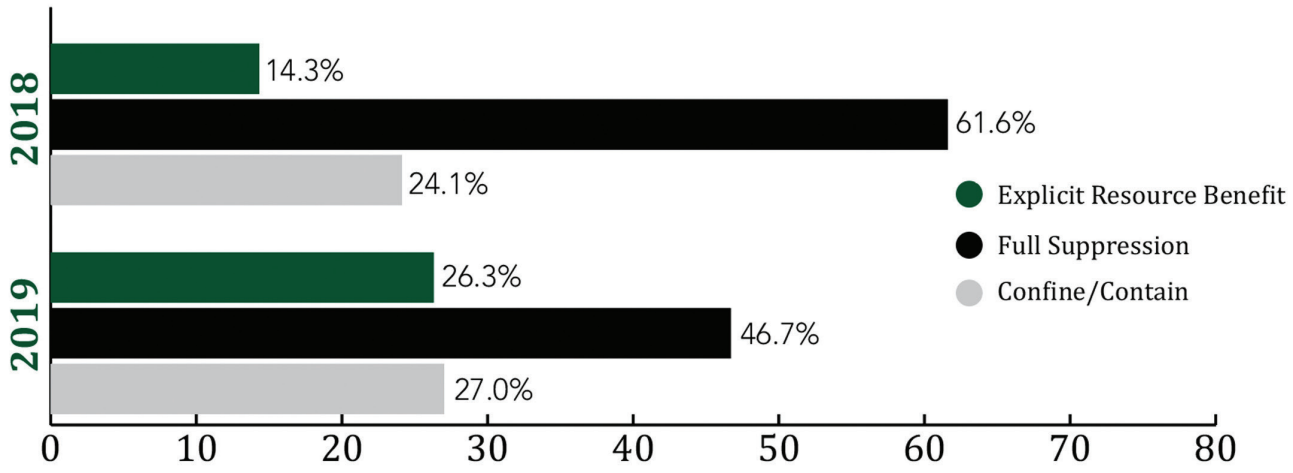
We then looked at each WFDSS Decision after eliminating all fires that were human-caused or of unknown origin, because according to current policy only lightning ignitions provide opportunities to specify resource management objectives. We focused on data reported in the Objectives, Rationale and Resource Benefit slider sections of each WFDSS Decision. Sometimes several WFDSS Decisions were prepared over the course of a long event. Each fire was assigned a management strategy, either *full suppression, confine/contain,* or *resource benefit*. *Point protection* was explicitly stated in WFDSS Decisions so infrequently that we lumped that with *confine/contain* unless there was a clear resource management objective. We quickly realized that, from a language perspective, *confine/contain* is usually synonymous with *resource benefit* in describing fires in the Southwest Region, but we still found fires there that had a *confine/contain* strategy with no clear resource management objectives being articulated. In California and to a lesser degree the Northern Region, *confine/contain* implies an indirect suppression strategy. Consequently, we made a distinction between *confine/contain* and *resource benefit* even though in some cases the two may have been combined in the minds of managers. To be counted as a fire managed for resource benefits in our analysis, a clearly articulated incident objective in the Decision document had to be identified, often directly from the agency administrator's own words in the Objective/Rationale sections. If the fire was managed for resource benefit objectives at any point, it was categorized as such to be on parity with the old WFU fire classification.

Results

Extent to which WFDSS was used to articulate an other-than-full-suppression strategy. In California, the vast majority of wildfires are human-caused. Additionally, because we were looking (at the time of analysis) at the most recent two-year period, many fires were still under investigation, showing as "unknown" in origin. That being said, for all confirmed lightning-caused fires greater than 10 acres having a WFDSS Decision, 37% were managed with an other-than-full-suppression strategy, accounting for only 6% of acres burned. The proportion of management strategies selected for *all* fires with a WFDSS Decision for California is shown in Figure 4.

The many destructive fires in California in 2018 pushed managers to select a full suppression response. With so much burning in state and local jurisdictions, no managers wanted to be seen as hoarding scarce firefighting resources when homes were burning. But the data also show that WFDSS is being used extensively for all significant fires, no matter the cause.

Figure 4. Proportion of management strategies selected for all fires >10 acres and having a WFDSS Decision, USFS California Region (Region 5), 2018–2019.



For the two-year period in the Northern Region, 69% of lightning-caused fires greater than 10 acres were managed with an other-than-full-suppression strategy, accounting for 72% of acres. The proportion of management strategies selected for all fires with a WFDSS Decision for the Northern Region is shown in Figure 5.

Most impressive was in the Southwest Region, where 78% of lightning-caused fires greater than 10 acres having a WFDSS Decision were managed under an other-than-full-suppression strategy, accounting for 67% of acres. In 2019, 96% of all acres reported as having been burned by lightning had a WFDSS Decision. So, at least in the Northern and Southwest Regions, a majority of larger lightning-caused wildfires are not receiving full suppression as a default. Management strategy as a percentage of all fires with a WFDSS Decision for the Southwest Region are shown in Figure 6.

Extent of fires managed explicitly for resource benefit. Table 1 compares the number and extent of fires managed under the *resource benefit* and *confine/contain* strategies—which, taken cumulatively, we consider equivalent to the old WFU categorization—with the ten-year (1999–2008) average of actual WFU data from the National Interagency Coordination Center, which were used to develop the nationwide data shown earlier in Figure 2. This is ten-year average (1999–2008) WFU data for separate Geographic Areas, so direct comparisons of the fires managed for resource benefit in 2018-2019 are found in the second and third column and can be compared Region-by-Region.

Figure 5. Proportion of management strategies selected for all fires >10 acres and having a WFDSS Decision, USFS Northern Region (Region 1), 2018–2019.

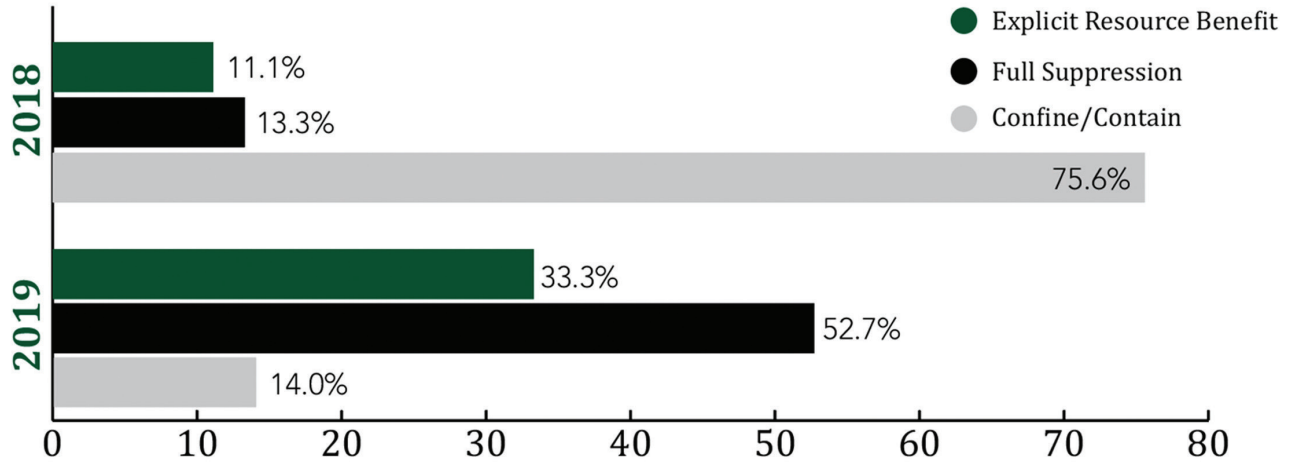
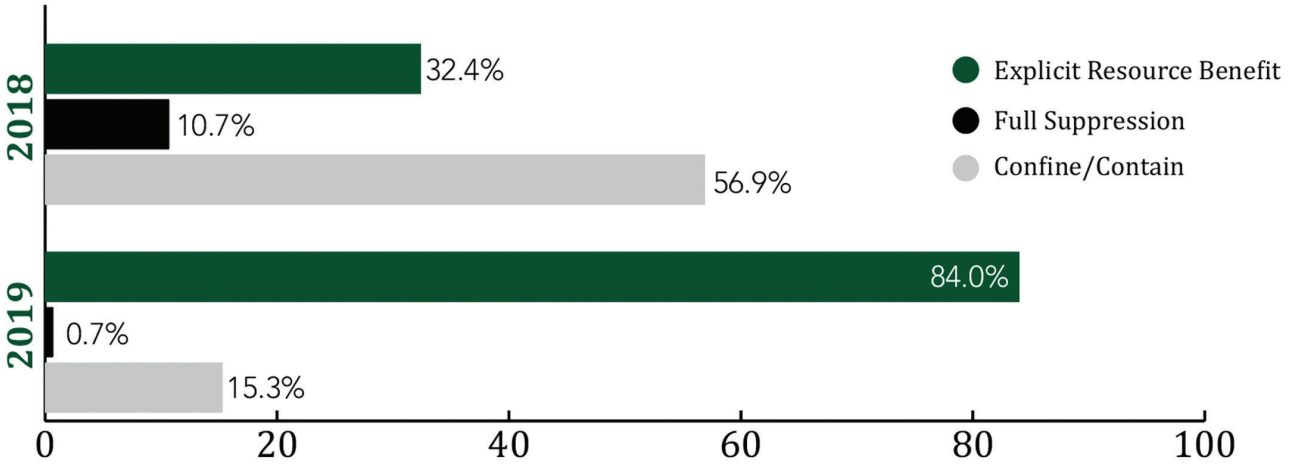


Figure 6. Proportion of management strategies selected for all fires >10 acres and having a WFDSS Decision, USFS Southwest Region (Region 3), 2018–2019.



Northern	2018	2019	'99–'08 Average	Southwest	2018	2019	'99–'08 Average	California	2018	2019	'99–'08 Average
Resource Benefit (#Fires)	6	9	75	Resource Benefit (#Fires)	22	55	32	Resource Benefit (#Fires)	6	6	204
Resource Benefit (#Acres)	10,278	4,494	34,881	Resource Benefit (#Acres)	53,394	196,956	46,691	Resource Benefit (#Acres)	15,393	7,440	15,152
Confine/Contain (#Fires)	17	6		Confine/Contain (#Fires)	17	15		Confine/Contain (#Fires)	6	7	
Confine/Contain (#Acres)	69,671	10,734		Confine/Contain (#Acres)	93,803	35,835		Confine/Contain (#Acres)	9,187	7,651	

Table 1. Number and extent of fires managed under *resource benefit* and *confine/contain* strategies, 2018–2019, compared with ten-year average of WFU data, 1999–2008. WFU data from the National Interagency Coordination Center.

The data show that only in the Southwest Region are both the number and acreage of fires managed for resource benefits continuing to rise. The other regions not only showed much less acreage of wildfires that were managed explicitly for resource benefits, but this extent was greatly reduced in 2019 even when wildfire activity was low, and conditions were more favorable for WFU.

Analysis

The only way to make direct comparisons of recent accomplishments of other-than-full-suppression responses to wildfires managed for resource benefits with those realized under the retired WFU program is to find contemporary wildfires where explicit resource management objectives are built into the guiding documents. The problem is that the ICS-209 form does not provide a management strategy reporting option that explicitly refers to resource management objectives. The options available for input through the SIT 209 program (refer to Figure 3) are shown in Figure 7.

Since none of these options expresses a natural resource management objective alone, they cannot serve as a surrogate to determine if earlier efforts to manage for those objectives are continuing today. So, noting trends in ICS-209 data and equating management of fire by anything other than full suppression, from the categories above, does not address whether or not progress is being made on the reintroduction of fire to fire-dependent landscapes.

Clearly, there was variation in how WFDSS was utilized, depending on the geographic area of reporting. Just the sheer number of WFDSS Decisions in the Southwest Region indicated a greater willingness to go through the process. Managing for resource benefit seems well accepted in the Southwest Region, yet the complex analysis and

Figure 7. Possible selections for completing the ICS-209 Question #9 regarding incident strategy.

- **Monitor** is the systematic process of observing, collecting, and recording of fire-related data, particularly with regards to fuels, topography, weather, fire behavior, fire effects, smoke, and fire location. This may be done onsite from a nearby or distant vantage point in person or using a sensor, or through remote sensing (aircraft or satellite).
- **Confine** is to restrict a wildfire to a defined area using a combination of natural and constructed barriers that will stop the spread of the fire under the prevailing and forecasted weather conditions until out. This means "some action is or has been taken" (line construction, bucket drops, etc.) to suppress portions of the fire perimeter.
- **Point to Zone Protection** involves protecting specific points from the fire while not actively trying to line the entire fire edge. Points being protected may be communities, individual homes, communication sites, areas of high resource value, etc.
- **Full Suppression** implies a strategy to "put the fire out" as efficiently as possible, while providing for firefighter and public safety. To complete a fireline around a fire to halt fire spread, and cool down all hot spots that are an immediate threat to control line or outside the perimeter, until the lines can reasonably be expected to hold under foreseeable conditions. Full Suppression is synonymous with "Full Perimeter Containment and Control."

decision support tools of WFDSS are less utilized compared to other Regions. This is unlike California, where we found usage of WFDSS and its suite of decisionmaking tools to be widespread on all fire types. The year 2019 was an unusually cool and short season for the Northern Region, driving numbers down, while 2018 was very active. In the Southwest, despite *confine/contain* usually being synonymous with fires managed as *resource benefit,* in 2018 more fires were managed *confine/contain* as a suppression strategy without any mention of resource benefit. They were constrained by what was going on nationally, especially in California, but they clearly had excellent conditions in 2019 to really expand their burning for resource benefits.

The number of fires reported as being for resource benefit is down in all USFS Regions compared with the WFU era, but that is likely due to the tiny fires (less than 10 acres) surrounded by rocks, which were earlier designated as WFU, being excluded from our analysis. Those "goat rock" fires, though they didn't amount to any acreage, were being actively designated as WFU back in that era. But without the WFU designation today, there does seem to be a difference in response: many of those fires now will get a heli-rappel or smokejumper response with the associated unnecessary firefighter risk exposure when instead they could be simply monitored periodically by ground or air.

California is under-utilizing natural ignitions as a management tool, likely due to (1) the fact that they trigger Title 17 California air quality rules that allow local air districts to be in a regulatory position to approve daily acres burned and be in receipt of per-acre fees; and (2) a desire to stave off the allegations of insufficiently aggressive firefighting from uninformed local, county, and state cooperators. The number of acres didn't show any increase from the WFU program days, and the number of incidents is down since the smallest fires aren't being designated as having resource management objectives and weren't included in our analysis of WFDSS Decisions. Arguably, these remote fires may be of limited ecological significance due to their small size. Overall, there appears to be a general aversion to conceding resource benefit objectives in California, particularly if there is any concern about liability for nearby private property damage. Clearly, with the slow pace of official investigations into the cause of fires, there is no rush or sense of urgency to declare a wildfire as being lightning caused—the most important piece of information needed to allow a fire for resource benefit to move forward.

California also suffers from local incident management teams consisting of a minority of current agency employees, ceding many positions to local, county, and state cooperators, as well as recent annuitants. Since managing for resource benefit is restricted to agencies having a land base, state and local officials have no buy-in or understanding of such goals. Many of these team members are in key operational roles, where clear leader's intent is so important for outcomes. Sadly, this has led to cooperators, and by extension law enforcement and other civic leaders, to claim "the Feds don't fight fire aggressively anymore," and conflicts arise among different agencies on fires managed under a unified incident command.

Conclusion: Whither the new paradigm?

This paper represents an initial exploration into current levels of application of wildland fire use for resource and ecological benefits. This study was limited by its focus on just two years of fires managed by USFS across three Forest Service regions. More robust studies should follow looking at other data sources and examining other USFS regions. Different methods for data analysis, particularly using machine learning to process more suppression records such as ICS-209s and Incident Action Plans, could be employed, although the WFDSS documents may yield the best data. The real discovery from this pilot study is that there may be more to see than meets the eye: more ecological fire use may be occurring on the ground even if the various euphemisms (e.g. "other-than-full-suppression") and lack of official documentation obscures it.

Progress since the end of the WFU era (and the end of the term as an officially recognized category for analysis) can be seen as either a glass half-empty or a glass half-full. On the one hand, the understanding of the ecological necessity of managing wildfires for resource benefits, and the confidence by fire managers and commitment by agency decisionmakers to implement fire use seems to be waning, leaving a glass half-emptied. On the other hand, the risk assessment and fire behavior predictive tools that are being used to manage long-term wildfires, along with

the use of *confine/contain, box-and-burn,* and other less-than-full-clarity suppression strategies reveals that land and fire managers are taking opportunities to increase the amount of fire on the ground despite the lack of explicit resource management goals. Most encouraging in our research results is the discovery that resource benefit objectives are frequently and explicitly stated in the WFDSS Decisions in the Southwest Region, indicating that a cultural shift favoring more ecological fire use is happening there, giving a glass that is half-filled.

Current language around management of natural ignitions lacks clarity and continues to favor a suppression response, a feature exploited in and exported from California. If we continue to suppress the easy fires during the shoulder seasons (spring/fall), preferring instead to apply resource benefit objectives by benign neglect at the peak of wildfire season when attempted full suppression fails, then we are certainly not optimizing our management for beneficial fire effects. Having explicit resource benefit objectives would facilitate and even legitimize raising the number of acres being burned by *intent* rather than by accident. This would require more involvement by "ologists" in fire management, and more input by resource specialists in designing wildfire response strategies. And above all, it would require more courage among administrators and decisionmakers, demonstrated by a willingness to explain themselves more fully to the public, and expose themselves to potential negative press or public reaction, and opposition from affected private landowners, especially timber companies. Fortunately, ecological fire use enjoys substantial scientific support, along with economic rationale and justifications framed by firefighter safety concerns. Such courage to authorize more fire use may force some managers to step out front and lead—but they won't be out on a limb.

With annual wildfire losses exceeding $10 billion in three of the past four years (2017 to 2020), the danger exists that managers will become even more risk-averse to managing wildfires, and double down on the fire suppression paradigm despite its short-term failures and long-term futility. This would be a mistake. During the most extreme fires in 2020 there was *only one thing* tempering fire spread and intensity: a nearby mosaic of patches recently burned by wildfires. During the pivotal wind events that led to the most rapid rates of spread, when no human intervention in the moment tempered fire growth, recent fire history did. Timber harvest and other mechanical fuels treatments do nothing to reduce surface fuels. Only broadcast burning eliminates the connective tissue of wildfires: the surface fuels. Increasing ecological fire use when conditions permit good consumption of surface fine fuels can be viewed as investments in future suppression success when conditions may yield extreme fire behavior or unwanted severe fire effects.

What we are seeing now is what fire ecologists have long observed. Over time, a fire mosaic can be created across a landscape such that fire size becomes self-limiting (van Wagtendonk 2004; Collins 2009; Scholl 2010; Haire 2013), but this is occurring with a speed and amount of change that is straining social acceptance. For example, the southern half of the Mendocino National Forest burned during the 2018 Mendocino Complex. That was the largest wildfire in recorded California history—until 2020, when the remainder of the Mendocino National Forest burned during the August Complex. But, even as these behemoths churned away, they met resistance and were slowed in the Yolla Bolly-Middle Eel Wilderness where past fires had been managed for resource benefit. Other recent wildfires around the periphery of these two giants either stopped or slowed the spread of the August Complex during conditions when suppression actions were ineffective. There is a need to investigate the effects of wildfires that burned over the last 15 years, especially those few that were managed for resource benefits, on the rates and patterns of fire spread and ecological effects of the 2020 California wildfires.

Obviously, society would prefer that wildfire remain in wildlands, and not burn near communities or threaten any lives or property. Ecological fire use in remote wildlands is too often viewed as exclusively an environmental benefit, with no recognition of how this can also be a social benefit. Indeed, the only practical and economical way to reduce hazardous fuels at the scale of federal wildlands that require it involves the application of fire—much more fire. For a number of reasons, prescribed burning will not be able to provide the needed amount of ignitions, so a shift in social acceptance of managing naturally ignited wildfires to function like prescribed fires, as is occurring in the USFS Southwest Region, needs to

happen across the western US. Greater use of spring season lightning fires combined with allowing more late-season fires to burn until their season-ending weather event occurs are both critically needed. This expanded fire use for the purpose of landscape-scale fuels reduction will reduce the probability of high-intensity wildfires migrating toward communities; and if the wildlands are good with fire, this will enable managers to focus on reducing vulnerability of communities to wildfire ignitions. Consequently, there is a beneficial effect of ecological fire use in enhancing community wildfire protection goals, but the way to accomplish these goals, counterintuitively, is with more fire, not less.

There is a growing number of land and fire managers who fully understand the social and ecological need for and benefits of managing wildfires for resource objectives. Within USFS there should be deliberate efforts to integrate fire use in the agency's multiple-use philosophy, acknowledging fire use as both management inputs and outputs. Progressive managers using the best available science and most advanced technology to safely manage fire spread and behavior for desired effects should be able to document and share their successes, and be rewarded for them. These successes are happening, albeit rarely in the California Region while more frequently in the Southwest and Northern Regions.

In June 2020 with COVID concerns running high, USFS Chief Vicki Christiansen issued direction emphasizing "rapid containment" of wildfires during the 2020 season. That did not deter managers on the Bighorn Fire outside of Tucson from including explicit resource management objectives in their WFDSS Decision documents later that month. As long as the agency masks its management actions and intentions with vague terminology that avoids admitting to the resource and ecological benefits of fire use, this will reduce the success the agency can achieve. So let's not be tolerant of "suffering resource benefits" by default when managers' first resort to suppression resources are unavailable. Managers should call it what it is and be *loud and proud* of their professional knowledge and skills in safely using wildland fire for social and ecological benefits. With commitment by their agency leaders, the rest of society can and will support their success.

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Endnote

1. "Wildland Fire Use" (WFU) is officially an obsolete term according to the NWCG glossary of fire management. However, WFU remains a current term of use in the official glossary of the National Cohesive Wildland Fire Strategy. This contradiction is an example of the institutional ambiguity and uncertainty over what to call fire use actions. We will use WFU as the traditional term that is most clear to the fire management community, although we recommend calling it "Ecological Fire Use" for actions to manage wildfires for resource benefits.

References

Bahr, R. 2009. 1989 fire management policy review: Work together with an interagency emphasis. In *The '88 Fires: Yellowstone and Beyond, Conference Proceedings.* R.E. Masters K.E.M. Galley, and D.G. Despain, eds. Miscellaneous Publication no. 16. Tallahassee, FL: Tall Timbers Research Station.

Black, A., M. Williamson, and D. Doane. 2008. Wildland fire use barriers and facilitators. *Fire Management Today* 68: 10–14.

Calkin, D.E., M.P. Thompson, and M.A. Finney. 2015. Negative consequences of positive feedbacks in US wildfire management. *Forest Ecosystems* 2:9. https://doi.org/10.1186/s40663-015-0033-8

Collins, B.M., J.D. Miller, A.E. Thode, M. Kelly, J. van Wagtendonk, and S.L. Stephens. 2009. Interactions among wildland fires in a long-established Sierra Nevada natural fire area. *Ecosystems* 12: 114–128. https://doi.org/10.1007/s10021-008-9211-7

Haire, S.L., K. McGarigal, and C. Miller. 2013. Wilderness shapes contemporary fire size distributions across landscapes of the western United States. *Ecosphere* 4(1): 1–20. http://dx.doi.org/10.1890/ES12-00257.1

Miller, R.K., C.B. Field, and K.J. Mach. 2020. Barriers and enablers for prescribed burns for wildfire management in California. *Nature Sustainability* 3: 101–109. http://dx.doi.org/10.1038/s41893-019-0451-7

North, M., B.M. Collins, and S.L. Stephens. 2012. Using fire to increase the scale, benefits, and future maintenance of fuels treatments. *Journal of Forestry* 110(7): 392–401. http://dx.doi.org/10.5849/jof.12-021

Pyne, S.J. 2015. The new approach to fighting wildfires. *Slate* (July 15).

Pyne, S.J. 2020. Our burning planet: Why we must learn to live with fire. *Yale Environment 360* (October).

Scholl, A.E., and A.H. Taylor. 2010. Fire regimes, forest change, and self-organization in an old-growth mixed-conifer forest, Yosemite National Park, USA. *Ecological Applications* 20(2): 362–380. http://dx.doi.org/10.1890/08-2324.1

Schultz, C.A., S.M. McCaffrey, and H.R. Huber-Stearns. 2019. Policy barriers and opportunities for prescribed fire application in the western United States. *International Journal of Wildland Fire* 28(11): 878–884. http://dx.doi.org/10.1071/WF19040

Sielstad, C. 2015. Reconsidering wildland fire use: Perspectives from the Northern Rockies. In *Proceedings of the Large Wildland Fires Conference, May 19–23, 2014, Missoula, MT.* R.E. Keane, J. Matt, R. Parsons, and K. Riley. Proc. RMRS-P-73. Fort Collins, CO: US Department of Agriculture–Forest Service, Rocky Mountain Research Station.

Thompson, M.P, P. Bowden, A. Brough, J.H. Scott, J. Gilbertson-Day, A. Taylor, J. Anderson, and J.R. Haas. 2016. Application of wildfire risk assessment results to wildfire response planning in the southern Sierra Nevada, California, USA. *Forests* 7(3): 64. http://dx.doi.org/10.3390/f7030064

USDI/USDA [US Department of Interior, US Department of Agriculture]. 2009. *Guidance for Implementation of Federal Wildland Fire Management Policy.* Washington, DC: USDA/USDA.

USDI/USDA. 2019. *Interagency Standards for Fire and Fire Aviation Operations.* (The "Red Book.") Washington, DC: USDA/USDA.

van Wagtendonk, J.W. 2004. Fire and landscapes: Patterns and processes. In *Sierra Nevada Science Symposium: Science for Management and Conservation.* General Technical Report PSW-GTR-193. Albany, CA: US Department of Agriculture–Forest Service, Pacific Southwest Research Station, 69–78.

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