



# Wyoming Game & Fish Department

## Wildfire Response Guide

August 2019



## Introduction

The information contained in this report is based on Wyoming Game and Fish Department (WGFD) employee experiences with wildfire events throughout the state and is intended to guide efforts in stimulating a strategic response to wildfire. The thoughts and ideas presented here should not be considered an exhaustive listing of potential options since each event is unique and will require creative solutions based on the affected stakeholder needs.

Wildfires are unplanned disturbances; however, the WGFD has found that they also present a prime opportunity to maximize resource benefits for wildlife and agriculture. Ensuring the cooperation of state and federal agencies, non-governmental organizations (NGOs), funding partners, and livestock managers is largely based on fostering relationships. Often key to this effort is developing relationships with local, state, and federal agency personnel, the livestock community, local governments, and any entities that may inadvertently cause wildfires, such as railroads and local electric CO-OPs.

In order to facilitate discussions on new wildfires, develop effective management strategies, and identify areas that may be appropriate for wildlife enhancements, the development of a resource management team is important. This group should be comprised of as many of the stakeholders outlined above as appropriate, early establishment of this group will result in effective communication and development of practical solutions. Establishing relationships and trust is critical in developing creative solutions to a wildfire and ensuring that potential solutions are supported by all stakeholders is imperative.

In addition to building relationships with other agencies, obtaining Red Card Fire Fighter 2 qualifications will likely allow for more opportunity to participate during a wildfire event, increase credibility with fire managers, and provide a greater understanding of fire management logistics.

## During Wildfire

The scale of the fire and necessary response will likely be known within the first few days of the fire. Involvement with a Type 1 or 2 Incident Management Team as a partner agency or collaborating resource advisor will allow the opportunity to provide input on considerations such as: critical resource areas to avoid with dozer lines, appropriate camp and heli-base locations, water dipping locations, AIS considerations, and retardant use areas. In sage-grouse core areas, discussions can occur with the Incident Commander to encourage the minimization of large burnout operations, however, there may be situations in which this is simply not feasible. Department employees often serve as a collaborating resource advisor; however, the designated Resource Advisor for each wildfire is typically a local federal employee who will serve as an important liaison to the Incident Management Team. The designated Resource Advisor should be aware of important wildlife habitats such as migration corridors and sage-grouse core areas and will provide input if a Burned Area Emergency Response (BAER) Team is called in. The Burned-Area Report may or may not include a funding request for emergency stabilization funds.

The traditional types of projects that these funds are eligible for include seed purchase for rehabilitation, noxious weed inventory and treatments, fence reconstruction to protect cultural resources, and road/trail improvements such as culvert and sediment/erosion rehabilitation. Discussions about restoration or seeding dozer and hand lines should happen through the Resource Advisor during the wildfire operations. Some of these proposed actions are more likely to be implemented while manpower for the fire is onsite, once crews and equipment have been released limitations exist for local resource managers



to complete work. Assuming the wildfire has occurred during typical fire season there could be livestock already out on the rangelands affected by the disturbance. Ideally, finding alternative pasture or herding away from recently burned areas is preferred. Department administrators should be informed about potential projects to raise awareness and leverage any available funding in the short term. A team of managers, including USFS, BLM, NRCS, County Conservation District, County Weed and Pest, State Office of Land and Investments, Sage-grouse Local Working Groups, private landowners, livestock permittees/managers, and other entities such as the energy industry should be convened to generate solutions and facilitate funding for follow-up management. Focusing on common goals, such as maximizing the benefits of the disturbance to the vegetation resource and preventing excessive sedimentation and erosion, should be explored at this stage to encourage participation and success.

Depending on the timing of the wildfire, opportunities may exist to begin weed treatments post event. Preventing weed species from germinating or re-sprouting eliminates the opportunity for these species to outcompete native vegetation. Assessing and setting up repeatable photo points to document critical resource issues such as riparian areas with high severity fire effects, steep slopes at high risk for erosion, livestock fence conditions, previously known weed infestations, timber resources, and other potential issues is important at this stage.

### Cheatgrass Treatment Considerations

Areas of high fire intensity, shallow soils, steep slopes, and southerly aspects may be prone to cheatgrass invasion post-wildfire. In many cases, local managers have a fairly good idea of where infestations occurred prior to disturbance. Other available resources to target treatments include GIS datasets, such as infestation or monitoring data or remote sensing data (i.e. Landsat, Lidar, or drone imagery). Using GIS or other programs, models can be developed to help direct treatments to areas where cheatgrass is most likely to occur post-fire using data such as vegetation community type, elevation, slope, aspect, disturbances, and fire severity. After a wildfire, nearly all litter is removed from the soil surface which allows for excellent herbicide contact. In these instances, a reduced amount of active ingredient may be required to achieve success.

Ash deposits following a fire have been known to bind to herbicides and lessen the effect of the active ingredients imazapic and indaziflam commonly used to treat cheatgrass. Ensuring at least one moisture event occurs on the treatment site prior to aerial or ground application of herbicides will help to ameliorate this effect. Imazapic and indaziflam applications a full year post-wildfire are still recommended and are most effective when applied as a pre-emergent. Glyphosate may be considered and included with other herbicide treatments if some germination of cheatgrass has occurred. Under this scenario, glyphosate likely needs to be applied at a reduced rate, often in the 6 to 10 ounce per acre. All herbicide treatments need to be authorized and approved by local landownership agencies and remain in compliance with the National Environmental Policy Act (NEPA).

Livestock grazing deferment, particularly during the active growing season, is necessary to afford ample recovery opportunity for native perennial vegetation and to begin covering bare ground. When livestock grazing is reinstated, partial to full rest during the active growing season should be incorporated when possible until vegetative recovery goals are met.

Landsat imagery has been successfully utilized to map cheatgrass infestations and may be a useful resource to assist with monitoring changes between pre- and post- herbicide applications across the burn unit which can ultimately inform future retreatment prescriptions.

News releases and directed outreach is often a component of herbicide spraying and is used to inform and educate the public and adjacent landowners of planned treatments and action plans.

## Winter after the Event

In fall or early winter, all stakeholders or agencies affected by the wildfire should meet to discuss resource concerns for upcoming management including weed mapping and treatment, livestock management, high severity burn areas, rehabilitation areas, areas prone to significant erosion, and infrastructure such as fences, roads or trails. The group should utilize a final wildfire burn perimeter shapefile and, if generated, a burn severity map, to assist with determining the severity of impacts.

Once the collective needs are identified, a brainstorming session focusing on creative solutions is important. The group should identify and utilize team members' strengths including local knowledge and personal connections to affected livestock managers. Assigning clear roles and responsibilities is an important task at this point.

Finding alternative pasture for affected livestock operators is often important. Examples of potential options to consider include:

- Evaluating vacant or forage reserve federal allotments for use
- Evaluating the use of grass banks
- Leasing pasture on private land
- Discussing grazing on state or federal Wildlife Habitat Management Areas
- Evaluating federal allotments where an unaffected permittee is willing to take non-use for resource protection and stock with displaced livestock
- Purchasing hay to replace forage consumed on a hay meadow
- Hiring riders to herd livestock into unburned portions of management units
- Voluntary reduction in AUMs
- Granting non-use for resource protection on federal allotments
- Use of electric fences to exclude livestock from a portion of an allotment
- Deferment of grazing to winter season or less critical time for forage production and site stabilization

There is no one size fits all strategy that works best. Working at the local level with the affected livestock producer(s) is imperative to developing realistic and achievable solutions. These solutions may require financial assistance from funding partners to help alleviate the cost of implementing changes.

In communities where key plant species are not well adapted to fire, for example low precipitation Wyoming Big Sagebrush, it may necessary to develop a restoration plan for replanting these key species, particularly in sage-grouse core areas where wildfire counts against the disturbance thresholds. Fall or winter seasons may be a good time to collect local native plant stock and seeds to send to a greenhouse for production of plants for the following planting window. Please see the WGFD Tree and Shrub Planting Guide for suggestions on planting techniques.

## Field Season, Year 1 Post-Fire

Developing a monitoring plan that is meaningful, repeatable, and ecologically sound is an important component to rehabilitating an area post-fire and to better understanding thresholds for future management-based decisions. Monitoring should be organized to include all livestock management units (i.e., allotments, pastures, etc.) due to variables created after livestock return to the burned area. The concept of selecting critical areas to represent the worst case scenario will ensure objectives are being met in other areas across the landscape. The monitoring plan should be well documented, shared amongst stakeholders, and include quantified metrics. General monitoring locations may be drafted in the office but should not be established prior to ground truthing in year one or two post-fire. Monitoring plans ideally include pre-treatment monitoring (if available), immediate post-disturbance, year one post-fire (often photos only), and quantified data collection in years 2, 5, 10, and 15 (if needed) post-disturbance.

Monitoring plans should include photo points and a ground cover threshold for site stabilization. Photo points will serve as an excellent communication tool and can help document site potential and disturbance ecology principles for the affected area. Photos from RHAs or other monitoring programs that were located in relevant areas prior to the fire could offer options to repeat in the future. Ground cover thresholds should be based on site potential for the vegetation communities involved in the wildfire. Conifer and aspen stands should have a great deal of litter, even post-fire from needles and vegetation and as a result 80% cover is often attainable. Sagebrush communities are more variable and should be based on Ecological Site Descriptions (ESDs) or general knowledge of site potential.

A common timeframe for livestock rest or deferment is two years post-fire in order to establish roots and sprouts of important species, as well as to stabilize sediment prone areas. At times, federal agencies may decide to return livestock to the burned area after a certain quantified vegetation objective is met while livestock managers typically prefer to have a set schedule in which to make operation-based decisions. Merging these interests and finding common ground and sensible alternatives is often the role of the group. It may be of value to indicate that areas previously unavailable to livestock due to heavy timber could be available and potentially preferred in future years.

Riparian areas are critical for sediment catchment and often respond rapidly due to the presence of graminoids and re-sprouting woody vegetation combined with moisture availability. These areas are important to monitor through photo points and areas to watch for weed control work.

Aspen regeneration is a common outcome of wildfires provides a great benefit to wildlife, making these sites a priority area for monitoring efforts. Typical aspen monitoring objectives include attaining 1,000 aspen stems per acre, greater than 10 feet tall, within ten (sometimes fifteen) years post-wildfire. The timeframe for this objective is based on site potential as granitic soils typically take longer to reach ten feet tall than sedimentary based soils. Data should continue to be collected in order to develop an intermediate goal and to monitor progress to meet the stems per acre goal by year five. A common secondary and contributing objective is a threshold of no more than 30% annual incidence of use on terminal leaders (regardless of species responsible for browse). Suckers are particularly attractive to livestock and wildlife in early growth stages and can be eliminated from a stand by uprooting in the first few years. Unfortunately, wildlife use cannot be controlled, but livestock use can be managed more effectively. Factors known to influence browse levels include scale of the disturbance, proximity to concentration areas (water, fence corners, adjacent feedgrounds, etc.), and proximity to alternative quality forage. For example, high severity conifer burns typically release hollyhock, a forb preferred by livestock over aspen suckers due to crude protein and digestibility.

Weed locations should be mapped with species and a center point at a minimum, but it is better to include a component of spatial extent (polygons) and density of infestation. Treatments should be aggressive and led by, or coordinated with, the local County Weed and Pest districts. Weed treatments should be monitored and continued over several years' post-fire, targeting areas such as roads, trails, campgrounds, high use areas and former timber harvest areas.

## Funding

Significant funding may be required to implement the solutions generated for habitat restoration. If actions such as weed treatments or livestock rest are taken the same season as the wildfire, there may be emergency funds available through Wyoming Wildlife Natural Resources Trust (WWNRT) or WGFD Trust Fund. Additionally, County Commissioners may have funds available that can be utilized until grant funds are secured and reimbursed the next year. These funds would be most appropriate for private land projects or infrastructure needs in order to facilitate future livestock grazing activities. Project funds required for future management need to be solicited through grant writing in the first winter post-disturbance. Ideally, this budget will be developed for two or more years of expenses. If the plan will generate the end goal of improving habitat, funding sources may be lenient with what money can be spent on as long as grant agreements are written broadly and all-inclusive. There is a good track record for out-of-the-box thinking generating great partnerships and results on these projects already.

Potential sources of funding include WWNRT (February and September application deadlines), WGFD Trust Fund (January), Mule Deer Initiative (MDI, August), Rocky Mountain Elk Foundation (RMEF, January), Wyoming Governor's Big Game License Coalition (WGBGLC, February), Muley Fanatics Foundation (MFF, variable), Mule Deer Foundation (MDF, variable), Trout Unlimited (TU, variable), Sage-grouse Local Working Groups (LWG, typically July, then year-round thereafter) and others. Federal sources of funding include USFS BAER and Regional Office accounts, particularly for fence reconstruction. NRCS Farm Bill programs are available for private land livestock deferral or federal allotment deferral that can be tied to a benefit to private land. Wyoming Landscape Conservation Initiative (WLCI) may not be a good option for year one funding due to the timing of applications and delay in acquiring funding, but may be an option for year two or later of implementation. The energy industry may be amenable to providing funding as well, especially in sage-grouse core areas, in order to help offset disturbances that count against disturbance thresholds. Grant writing will be significantly more successful if the collaboration between livestock and wildlife entities is explained.

## Hunting Season Considerations

In certain cases, hunters may need to be granted the opportunity to defer their license to the following season. On larger wildfires, it is important to complete aerial flights to assess burn severity and habitat conditions and provide maps of the fire to department administration to assist them with license deferral recommendations. Current perimeter maps and GIS information can be found at the National Interagency Fire Center FTP site (<https://ftp.nifc.gov/>). Hunters occasionally assume that big game is unavailable post fire and have all left the disturbance area, however, this may not be true depending on a variety of factors. Oftentimes, individual animals temporarily redistribute away from the disturbance and return to the area post-fire to capitalize on fresh vegetation. This is particularly true in sagebrush/grassland systems as wildlife will often take advantage of cactus whose spines have been removed post-fire. If a wildfire occurs in sage-grouse core area, ensure that the sage-grouse biologist is aware of the situation so the process of identifying adaptive management triggers can begin.

## Future Years

Communication and trust should be well developed among stakeholders if a detailed and inclusive process is followed. As new challenges arise, adaptive management can resolve issues to improve habitat for multiple users of the burned area. If critical areas with a slower rate of recovery persist after the rest period, electric fencing or livestock riders are important tools to consider. Monitoring and weed treatments will ideally continue for several years. Ensure the group reports results in a timely manner and recognizes stakeholder and funding partner efforts widely. The collaborative work should generate new opportunities for habitat management with livestock managers for years to come.

**Appendix A: Example Monitoring Plan**

<b>Fire Effects Monitoring Plan Bureau of Land Management, Pinedale FO</b>	
Unit Name: <b>Pine Grove</b>	Field Office: <b>Pinedale BLM</b>
Project Name: <b>WY Range Mule Deer</b>	Responsible FMO: <b>M. Randall</b>
Implementation Year: Season <b>2015: mechanical slash (Summit) 2016: cut-pile (Summit) 2017: Spring burn</b>	Project Lead: <b>R. Kaiser/J. Randall</b>
Type of Treatment: <b>Mechanical Slash/RX Fire</b>	Monitoring Leader: <b>J. Randall</b>

**Monitoring Objectives, Methods, and Schedules:** Provide the following info for each objective you have chosen to monitor. NEPA objectives should dictate these. **Two to four total objectives are recommended.** Delete or add tables as needed. See examples in “**Monitoring Plan Writer’s Guide.**”

<b>Monitoring Objective 1: Density/Regeneration of Aspen</b>	
Objective Target	Obtain sucker (ε 10ft) density of 1000 stems/acre 10-15yrs post-burn
Variable(s) being measured	Height and Density of aspen suckers
Methods / plot types	- At least 30, variable-radius (1/100 to 1/500 acre) circular aspen plots distributed randomly throughout representative stands (i.e., previously conifer-encroached aspen) - Permanent photo-points
Schedule for plot visits	Pre-burn and 2, 5, and 10 yrs post-burn or until conditions are met

<b>Monitoring Objective 2: Annual Use Indicator (Aspen Browse)</b>	
Objective Target	Browsing limited to 30% or less of all current-year terminal leaders of aspen
Variable(s) being measured	Total current-year terminal leaders browsed per total aspen stems in circular plots, extrapolated to proportion (%) browsed
Methods / plot types	At least 30, variable-radius (1/100 to 1/500 acre) circular aspen plots distributed randomly throughout representative stands (i.e., previously conifer-encroached aspen)
Schedule for plot visits	Pre-burn and 2, 5, and 10 yrs post-burn or until conditions are met



## Appendix B: Example Monitoring Instruction Sheet

<b>WGFD Monitoring Instruction Sheet</b>	
Project Unit Name: Pine Grove	Date: 10/24/2016
Written By (Project Monitoring Leader): Jill Randall	
<p>Monitoring Protocols (plot types, layouts, etc.):</p> <p>One Aspen Circular Plot (Pine Grove Cut/Pile) was established on 9/1/2016. At the site a random pace and azimuth was chosen to follow. Recorder(s) walk along azimuth stopping when designated pace has been reached; at that point a Circular Plot is established using an 11.7' rope. Within circle, height class of all live aspens <math>\leq 5</math>" DBH is recorded as well as browse category (Unbrowsed or Browsed). Once all aspens are noted, recorder(s) move along same azimuth until they reach distance to next plot. 30 plots total are completed within treatment polygon. If recorder(s) reach edge of polygon, choose new random azimuth to stay within treatment area. At UTM locations, photos were taken in cardinal directions.</p> <p>Five additional photo points will be monitored as well. These photo points were put in by the Teton Science School in 2009 and will be utilized for this project.</p>	
<p>Plot Location and Navigation Info (include relevant UTM's and datum):</p> <p>Travel South from Daniel Junction on Highway 189. Pass through the towns of Marbleton/Big Piney and turn Right onto the Big Piney Calpet Rd (approx. 3.1 miles south of Big Piney). Travel west for approximately 11 miles on this road. Turn Right onto Pine Grove Ridge Rd. Follow this road for approximately 5 miles and turn right. Follow this road to the UTM locations.</p> <p>Pine Grove Cut/Pile: UTM 549941 4698656            HB-47A-S: UTM 549731 4697301            HB-48B-SW: UTM 550418 4698612            HB-51A-W: UTM 550717 4697228            HB-52B-SW: UTM 550727 4696228            HB-52C-E: UTM 550340 4696196</p>	
<p>Photo Info:</p> <p>Pine Grove Cut/Pile: Cardinal Directions            HB-47A-S: one photo taken South            HB-48B-SW: one photo taken South-West            HB-51A-W: one photo taken West            HB-52B-SW: one photo taken South-West            HB-52C-E: one photo taken East</p>	
<p>Equipment Needed:</p> <p>GPS, camera, photo board, carpenter's ruler, data forms (Aspen Circular Plots), compass, circle plot ropes (11.7')</p>	