



Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Region 8

April 30, 2025

Mechaw Fire Shed Compartment 171 Prescribed Fire – Lincoln Fire Declared Wildfire Review

Francis Marion & Sumter National Forests, Southern Region
Francis Marion Ranger District

Forest Supervisor Delegation



Private property involved in the Lincoln Fire. No structures were damaged.



Example of volatile bay fuels.

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Contents

Executive Summary.....	4
Setting.....	4
Social and Political Setting – National and Regional	4
Forest	5
Project Area Location and Description.....	5
Prescribed Fire Objectives and Resource Goals (Burn Plan Element 5).....	8
Prescribed Fire Prescription (Burn Plan Element 7).....	8
Narrative.....	8
Preceding Events	8
Special Circumstances/Fuels.....	9
Background.....	10
The Operational Plan	10
What Happened	12
Conclusion	16
Lessons Learned by the Review Team and Participants	17
Appendices	19
Appendix A: Analyses and Assessments	19
#1: Analysis of seasonal severity, weather events, and on-site conditions.....	19
#2: Analysis of the prescribed fire plan for consistency with agency policy.....	25
#3: An analysis of prescribed fire implementation for consistency with the prescription, actions, and procedures in the prescribed fire plan.....	28
#4: The approving agency administrator’s qualifications, experience, and involvement	31
#5: The qualifications and experience of key personnel involved.....	31
Appendix B: Contributing Factors or Conditions	32
Appendix C: Findings & Recommendations	33
Recommendations	33
Appendix D: Chronology.....	35
Appendix E: Delegation of Authority and Expectations	36
Appendix F: Glossary of Terms	38
Appendix G: Declared Wildfire Review Team	42

Executive Summary

On February 26, 2025, the Francis Marion Ranger District's Agency Administrator (AA) authorized the Mechaw Fire Shed Compartment 171 Prescribed Fire (C-171 RX). Weather parameters were within prescription, although the KBDI required a Forest Level Variance. Following a 1000 onsite briefing and test fire, resources began ignitions to include hand and aerial firing. By 1500, numerous spots had lofted across holding lines, and the Prescribed Fire Burn Boss Type 2 (RXB2) contacted the AA saying, "we lost it." The AA interpreted that phone call as a declaration and proceeded to inform the Forest Supervisor and others that the C-171 RX was declared a wildfire, becoming the Lincoln Wildfire.

Forest Service Manual (FSM) 5140 policy mandates a review of all prescribed fires that result in the declaration of a wildfire. As stated in FSM 5137, "Where prescribed fires escape their planned perimeter and are declared wildfires or a notice of air quality violation is issued, they are reviewed to help prevent future escapes or violations from occurring." In the event of a declared wildfire, the Agency Administrator is required to initiate the declared wildfire review process (PMS-484).

The Declared Wildfire Review Team consisting of prescribed fire subject-matter experts convened on March 7, 2025, to review the Mechaw Fire Shed Burn Plan, execution of the Burn Plan, and qualifications of burn participants. The team conducted interviews with those involved and reviewed supporting documents to develop a narrative including events and the reasoning behind actions participants took before, during, and immediately following the prescribed fire (RX) and subsequent declaration. The review team also visited the burn site with Francis Marion Ranger District personnel to better understand the events as they occurred. This resulting document includes lessons learned and recommendations from which others involved in wildland fire might benefit.

Setting

Social and Political Setting – National and Regional

The national posture regarding prescribed fire may be described as tense, due to uncertainty around funding for prescribed fire projects and personnel. Salary differences regarding WFSE and NFSE funded positions have caused many NFSE employees to be limited in the amount of time they spend in auxiliary fire positions and related collateral duties. In many circumstances funding is not prioritized for overtime for NFSE employees, further limiting the ability to assist with prescribed fire. Flexibility regarding suppression funds and fuels funds also limit the mobilization of prescribed fire resources nationally. Regionally, the number of resources from outside the geographic area (GACC) in early 2025 was at less than 25 percent of the five-year average, due to funding limitations and seasonal availability.

One of the most noted external pressures firefighters mentioned during this review was, “noise in the system.” Specifically, an administration change at the national level to include a new Chief of the Forest Service, speculation concerning tolerance regarding escaped prescribed fires, impacts to funding and resources at the national level, employment deferments, employment uncertainty, and uncertainty about the future of the Forest Service. This, along with a sincere desire to prove personal and professional worth, has led to internal and external pressures from individual to programmatic levels. The “noise” has a noticeable impact on stress to firefighters and leaders on the Francis Marion and Sumter National Forests.

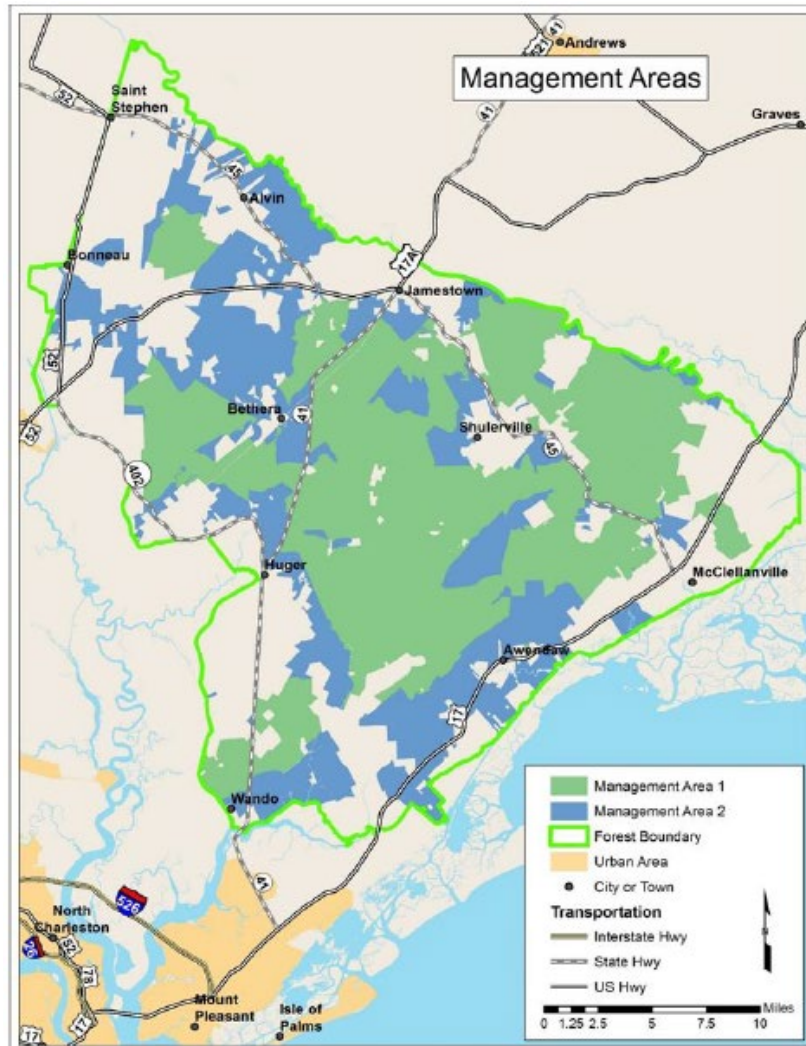
Forest

Established in 1936, the Francis Marion and Sumter National Forests comprise more than 629,000 acres throughout South Carolina. Headquartered in Columbia, the Forests are divided into four ranger districts: the Andrew Pickens, the Enoree, the Long Cane, and the Francis Marion. The Forests have an active prescribed burn program, averaging 68,548 acres and 133 burns a year (2016 through 2024). Fire is used as a management tool for a multitude of reasons including reduction of catastrophic wildfire risk to communities along the Wildland Urban Interface, minimization of smoke impacts to local communities, enhancement and maintenance of wildlife habitat, sustaining a diversity of ecosystems, and completing site preparation for tree planting and timber sales.

Employees have sincerity and drive to increase the amount of burning annually. A self-imposed target adds to internal pressure at the district level to treat more acres based off the historical acreage from previous years. The cooperation and relationships with local fire departments, cooperators, and adjacent units is critical to the local prescribed burn program. Additionally, the positive relationship with landowners and the public provides the Francis Marion Ranger District a large amount of social license and acceptability to burn the number of acres they historically have.

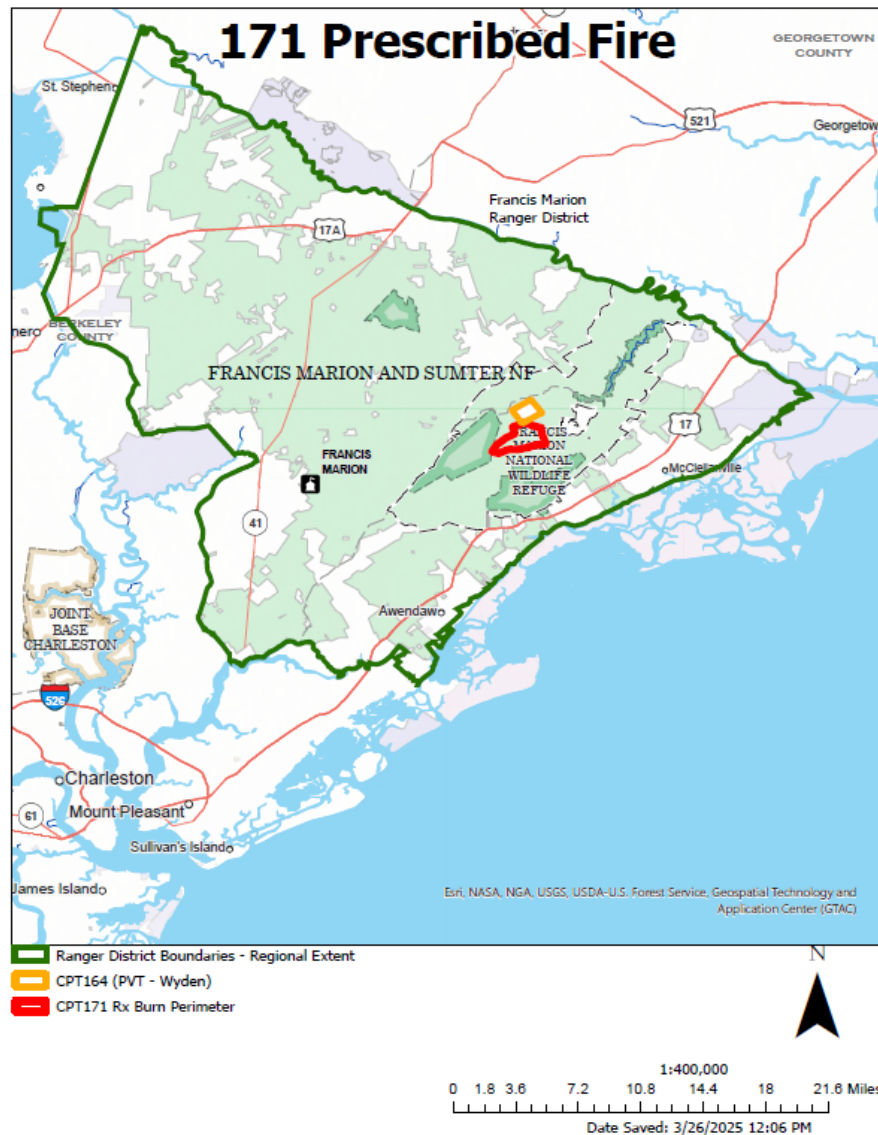
Project Area Location and Description

The Francis Marion Ranger District (FMRD) spans nearly 259,000 acres within the coastal plain of South Carolina. Prescribed fire management primarily focuses on reducing risks to the substantial acres of Wildland Urban Interface largely along district boundaries, and on the maintenance and restoration of longleaf pine within the core of the district. The Francis Marion National Forest Land Management Plan (2017) parses district lands into two management areas; Management Area 1 aims to burn between 30,000 to 50,000 acres annually, and Management Area 2 aims to reduce fuel loadings near communities and roads on 15,000 acres by 2030.



Management Areas within the Francis Marion Ranger District.

The Mechaw Fire Shed is located in Charleston County, encompassing 11 prescribed fire compartments for a total of 7,306 acres within Management Area 1. Three compartments (164, 164A, and 166) include Wyden Agreement properties, totaling approximately 100 acres. Compartment 171 is 1,435 acres, however, to meet prescription, 601 acres of upland species (loblolly/longleaf pine) are prioritized for burning. Bay fuels comprise 834 acres of the unit and are not typically anticipated to burn but may under certain conditions. As stated in the Mechaw Fire Shed Burn Plan, “Seasonality, fire return interval, and daily weather values will dictate the probability that bay vegetation will be available for consumption. In the event there is a likelihood of consumption, bay acres must be calculated in the total acres treated and included in the smoke management process at 6 tons per acre.”



Map of the Francis Marion Ranger District with overlaps of the Compartment 171 (red) and 164 units (orange).

The Compartment is bounded by FS217, FS215, FS221, FS220, FS220A, hardwood branches, and the Little Wambaw Swamp Wilderness. Encompassed by roads, there is no construction of handline or dozer line. Private property is located directly north of the unit on Victor Lincoln Road, with two houses and multiple outbuildings. These properties are under a Wyden Agreement within Compartment 164.

Fuels within the unit include an overstory of loblolly and longleaf pine, and sparse hardwood species. There is a scattered hardwood midstory located primarily along drainages and creek

bottoms. The substantial bay (pocosin) community is comprised of dense ericaceous shrubs up to 8 feet tall.

Prescribed Fire Objectives and Resource Goals (Burn Plan Element 5)

The following objectives are detailed in the Mechaw Prescribed Fire Burn Plan:

- A. Resource Objectives:
 - 1. Reduce hazardous fuel accumulation to provide greater wildfire protection.
 - 2. Maintain and improve habitat for federally listed threatened and endangered species.
 - 3. Maintain, improve, and restore fire-adapted ecosystems including upland pine woodlands, wet pine savannas and flatwoods, depressional wetlands and Carolina bays, and pocosin.
- B. Prescribed Fire Objectives
 - 1. Provide for public and firefighter safety and protect both on-site and off-site values.
 - 2. Minimize duration of smoke impacts to the surrounding area.
 - 3. Maintenance condition class- 1-3 year fire return interval.
 - a. Continue to apply fire in areas that have an established one-to-three-year fire return interval.
 - 4. Improve condition class- Fire return interval of four to six years.
 - a. Reduce litter layer by 20% to 90%.
 - b. Reduce shrub layer by top killing by 20% to 90%.
 - c. Reduce midstory by 20% to 90%.
 - 5. Restore condition class- Fire return interval of over six years.
 - a. Reduce duff layer consumption by no more than 50%.
 - b. Reduce litter layer by 20% to 90%.
 - c. Reduce shrub layer by 20% to 70%.
 - d. Reduce midstory up to 20%.

Prescribed Fire Prescription (Burn Plan Element 7)

The desired objectives in the prescription are to reduce hazardous fuel loads and to promote a healthy wildlife/forest habitat with the use of fire as a natural form of disturbance. The parameters set forth in this prescription should have a low to moderate fire behavior in the burn area which should reduce fuels to the desired conditions (depending on age of rough) with 2-3-foot flame lengths on the backfire and no more than 6 feet on the flanks and head fires. There could be occasional flare ups exceeding the 6-foot threshold due to the fuel loads but will not be continuous throughout the burn areas.

Narrative

Preceding Events

The FMRD's Fuels Assistant Fire Management Officer (AFMO) arrived early the morning of Tuesday, February 25 to discuss ignition plans for the planned Compartment 182 (C-182) prescribed burn.

Following the discussion with the Burn Boss Type 2 (RXB2), the AFMO examined the forecast for potential burning on Wednesday which called for transport winds out of the southeast. Though the North Hampton Plantation burn unit was a priority for Wednesday, the forecasted weather was, “a perfect day also for 171 because it would take the bay fuel out of the picture of the [adjacent Little Wambaw Swamp] Wilderness area.”

The FMRD developed a burn sequence for the units around Compartment 171 (C-171). Portions of the compartment to the north were burned first, on January 25, 2025. C-171 was the next planned ignition in the sequencing. The final portion of the sequence was to burn Compartment 166. The intent of the sequencing was to blacken the compartments to the north and west of Compartment 166, as the highly combustible bay fuels in that compartment are immediately next to the road, presenting major holding concerns when burning.

The AFMO spoke with the C-171 RXB2 to discuss Wednesday’s potential operations, and they agreed burning both units (North Hampton Plantation and Compartment 171) on the same day would be feasible. Later that afternoon, the AFMO prepared C-171 burn packet materials for the RXB2 and checked the forecast again before submitting a NWS SPOT request. The AFMO and Compartment 182 RXB2 discussed conditions on C-182. The bays were burning only along the fringes with minimal combustion. The AFMO thought C-171 would be the same, believing it was too early for those fuels to consume.

The morning of February 26, the AFMO spoke with the C-171 RXB2 regarding a shift in the weather forecast from southeast transport winds to south. The RXB2 was concerned about impacts to Victor Lincoln Road with the shift, and the AFMO advised allowing fire to back into the bay fuels to mitigate fire behavior and smoke impacts. They also suggested resources from the North Hampton Plantation burn could shift, after ignitions there were complete, to C-171.

Special Circumstances/Fuels

Local personnel have relied on colloquial knowledge and anecdotal observations regarding the availability of bay fuels. In general, these fuels become receptive around March 15 when experiencing annual new growth. As the vegetation begins to absorb large amounts of water from the soil it produces a highly flammable waxy residue. Fuels typically remain flammable until late June/early July, when growing slows drastically. It’s been noted by the District Fuels AFMO this general mid-March timeframe has moved up by two to three weeks in recent years.

Concentrations of bay fuels within FMRD burn units partially consume on average every five to six years. Fuels may fully consume every 10 to 15 years, depending on conditions. The bay component in C-



Example of bay fuels within Compartment 171.

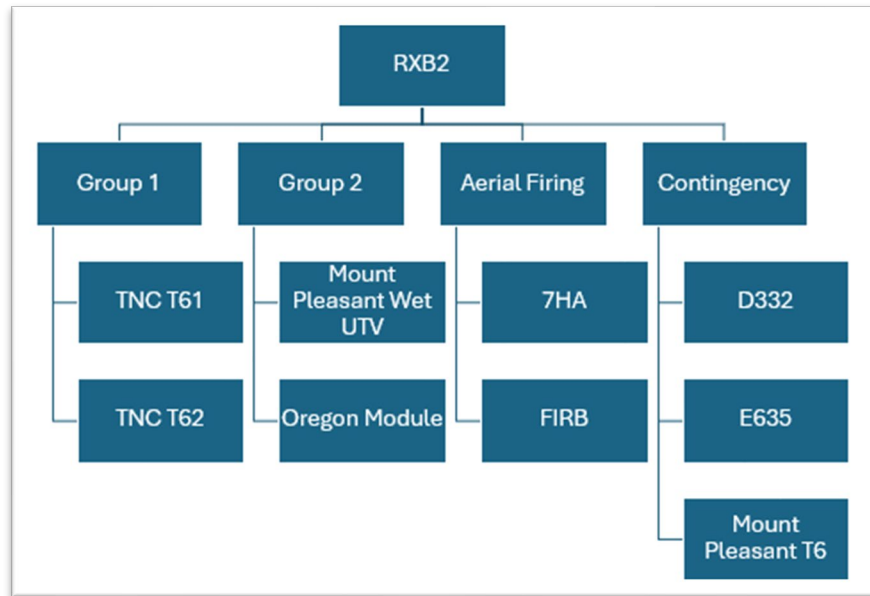
171 last burned in 2011, resulting in 15-year vegetation growth. The area observed two weeks of high temperatures in January followed by a hard freeze, potentially “freeze-drying” the bay fuels and may have contributed to the availability of fuels during the C-171 prescribed burn.

Background

On Wednesday, February 26, 2025, personnel on the FMRD began ignitions on two units: Compartment 171, which was later converted to the declared Lincoln Fire, and the North Hampton Plantation. The C-171 RXB2 met with the assigned District Duty Officer (DO) and Agency Administrator (AA) at 0700 to conduct the “2A” briefing. During the briefing the spot forecast was reviewed, and modeling runs were conducted using BlueSky. Contingency plans and Incident Within an Incident were also discussed. KBDI was calculated at 537 that morning, requiring Forest Level Variances for both units. C-182 had been burned the previous day, with similar bay fuel loading as C-171. Based on the lack of bay fuel consumption/involvement in C-182, the RXB2 felt the bay in C-171 would not be available. All parties felt comfortable burning in the predicted conditions with burn resources and contingency resources, and the AA approved the C-171 burn at approximately 0800.

The Operational Plan

Compartment 171 resources received an operational briefing at Drop Point (DP) 1 at 1000. Though the RXB2 didn’t expect the bay fuels to burn, the intention was to burn them should conditions allow. The line between DP2 and DP3 was considered a critical holding concern due to the southerly winds and previous spotting occurrence on past burns. One of the members of the smokejumper (Oregon) module was identified as a holding “IC” in the event there were issues, specifically at DP3.



Compartment 171 Prescribed Fire Organizational Chart.

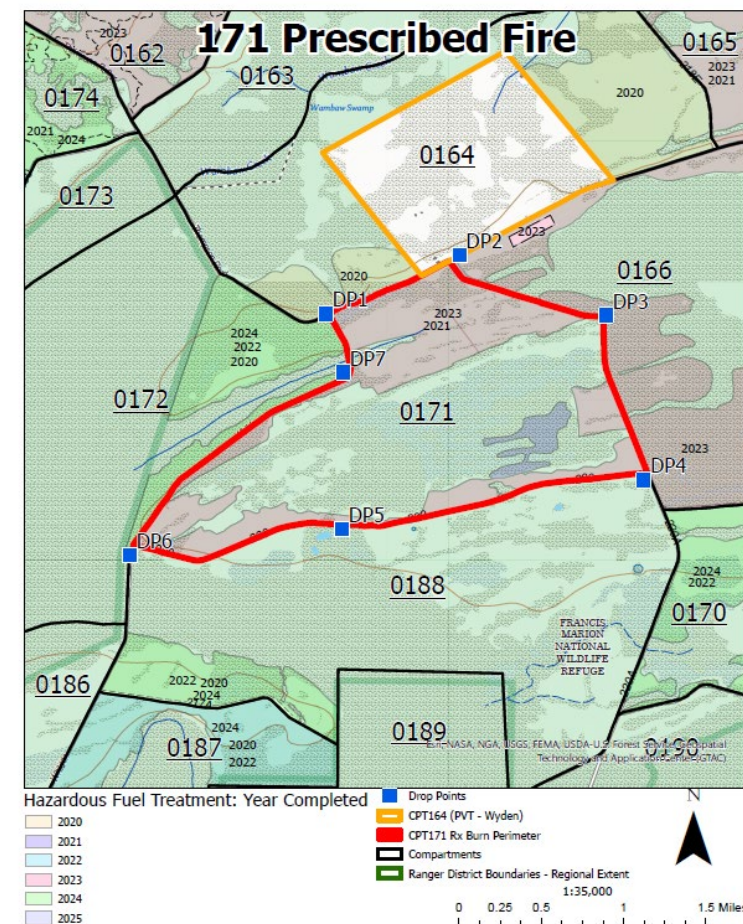
Following the briefing, a test fire was ignited at DP1 and the RXB2 notified South Carolina Coordination Center (Columbia Dispatch). Group 1 began blackline operations from DP1 to DP6 (CCW) while Group 2 began blacklining from DP1 to DP4 (CW). Group 2 resources were instructed to work towards building 4-6 chains of depth along this line. Both groups aimed to complete their respective ignitions by 1200.

What Happened

From approximately 1015 to 1040, Group 1 proceeded from DP1 to DP7. By 1130 the group progressed approximately halfway between DP7 and DP6. The engines experienced a total of five small spots directly across the road, the largest of which was 10 feet by 10 feet in size. At this halfway point, the RXB2 instructed Group 1 to slow

their firing as the resources on the east side (Group 2) caught up. Fire was actively backing, occasionally flaring up in areas with concentrated fuels. From this location, and for the rest of the operational period, radio communications were spotty at best. The Group 1 lead relied on cell phone calls and one face-to-face meeting to communicate with the RXB2 for much of the day.

Group 2 quickly progressed from DP1 to DP2 as fire backed into the unit. The group firing lead observed fire behavior was active, recalling, "I already knew how dry it was." As the group rounded the corner at DP2 and began igniting toward DP3 they worked to build depth off the line. The lead lighter focused on lighting a stringer of shrub vegetation, building approximately nine chains of black as they approached the dogleg at DP3. Holding resources extinguished two to three small spots across the road. They then began working their way into the bay fuels at DP3, building approximately 4.5 chains of black. The RXB2 radioed Group 2 around 1100 and was informed they were experiencing some small spots across the road into grasses and needles, furthering the delay of progress.



Compartment 171 Operational Map. Shading in the background indicates marsh type areas surrounding the RX.

At 1230 Group 1 had moved closer to DP6, observing the fire was transitioning from backing to actively flanking with flame lengths approaching 20 feet and individual tree torching. Group 1 pulled fire around the corner at DP6 to keep pace with the main fire's edge, transitioning to monitoring and patrol.

“Stopping firing in the bay earlier probably would have been best. You can always turn the machine back on.”

By 1400 enough blackline progress was made to launch the helicopter for PSD operations. All small spot fires around the unit had been extinguished. The aerial FIRB was flying front seat for the fourth time, and did not receive a detailed briefing on firing expectations from the RXB2 prior to takeoff. “Sometimes I assume too much...and should take the time to leave the burn and tie in with the helibase with a map.” The RXB2 tried to indicate the helicopter should build heat in the northwest corner of the bay fuels to draw fire away from the pressure line on the eastern edge of the unit. Instead, at 1431 the helicopter began strip firing to fill in the northern end of the unit and along the bay fuels. Firing initially “looked good” and the FIRB relayed to the RXB2 that 20 percent of the bay was burning. After lighting for approximately 15 minutes, the FIRB attempted to contact the RXB2, noticing fire behavior in the bay was far more active than anticipated. Unable to establish contact, the FIRB made the decision to stop firing. Later recalling, “Stopping firing in the bay earlier probably would have been best. You can always turn the machine back on.” When the RXB2 did make contact, the helicopter was instructed to sit down and prepare for bucket work.

The DZOP(t), staged at DP1 with the qualified DZOP, noticed a dark plume of smoke over Victor Lincoln Road at 1446. Group 2 resources patrolling along the road by the two homes noticed multiple spots spreading on the front lawn. They radioed the Group 2 lead stating, “Hey...it’s getting pretty hot down here.”

The preidentified holding “IC” took command of the emerging situation and instructed the DZOP(t) to unload. Additionally, multiple spots became established in the northern edge of adjacent Compartment 166. The source of spotting was likely from the northeastern edge of the bay fuel, casting embers up to .75 miles to the north and northeast.

The Group 2 lead arrived to DP2 from DP3 on the wet UTV after passing, “a wall of fire and it’s not even the bay.” They recalled looking towards and houses and it was, “as black as night out there.” There was a significant amount of ember wash falling on the house closest to DP2. The wet UTV and Mount Pleasant engine began extinguishing spots, noticing smoke in the hardwood stand directly behind the house. The dozer attempted to access the hardwood stand, but became stuck in the mud and backed out, later



Smoke column over Lincoln Victor Road at 1446.

approaching from a different direction to construct line. Contingency resource E635 heard traffic regarding the spots on the radio, recalling, “It sounded worse on the radio than it actually was.” They made their way to the spots from the south end of the unit and engaged in suppression.

The spots directly threatening the house nearest to DP2 were contained within about 20 minutes. The Group 2 lead recalled, “It happened so fast and then it was done.”

At 1500 the AA received a call from the RXB2 and was informed, “We lost it.” The RXB2 described the spots in Compartment 166 and around the houses on Victor Lincoln Road, proceeding to describe the utilization of on-scene contingency resources. The RXB2 requested multiple resources from the North Hampton burn. They also notified the AA an IC from the South Carolina State Forestry Commission, three state bulldozers, and potentially 2 fixed wing Firebosses had been requested.

From 1502-1506 the AA contacted the Deputy Forest Supervisor and the Forest Assistant Fire Management Officer to inform them of the situation. Meanwhile, the District DO was making their way towards C-171 after checking other completed burns on the district. As they were driving up the highway, they began hearing broken chatter over the radio about spots on private property and a need for structure protection. Upon arrival to the scene, the DO met with the RXB2 who instructed them to tie in with the holding “IC”. The DO’s first thoughts were that there were plenty of resources on-site to handle the fire activity. “It was busy, but not an emergency. The tempo wasn’t there,” they recalled. The DO was able to relay information from the holding “IC” to the Assistant Forest Management Officer via cell phone.

After arriving back to the District Office at approximately 1540 the AA called the District DO and asked for a ride to the scene. The DO picked up the AA at 1620 and they proceeded to the fire area. As they were driving, the AA told the DO they had made the decision to declare a wildfire. The DO remembered being, “a little surprised” at the news. The declaration was not relayed to the RXB2 or the other resources on scene. The DO, an off-forest detailer, has several years of experience burning on the FMRD but was unsure of their responsibility in passing the message of the declaration.



Firing operations between DP6 and DP5.

Resources had contained all spots by approximately 1600, resuming patrol and mop-up along the unit perimeter.

At 1800 members from Groups 1 and 2 began ignitions on the southern line. Fire behavior was active, as a flaming front pulled toward the interior of the unit. Following the completion of firing operations, all resources were released from the scene at 1830.

The following morning, the Fuels AFMO and C-171 RXB2 spoke via phone. They discussed preparing some new unit maps in preparation to finish burning the bay fuels within C-171. Both assumed the ignition plan was part of the prescribed burn, however when the Fuels AFMO reached out to the AA they were told they weren't allowed to resume firing operations because the burn had been declared a wildfire. The Fuels AFMO reached out to the Forest AFMO, who was not aware of the declaration either. Ground resources assigned to the C-

171 burn learned of the wildfire conversion during the morning briefing at approximately 0800.

The Lincoln Fire totaled 32 acres, with 30 acres on FMRD property (in Compartment 166) and two acres on private. The fire was contained on March 3, 2025.

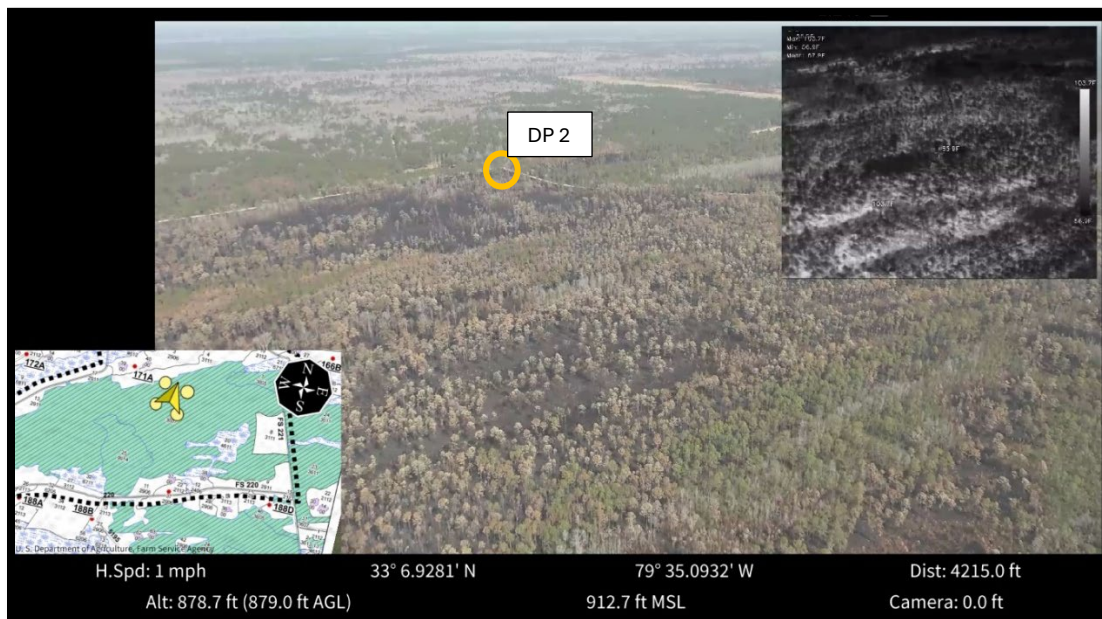


Photo captured by UAS on March 8. Looking towards DP2 from above the bay vegetation in the interior of the unit.

Conclusion

On March 6, 2025, the Forest Supervisor of the Francis Marion Sumter National Forests signed a Delegation of Authority to initiate a Forest Level Declared Wildfire Review (FSM 5140 Declared Wildfire Review) for the Compartment 171 Prescribed Burn implemented on February 26, 2025, resulting in the Lincoln Fire. According to the procedures outlined in the National Wildfire Coordinating Group's (NWCG) Standards for Prescribed Fire Planning and Implementation (PMS 484), a review team was delegated authority to conduct a thorough analysis of the Francis Marion's efforts to meet the five required review elements listed below, which are addressed in detail within Appendix A of this report.

1. An analysis of the seasonal severity, weather events, and on-site conditions leading up to the wildfire declaration.
2. An analysis of the Prescribed Fire Plan for consistency with agency policy and guidance related to prescribed fire planning and implementation.
3. An analysis of prescribed fire implementation for consistency with the prescription, actions, and procedures in the Prescribed Fire Plan.
4. The approving Agency Administrator's qualifications, experience, and involvement.
5. The qualifications and experience of key personnel involved.

Between March 5 and March 12, 2025, the review team conducted an in-depth review of all relevant project files associated with the Prescribed Fire Management Environmental Assessment, the Mechaw Fire Shed Burn Plan, IAPs, and the Francis Marion National Forest Land & Resource Management Plan (LRMP). The team conducted 29 interviews with Francis Marion fire personnel and off-Forest resources who were engaged in the planning and implementation of the C-171 RX, and/or suppression efforts on the Lincoln Wildfire. Finally, the Review Team participated in a site visit to the C-171 RX/Lincoln Wildfire.

The Review Team developed a comprehensive understanding of the actions taken by the Francis Marion Ranger District to conduct necessary planning and preparation for the C-171 RX in accordance with Forest Service and NWCG policy, as well as the Quality Assurance Checklist; what factors may have been contributing factors for the fire to escape outside established holding lines; and how contingency resources were utilized to contain the Lincoln Wildfire prior to significant impacts occurring on NFS and private lands.

Lessons Learned by the Review Team and Participants

1. Thorough and consistent communication during prescribed fire planning and implementation may lead to less confusion during fire operations.

a. The Agency Administrator for this RX may have benefited from being more physically involved in the implementation phase of the fire. Historically on the unit, the AA signs the 2A in the morning, and then relies on dispatch and the RXB2 to communicate. However, as the spots and slopover occurred on this fire, the RXB2 was operationally engaged, and no information regarding the fire was available. This led to a lack of awareness by the AA as to what was happening on the RX, as well as for the RXB2 regarding the declaration.

b. Developing a unit specific written plan for AA engagement may lead to a better understanding of expectations and communication during operations. In the Chief's Prescribed Fire Review, Agency Administrators were encouraged to be more engaged with prescribed fire, and minimum standards were outlined for physical engagement. Defining what those expectations are on the unit may assist in shared risk responsibilities.

c. Fire management and leadership should review the Burn Plan regarding Element 18, and identify roles and responsibilities listed in the plan. During this RX, the AA assumed the RXB2 was going to declare the RX a WF. However, the communication listed in the plan was not followed and later led to confusion throughout the local organization.

d. Face-to-face small team briefings may help new or less experienced personnel understand the plan and clarify any questions. Taking the time to individually breakout with key individuals, such as the FIRB or Holding, may allow for more open communication and an understanding of expectations and outcomes from the leader's intent.

2. Dedicated annual training regarding prescribed fire plan elements may help key personnel understand their roles and responsibilities, especially during high-tempo operations.

a. Scenario-based training regarding wildfire declarations may provide an opportunity for fire management to rehearse their actions outside of an emergency. While the Burn Plan specifically addresses the actions and communication required, the plan was not followed during this WF conversion. Having those conversations beforehand may have led to less confusion the following day.

b. Dedicating time to review Burn Plans with local unit personnel may allow an open environment for experienced firefighters to share their corporate knowledge. Although there is a breadth of knowledge regarding RX on the unit, it is largely based on local experience. Encouraging a collective sharing of information to off-forest resources and less experienced firefighters may provide a better understanding of operational decisions during prescribed burns and wildfires.

3. Accurately representing the bay fuels as a critical fuel requiring treatment may reduce the potential for unintended outcomes.

a. Adding bay fuels analyses into the Burn Plans would provide an opportunity to understand the associated spotting and needed containment. Currently, the bay fuels are not well represented in the associated Burn Plans. Local knowledge and experience are the key determining factors when igniting the bay fuels, however it is not well documented within the Burn Plans. Fuels specialists at the Regional Office may work with local fire planners to further understand the factors associated with bay fuel ignition.

b. Fire managers may not be accurately capturing smoke output on compartments containing bay fuels. By not analyzing and understanding the availability of the bay fuels, fire managers do not know if they will ignite, until they ignite. This may lead to increased smoke impacts not addressed in the plan. Additionally, smoke outputs may not be within South Carolina's Smoke Management policy for allowable tonnage.

4. The operational maps available in the Burn Plan and IAP are adequate for local resources to understand, however, they were not as useful for off-unit resources.

a. Compartment maps may need to be more generic while being descriptive for operational personnel. Some of the elements for consideration when updating the unit maps are as follows:

- Drop Points
- Values at Risk
- More description regarding timber stand numbers
- A key to stand identification
- If the maps are built in color, RXB2s may consider having colored maps available to resources as well, as the black and white shading does not transfer some of the information.

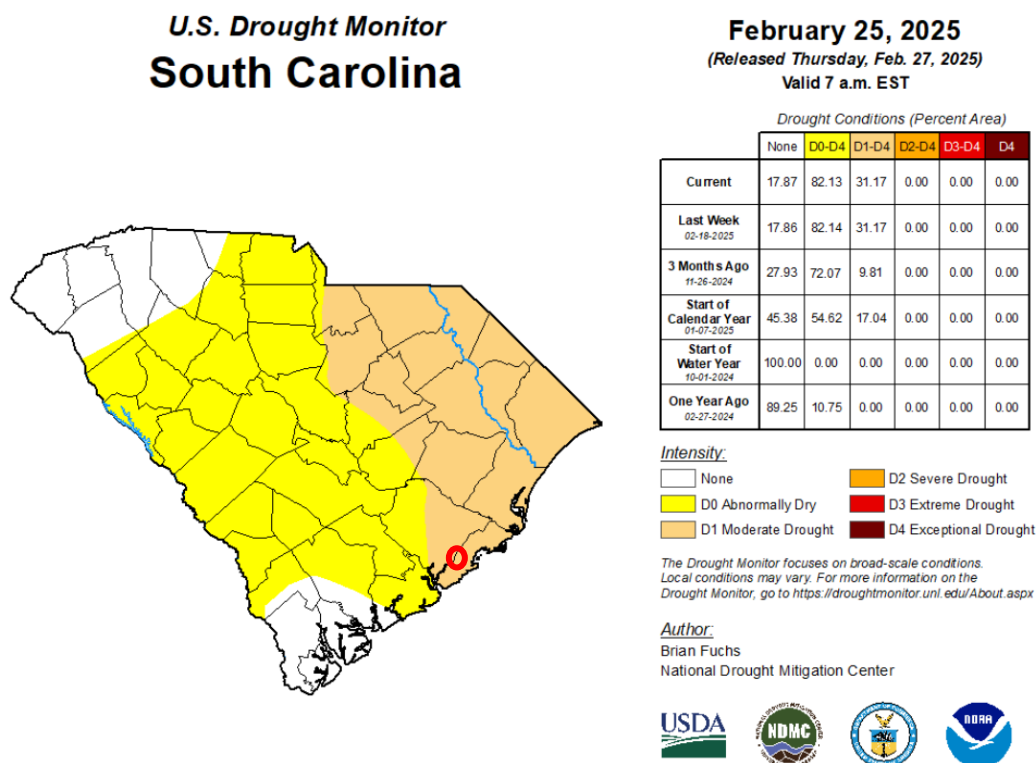
5. Writing a Burn Plan with off-forest resources in mind may help overcommunicate some of the critical components identified by local knowledge. The "burn boss packet" used for the Compartment 171 RX contained a lot of information that is not captured in the Burn Plan, such as clearer operational maps, notes for fire monitoring and effects, and other tactical elements not included elsewhere.

Appendices

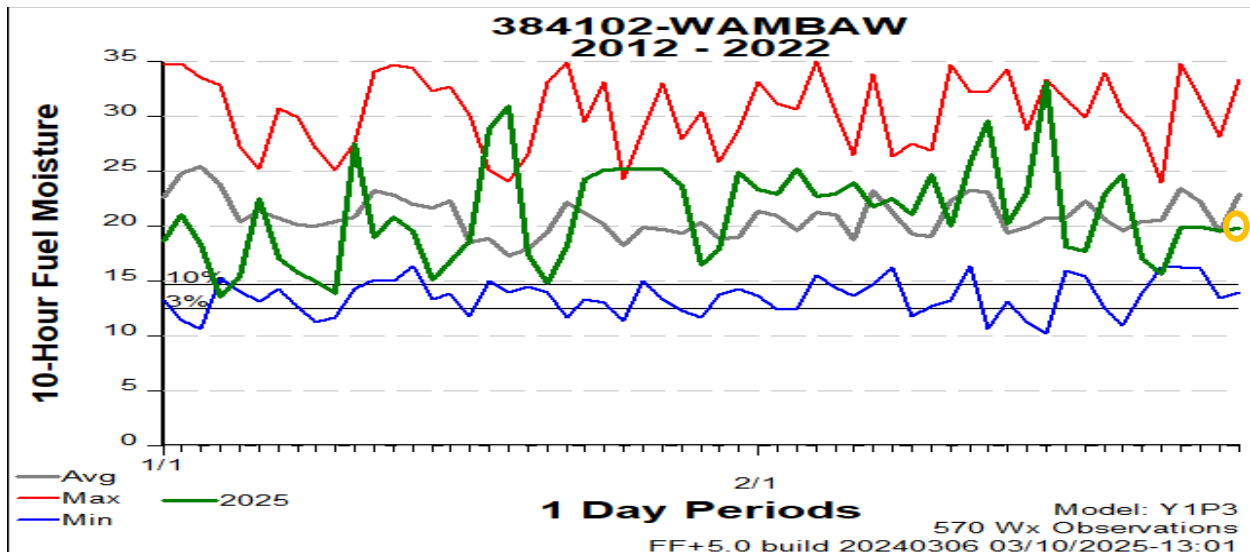
Appendix A: Analyses and Assessments

#1: Analysis of seasonal severity, weather events, and on-site conditions

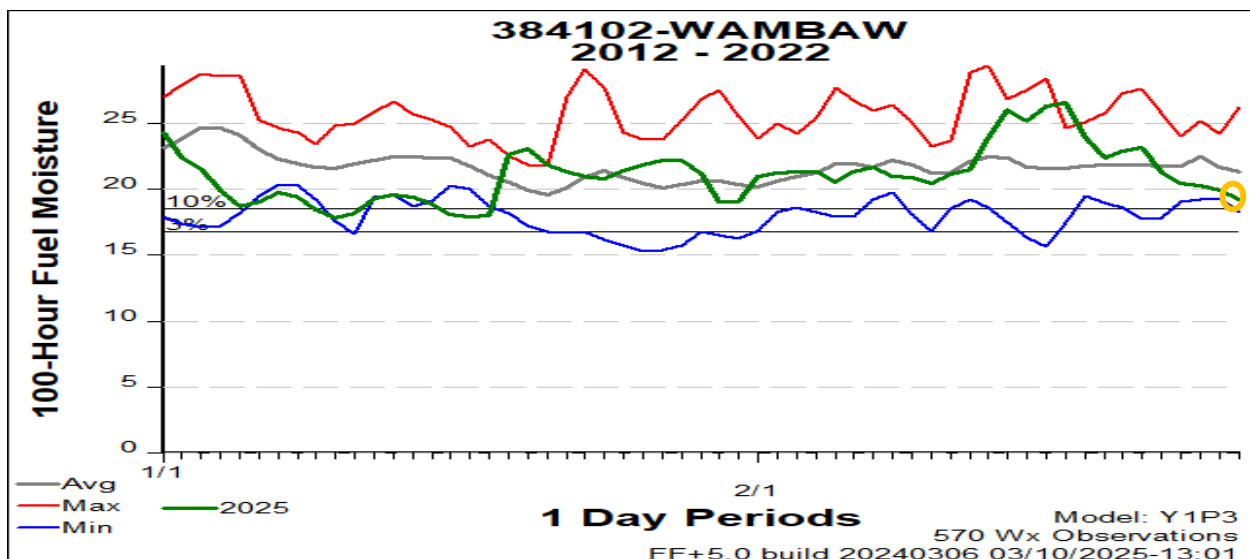
Though experiencing sporadic bouts of rainfall, the Francis Marion has been in drought conditions since October 2024, during what should be the wet season. Traditionally, December through February has multiple rain events with numerous storms producing recurrent precipitation events of 1+ inches. Below is the drought monitor from the week of the burn published February 25, 2025. Fuel conditions were not outside seasonal averages. The tables below are an analysis to support the seasonal conditions with the only anomaly being the KBDI.



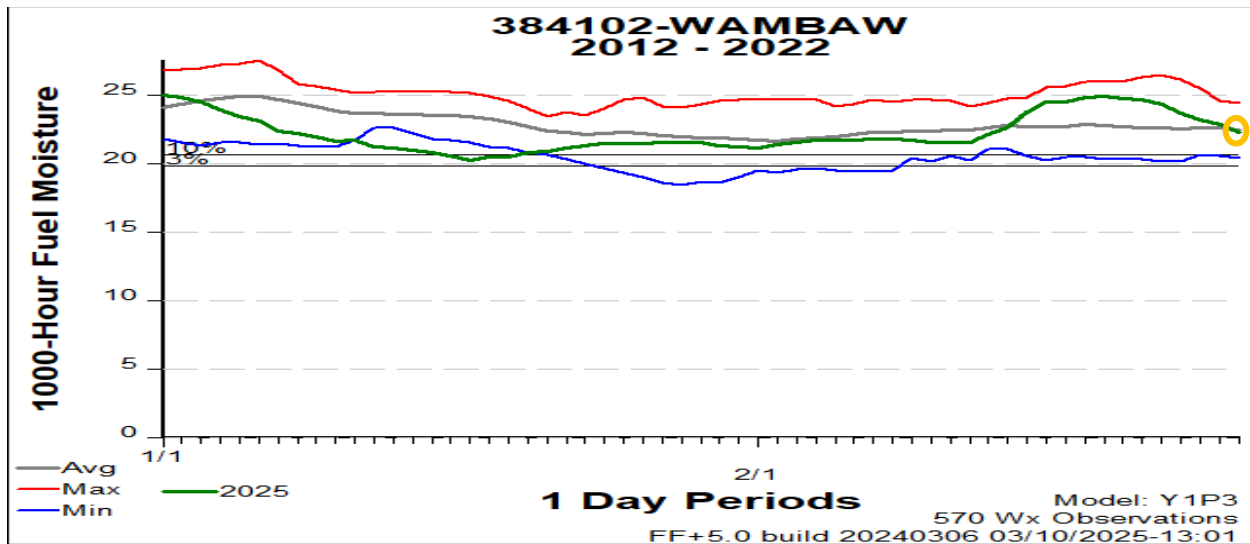
The Francis Marion Ranger District was experiencing a Moderate Drought the week of the C-171 Prescribed Burn.



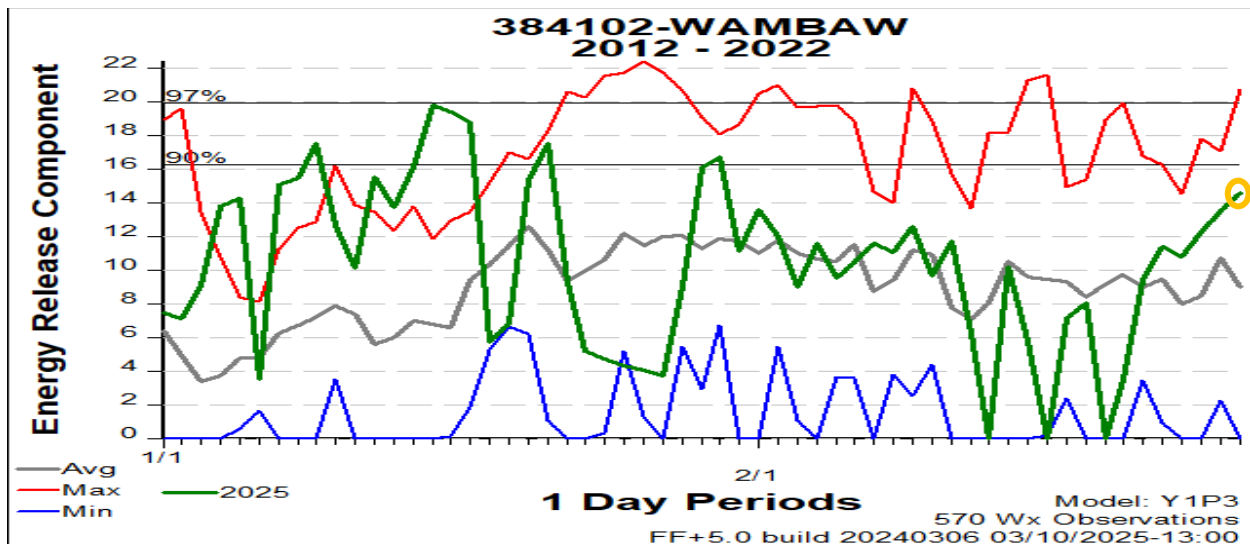
10-hour fuel moisture was recorded at 20 percent on February 26. This is just below seasonal averages for this date. 2025 daily values are shown in green on the chart.



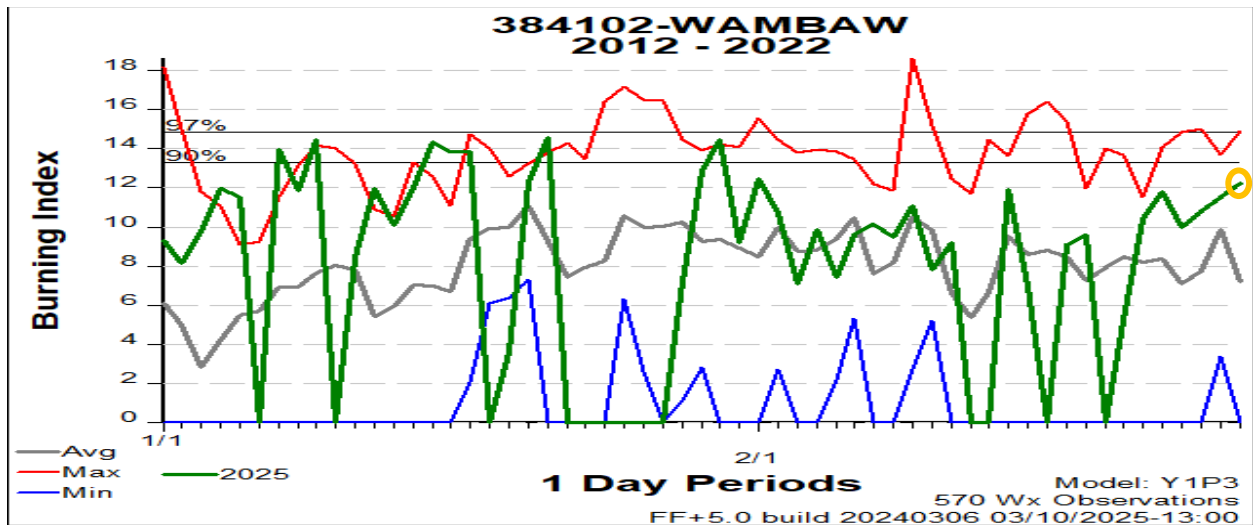
100-hour fuel moisture was recorded at 20 percent on February 26. This is trending toward the minimum value recorded, and demonstrates the long-term drought experienced in the area. 2025 daily values are shown in green on the chart.



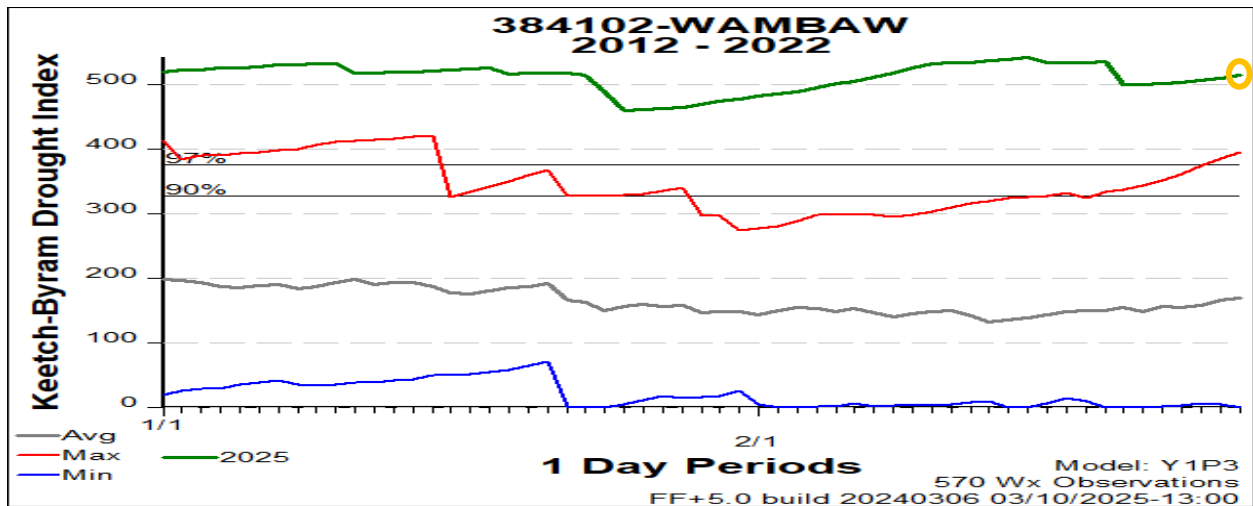
1000-hour fuel moisture was recorded at approximately 23 percent on February 26. This is near the seasonal average and was beginning to trend lower as drought conditions persisted. 2025 values are shown in green on the chart.



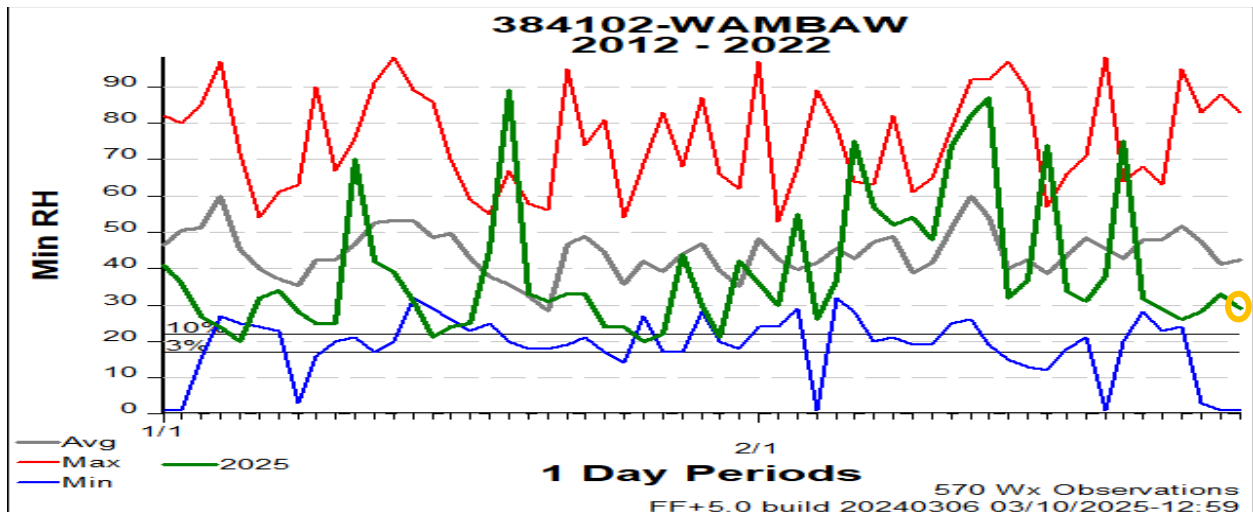
The Energy Release Component was recorded at a value of 14 on February 26. This is a departure from the seasonal average and is influenced by the long-term drought affected the area. 2025 values are shown in green on the chart.



The Burning Index was recorded at a value of 12 on February 26. This is a slight departure from the seasonal average. 2025 values are shown in green on the chart.

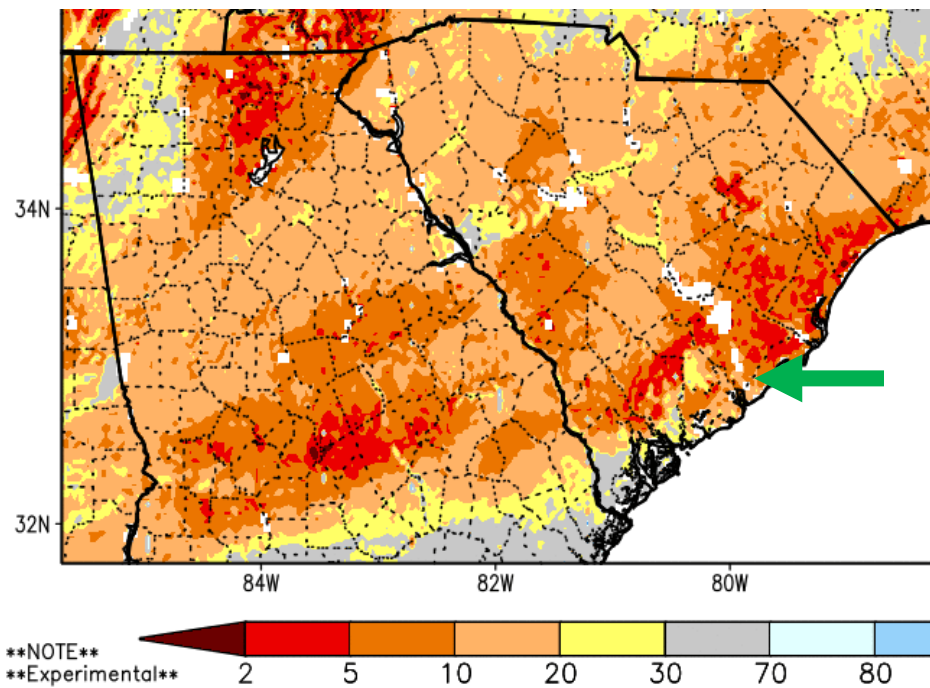


The Keetch-Byram Drought Index was recorded at a value of 537 on February 26. Values from January through February were setting new maximum records in comparison to the analysis period of 2012-2022. This is indicative of the long-term drought the area was experiencing.

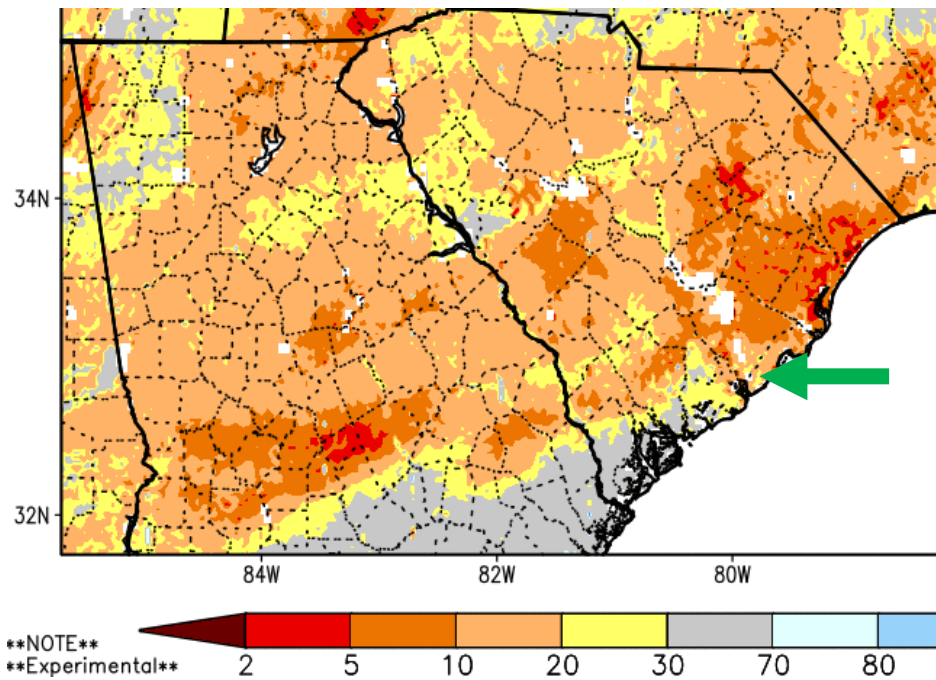


Minimum Relative Humidity was recorded at 28 percent on February 26. This is a slight departure from seasonal averages, but not outside of burn plan parameters.

The upper-level soil moisture percentiles provided by NASA Sport LIS at the 10cm and 40cm range indicate there was very little moisture in the soils at ignition



Soil moisture percentile map provided by NASA Sport LIS at the 10cm range. The green arrow indicates the approximate RX location.



Soil moisture percentile map provided by NASA Sport LIS at the 40cm range. The green arrow shows the approximate RX Location.

#2: Analysis of the prescribed fire plan for consistency with agency policy

PRESCRIBED FIRE PLAN ELEMENTS	CONSISTENT WITH POLICY (NWCG and USFS)	COMMENTS	CONTRIBUTING FACTOR?
Element 1: Signature Page	Yes	All required signature blocks completed. Some additional blocks (some specialist signature blocks not completed)	No
Element 2A: Agency Administrator Ignition Authorization	Yes	Signed 2/26/2025, starting at 1000hrs. All elements discussed and documented. District communication protocols penned in on the 2A, but these do not exist independent of what is clear and specific in the burn plan.	No
Element 2B: Prescribed Fire GO/NO-GO Checklist	Yes	Documentation not available for 2/26.	No
Element 3: Complexity Analysis Summary and Final Complexity	Yes	Two complexity analyses completed for Management Area #1 and #2.	No
Element 4: Description of Prescribed Fire Area	Yes	Thorough, including breakout of fuel types (including Bay Fuels) for each compartment, and date last burned. Compartment Maps are included but specific Critical Holding Points are not identified.	No
Element 5: Objectives	Yes	Resource Objectives are not measurable (SMART).	No
Element 6: Funding	Yes	Consider if it is reasonable to have a single charge code identified.	No
Element 7: Prescription	Yes	Bay Fuels spotting potential was not considered in modeling. While containment actions would not occur in this fuel type, knowing the potential would assist the RxBB to consider wind directions and baseline considerations day of burn.	Yes
Element 8: Scheduling	Yes	Includes Prescribed Fire Approval Act of 2016 compliance check.	No
Element 9: Pre-burn Considerations and Weather	Yes	Clarity was not provided on what to consider regarding the statement that it contains significant Bay Vegetation.	Yes
Element 10: Briefing	Yes	Although expected to be included in Holding (which is identified for briefing), consider adding critical holding points as determined by	No

		the burn boss if not identified on compartment maps.	
Element 11: Organization and Equipment	Yes	Consider clarification of either/or pertaining to holding capabilities between a helicopter with bucket or a UAS with Module.	No
Element 12: Communication	Yes	Comprehensive-includes specifics on declared wildfire communication requirements in addition to other significant events.	No
Element 13: Public and Personnel Safety and Medical	Yes	Complete. RA/JHA, and MASP addressed and Helicopter Crash Rescue plan included.	No
Element 14: Test Fire	Yes	No comments	No
Element 15: Ignition Plan	Yes	No comments	No
Element 16: Holding Plan	Yes	All Dec. 2022 FS Template sections addressed.	No
Element 17: Contingency Plan	Yes	Complete	No
Element 18: Wildfire Declaration	Yes	Fully meets PMS484, clear Communication requirements also reiterated in Element 12: Communications, A: Key Communication Points	No
Element 19: Smoke Management and Air Quality	Yes	South Carolina Smoke Management guidelines and unit specifics (including Compartment 171) complete.	No
Element 21: Post Burn Activities	Yes	Includes conducting an AAR and addressing deficiencies among other requirements.	No
Prescribed Fire Plan Appendices: Appendix A: Maps: Vicinity, Project (Ignition Units)	Yes	Recommend including more operational specificity, including the critical holding points that may be contingent on wind direction, values at risk, and smoke management considerations.	Yes
Appendix B: Technical Review Checklist	Yes	Light on details/feedback, only as satisfactory. In-house technical review. PMS484 recommends review from outside of organization.	No
Appendix C: Complexity Analysis	Yes	Two analyses completed (Management Area #1 and #2) for programmatic plan, AA engagement in preliminary and final. Limited consideration for Bay fuels and addressing the potential for Fire Beh and Resistance to Containment, and Technical Difficulty.	Yes
Appendix D: JHA Risk Assessment	Yes	Includes RA and MASP.	No

Appendix E: Medical Plan	Yes	No comments.	No
Appendix F: Fire Behavior Modeling Documentation	Yes	Consolidation/Clarity of various fuel models used would provide an incoming RxBB or out of area resources more general awareness of nuanced vegetative characteristics. Behave and IFTDSS used.	No
Appendix G: Smoke Management Plan and Smoke Modeling Documentation (Optional)	Yes	Smoke management and state guidelines are well represented within body of plan.	No

Summary: The Mechaw Burn Plan was clearly written and within USFS and NWCG policy, however the key factor in this escape included the bay fuels, which have no analysis available on them. While they are included within Compartment 171, the fuels have a seasonal component where the RXB2 plans on them burning but does not count the acres when they do not burn. Crews were well briefed on the potential intensity of the bay fuels burning, but the analysis does not include holding, spotting, or contain modeling when accounting for bay fuels. The additional comments in the above table are auxiliary and may help in future iterations of burn plan development.

#3: An analysis of prescribed fire implementation for consistency with the prescription, actions, and procedures in the prescribed fire plan

PRESCRIBED FIRE PLAN ELEMENTS	IMPLEMENTATION CONSISTENT WITH PLAN	COMMENTS	CONTRIBUTING FACTOR?
Element 1: Signature Page	Yes	No comments	No
Element 2A: Agency Administrator Ignition Authorization	Yes	Thorough and completed, included significant discussion for wildfire declaration.	No
Element 2B: Prescribed Fire GO/NO-GO Checklist	No	No available documentation, RXB2 did not complete.	No
Element 3: Complexity Analysis Summary and Final Complexity	Yes	No comments	No
Element 4: Description of Prescribed Fire Area	Yes	No comments	No
Element 5: Objectives	Yes	Objectives and effects were met.	No
Element 6: Funding	Yes	Funding identified in the plan was not the funding used, although consistent with current policy.	No
Element 7: Prescription	Yes	Implementation consistent with burn plan.	No
Element 8: Scheduling	Yes	Consistent with burn plan.	No
Element 9: Pre-burn Considerations and Weather	Yes	Significant Bay vegetation is noted but specific considerations are not. This would be a location in the plan to lay out specifics that may be developed in preparations for these fuel types to be treated.	No
Element 10: Briefing	Yes	Elements as described within plan were addressed, including contingency areas, and resources identified.	No
Element 11: Organization and Equipment	Yes	Burn resources were greater than minimally required and on-site.	No

Element 12: Communication	No	Section A: Key Communication Points clearly articulate notification either directly or through dispatch of conditions/situations when the Burn Boss will notify the fire management and AA. These were not followed, or clarity in communication was not evident, ultimately leading to the wildlife declaration.	Yes
Element 13: Public and Personnel Safety and Medical	Yes	Based on team's analysis, burn organization both met and went above minimally required actions. MASP, Medical Plan, and Helicopter Crash Rescue was available.	No
Element 14: Test Fire	Yes	Weather Conditions On-Site, and Test Fire Results were noted in the Burn Boss packet.	No
Element 15: Ignition Plan	Yes	Ignition challenges using aerial resource manifested from communication challenges, relatively new aerial Firing Boss, and significant variability in fuel type led to significant number and long range (up to ¾ mile) spotting.	Yes
Element 16: Holding Plan	Yes	All holding resource requirements and actions were followed.	No
Element 17: Contingency Plan	Yes	Operations included more than required resources, all within 30 min response time (on-site).	No
Element 18: Wildfire Declaration	No	Notification and decision did not follow as clearly identified in the plan and as discussed in the 2A. AA declared the prescribed fire a wildfire inclusive communication did not occur.	Yes
Element 19: Smoke Management and Air Quality	Yes	Burn was implemented in compliance with the burn plan and state requirements. State smoke management requirements may have led the burn implementation to put critical holding areas in adverse wind conditions that elevated the intensity	Yes

		of holding and contingency resources when significant spotting occurred.	
Element 21: Post Burn Activities	No	AAR for Compartment 171 was not completed as specified.	No
Prescribed Fire Plan Appendices: Appendix A: Maps: Vicinity, Project (Ignition Units)	Yes	All resources were provided daily compartment IAP, which included unit and contingency maps.	No
Appendix B: Technical Review Checklist		No comments	
Appendix C: Complexity Analysis		No comments	
Appendix D: JHA Risk Assessment		No comments	
Appendix E: Medical Plan		No comments	
Appendix F: Fire Behavior Modeling Documentation	Yes	Day of containment calculations required by the burn plan completed.	No
Appendix G: Smoke Management Plan and Smoke Modeling Documentation (Optional)	Yes	Prior and day of calculations were completed as required.	No

Summary: The implementation of Compartment 171 using the Mechaw Burn Plan was consistent and within policy for much of the implementation. The review team found that the common denominator in the implementation and subsequent declaration of the wildfire was communication failures. While the Burn Plan articulates who should be notified, that process was not completely followed. Additionally, communicating the slop-over as “we lost it” would lead the AA to believe that it was declared. Additional elements were found to be contributing factors that marginally contributed to the escape and ultimate declaration.

#4: The approving agency administrator's qualifications, experience, and involvement

Summary: The approving Agency Administrator had qualifications and experience that met the minimum requirements to implement the Compartment 171 Prescribed Burn. The Agency Administrator participated and was engaged in the Agency Administrator Ignition Authorization (2A) that occurred on February 26, an on the administrative unit during the prescribed burn. It was observed by the team that expectations for communication were minimal during the operational period of the burn and for the process of declaring a wildfire.

#5: The qualifications and experience of key personnel involved

Summary: Our review of the Compartment 171RX IAP and associated IQCS qualifications determined that all personnel assigned to Compartment 171 RX were qualified for their respective assigned positions on February 26.

Appendix B: Contributing Factors or Conditions

	Contributing Factor or Condition	Mark 'X' if Observed
Planning	Burn area boundaries not aligned with favorable locations for fire containment.	
	Interdisciplinary team coordination lacking during design and planning of the treatment.	
	Lack of proficiency using fire behavior and related modeling tools.	
	Insufficient holding plan.	
	Insufficient ignition plan.	
	Insufficient mop-up and patrol plan.	
	Insufficient contingency plan.	
	Insufficient technical review.	
	Complexity rating did not adequately reflect the conditions actually experienced.	X
Operations	Burn could not be completed and secured before forecasted worsening weather arrived.	
	Test fire did not provide accurate representation of fire potential.	X
	Actions taken inconsistent with those described in the burn plan.	X
	Insufficient patrol after burn boss transfers control to local unit.	
Communications	Unit boundaries or special features not communicated or identified accurately.	
	Instructions not given or well understood.	
Equipment	Malfunction or breakdown.	
	Equipment not set-up and tested prior to need.	
Fire Environment	Extended fire persistence – 2 weeks or more in patrol status.	
	Actual weather experienced was outside what was forecast.	
Fuels	Severe drought conditions contributing to unusually dry fuels.	X
	Higher than typical fuel quantity/loadings.	
	Large machine piles.	
	Hand piles.	
Human Factors	External Influences or distractions.	X
	Internal stress or fatigue.	X

Contributing factors or conditions listed above are further described below:

The complexity rating does not account for bay fuels as described above. Without a representation of the bay fuels, the test fire did not adequately demonstrate how they would burn. Additionally, the burn plan does not address bay fuels, and no actions are associated with them. The ignition operations with PSD operations contributed to the lofting fuels and increased fire activity, leading to an escape north of the planned RX.

While the Southern Area had been under drought conditions, only the soil moisture and KBDI were elevated, however this likely contributed to the bay fuels igniting.

External distractions and the human factors are hard to quantify, but it was apparent that many external factors had key personnel concerned, and pressure to complete RX was a contributing factor.

Appendix C: Findings & Recommendations

Recommendations

1. Burn Plan elements need to be reviewed for NWCG and USFS Policy consistencies. For further information refer to Appendix A-2 for Burn Plan analysis and Appendix A-3 for implementation analysis. However, the team recommends examining the following elements specific to the Mechaw Burn Plan.

- a. Element 2B: While the intent of determining the Go/No Go checklist was met with regards to conditions being met for ignitions, no documentation in the official file was located by the team.
- b. Element 7: The prescription for compartments must analyze all the fuels that could be ignited. In Compartment 171 no analysis was given for bay fuels which would have provided spotting and containment information.
- c. Element 12: Communication for the Compartment 171 RX implementation was not consistent with the QA Checklist and Chief's Review regarding Agency Administrator participation and involvement. While there is no identified check-in time required, positive communication (back and forth) during the day with the RXB2 and AA would have prevented the misunderstanding of the wildfire declaration.
- d. Element 18 Wildfire Declaration: The Mechaw Burn Plan identifies the AA, the RXB2, the Duty Officer, and the FMO will have a conversation before declaration of a wildfire. Before implementing further burns, it is recommended that those names and positions are identified and clarified AND positive communication during the 2A conversation occurs regarding Element 18. AAs should not declare a WF; they should discuss with the RXB2 to declare, and work through the operational needs for resources.
- e. Appendix B Technical Review Checklist: It is recommended by NWCG PMS 484 that Burn Plans are reviewed by an off-unit burn boss. The frequency of burns and repetition of local resources does not provide an "outside" perspective for review.

2. Quality After Action Reviews (AARs) should be completed daily. The review team could not find documentation for an AAR, and it was reported that previously completed burns did not conduct AARs. An effective AAR should be used to improve the planning and implementation of prescribed fire and should be reinforced for future operations.

3. A revision of the Southern Region FSM 5140 supplement is needed to provide clear guidance to the field with standardized region-wide 5140 language.

a. Develop standardized processes, language, definitions, and roles and responsibilities for Element 18: Wildfire Declaration. Copied from PMS 484, Element 18 in the Mechaw Burn Plan did not completely explain how the unit would achieve Element 18's objectives.

b. Define the Region 8 minimum staffing using production rates and reasonable holding expectations. A clearer expectation in the R8 5140 would improve expectations to be written into Burn Plans.

c. Refine the Region 8 expectation of Element 16: Holding Plan to include post-burn monitoring (Patrols/Checks), frequency, types, etc. Holding Plan expectations should call for increased holding line checks, to include peak-burn period checks and using risk-informed decisions based on predicted severe weather (low RH, high winds, dry fuels, etc.).

d. Provide clarification and expectations for off-unit Burn Plan technical reviews.

Appendix D: Chronology

Lincoln Declared Wildfire | Francis Marion & Sumter National Forests

February 26

- 0700 – Agency Administrator Ignition Authorization Briefing (Element 2A)
- 0900 – Resources travel to Compartment 171 Burn Unit
- 1000 – Prescribed Fire Briefing conducted at DP1
- 1015 – Test fire initiated at DP1; Columbia Dispatch notified
- 1037 – RXB2 notifies Columbia Dispatch ignitions will continue
- 1100 – Light spotting occurring during blackline operations from DP2 to DP3
- 1352 – RXB2 requests Columbia Dispatch to launch helicopter to C-171 for aerial ignitions
- 1410 – Helicopter enroute to C-171
- 1418 – Helicopter contacts C-171 resources and begins local Flight Following with RXB2
- 1431 – Helicopter begins aerial ignitions
- Approximately 1445 – Aerial FIRB reports 20% of the bay fuels has been fired out
- Approximately 1450 – Aerial FIRB attempts to contact RXB2 with concerns of active fire behavior in bay fuels; stops PSD operations
- 1456 – RXB2 contacts Columbia Dispatch to request 3 state tractor plows, Dozer 55, Helicopter 7HA for bucket work, and a state IC
- 1500 – AA receives phone call from RXB2 and is informed, “We lost it.”
- 1503 – Helicopter returns to helibase
- 1506 – AA contacts Deputy Forest Supervisor followed by Forest Assistant Fire Management Officer; initiating Wildfire Declaration
- 1533 – RXB2 requests helicopter for aerial observations
- 1544 – State resources arrive on scene
- 1620 – DO and AA proceed to fire area
- 1749 – RXB2 complete GPS mapping of private land burned area, totaling two acres in size
- 1830 – Resources released from incident

February 27

- 0825 – Francis Marion Ranger District employees and off-forest resources are notified of the Wildfire Declaration

Appendix E: Delegation of Authority and Expectations



Forest Service

Francis Marion and Sumter National
Forests

4931 Broad River Road
Columbia, SC 29212
803-561-4000

File Code: 1230
Route To:

Date: March 6, 2025

Subject: Delegation of Authority – Lincoln Road Declared Wildfire Review

To: Heath Bell and Kimberly Bittle

This letter formalizes your appointment as Review Team Leader to complete a Forest Level Declared Wildfire Review for the C-171 Prescribed Fire (RX) initiated on February 26, 2025, that resulted in the Lincoln Road Wildfire (WF) on the Francis Marion Ranger District of the Francis Marion and Sumter National Forests. To ensure an objective and insightful review, I have approved your review team roster that includes subject matter experts.

As Team Leaders, you have the authority of my office to execute and complete a thorough and systematic review as described in the enclosed Expectations document. Your Point of Contact for assistance and coordination with the Southern Region Fire and Aviation Management is Andy Baker, Assistant Director of Fire & Aviation, 706-400-2150 andrew.baker@usda.gov. Your Point of Contact for assistance and coordination with the Francis Marion and Sumter National Forests is Rocky Beery, Assistant Fire Management Officer, 864-200-5498, rocky.beery@usda.gov.

For necessary Travel, equipment, salary, or other costs related to this review use the Lincoln Road charge code P8SF1025 with override code 0812.

Your authority includes, but is not limited to:

- Controlling, organizing, managing, and directing the review.
- Maintaining the confidentiality of the process.
- Protecting and managing the integrity of documents, media or other artifacts collected.
- Authorizing requests for additional personnel, including technical specialists, to support the team and releasing them upon completion of assigned duties.
- Authorizing and coordinating the expenditure of funds.
- Coordinating all media releases about the review with Greg Cunningham, 803-543-7393, Gregory.Cunningham2@usda.gov
- Issuance of Safety Alerts, if warranted, in coordination with Kurt Kause, 435-260-9872, kurt.kause@usda.gov
- Providing me or my designee with status updates as described in the enclosure.

As clarified in the attached expectations for your team, it is my intention that no punitive actions, such as removal or termination from their position, will be taken by the Forest Service against any employee as a result of information provided to any member of your team. Information provided to your team may however be used by individual supervisors at their discretion to inform



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discussions with employees pertaining to their individual performance. I will expect a report from your team 60 days from our scheduled in-brief

I want to thank you for your willingness to lead this important review. Please contact Michelle Holmes at 803-561-4081 or michelle.holmes@usda.gov to schedule meetings or status updates.

X 

Signed by: DERRICK MORRIS

HEATH
BELL

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HEATH BELL
Date: 2025.03.07
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KIMBERLY
BITTLE

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KIMBERLY BITTLE
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Appendix F: Glossary of Terms

Agency Administrator (AA): The official position responsible for the management of a geographic unit or functional area. The managing officer of an agency, division thereof, or jurisdiction having statutory responsibility for incident mitigation and management.

After Action Review (AAR): A structured review or de-brief process of an event, focused on performance standards, that enables participants to discover for themselves what happened, why it happened, and how to sustain strengths and improve on weaknesses. After action reviews, informal or formal, follow the same general format, involve the exchange of ideas and observations, and focus on improving performance.

Assistant Fire Management Officer (AFMO): In this report, District AFMOs and the Forest AFMO are mentioned.

Backing Fire: Fire spreading, or ignited to spread, into (against) the wind or downslope. A fire spreading on level ground in the absence of wind is a backing fire.

BehavePlus: The BehavePlus fire modeling system can be used for any fire management application that needs to calculate fire behavior. It uses specified fuel and moisture conditions to simulate surface and crown fire rate of fire spread and intensity, probability of ignition, fire size, spotting distance, and tree mortality.

BlueSky: A smoke modeling framework designed to enable simulations of the cumulative smoke impacts from fires (prescribed, wildland, and agricultural) across a region.

Burning Index (BI): A relative number related to the contribution that fire behavior makes to the amount or effort needed to contain a fire in a specified fuel type. Doubling the burning index indicates that twice the effort will be required to contain a fire in that fuel type as was previously required, providing all other parameters are held constant

Blackline/blacklining: Preburning of fuels adjacent to a control line before igniting a prescribed burn. Blacklining is usually done in heavy fuels adjacent to a control line during periods of low fire danger to reduce heat on holding crews and lessen chances for spotting across control line. In fire suppression, a blackline denotes a condition where there is no unburned material between the fireline and the fire edge.

Burn Boss Type 2 (RXB2): Person responsible for supervising a prescribed fire from ignition through mop-up. The Burn Boss is responsible for writing prescribed fire plans, determining when the prescribed fire is in prescription, obtaining smoke clearance and weather forecasts, notifying officials of the upcoming fire, and obtaining all qualified personnel and equipment needed to conduct the patrol the area. The Burn Boss must also ensure all operations are conducted in a safe manner and considers personnel and public safety during and after the prescribed fire.

Chain: Unit of measure equaling 66 feet.

Chains per Hour: The rate of fire spread is measured in “chains per hour.” A chain is 66 feet.

Chief's Review: Chief's 90-Day Prescribed Fire Program Review

Dead Fuel Moistures: Ralph M. Nelson (2000) developed a fuel moisture model for estimating the diurnal fuel moisture changes in a 10-hr NFDRS fuelstick. Requiring hourly observations, it produces a more dynamic estimate that better reflects changes in precipitation, humidity, and sunshine.

Drop Point (DP): A previously agreed upon rendezvous or supply location noted on situational maps.

Dry Bulb Temperature: The ambient air temperature that is measured by a thermometer.

Duty Officer (DO): Individual working for a jurisdiction or agency responsible for coordinating that agency (Wildland Fire Response) on a given day.

Environmental Assessment (EA): A requirement of National Environmental Policy Act (NEPA), an EA evaluates the potential impacts of proposed actions, such as a prescribed fire, on the environment and suggests alternatives or mitigations to reduce or eliminate these impacts.

Energy Release Component (ERC): Index of the National Fire Danger Rating System (NFDRS) relating to the available energy (BTU) per unit area (square foot) within the flaming front at the head of a fire. It is a cumulative or "build-up" type of index and is an indicator of potential fire intensity.

Escaped Prescribed Fire: A prescribed fire that has exceeded or is expected to exceed prescription parameters or otherwise meets the criteria for conversion to wildfire. Criteria are specified in "Interagency Prescribed Fire - Planning and Implementation Procedures Reference Guide."

Fine Dead Fuel Moisture (FDFM): The moisture content of dead organic fuels, expressed as a percentage of the oven dry weight of the sample, which is controlled entirely by exposure to environmental conditions.

Fine Fuels: Fast-drying dead or live fuels, generally characterized by a comparatively high surface area-to-volume ratio, which are less than 1/4-inch in diameter and have a time lag of one hour or less. These fuels (grass, leaves, needles, etc.) ignite readily and are consumed rapidly by fire when dry.

Flanking: The parts of a fire's perimeter that are roughly parallel to the main direction of fire spread.

Firing Boss (FIRB): The Firing Boss reports to the Prescribed Fire Burn Boss and is responsible for supervising and directing ground and/or aerial ignition operations according to established standards in the Prescribed Fire Plan.

Fire Behavior: The manner in which a fire reacts to the influences of fuel, weather, and topography.

Fireline: The part of a containment or control line that is scraped or dug to mineral soil.

Fuel Loading: The amount of flammable material that surrounds a fire. Fuel load is measured by the amount of available fuel per unit area, usually tons per acre. A small fuel load will cause a fire to burn and spread slowly, with a low intensity.

Hardwood Branch: Refers to a type of bottomland hardwood forest, which typically occupies the floodplains along coastal plain river systems. These forests are characterized by deciduous trees such as oaks, sweetgum, and tupelo, often found in areas that are seasonally flooded or covered with water. They can often be used as natural firebreaks, due to the presence of water.

Helibase: The main location within the general incident area for parking, fueling, maintenance, and loading of helicopters. It is usually located at or near the incident base.

IC: Incident Commander

Incident: An occurrence either human-caused or natural phenomenon, which requires action or support by emergency service personnel to prevent or minimize loss of life or damage to property and/or natural resources.

Keetch-Byram Drought Index (KBDI): An estimate (0-800) of the amount of precipitation (in 100ths of inches) needed to bring the top 8 inches of soil back to saturation. A value of 0 is complete saturation of the soil, a value of 800 means 8.00 inches of precipitation would be needed for saturation. In the 1988 version of NFDRS, outputs of KBDI are used to adjust live and dead fuel loadings.

Management Area: A land area identified within the planning area that has the same set of applicable Forest Land Management Plan components. A management area does not have to be spatially contiguous.

NFDRS: The National Forests in South Carolina uses the National Fire Danger Rating System which utilizes RAWs stations across the country for observed Daily NFDRS values.

Plastic Sphere Dispenser (PSD): Device installed, but jettisonable, in a helicopter, which injects glycol into a plastic sphere containing potassium permanganate, which is then expelled from the machine and aircraft. This produces an exothermic reaction resulting in ignition of fuels on the ground for prescribed or wildland fire applications.

Pocosin (bay): A wetland bog with sandy peat soil and woody shrubs throughout. Generally found along the Atlantic coastal plain of the United States, from southern Virginia to northern Florida. These areas typically occur in board, low-lying shallow basins that do not drain naturally. The landscape of these wetlands grades from shrubby, low pocosins dominated by a dense layer of low heath vegetation and occasional open herbaceous areas to higher forester pocosins with sparse to dense small trees and scrubs.

Prescribed Fire Plan (Burn Plan): A plan required for each fire application ignited by management. It must be prepared by qualified personnel and approved by the appropriate Agency Administrator

prior to implementation. Each plan will follow specific direction and must include critical elements and how to mitigate each element.

Remote Automatic Weather Station (RAWS): A weather station that transmits weather observations via GOES satellite to the Wildland Fire Management Information system.

Slopoever: A fire edge that crosses a control line or natural barrier intended to confine the fire.

Spot Fire: Fire ignited outside the perimeter of the main fire by a firebrand.

Spot Weather Forecast (NWS): A site-specific forecast issued by the National Weather Service (NWS) to fit the time, topography, and weather of a specific incident. These forecasts are issued upon request of the user agency and are more detailed, timely and specific than zone forecasts. On-site weather observations or a close, representative observation is required for a forecast to be issued.

Spotting: Behavior of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire.

Stringer: A narrow finger or band of fuel that connects two or more patches or areas of wildland fuel.

Strip firing: Setting fire to more than one strip of fuel and providing for the strips to burn together. Frequently done in burning out against a wind where inner strips are fired first to create drafts which pull flames and sparks away from the control line.

UAS: Unmanned Aircraft System.

Wet Bulb Temperature: Dry bulb and wet bulb are used to calculate relative humidity. Wet bulb temperature is measured by sling psychrometers within a belt weather kit using thermometers that are wrapped in wetted wicks. The higher the difference between the dry bulb and wet bulb temperatures (called the depression), the greater the felt effect is on the discharge air temperature.

Wildland Fire: Any nonstructural fire, other than prescribed fire, which occurs in the wildland. This term encompasses fires previously called both wildfires and prescribed natural fires.

Wildland Urban Interface (WUI): The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetation fuels.

Wyden Agreement: A legislation that authorizes the Forest Service to enter into cooperative agreements with willing participants for the protection, restoration, and enhancement of fish and wildlife habitat and other resources on non-Forest Service lands.

Appendix G: Declared Wildfire Review Team

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