

# Spruce Beetle Epidemic Aspen Decline Management Response (SBEADMR) Community Report



Fiscal Year 2020



## History of SBEADMR and Adaptive Management Group (AMG)

In the Grand Mesa, Uncompahgre and Gunnison (GMUG) National Forests, approximately 40 percent of Engelmann spruce and aspen forests have been affected by insects and disease over the past decade. The Spruce Beetle Aspen Decline Management Response (SBEADMR) Environmental Impact Statement (EIS) was created to address a decade of disturbance issues and improve forest health for roughly 120,000 acres on the GMUG.

The purpose of SBEADMR is three-fold: minimize threats from falling, dead trees and better manage wildfires (safety); improve the resiliency of stands at risk to insects and disease (resiliency); and treat affected stands via recovery of salvageable timber and re-establishment of desired forest conditions (recovery).

Launched by the GMUG in 2016, SBEADMR is

designed to allow a more nimble “adaptive management” response to rapidly changing forest conditions associated with insect and disease outbreaks than is typically possible under U.S. Forest Service’s (USFS) planning process. Conventional planning processes for forest treatments like timber harvesting can take years to complete. Although insect and disease outbreaks are part of natural disturbance cycles, the epidemic level outbreaks occurring over the last decade have produced significant mortality in the time it can take to complete the planning and analysis process for a forest treatment. Given the rapid rates of changes on forest landscapes, resiliency treatments frequently need to be redesigned into salvage treatments, a process that traditionally would require restarting the entire planning process. SBEADMR avoids this problem by using an adaptive management approach that allows the USFS to designate large swaths of land as priority treatment areas and then target specific stands of trees on an annual basis, based on current conditions.

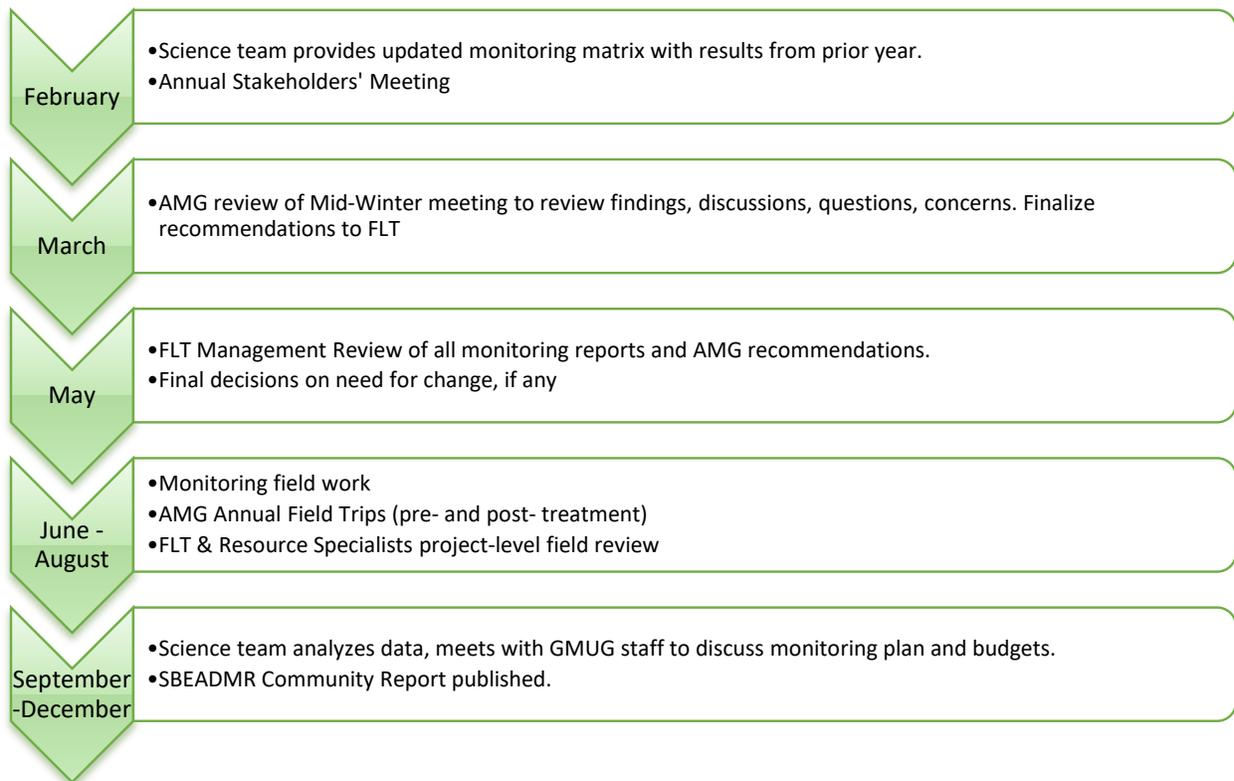
While this novel approach provided flexibility for management response, it also generated concerns from local stakeholders because of the lack of specificity about the proposed projects and the areas that would be treated. Moreover, stakeholders wanted to see more science-driven management decisions and had concerns about the impacts of temporary logging roads, disruption to recreational users, impacts on wildlife and lack of public input on specific projects. To address these concerns the USFS agreed to fund an independent science advisory team to help identify treatment



*The SBEADMR Adaptive Management Group circles up at a pre-treatment review field trip for the Big Park Timber sale, August 2019*

locations and inform the adaptive approach and management decision making. The GMUG also supported stakeholders' interest in convening a community based collaborative working group, which later evolved into the SBEADMR Adaptive Management Group (AMG).

The AMG is a citizen-based working group composed of individuals representing diverse local and regional interests and perspectives. Members are self-selected by stakeholder category except for the community at-large representatives, who are appointed by their respective county commissioners. Stakeholder categories include county commissioners, forestry processors, forestry loggers, conservation groups, water resources, recreation, wildlife and fish, education, Colorado State Forest Service and at-large members. The primary purpose of the AMG is to assist the GMUG in applying the adaptive management framework over a multi-year timeframe in accordance with the SBEADMR Record of Decision.



*An overview of a typical year of engagement in the SBEADMR adaptive management process*

The goals of the AMG are to:

- Provide comments on proposed treatment sites.
- Help with articulating monitoring questions.
- Participate in post-treatment evaluations.
- Review monitoring to make recommendations for adaptive management for future projects.
- Anticipate local roadblocks that may arise and work to resolve them.
- Strive for consensus of diverse interests on recommendations submitted to the GMUG.

In addition, the AMG appointed a Monitoring Committee to identify, organize, observe and monitor the following:

- Community understanding and engagement.
- Socio-economic data and impacts.
- Collaborative adaptive management process and outcomes.
- Tracking science studies and monitoring efforts.

The AMG also works directly with the SBEADMR Science Team to determine questions that need to be answered using the best available science. Comprised of researchers with expertise in forest ecology, silviculture, wildlife biology and natural resource socioeconomics, the Science Team designs rigorous studies and collects and analyzes data. The results of these scientific studies can then be used to guide management policies and projects on the ground.

## SBEADMR Science Team Updates

The Science Team presented the 2019 monitoring results at the February 2020 SBEADMR Annual Meeting. Presentation summaries are listed below by project title.

Impacts of spruce bark beetle and subsequent salvage in Engelmann spruce and Engelmann spruce-aspen forests in the GMUG on forest structure and tree regeneration.

*Lead: Dr. Mike Battaglia, US Forest Service Rocky Mountain Research Station*

### Background

A major concern raised by stakeholders in the initial stages of SBEADMR was the impact of spruce beetle and salvage treatments on forest regeneration. Would salvage treatments have a detrimental impact on existing advanced regeneration (i.e. seedlings and saplings) in spruce-dominated stands? To address this concern and improve understanding of the legacies of previous management in spruce beetle-affected stands on current forests, in 2015 and 2016 the science team established 117 forest inventory plots in spruce and spruce-aspen forests in the Gunnison Basin on the GMUG National Forest. Forty-five plots are “intensive” plots and are sampled annually.

### 2019 Monitoring

Variables measured in 2019 include tree regeneration, regeneration survival, and seed production. In addition, field crews collected hare scat (feces) to measure snowshoe hare density in the monitoring plots, and collected temperature data from sensors placed below ground, ground-level and above-ground. Field crews also installed 3 new salvage plots in spruce-aspen forest.

### 2019 Results

Seed production was higher in 2019 than 2018. Spruce dominated stands averaged 547,768 seeds/ac in previously managed sites, 241,032 seeds/ac in unmanaged sites, and 290,401 seeds/ac in salvage sites. Spruce-aspen stands averaged 423,404 seeds/ac in previously managed sites, 284,592 seeds/ac in unmanaged sites, and 348,481 seeds/ac in salvaged sites.

Snowshoe hare density, an indicator of viable Canada lynx habitat was highest in unmanaged spruce and spruce-aspen stands, followed by previously managed

stands and lowest in salvaged stands. These results were similar to 2018 data, though data reflected in increase in hare density in unmanaged spruce-aspen stands between 2018 and 2019.

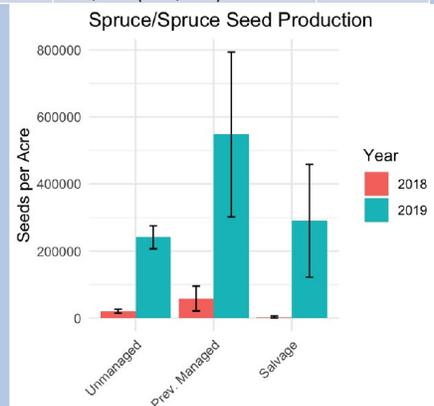
### Seed Production - Engelmann spruce stands

Habitat	Treatment	Seeds per acre (mean + SE)	N
Spruce	Control	241,032 (34,238)	3
Spruce	Harvest Control	547,768 (245,953)	4
Spruce	Salvage	290,401 (168,507)	3

- Seed production was much greater in Fall 2018 than Fall 2017
- Variability was high; no statistical difference in treatments



Seed production data collected in 2019 indicates much higher seed abundance than in the previous year.



Impact of Forest Management and Bark Beetle Outbreaks on Canada Lynx and their Prey  
*Lead: Dr. Jake Ivan, Colorado Parks and Wildlife*

*Background*

The Canada lynx is an endangered species that was extirpated from and then re-introduced into Colorado's San Juan Mountains in the 1990s. This study was developed to understand how the spruce beetle outbreak and forest management is impacting lynx and their prey. Scientists monitor snowshoe hare and red squirrel populations in forests across Colorado and analyze this prey data in conjunction with GPS data from radio-collared lynx.

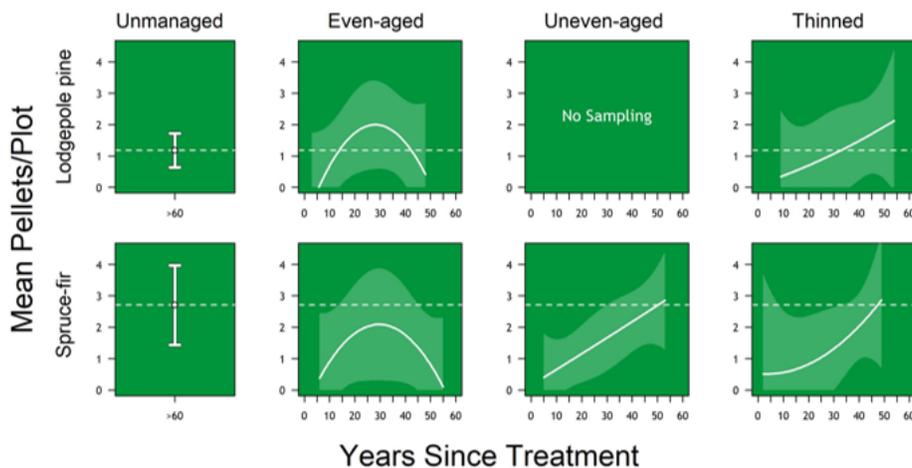
*2019 Monitoring*

In 2019 monitoring expanded beyond the focus on bark beetle outbreak impacts on lynx and their prey to also address the impacts of forest management on snowshoe hare density. This new aspect of the project uses USFS spatial data on timber activities and timing in lodgepole and spruce-fir forests in Colorado in conjunction with field-collected snowshoe hare pellet counts in control and treatment plots to examine relationships between timber activities, time since treatment, and snowshoe hare density.

*2019 Results*

Preliminary results indicate that impacts of forest management on snowshoe hare density vary by forest type, treatment type, and time since treatment.

## Preliminary Results:



*Preliminary results indicate complex interactions between forest type, treatment type, and time since treatment in impacts on snowshoe hare density in Colorado forests.*

## Landscape-scale Impacts of Spruce Bark Beetle and Climate on Forest Change

*Lead: Dr. Jason Sibold, Colorado State University*

### *Background*

2017/2018 was an exceptional drought year, with Colorado experiencing the warmest annual temperatures on record, while average low temperatures continue to increase. Climate conditions are acting in concert with the ongoing spruce beetle outbreak to shape patterns of forest change in Engelmann-spruce-dominated landscapes on the GMUG.

Understanding how the Engelmann spruce is reacting to changing temperatures and snowpack conditions and identifying specific landscape features that may be suitable for more successful regeneration in the future will be critical to guide treatment site selection. This data can tell us which areas on our landscape are more resilient to climate change and where spruce forests are more likely to persist in the coming decades. It also has implications for wildlife, like the Canada lynx. This project utilizes LiDAR (Light Detection and Ranging), a remote-sensing technology to model how high-quality lynx habitat has changed due to spruce beetle outbreaks. This habitat model can then be used in conjunction with GPS data from radio collared lynx to see how lynx are using these new landscapes.

### *2019 Monitoring*

Field crews continued to install temperature sensors on different aspects, slopes and elevations in untreated areas, previously harvested areas, and in salvaged areas where beetle-kill trees had been removed. Sensors were also deployed at Forest Inventory and Analysis (FIA) plot locations on the GMUG to provide landscape-scale context for temperature data. FIA is a nationwide “forest census” run by the USFS Research & Development branch that collects data on extent, condition, volume, growth, and health of forest resources across the nation.

Monitoring that will be used to validate remotely-sensed LiDAR data continued in the West Elks. Field crews installed 68 new intensive plots to document pre-outbreak conditions. Data collected at these plots included tree inventory, dense horizontal cover measurements, snowshoe hare scat count, and temperature sensor and seed trap installation. These plots will be used to ground-truth LiDAR data and to apply this knowledge to track forest change across spruce-dominated forests on the GMUG.



*Dr. Jason Sibold speaks to field trip participants at the Big Park pre-treatment review, August 2019*

### *2019 Results*

Field crews observed fairly widespread subalpine fir mortality in the West Elks. Since plots were just installed in summer 2019 no quantitative results are available at this time.

## Assessing the Socioeconomic Impacts of SBEADMR

*Lead: Dr. Tony Cheng, Colorado Forest Restoration Institute*

### *Background*

One of the project's goals described in the SBEADMR Record of Decision (ROD) is to "Provide commercial forest products to local dependent industries at a level commensurate with the GMUG Land and Resource Management Plan direction and in harmony with other Plan goals" (Recovery Goal #1, ROD, p. 4). In order to evaluate achievement of this goal and potential increased efficiencies found in SBEADMR's adaptive approach, the SBEADMR Science Team is looking at the following questions:

- To what extent do the USFS administrative costs change over the SBEADMR Project timeframe? What issues affect costs?
- To what extent does timber output and revenue change over the SBEADMR project timeframe?
- In what ways does the SBEADMR project contribute wood volume to the wood products industry that sustains the interdependence of producers?
- What are the direct non-governmental employment impacts on wood producers from the SBEADMR implementation?

### *2019 Monitoring*

In late 2019, Jarod Dunn (CFRI) took the reins on this project from Molly Pitts (who had been assisting Dr. Tony Cheng in a contracting capacity). Initial efforts to collect information to answer the above questions ran into issues with data availability.

### *2019 Results*

No results to report. In 2020, Clay Speas (GMUG NF Renewable Resources Staff Officer) has been leading the effort to answer the first question (administrative costs), as this data is generally more accessible to internal FS staff. Jarod Dunn will revisit and readjust the other questions to ensure that they are able to be answered with the available data.



*A skidder operating on the Big Willow Good Neighbor Authority Sale*

## Adaptive Management

The GMUG's Annual Management Reviews consider input from AMG recommendations, GMUG resource specialists, SBEADMR Science Team and other relevant research in order to make adaptive management decisions for the design and implementation of SBEADMR projects. Management Reviews are conducted by the GMUG Forest Leadership Team who make final decisions on changes to SBEADMR implementation. The following changes were made in 2020.

### 2020 SBEADMR Treatment Checklist Changes

1. Range and Invasive Species Surveys – Integrated Pest Management Strategies will be used to prioritize high priority invasive weeds for treatment.
2. IW-5 Design Feature modified to allow more flexibility during operations to avoid spreading weeds from weed units to non-weed units.
3. SV-1 Design Feature modified to better to clarify that all regeneration cutting must comply with Forest Plan stocking requirements within 5-years of harvest.
4. SP-4 Design Feature modified to clarify that slash piles must be a tee-pee shape and not in windrows. Allowances were made to allow retention of slash piles away from roads and where other objectives (e.g. fuels) could be achieved. Pile will be retained to increase levels of snowshoe hare habitat in the area.
5. SP-7 Design Feature modified to eliminate placement of slash piles two tree lengths or greater from residual stands. This is impossible to implement when using resiliency treatments.
6. TSHR-2 Design Feature modified to strengthen temporary road closure methods and to reduce sub-soiling from the current 8-12 inch ripping depth to 3-8 inches. These changes should significantly improve the soils ability to revegetate.
7. WFRP-3 Design Feature modified to increase the amount and size of large wood retained in treatments areas. Table A-17 was added which reflects changes in best available science since the Forest Plan was signed in 1993.
8. Design Feature tables were determined not to be 508 Compliant. Tables were modified to make them compliant.

### Other Changes

Step 6 of the Adaptive Implementation Process (Appendix E of the FEIS) was modified to clarify the type of input sought from the Forest Service during the 30-day informal public comment period. Many publics were providing input regarding the analysis completed in 2016 for the FEIS. These comments are not helpful to treatment design.

Step 6 of Appendix E also requires a response to public comments. Since many of the comments are related to the structure and processes within SBEADMR it was determined to produce a list of Q&A that could be updated annually and provided to the public during the mid-winter meeting and posted on the CFRI SBEADMR website.

Contract Provisions Crosswalk – in order to better link design features from the checklist to timber sale contract provisions, GMUG staff assembled across-walk for District staff use. This improves speed and efficiency to prepare a contract and ensure design features are properly implemented on the ground.

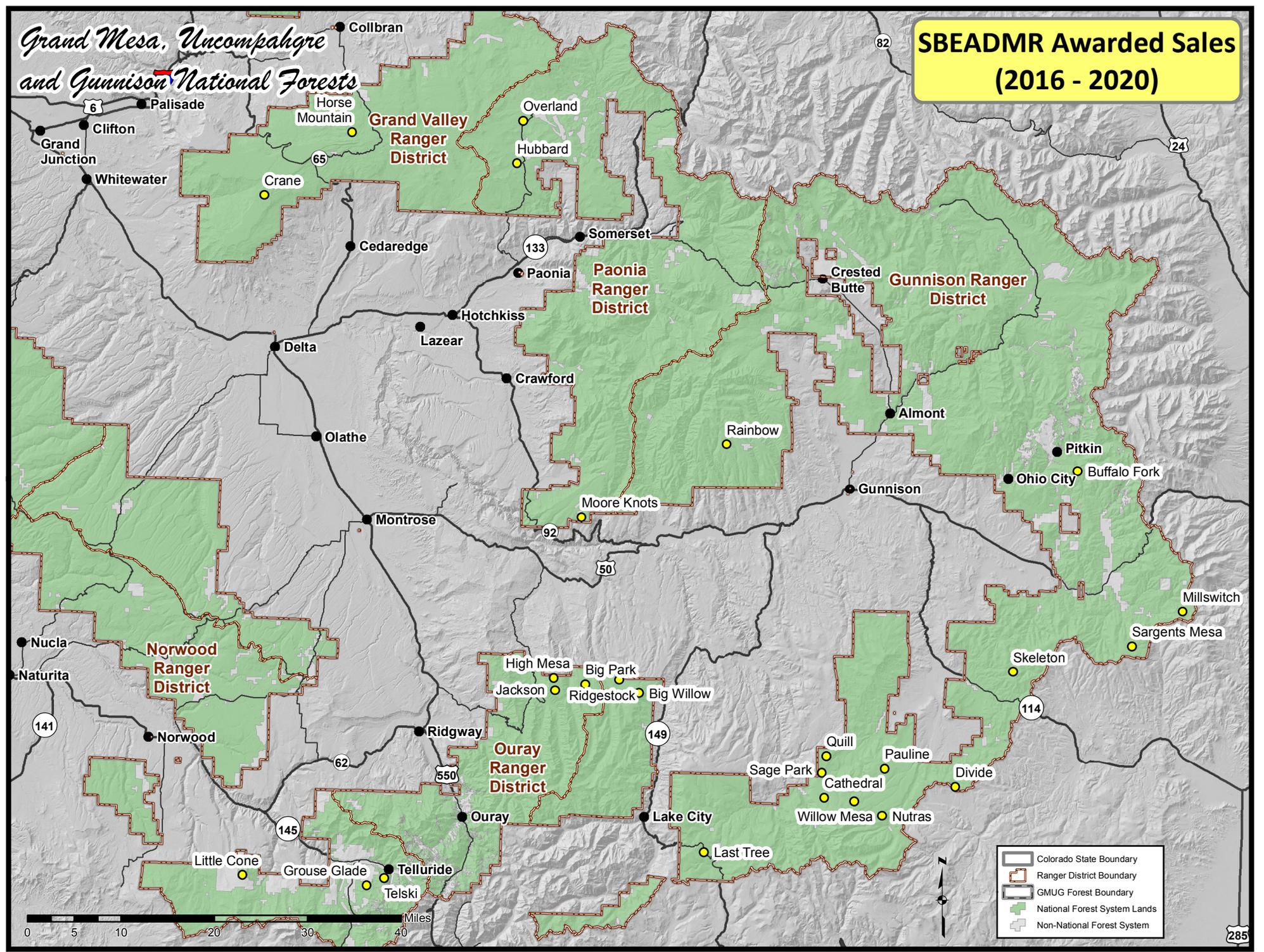
**SBEADMR Timber Treatments**  
**Sales awarded from Fiscal Year 2016 through Fiscal Year 2020**

<b>Sale Name</b>	<b>FY Awarded</b>	<b>Resource Zone*</b>	<b>Treatment Type</b>	<b>Acres Treated</b>	<b>Volume Produced (CCF)</b>	<b>Miles of Temporary Road</b>	<b>Treatment Status</b>
<i>Horse Mountain</i>	2016	North	Resiliency	110	1,449	0	Complete
<i>Cathedral</i>	2017	East	Salvage	640	13,497	10	Complete
<i>Nutras</i>	2017	East	Salvage	210	5,835	1.8	Complete
<i>Pauline</i>	2017	East	Salvage	1,874	18,615	9.7	Complete
<i>Skeleton</i>	2017	East	Salvage	610	12,777	8.4	Complete
<i>Willow Mesa</i>	2017	East	Salvage	440	5,800	6.4	Complete
<i>Moore Knots</i>	2017	North	Sanitation	15	70	0	Complete
<i>Little Cone</i>	2017	West	Resiliency	86	1,775	0	Complete
<i>Cooler</i>	2018	East	Salvage	244	2,167	0.8	Complete
<i>Divide Salvage</i>	2018	East	Salvage	160	2,545	1	Complete
<i>Last Tree</i>	2018	East	Salvage	466	6,270	3.7	Active
<i>Millswitch</i>	2018	East	Salvage	885	18,516	2.6	Sold
<i>Quill</i>	2018	East	Salvage	569	6,708	0	Active
<i>Sargents Mesa</i>	2018	East	Salvage	1,468	14,195	9.7	Active
<i>Crane</i>	2018	North	Resiliency	475	8,552	1.6	Active
<i>High Mesa</i>	2018	West	Salvage	320	13,178	3	Complete
<i>Big Willow</i>	2019	East	Salvage	2177	41,224	12	Active
<i>Buffalo Forks</i>	2019	East	Salvage/ Resiliency	100	1,441	2	Sold
<i>Ridgestock</i>	2019	East	Salvage	1,300	28,858	12	Active
<i>Sage Park</i>	2019	East	Salvage	14	130	0	Complete
<i>Jackson</i>	2019	West	Salvage/ Resiliency	321	10,789	2	Active
<i>Telski</i>	2019	West	Resiliency	50	500	0	Complete
<i>Overland</i>	2020	North	Resiliency	701	18,761	4	Sold
<i>Hubbard</i>	2020	North	Resiliency	896	16,114	7.2	Sold
<i>Rainbow</i>	2020	East	Resiliency	956	5,418	0	Sold
<i>Grouse Glade</i>	2020	West	Resiliency	20	111	0	Sold
<i>Big Park</i>	2020	West	Resiliency	1,056	16,145	1	Sold
<b>Totals</b>				<b>16,173</b>	<b>271,440</b>	<b>103.7</b>	

\*Resource Zones: East = Gunnison Ranger District, North = Grand Valley and Paonia Districts, West = Ouray and Norwood Ranger Districts

*Grand Mesa, Uncompahgre  
and Gunnison National Forests*

**SBEADMR Awarded Sales  
(2016 - 2020)**



## Contact Information

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Nicole Hutt, Timber Program Manager - [nicole.hutt@usda.gov](mailto:nicole.hutt@usda.gov)

For information about specific treatments contact your USFS District Timber Management Assistant:

East Zone (Gunnison Ranger District) – Arthur Haines, [art.haines@usda.gov](mailto:art.haines@usda.gov)

North Zone (Grand Valley and Paonia Ranger Districts) – Cari Johnson, [carijohnson@usda.gov](mailto:carijohnson@usda.gov)

West Zone (Norwood and Ouray Ranger Districts) – Joseph Gonzalez, [joseph.f.gonzales@usda.gov](mailto:joseph.f.gonzales@usda.gov)

SBEADMR website (hosted by CFRI)

<https://cfri.colostate.edu/projects/sbeadmr/>

SBEADMR Facilitator

Susan Hansen - [shansen42@gmail.com](mailto:shansen42@gmail.com)



*Log deck on the Big Willow Good Neighbor Authority timber sale*