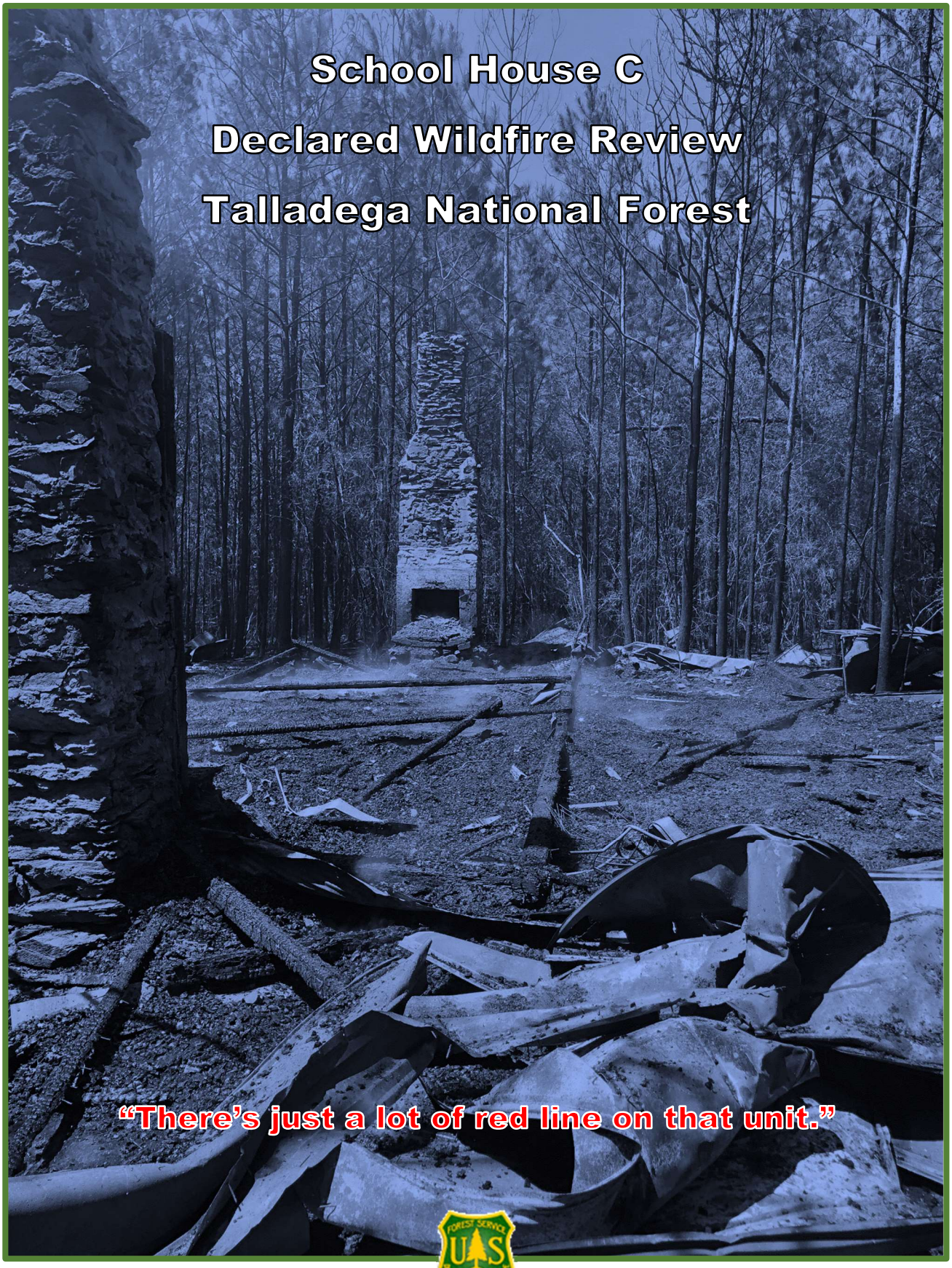

School House C
Declared Wildfire Review
Talladega National Forest
“There’s just a lot of red line on that unit.”

EXECUTIVE SUMMARY

The National Forests in Alabama, Talladega National Forest, Talladega Ranger District conducted the School House C&D prescribed burns 3.5 miles northeast of Hollins, AL on April 19th, 2021 (see attached map, figure 1). On April 21st, 2021 the School House C prescribed burn escaped and was converted to a wildfire by the local unit. The fire was contained at 14 acres on private land and 1 abandoned structure was destroyed. No injuries resulted from the escape.

The NWCG Interagency Prescribed Fire Planning and Implementation Procedures Guide (PMS 484) and FSM 5100, Ch 5140, 5142-PRESCRIBED FIRE, 5142.3-Policy, direct that a Declared Wildfire Review be conducted for all prescribed fires that result in the declaration of a wildfire. This report concludes the findings of the escaped prescribed fire by this fire review team.

INTRODUCTION

The Talladega Division (Shoal Creek and Talladega Ranger Districts) of the Talladega National Forest operate as a zone fire program responsible for prescribed fire/fuels treatments and wildfire suppression efforts on 235,426 acres in eastern Alabama stretching from Piedmont to near the southern terminus of the Appalachian Mountains. It is located at the northern range limit of mountain longleaf pine in Alabama. A major emphasis of the fire program is to use prescribed fire for the maintenance and restoration of this declining ecosystem and to maintain habitat for the federally endangered Red-Cockaded Woodpecker. This prescribed fire was part of the restoration and maintenance efforts being completed by the local unit.

The Talladega Division has one of the oldest burn programs in the Southern Region with a well-established history of utilizing prescribed fire for vegetation management. They continue to find innovative/creative ways to increase program accomplishments such as, the utilization of programmatic burn planning to shorten planning cycles, prescribed fire specific after-action review (AAR) sheets to better identify lessons learned, and efforts to take advantage new burn windows during the summer and fall to increase available burn days. There is generally strong acceptance from the public for the use of prescribed fire and fair tolerance of smoke. On average, the Division takes advantage of 50-60 burn days/year and has multiple units ready for implementation based on weather, resources, and other factors that provide for flexibility. The unit has created and maintained spatial data of prescribed fire and wildfires occurring on the Division dating back to 1978 with information such as day of burn weather, seasonality, size, and other pertinent information. Approximately 71% of the Division has National Environmental Policy Act (NEPA) coverage for prescribed fire.

Over the past 10 years, the Division has prescribe burned an average of 35,832 acres/year. FY 19 and 20 prescribed fire accomplishments were well below average due in part to furlough and COVID respectively. In FY 21, at the time of this review, the Division has burned 45,333 acres. Almost 73% of the acres were implemented with ground-based ignition. Most of the prescribed burning occurs between October and May, with 60-70% occurring during the dormant season and the remainder during the growing season. Most of the burn units on the Division are on a 2-3 year fire return interval, with some outliers burned every 3-5 years. In addition to prescribed fire, the Division responds to an average of 15-20 wildfires/year.

ORGANIZATION

The Talladega Division fire program has 13 employees including an FMO, 2 AFMOs, 2 fuels technicians, 3 heavy equipment operators, a supervisory fire engine operator, an assistant fire engine operator, 2 firefighters, and a fire apprentice. The fire program is supplemented with militia fire resources, a Nature Conservancy (TNC) prescribed fire module, and western fire detailers during the peak of the prescribed fire season.

SETTING

A. ENVIRONMENTAL

An analysis of fire environmental factors including National Weather Service (NWS) General and Spot Weather Forecasts created by the NWS Birmingham, AL office, seasonal climatology trends, and specific weather observations before, during, and after the initial burn day through the subsequent escaped fire event was conducted to evaluate modeled fire behavior outputs for the burn area during this incident.

Weather: Weather data for the analysis was pulled from the representative Remote Automated Weather Station (RAWS): Schoolhouse (WIMMS ID 012801) which is identified in the burn plan and is located approximately 2 miles northwest of the burn unit at an elevation of 935 feet ASL. The station was installed by the Talladega National Forest and became operational on April 16th, 2016. It has been properly maintained and the record database has very few holes in collection continuity. It is located on a ridge top in similar terrain and forest type as the burn unit. This station was utilized to monitor and record all burn day fire weather observations. No field weather observations were recorded.

The forecasted conditions in the spot weather forecast issued for the School House burn on April, 19th were within prescription and no forest/regional variances were required. The spot weather forecast and the general fire weather forecasts issued for the subsequent days and nights after the initial burn did mention a strong frontal passage expected to pass through the area during the night of April 20th and morning of April 21st capable of producing strong gusting winds and low relative humidity. Observations from the Schoolhouse RAWS recorded gusts between 13 and 23 mph from the north and northwest starting at 0300 on April 21st and persisting through 1900. Comparison of the weather observations recorded by the Schoolhouse RAWS and the forecast conditions are very close throughout the event period of April 19th through April 22nd, 2021.

Fuels: Fuels within the burn unit are characterized as light to moderate timber litter in forested stands and moderate to heavy slash in recently logged areas. The estimated available fuel loading within the burn units on April 19th, 2021 was 2-4 tons per acre based on calculated fuel moisture levels provided by the Schoolhouse RAWS station. Fuels outside of the unit varied from clear cuts with raked piled debris to very dense stands of planted pine and heavily stocked mixed hardwood/pine stands with high fuel loading accumulation and closed canopies that had no recent fire history. No on-site fuel moisture or fuel loading observations were conducted prior to the April 19th ignition.

Seasonal Severity: Observations from the Schoolhouse RAWS indicate frequent precipitation events over the 2 months preceding April 19th, 2021 keeping the Ketch Byrum Drought Indices

(KBDI) at or below average conditions and well within prescribed fire parameters. Nightly relative humidity levels recovered above 80% over the preceding 8 nights contributing to high fuel moisture content estimates. Abundant rainfall events also contributed to average to above-average streamflow observations for monitoring stations nearby. Minimal fire activity had been observed in natural drainages on prescribed burns and wildfires the week before the burn.

B. SOCIAL/POLITICAL

The use of fire as a tool has a long-standing cultural acceptance in Alabama. In 1996, the Alabama State Legislature passed a "Right to Burn" law that listed prescribed burning as an inherent property right for landowners. Public support for prescribed burning in Alabama is generally high. Most sociopolitical concerns are primarily centered around the seasonality of burns and the effects of "Growing Season" burns on ground-nesting birds, specifically turkeys.

Impacts from smoke are a concern to smoke-sensitive populations. Overall, public tolerance of temporary impacts from smoke is good. There were identified smoke-sensitive individuals adjacent to the School House burn units.

C. BURN UNIT DESCRIPTION

Unit Layout: The 1,845 acre School House burn unit is located in the southwest corner of Clay County, AL along the southern border of the Talladega NF & Talladega RD. "The only reason you would drive down there is to go to this unit" according to local resources. The unit is broken into 4 smaller blocks to provide flexibility during implementation. On April 19th, 2021 the 411 acre C block and the 376 acre D block were planned to be burned for a total of 787 acres. The majority of the control lines for the combined C & D blocks are adjacent to private lands. Control lines consist primarily of constructed dozer lines and roads with small portions of creek/stream as line. The composition of the unit is described predominantly as a mix of pine woodland and hardwood bottoms. The burn plan describes the representative fuel models as TL4-Small downed logs and TL6-Moderate load broadleaf litter. The School House unit has a well-established burn rotation with over 5 entries since 2008.

Figure 1. School House C Project Map

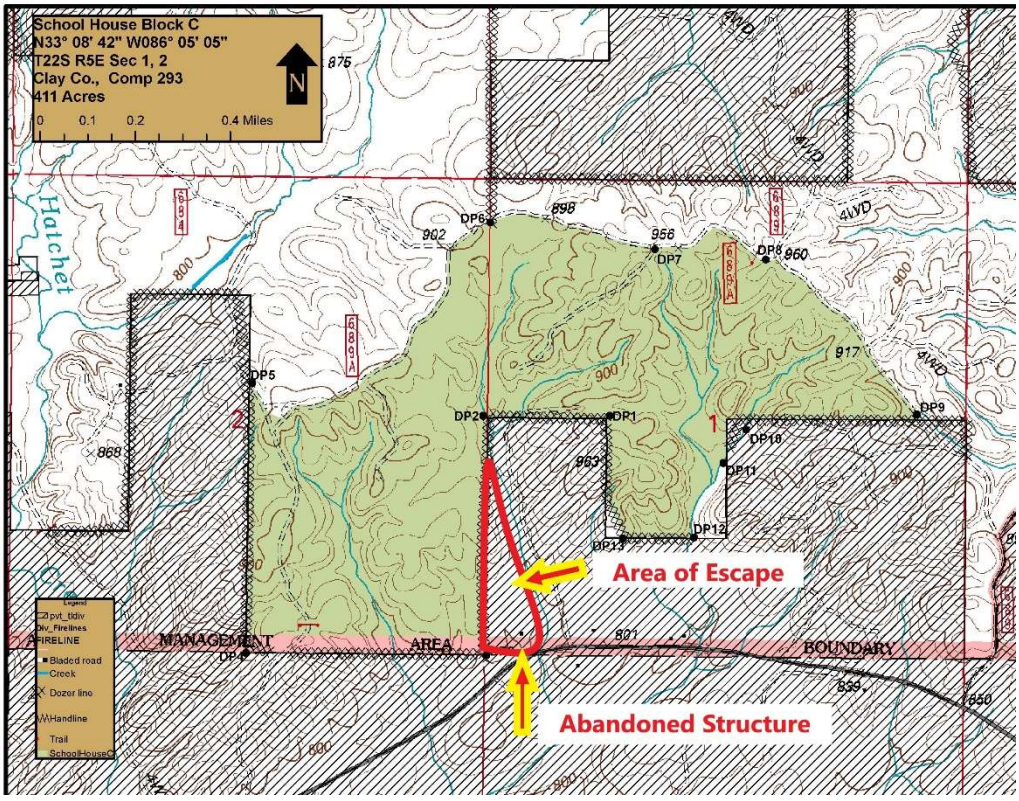
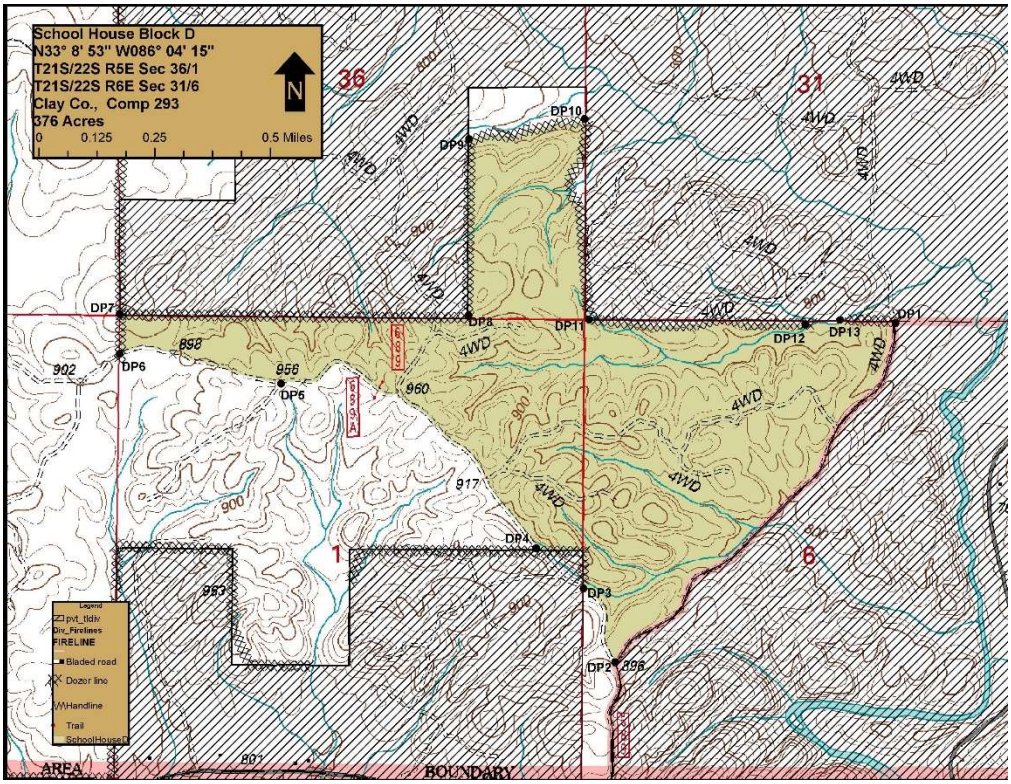


Figure 2. School House D Project Map



Prescribed Fire Goals/Objectives: Resource objectives for growing season burning (April 1st – September 30th) as described in the Talladega South Prescribed Fire Plan include;

RLRMP (Revised Land and Resource Management Plan) Goal 1 - Manage forest and woodland ecosystems in order to restore and/or maintain native communities to provide the desired composition, structure, and function. Emphasis will be placed on maintaining forest and plant community types not abundant on private lands.

RLRMP Goal 11 - Substantially contribute to the recovery of federally listed threatened and endangered species, and provide for the conservation of sensitive species so as to minimize the need for additional federal listings under the Endangered Species Act.

RLRMP 2-51 Goal 18- Use fire to restore and maintain fire-dependent and associated communities. Fire regimes are restored within or near the historical range (Condition Class 1).

RLRMP 2-51 Goal 19 - Reduce hazardous fuels through use of wildland fire, prescribed fire, and mechanical fuels treatment.

Prescribed Fire Objectives as described in the plan include;

Reduce 1-hour fuel loadings by 40% or more.

Reduce 10-hour fuel loadings by 30% or more.

Reduce logging slash in the timber sale units to promote future planting.

Top-kill at least 30-60% of undesirable brush and woody understory.

Prescribed Fire Prescription

Representative RAWS Stations: Talladega [012701]

	Regional or Forest Standard	Rx BP Site Prep 1/	Rx BP Dormant 1/	Rx BP Growing 1/	General Forecast 2/	Test Fire 3/
Date/Time						
Fuel Models (FBPS)		SB2	TL 9, TL6, SB2, GR3	TL4, TL2, SB2, GR3		
1 HR Fuels %						
10 HR Fuels %	≥6% open site	≥6%	≥6%	≥6%		
Live Fuel Moisture (Herb) %						
Live Fuel Moisture (Woody) %						
Temperature (F)	≤95°	100° Max.	≤80°	≤95°		
Relative Humidity %	≥30%	≥30%	≥30%	≥30%		
20 Ft Wind (mph)	≤20 mph	≤20mph	≤20mph	≤20mph		
20 Ft Wind Direction		See appendix J	See appendix J	See appendix J		
Midflame Wind Speed (mph)		--	--	--		
Midflame Wind Speed Direction		--	--	--		
Transport W/S Direction		≥7 mph	≥ 7 mph	≥7 mph		
Mixing Height (ft) Transport Wind Speed (mph) 5/	2000 Ft / 9 mph 2300 Ft / 8 mph 2700 Ft / 7 mph	2000 Ft / 9 mph 2300 Ft / 8 mph 2700 Ft / 7 mph	2000 Ft / 9 mph 2300 Ft / 8 mph 2700 Ft / 7 mph	2000 Ft / 9 mph 2300 Ft / 8 mph 2700 Ft / 7 mph		
Smoke Dispersion		--	--	--		
NFDRS Parameter (BI)	≤34	≤34	≤38	≤34		
Probability of Ignition (%)	≤60%	≤60%	≤60%	≤60%		
KBDI	≤450	≤500	≤300	≤450		
Days Since Rain						
Amount (Inches)						
Firing Technique		Any	Any	Any		
Ignition Method		Hand and/or Aerial	Hand and/or Aerial	Hand and/or Aerial		
Slope (Average) %		--	--	--		
Effective Windspeed (Mph)		--	--	--		
Flame Length (Ft)		--	--	--		
Rate Of Spread (Chs/Hr)		--	--	--		
Fireline Intensity (Btu/Ft/Sec)						

1/	All prescription items to be completed at planning time.
2/	General forecast items to be completed on the day of the burn; secured general & spot WX forecasts are to be attached to RxBP.
3/	Test fire required and post fire weather parameters must be taken on-site.
4/	RH predicted 25-29% requires FMSO or Forest Supervisor approval.
5/	Sliding scale based on transport wind speed and mixing height.

NARRATIVE AND CHRONOLOGY

A. Pre-Ignition Activities

April 19th, 2021-

Around 0700 the agency administrator trainee/trainer and zone duty officer discuss the day's prescribed fire virtually over Teams. During this discussion, they evaluated the general weather forecast, current fuel conditions, available personnel, and equipment to determine the priority burn unit that would fit the day's window. The decision was made by the group to treat the School House block C & D burn units.

After the group decided to go with School House blocks C & D the burn boss continued with the daily morning preparations including obtaining a spot weather forecast, fire BEHAVE runs, incident action plan, and other required components of the day of burn package.

As resources arrived on-scene, they checked holding lines and made sure the public was clear of the area. Resources found a turkey hunter's vehicle in the C block. The decision

was made by the burn boss to start in the D Block to allow the hunter time to clear the unit.

B. Ignition

The following is a compilation of logs from resources that were assigned to the prescribed fire on April 19th:

- 1000 all resources on-scene.
- 1010 all resources briefed.
- 1045 test fire started in block D, was successful, continued with ignition.
- 1300 completed ignition on block D and all resources moved to block C.
- 1320 first spot fire at DP 2.5, quickly contained at 0.1 acres.
- 1400 a couple of spots near the gate at DP 3.5 and DP 3, both less than .02 acres and easily contained with on-site holding resources.
- 1430 spot at DP 1, dozer and ground resources contained it at .25 acre.
- 1440 all ignition complete.
- 1600 all holding lines are secure and all spots are contained.
- 1620 conducted after-action review (Nothing significant was identified during the AAR).
- 1645 all resources released.

C. Post Ignition Activities

Through interviews, daily logs, and burn plan information, the following information was provided to the prescribed fire review team:

April 20th, 2021-

The Division planned to burn the Tip Top unit on the Shoal Creek RD that day, about an hour away from the School House Rx. Two crewmembers were assigned to check the School House Rx that morning and were planned to join the Tip Top burn organization when finished.

At 0730 the crewmembers arrived on-scene and checked all containment lines for the School House Rx. They utilized UTVs with water and tools for mop-up. While checking holding lines they mopped up any threats they could find and cold trailed handlines on the previous day's spot fires. Some interior fuels (stumps and snags) were still burning but not perceived as a threat to any holding line when the two crewmembers left the burn unit. The crewmembers departed for the Tip Top Rx @ 0850.

The crewmembers suggested the burn be checked again first thing the next morning. The School House Rx was not checked again that day based on crewmembers' recommendation. This was SOP for checking burns post ignition when no threats to containment lines were identified.

April 21st, 2021-

- 0800 same two crewmembers arrived on-scene and preceded to check both burn blocks C & D on the School House Rx.
- 0822 burn boss was notified by an AL Dept. of Wildlife and Freshwater Fisheries (DWF) employee at Hollins WMA that they had received a report from a turkey hunter in the area that there was a fire coming down the ridge and headed to an abandoned structure.
- Burn boss notified the two crewmembers that were currently checking the burn to "go check the reported area that had escaped." The burn boss also proceeded to move more resources to assist them if needed.
- 0905 DWF employee called back verifying that the fire had "one structure involved" and they were getting Hanover VFD headed that way to assist with the structure.
- 0920 additional resources from TNC arrived on-scene with the burn boss and started suppression efforts putting in containment line on the spot fire. Hanover VFD arrived as well and was directed to suppress the structure fire.
- 0955 Dozer 461 and Shoal Creek resources that were dispatched arrived on-scene and assisted in improving the containment line around the spot fire.
- 1040 all holding and containment lines for the original burn units and all spot fires were checked and secure.
- 1200 TNC and VFD resources released, the rest of the resources remained on scene and continued with mop-up.
- 1445 a few smokes were still showing in the interior of the new spot fire. However, all containment lines were secure, and all remaining resources were released.

D. Wildfire Conversion

On April 23rd the District Ranger decided to declare the School House Rx a wildfire after discussions with the FMO, fire staff, and burn boss. Primary reasons for the declaration were the size of the spot fire on private property, the impact of ground disturbance from suppression activity, and the possibility of a claim from the loss of the abandoned structure or damage to timber.

FINDINGS

Seasonal Severity/On-Site Conditions: Central Alabama experienced frequent rainfall events and relative humidity recoveries above 80% throughout the late winter/early spring season. As a result, the moisture content of thousand-hour and hundred-hour fuels, organic soils/duff, and wetland drainages remained above moisture of extinction levels. Although no on-site fuel moisture measurements were recorded for the burn unit, the calculated fuel moisture at the representative weather station was within acceptable parameters. The Schoolhouse weather station recorded 1.17 inches of precipitation 9 days before the burn day. There were no fire danger or red flag warnings issued by the NWS within two weeks prior, or on the burn day April 19th, 2021. The spot weather forecast for the burn unit was generated the morning of April 19th and all conditions were within prescribed fire plan parameters.

A climatology analysis of the Schoolhouse weather station data was conducted assuming National Fire Danger Rating System (NFDRS) Fuels Model 8G using Fire Family Plus 5.0 to assess fire danger rating calculations through the event period. The data indicate that several NFDRS indices on April 21st were above the 90th percentile, indicating a higher potential for increased fire occurrence, intensity, and resistance to containment. See figures 3-8 in appendix B for specific indices and weather data.

Prescribed Fire Plan Consistency With NEPA/Policy: The Talladega South Prescribed Burn Plan is consistent with the analysis and direction of the 2013 Talladega Division Prescribed Burning Environmental Assessment (EA) and with the direction and management prescriptions of the over-arching Revised Land and Resource Management Plan for the National Forests in Alabama (RLRMP).

Element 1: Signature Page – The approval signature in Element 1 of the Talladega South Prescribed Fire Plan was dated September 16th, 2019 by an approving line officer that has since retired from the agency. This is inconsistent with the direction of FSM 5140, which requires that burn plans be reviewed, updated, and approved before implementation if more than 1 year has elapsed since approval. While this review did occur and a new and current Agency Administrator Ignition Authorization was signed in Element 2A, a new approval signature was not added to Element 1. This was not considered a contributing factor to the escaped fire.

Consistency of Burn Implementation With Prescribed Fire Plan: The implementation of the School House C & D blocks was consistent with all elements of the Talladega South Prescribed Burn Plan. All notifications were made, pre-burn considerations were completed, lines were prepped, and minimum organizations were met*. All control lines adjacent to private ownership are identified as critical holding points and initial holding actions and post-burn line checks were consistent with the direction of the plan. The contingency plan was not activated due to the delayed escape. The wildfire declaration was consistent with the plan's direction.

**Element 15-Ignition Plan identifies a minimum organization of: "Burn Boss, Firing Boss; if aerial ignition utilized, Plastic Sphere Dispenser Operator, Helicopter Manager". While no firing boss was identified on the org chart, 3 qualified firing bosses were on-site and serving in that function for their respective areas.* This is not considered a contributing factor.

Qualifications of Key Personnel: All of the resources assigned to the School House C Rx were qualified for the positions they were assigned. The entire organization was comprised of local resources and cooperators. The depth of experience and qualification of the organization would generally be considered above average.

Over 70% of the burn organization were qualified at the single resource boss level or above, and 3 qualified RXB2s were on site. The average fire experience for the organization was 15.6 years.

The line officer for the Division was an AADM (agency administrator) trainee. All approvals and pre-burn dialogue were conducted under the supervision of an appropriately qualified AADM. Communication between fire leadership and the line officer(s) was excellent and according to the burn boss and District Ranger, occurred regularly.

Contributing Factors:

Cause determination and investigation of the escaped fire, though requested, had not occurred at the time of review. By the time the review team was assembled, the area of the escape had been subjected to several heavy downpours. This would have made cause determination difficult if not impossible. As a result, the specific cause of the escape is unknown and intentional arson has not been ruled out. The following contributing factors should be interpreted as potential factors for the escape. The review team requests that the unit treat these potential factors as definitive factors in the context of learning from the incident.

Factor 1: Decision to implement burn with a northerly wind component

Nearly the entire southern boundary of the School House C burn block consists of bladed dozer line adjacent to private lands. There are known smoke sensitive-receptors (individuals with asthma) to the north of the unit. These individuals are listed in the notification list for the School House burn units and efforts have been made in the past to implement the burns while these sensitive individuals are away. Earlier in the season, the School House B block was implemented with a southerly wind and the identified individuals were not notified and were impacted by smoke. A complaint call was received during the burn and the burn unit was cut off to limit further emissions. A decision was made by the Division's fire leadership to implement the remaining School House blocks with a northerly wind component to ensure no further impacts to the receptors.

North, northeast, and northwest wind directions are within prescription for the unit and the C block has been implemented under northerly winds in the past. The unit has several natural cutoffs that allow for implementation in phases. The burn plan identifies all control lines adjacent to private as critical holding areas. Burning with a northerly component on the C block puts additional pressure on critical holding points.

Factor 2: Decision to implement School House D block first

The original intent of the plan on April 19th was to begin the day's burn in the School House C block to allow the southern portion of the control line on the pressure side adjacent to private land to be burned under cooler morning conditions. The units were checked that morning to ensure they were clear of hunters. A vehicle was found parked within the C block. The decision was made to begin with the northern D block to allow time for the hunter(s) to clear the unit. Once ignitions on the D block were complete the C block was checked and the vehicle was no longer in the unit. Ignitions on the C block immediately followed.

Had the C block been implemented earlier in the day, fewer spots/slops may have occurred in the area of the escape between DP2 and DP3, and less residual heat would have remained along the

line. There is a strong possibility that the ignition source for the escape was within one of these spots.

Factor 3: Inadequate mop-up for predicted conditions

Post-burn line checks were performed as prescribed in the burn plan. Resources checked control lines and the contained spot fires on April 20th. They identified several hotspots and mitigated them appropriately for the current conditions. An assessment of the hotspots was completed by on-site resources and the decision was made that the unit would need to be checked again the following day due to the amount of heat still present. While a spot weather forecast was not generated for the School House burn for April 20th, the morning Fire Weather Planning Forecast for the zone mentioned a "strong cold front" moving through overnight with AM gusts on April 21st predicted to be northwest at 17mph. The evening forecast increased the gusts to 20mph.

While it is not known what the specific ignition source for the escaped fire was, it is speculated that it could have originated from a source that was not adequately mopped up to mitigate the risk of escape during the high winds associated with the frontal passage. The resources assigned to check the unit on April 20th were planned to be a part of the burn organization for the Tip Top prescribed burn on the Shoal Creek RD that day. However, they were not considered part of the minimum organization for the Tip Top burn and did not feel pressured to minimize the time spent checking the School House unit. It is not clear if the risk of escape created by the frontal passage was recognized or communicated.

Factor 4: Vague identification of critical holding points

The programmatic Talladega South Prescribed Fire Plan covers all burn units located on the southern half of the Talladega Ranger District south of AL-77. These units are of similar fuel types, terrain, and prescription and are considered appropriate for programmatic planning. Common considerations for these units are addressed within the main elements of the burn plan while site-specific information is captured on a one-page sheet for each unit and included as an appendix to the burn plan.

Most of the needed site-specific information is included in the "one-pager", such as location, unit boundaries, fuel models, allowable wind directions, burn history, notification list, and unique features. However, many of the considerations listed within the "Unique Features" portion of the page are not tied back to their appropriate burn plan elements. It is unclear if the features identified are associated with pre-burn considerations, on-site/off-site values, or critical holding points. Many of the identified features are blanket "cut and paste" statements such as "Private property is adjacent to the unit boundary".

LESSONS LEARNED & RECOMMENDATIONS

Lessons Learned Identified by Participants:

Determinations and lessons identified by the unit during after-action reviews were similar to the findings of this review. The Talladega Division has fostered the development and maintenance of a learning culture in pursuit of continual program improvement.

Lessons Learned Identified by Review Team:

The review team conducted an exhaustive review of the programmatic burn plan, burn day organization, personnel qualifications, firing/holding techniques & tactics, seasonal severity/weather, COVID19 operational influences, the potential for cumulative fatigue, and other internal/external influences. The support, participation, and desire to learn from this event demonstrated by the NF's in Alabama and the Talladega Division are a testament to their adoption of the principles of a High-Reliability Organization and learning culture.

Recommendation (Contributing Factors 1 & 2): The review team recommends that the unit consider implementing burns with multiple burn blocks in sequences that create advantageous holding conditions. Specifically, considering the School House C & D burn blocks; Burning the D block with a northerly wind component would reduce the pressure on critical holding points along the northern boundary and provide a buffer of Forest Service land within block C on the southern pressure side. Burning block C with a southerly wind component would reduce pressure on critical holding points along the southern boundary and provide a similar buffer to the north. This would also create a little more distance from sensitive smoke receptors to the north and could allow for adequate column lift when burning under ideal conditions. (It is noted that burning block C under south or southwest winds does not eliminate the potential for wind/slope alignment in the area of the escape between DP2 and DP3. A southerly wind would still serve to reduce pressure on the majority of critical holding points and push spots/slop-overs in that area towards Forest Service lands as opposed to private lands).

Additionally, when burned in sequence the second block would have the advantage of burning against black on the pressure side. This could serve to reduce the needed organization and shorten ignition time.

Recommendation (Contributing Factor 2) The review team recommends that the unit explore additional methods of public notification for planned prescribed burns to include better on-site signage/notification. The Forest currently utilizes a variety of methods to inform the public and cooperators of planned burns including a web page with geospatial data to inform the public of planned/completed burns. The addition of on-site signage at points of entry to burn units informing forest users the area is planned to be burned could reduce the number of public clearance issues.

Signage should include, the unit name, planned season or time frame, contact numbers, and a QR Code or other reference to the Forest's prescribed burning web page. If the web page is managed in real-time showing burns planned to be active for the day, it is highly likely an informed forest user would move to another area. This would require coordination between the Alabama Interagency Coordination Center (AICC) and public affairs or the assigned webmaster.

Placing of signs could become a regular part of prep standards for the Division's burn units and could be placed early in the season while other prep activities are conducted. Having on-site messaging would serve to inform forest users that are unaware of online resources of the potential hazard.

Recommendation (Contributing Factor 3) The review team recommends that the unit give extra consideration to post-burn weather on units with large amounts of critical holding or adjacent values. It is important for fire leadership to recognize clues in the general forecast that suggest there may be a need for more accurate post-burn weather. The Fire Weather Planning Forecast predicted strong morning gusts on April 21st when the burn is suspected to have escaped. There

were clues present in the general discussion that a more accurate weather forecast might have been required for the following day. The identification of a "strong cold front" in the general discussion and a lack of specific timing for morning gusts could have suggested the need for an updated spot.

If fire leadership and ground resources had been more aware of the threat the approaching cold front could pose to containment, it is likely some extra attention would have been paid to mopping up potential ignition sources. Additionally, in this case, having a clear picture of the condition of adjacent fuels would have played a significant role in assessing the actual risk. Nighttime humidity was forecasted to be near 90%. Under most circumstances, this would not be considered favorable for fire spread. One exception to this during the early growing season in the piedmont is young closed-canopy pine plantations that can continue to carry fire under extremely humid conditions. The area where the escape occurred was in such a stand, and the area burned in the escape matches the shape of the young loblolly stand nearly perfectly.

Most burn bosses would have probably underestimated the threat posed to containment based on the forecast. But there were clues present ahead of the escape that would have painted a picture of the accurate risk. It is recommended that when verbiage in the general fire weather discussion indicates the possibility of a significant weather event, that higher resolution forecasts be requested.

Recommendation (Contributing Factor 4) The review team recommends that the unit ensure that all necessary site-specific data is captured and associated with the appropriate element in the burn plan. Clear identification of site-specific on-site/off-site values, critical holding points, constraints, areas of concern, etc. is essential for adequate planning.

The review team supports the programmatic approach to burn planning that the Talladega Division is utilizing. The existing one-page unit info sheets provide the majority of site-specific info required for successful implementation. Care should be taken to ensure that all appropriate elements have been adequately addressed for each unit. Tying site-specific data to the appropriate burn plan element will help to ensure the nuances of each burn unit are adequately captured.

SUMMARY

The Talladega Division has a highly effective fire program. It is worth noting that this incident occurred amidst a year of great successes. The Division was able to achieve a unit record for prescribed fire accomplishments during FY21. The vast majority of the 44 prescribed burns and ~45,000 acres completed before this incident were executed without issue.

The evidence for the Forest/Division's adoption of learning culture is abundant. The unit's mix of substantial local corporate knowledge and willingness to adapt to new philosophies and approaches has allowed the program to further its accomplishment of the agency's mission of forest/ecosystem restoration.

Each member of the review team struggled to determine any action they would have done differently having been placed in the shoes of any of the individuals involved with this incident. The burn was implemented per the plan and all resources followed conventional best practices established by previous lessons learned. These factors only increase the importance of this

review. Learning from low probability/high consequence events is essential, especially when everything was done "right".

The review team analyzed a variety of potential secondary contributing factors such as cumulative fatigue and the COVID-19 operational environment. Though this incident occurred towards the tail end of a busy season for the Division, most if not all of the secondary factors were found to have been effectively mitigated. The timing of rain events preceding the escape created an adequate "tactical pause" and a break in tempo for ground resources. Additional workplace flexibilities in the COVID-19 environment allowed for better work/rest mitigation and work/life balance particularly increased telework.

Nearly every person interviewed made the same comment. "There's just a lot of red-line on that unit". "Red-line" refers to the Forest Service boundary with private lands, which are conventionally marked with red hash-marks in southern forests. Holding lines along property boundaries are often not ideally laid out for implementation because they tend to follow parcel lines as opposed to advantageous geographic features. They often require constructed control lines and can have limited access. The awareness of the large amounts of boundary line holding on this and similar units should serve as a management action point for increased situational awareness in both implementation and planning. Control lines along ownership boundaries present inherent risks. Risks, when identified should be mitigated. Mitigations during implementation could include additional holding resources, more frequent patrols, or increased mop-up standards. Mitigations during planning could include seeking agreements with adjacent landowners to utilize existing features, or strategically planning order of entry under specific windows to reduce pressure on critical holding points as noted in the recommendation for contributing factor 1.

Adjustments to procedures following negative outcomes can often be reactionary and can sometimes lead to unnecessary constraints that reduce flexibility for implementation. The National Forests in Alabama and the Talladega Division have done an excellent job of building flexibility into their plans and organizations. That flexibility is the greatest tool in their arsenal for risk management. The ability to adapt to changing conditions, select the right unit for the burn window, adjust organizational needs, or break burn units up to fit weather conditions and/or availability of personnel is paramount to program success and effective risk management.

This incident may have occurred, in part, due to a failure to recognize the threat posed by an overnight wind event. The fact that standard best practices were followed and still resulted in a negative outcome should clue the organization into the need to review those best practices and ensure that indicators for the possibility of an event are not missed. Outcomes for this incident could have been far worse. The intention of the review team is; as readers reflect on the content of this review and move forward with the planning and implementation of prescribed fire that they ask themselves the following…..

"What if someone had been home?"

Declared Wildfire Review Team

Michael Haisten, Lead, ZFMO, Cherokee NF South Zone

Jeff Gardner, District Ranger, Conasauga RD, Chattahoochee-Oconee NF

Paul Varnedoe, FFMO, Francis Marion-Sumter NF

Mike Ward, Regional Fuels Program Manager, R8

Appendix B Fire Environment Analysis:

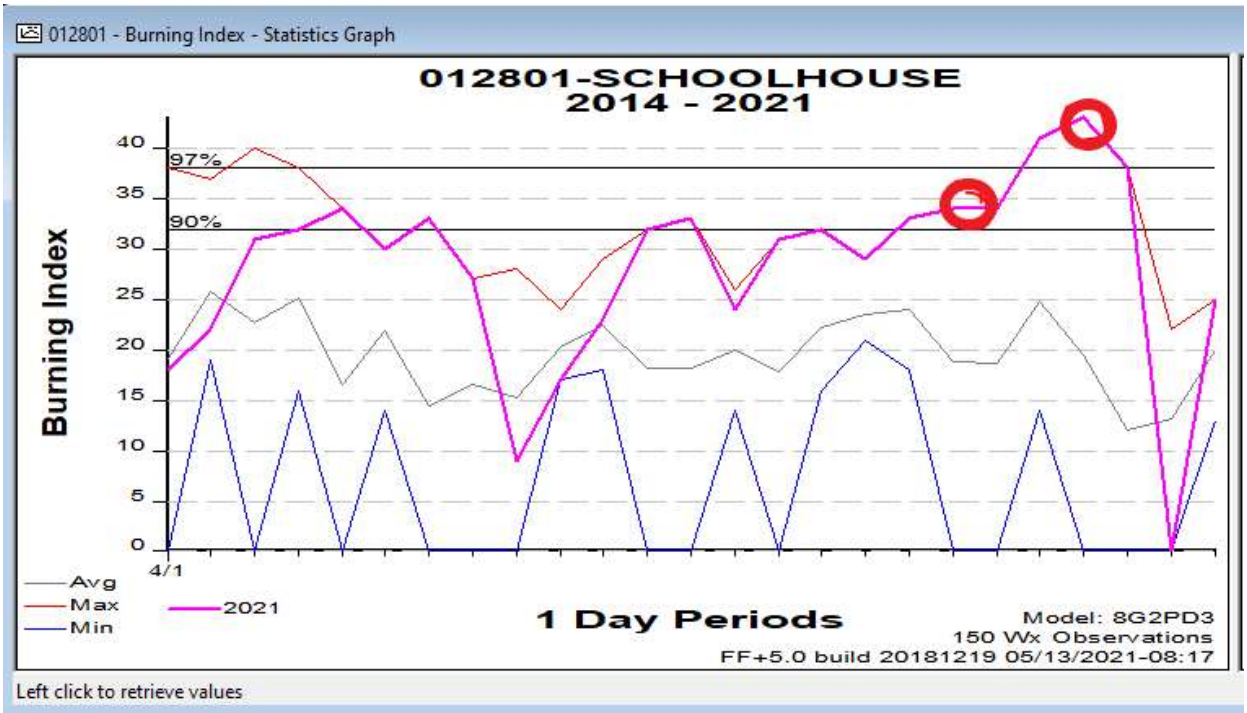


Figure 3. Burning Index using Fuel Model 8G April 1-24, 6 years historic observations.

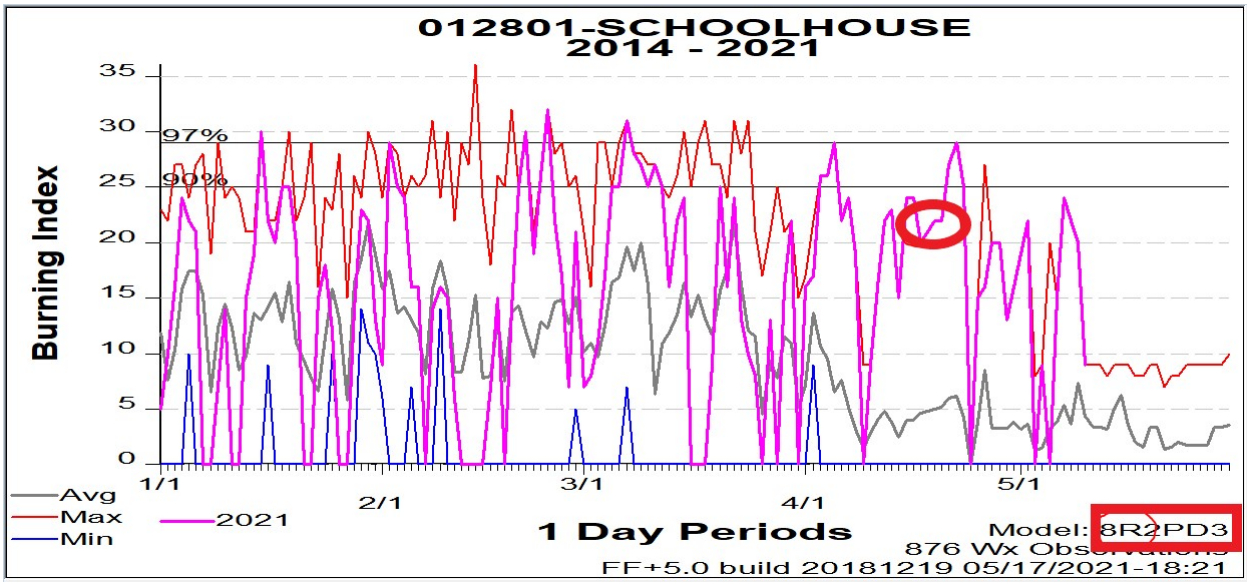


Figure 4. Burning Index using FM8R, from the prescription for growing season, date ranges from January 1-May 30, 6-year historical observations from the Schoolhouse RAWS. Below 90th percentile on burn day, but at the 97th percentile on the 21st. Reflects observed wind influences and lower humidity.

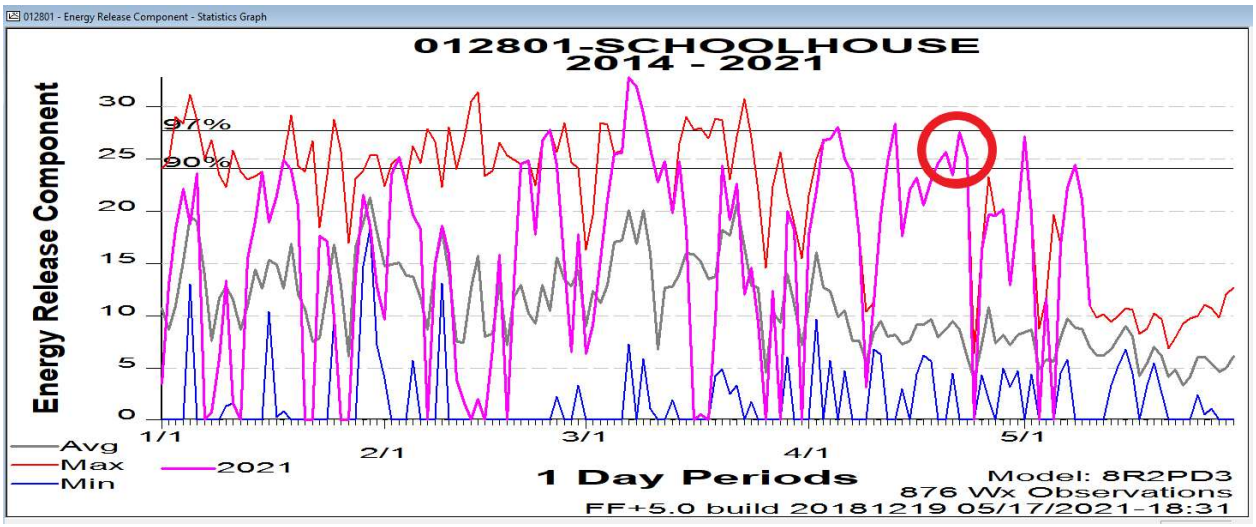


Figure 5. Energy Release component using FM8R from the prescription for growing season, date ranges from January 1-May 30, 6-year historical observations from the Schoolhouse RAWS. Burn day and escape day above 90th percentile.

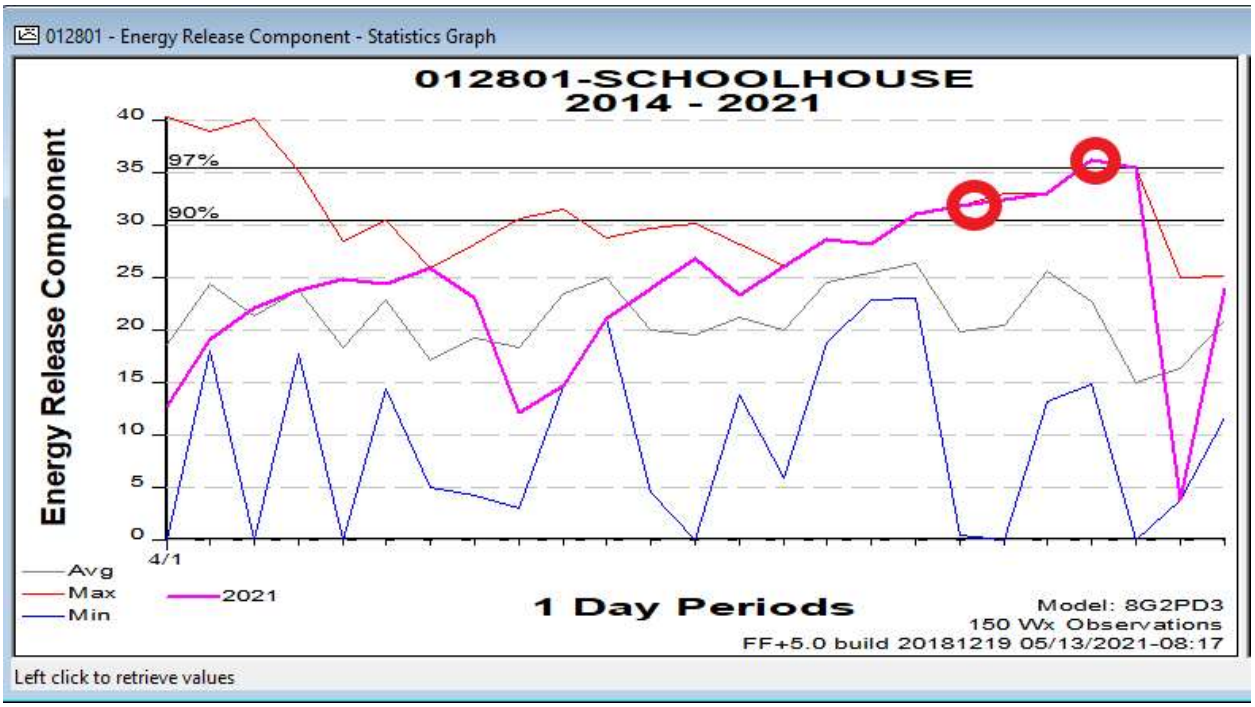


Figure 6. Energy Release component using FM8G from the prescription for growing season, date ranges from May 1-May 24, 6-year historical observations from the Schoolhouse RAWS. Burn day and escape day above 90th percentile.

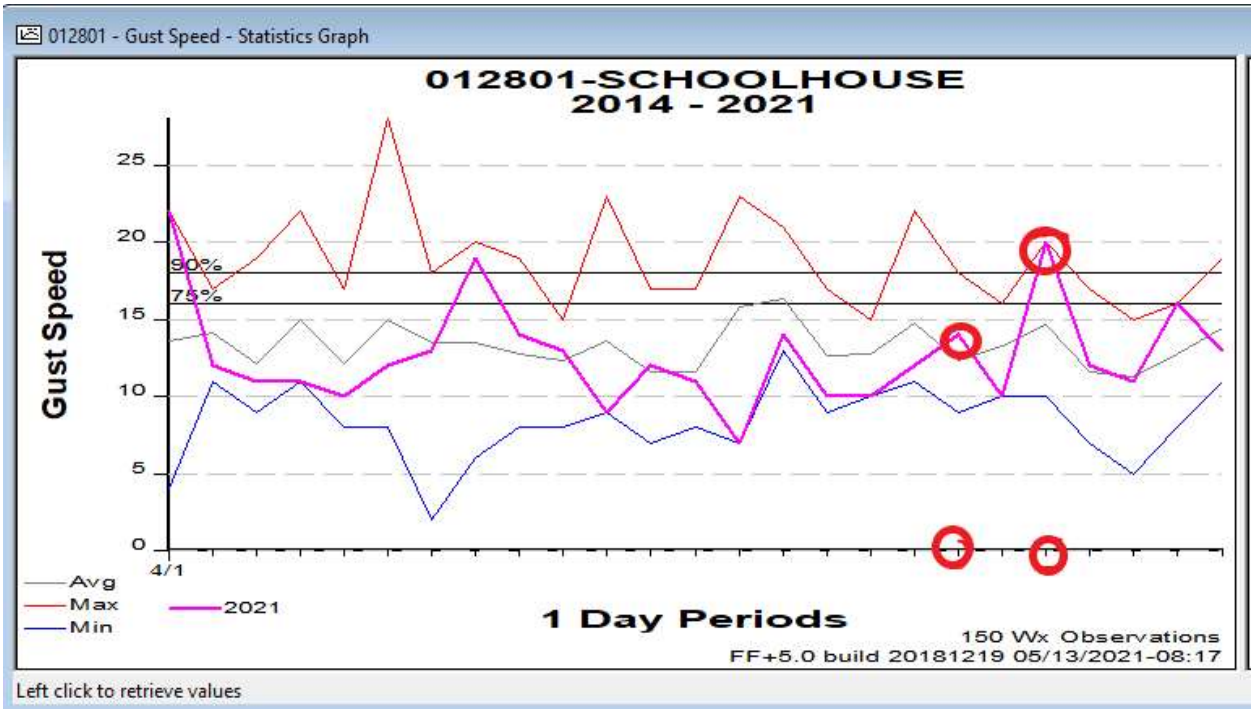


Figure 7. Wind gust speed observations from Schoolhouse RAWS April 1 - 24, 2021.

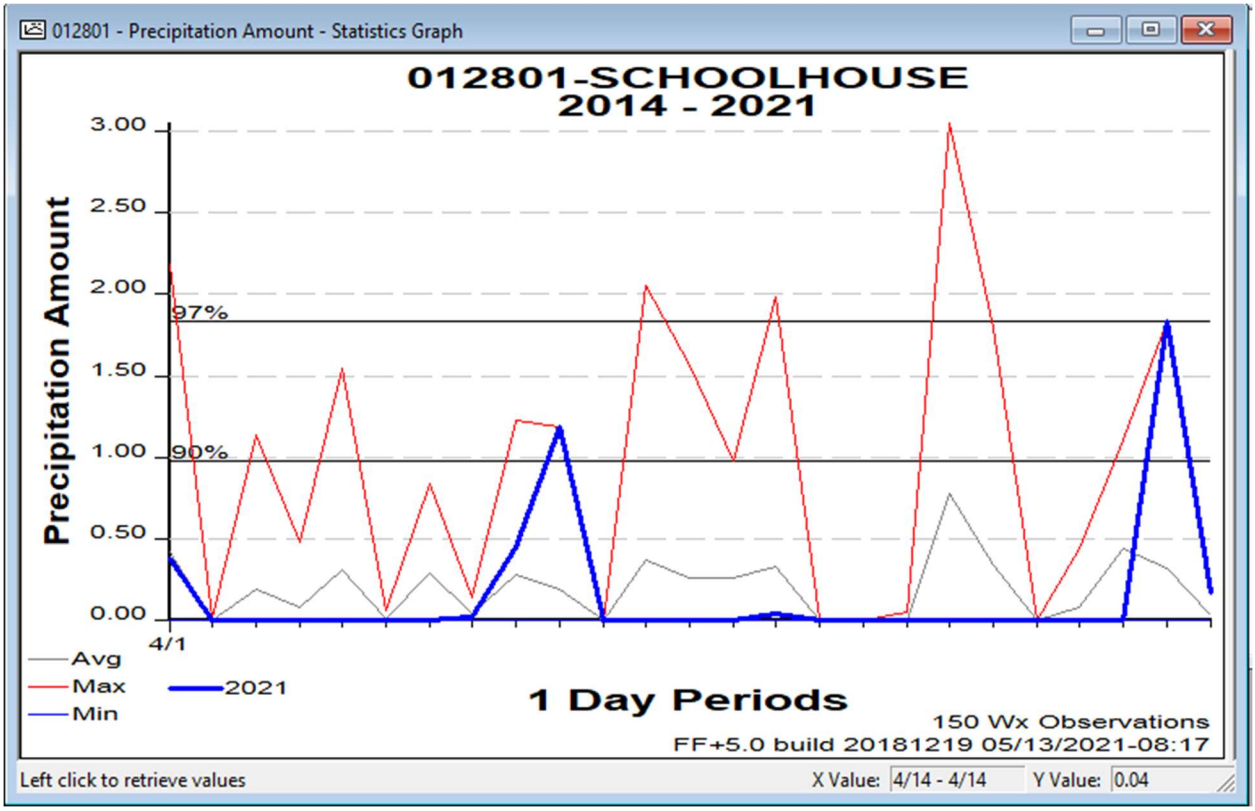


Figure 8. Observed precipitation at the Schoolhouse RAWS April 1 - 25, 2021.