

MCCORMICK HIGHWAY FIRE
BURNOVER REPORT
Lincoln County, Georgia

-FOR OFFICIAL USE ONLY-

February 21, 2011



A Board of Review has not approved this Summary Report. It is intended as a safety and training tool, an aid to prevent future occurrences, and to inform interested parties. Because it is published on a short time frame, the information contained herein is subject to revision as further investigation is conducted and additional information is developed.

Submitted by:

/s/ J. Mark Munns
Signature

02/23/2011
Date

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Preliminary Factual Section

Executive Summary

An incident occurred on the McCormick Highway Fire, Lincolnton, Georgia involving a volunteer firefighter. The incident occurred under Lincoln County jurisdiction (Prior to State of Georgia Forestry Commission's arrival at the fire scene).

On February 21, 2011 multiple volunteer fire departments responded to a grass fire in Lincoln County. The first engine on the scene arrived within 6 minutes of the dispatch. The fire ignited (Cause-Machine Use) in an active hay field approximately 100 yards behind a structure. Structure protection was immediately established adjacent to the fire's point of origin. As other engines arrived, attempts to control the fire were initiated. As the fire continued to grow in the flashy fuel bed and fed by 8 m.p.h. winds from the west with gusts in the 20s, it threatened additional nearby structures and vehicles. The Incident Commander made the decision to have the fire departments responding to utilize resources (Engines/Fire knockers) establish structure protection for 1 business, several homes, a water treatment plant, multiple vehicles and storage buildings in the threatened area. At the time of engagement the predicted weather was warmer and drier, winds were predicted at 8 in earlier part of the day and 16 m.p.h in the later part of the day with gusts up to 29 m.p.h and the district (including Lincoln County) had already responded to several fires well above our average size over the last week.

Most containment efforts on the fire were unsuccessful as the fire spread exceeded engine/knocker capabilities. Additional volunteer firemen, from the 5 Volunteer districts within the county, responded in their personal operated vehicles (POV) to add support to their engines. A volunteer fireman arriving to support the efforts of a fire knocker located near the head of the fire had to relocate his van from the threatening fire. Shortly after relocating the van and sizing the area up, he started approaching the area of the fire knocker on foot. As wind shifted intermediately, the spread of the fire exceeded his ability to escape the fire's path. The fireman was burned (Approximately 26% of his body) while escaping to his van. Shortly after, he drove the van out of harms way to seek medical treatment.

This report was created to identify contributing factors leading up to and during the incident, identify key findings that relate directly to the incident, identify any significant non-related safety factors and to make appropriate conclusions and recommendations as they relate to this incident and in a manner that will aid the Georgia Forestry Commission in preventing similar occurrences in the future.

Due to the dry conditions and drying winds across Georgia, fire occurrence and activity in the area was above average. Several fires were responded to within the East Oconee District in the eastern central Georgia area on this same date. A 56 acre fire had been contained by the GFC in Lincoln County three days prior to this fire.

A GFC Review on this fire concluded:

- The Rate of Spread (ROS) was greater than resource type (engines/fire knocker) could contain without natural barriers.
- Solid anchor points, lookouts, escape routes and safety zones were not in place.
- The tactical plan was not understood by all.
- Wildland Fire Orders and Watch Out Situations were not observed by all.

Narrative

Mission and Timeline

The Lincoln County 911 Radio Log Report indicates the first dispatches to the McCormick Highway Fire occurred at 1317 hours. The first resource to arrive at the fire was logged to be on scene by 1322 hours. 5 Volunteer Fire Departments were dispatched within approximately 24 mins (by 1341 hours).

The Incident Commander (Local EMA Director) attempted to communicate the need to focus on structure protection as fire containment efforts were unsuccessful. The organizational structure of the Incident Command System is not strongly established within the county when multiple (Independent Volunteer Fire Departments) respond to brush fires according to one member. The Incident Commander; however, did attempt to coordinate structure protection assignments while commanding his own engine company. Some of the coordination efforts were unobserved or not followed as arriving



engines attacked self judgment areas of the fire in attempts to contain it. The State of Georgia Forestry Commission, Wilkes County Unit, received a request for a tractor/plow suppression unit at 1348 hours. The fire progressed eastward, adjacent to State Highway 378 (McCormick highway), toward the water treatment plant. GFC scheduled Air Patrol entered the county at 1355hours and was over the fire within a few mins. At 1400 hours GFC dispatched a second tractor/plow unit to respond to the fire, due to a report from Air Patrol that the fire had spotted over the McCormick Hwy.

The head of the fire progressed into a narrow stand of pines at the end of the hay field around 1350 hours to 1400 hours. The fireman was on the northeast corner of the fire at this time and was reportedly trying to make it over to the fire knocker working the area to provide assistance and don his PPE. At approximately 1404 hours the fireman had been burned (Prior to making a connection with the fire knocker for his PPE) and was seeking help. The IC drove the victim over to meet the ambulance. At approximately 1410 hours GFC tractor/plow unit arrived and noticed an ambulance heading out as he was unloading the tractor/plow. Structure Protection remained in place while the tractor/plow anchored into a dirt road, near the burnover site, and started containment of the fire. The second tractor/plow unit was cancelled and was instructed to return to home unit at approximately 1425 hours since the RFD units on scene contained the spot over. The fire was contained within the boundaries on the McCormick Hwy (With exception on one spot over approximately ¼ acre), the dirt road on the east side of the fire, by the tractor/plow constructed line on the north side of the fire and a combination of wet line and tractor/plow constructed line on the western side of the fire. The victim was transferred from the ground ambulance to the Augusta Burn Center helicopter ambulance and is currently being treated.



Weather

From the Fire Weather Planning Forecast for Central South Carolina and East Central Georgia
For South Carolina National Weather Service Columbia SC (Issued 3:26 a.m. EST Monday
February 21, 2011:

Discussion – An increasing pressure gradient between high pressure to our SE and low pressure to our North will result in breezy conditions today. SW winds sustained around 20 m.p.h...with gusts around 30 m.p.h are expected. This will result in warmer temperatures...but also higher dewpoints. Current indications are that minimum relative humidity values will be in the 30 to 35% range.

So...meteorological criteria for Red Flag Warning will not be met; however, low fuel moisture values leads to Fire Danger concerns. A Special Weather Statement will be issued. A dry front will come through Tuesday, with a gradual wind shift and decrease in wind speed expected.

Forecast:

LINCOLN-MCDUFFIE-COLUMBIA-MCCORMICK-EDGEFIELD-
INCLUDING THE CITIES OF...LINCOLNTON...THOMSON...MARTINEZ...
EVANS...MCCORMICK...EDGEFIELD...JOHNSTON
326 AM EST MON FEB 21 2011

	TODAY	TONIGHT	TUE
CLOUD COVER	MCLEAR	PCLDY	PCLDY
PRECIP CHC (%)	0	0	0
PRECIP TYPE	NONE	NONE	NONE
MAX/MIN TEMP	75	56	72
WND20FT2MIN/EARLY(MPH)	SW 8 G21	SW 12 G25	W 9 G15
WND20FT2MIN/LATE(MPH)	SW 16 G29	SW 10 G16	W 11 G16
PRECIP AMOUNT	0.00	0.00	0.00
PRECIP DURATION	0	0	0
PRECIP BEGIN			
PRECIP END			
MIN/MAX HUMIDITY %	38	90	27
DSI	2		3
LAL	1	1	1
HAINES INDEX	5	5	5
MIXING HGT(FT-AGL)	4400		4800
DISPERSION		11PM-7AM/EX	
TRANSPORT WND (MPH)	SW 29		W 23
VENT RATE (MPH-FT)	127600		110400
ADI EARLY	10 POOR	44 GEN GOOD	17 GEN POOR
ADI LATE	82 GOOD	18 GEN POOR	68 GOOD
MAX LVORI EARLY	5	1	4
MAX LVORI LATE	1	3	1

Injury or Damages

The Fireman that was burned on 26% of the body with 5% consisting of quarter sized, third degree burns on the nose, ear, neck, both arms and one leg is being treated at the Augusta Burn Center. He drove his van a short distance and was met by the IC who drove him to the ground ambulance for initial care and transport to Augusta Burn Center's helicopter. No other injuries have been reported at this time.

Training and Qualifications

The training and qualifications of the fireman were within jurisdictional requirements of Lincoln County Office of Emergency Services. Having served on the Volunteer Fire Department for many years the fireman has responded to a number of field/grass fires in the past; however, as with other volunteer departments in the area, funding for wildland specific training and refreshers has been below desired level.

Attitudes and Performance

The attitude of the entire scene seems to be divided between an ICS oriented, organizational approach of attack (Using VFD engine resources to protect structures and turning containment efforts over to state (GFC) resources) and individual approach of attack (Departments working independently to engage areas of the fire) . While desire to focus water resources on structure protection had been established, some resources continued to focus on containment of the fire. The general attitude of most members of the VFD in Lincoln County is that of a very dedicated, hardworking group that puts forth more effort than they are equipped and trained to accomplish. Unfortunately, the level of training and available equipment to safely engage wildfires in the given conditions (Weather/Fuels) successfully without additional support of state resources is limited. These resources (GFC) were enroute and arrived at the scene just mins after the burnover occurred and established a solid anchor point and secured the area. Concerns of too much radio chatter, less than adequate understanding of initial ICS flow/organization and briefings on scene existed. While a lot of information for use in tactical implementation was obtained from initial efforts, the collection of that info, its dissemination and communication through a single leader did not occur. Organization and leadership within individual departments was maintained.

Causal and Contributing Factors

The following matrix was used to determine the degree to which various elements contributed to the burn over. The current fuel conditions, weather, tactics, communications, Incident Command Structure and training/qualifications for wildland fires were the significant contributing elements. Further discussion relating to the conclusions may be found in the narrative following the matrix.

See Matrix on next page...

Entrapment Elements

	Did not contribute	Influenced	Significant contribution
Fire Behavior			
Fuels			X
Weather			X
Topography		X	
Predicted vs. observed	X		
Other (drought)		X	
Environmental Factors			
Smoke, temperature, embers		X	
Slope	X		
Temperature		X	
Visibility		X	
Incident Management			
Incident Command			X
Strategy		X	
Tactics			X
Safety briefings/major concerns			X
Instructions given			X
Control Mechanisms			
Span of control		X	
Communications			X
Ongoing evaluations		X	
Ten Std Fire Orders/18 Watch-out Situations, LCES			X
Personnel Profiles of Those Involved			
Training/qualifications/physical fitness			X
Length of operational period/fatigue	X		
Attitudes		X	
Leadership			X
Experience levels		X	
Equipment			
Availability		X	
Performance/non-performance	X		
Used for intended purpose		X	
Other			

Fire Behavior

The McCormick Highway fire started in a low cut hay field on a day that winds were expected to exceed the previous 11 days (Which was date of last precipitation). Rate of Spread (ROS) in the grassy fuel models had already made considerable increases in average fire size in several counties in the district. The wind speed on this date ranged from 8 m.p.h. to 16 m.ph with gusts up to 29 reaching the 95th percentile in this area and the Spread Component reached the 96th percentile. The expectation was that fires in these type fuels would make significant runs in open areas down wind. Direct attack on these fires should only be considered where solid anchor points are established and control lines are established with the “One foot in the black” concept to prevent unburned fuel between resources and the fire. Indirect methods must be utilized otherwise to mitigate unburned fuels between resources and the fire. ROS in the combination of fuels and weather conditions on this fire indicate the ROS should be expected to exceed the Rate of Escape.

Environmental Factors

- **Smoke, temperature:** Smoke was an influencing factor in the burnover. Thick smoke, watering eyes, and heavy coughing all served to reduce the ability to see, sight distance, and reduces the rate of travel during an escape.
- **Terrain:** The land in this area consists of around 2% slope or less. The density of the bay fuels did add complexity in the escape route on this fire.
- **Visibility:** As the fire activity increased and the wind gusts blew the column across the area not allowing it to lift, the smoke restricted visibility.

Incident Management

- **Incident Command:** Command was established as the initial resources arrived on the fire. As other departments were dispatched and arrived, some resources followed through with IC's intent on focusing on structure protection while a few acted individually to use water toward attempts to contain the spread of the fire directly. One member stated that they weren't completely set up in the county for an ICS structure as they consist of 5 different individual fire districts. The implementation of tactics to meet control objectives is not as effective or efficient without a common command structure to improve an organized attack.
- **Strategy:** Lincoln County's overall strategy for initial attack on grass fires in Lincoln County is to utilize local Fire Departments in the area for containment before size or complexity of fire exceeds resource capabilities. GFC resources are staged in the neighboring county of Wilkes; therefore, response times vary on location of fire and time of dispatch. It is critical that GFC resources are dispatched as soon as the incident activities indicate control efforts will be difficult. The strategy for this individual response was difficult to communicate with resources without an established Incident Command structure identified and implemented throughout the structure of responding resources.
- **Tactics:** As containment efforts failed, utilizing engines, due to the R.O.S the decision was made to focus on structure protection; however, efforts to contain the fire continued without solid anchor points. The fire was primarily a wind driven fire, as it rapidly spread across the flashy fuel bed, additional strong wind gust made the timing of retreating (the trigger point) more crucial.
- **Safety briefings:** This element is rated for significant contribution, as communicating watchouts, changes in tactics, etc was difficult due to the amount of radio chatter.
- **Instructions given:** Instructions provided to engines came from several different directions but was not processed through a proper command structure to ensure a uniform effort.

Control Mechanisms

- **Span of Control:** Number of resources was manageable.
- **Communications:** Radio traffic remained heavy throughout the response. Not having a consistent structure of ICS throughout the supporting resources, makes the communications of strategy, tactics, safety concerns and other information more difficult to convey in timely and consistent manner.
- **Ten Standard Fire Orders/18 Watch-out Situations and LCES:** (Reference analysis of Fire Orders and Watch outs on following pages.)

Personnel Profiles of Those Involved

- **Training/qualifications/physical fitness:** The fireman had approximately 24 years of experience and is qualified as Captain. Additional need for Wildland Fire Behavior, Fuels and ICS training is recognized and needed in the community.
- **Length of operational period/fatigue:** This fire was contained within one operational period, the fireman burned was a volunteer and it is unknown at this time what his working status was prior to being dispatched for this fire.
- **Attitudes:** The attitudes to respond and assist neighboring departments in the county are respectable. The attitude of the fireman prior to the burnover was positive and eager to help. The overall attitude of responding resources to be adaptive to an ICS form of organization did have a negative influence on desired assignments vs. actual performance.
- **Leadership:** The organization and implementation of an effective Incident Command Structure to include Groups/Divisions and unified Command needs to be stressed throughout the departments to ensure a smoother transition as incident complexity increases. Pre-incident planning/training/high danger alerts for wildland fires in the area is becoming more critical as cooperative resources and equipment have reduced over time and/or relocated with longer response times.
- **Experience levels:** Experience levels of the on scene personnel ranged from intermediate to experienced; however, wildland fire activities in the county are generally low compared to most counties in the state. Most fires that do occur in the area are attacked quickly and are contained at a relatively small size. Experience of pulling back from a fire and focusing on structure protection is not a practice that is implemented often in this county (Due to the low fire occurrence for the past few years).

Equipment

- **Availability:** The availability of resources/equipment for this fire appeared to be adequate; however, the dispatch request for tractor/plow resources did not take place until 31 mins after initial resources were dispatched. The closest available resource of this type (tractor/plow) is located approximately 22 miles from this location which adds additional response time.

Evaluation of 10 Standard Fire Orders and 18 Watch-Out Situations

The 10 Standard Fire Orders were evaluated to determine both their application and any violations.

	Did not Contribute (Order was followed)	Influenced	Contributed Significantly (Order was not followed)	Unknown
10 Standard Fire Orders				
#1 – Fight fire aggressively but provide for safety first.			X	
#2 – Initiate all action based on current and expected fire behavior.			X	
#3 – Recognize current weather conditions and obtain forecasts.				X
#4 – Ensure instructions are given and understood.			X	
#5 – Obtain current information on fire status.	X			
#6 – Remain in communication with crewmembers.	X			
#7 – Determine safety zones and escape routes.			X	
#8 – Establish lookouts in potentially hazardous situations.	X			
#9 – Retain control at all times.				X
10 – Stay alert, keep calm, think clearly, and act decisively.	X			

Evaluation of adherence to the Ten Standard Fire Orders

The Ten Standard Fire Orders were not followed. The fire was fought aggressively, however safety was not provided first as all personnel did not have solid anchor points. Expected fire behavior in a hay field with wind gusts over 20 m.p.h. should have discouraged any resources from working close to the head of the fire without solid anchor points, solid escape routes and safety zones. The instruction to focusing efforts of water handling equipment toward structure protection was given. It is unclear if all resources received or understood the instructions as some personnel and equipment continued to be scattered along other areas of the fire.

The 18 Watch-Out Situations were evaluated in terms of their application and contribution to entrapment that occurred.

18 Watch-Out Situations	Did not Contribute (Not applicable and/or was considered if Influenced		Contributed Significantly (was applicable and	Unknown
1 – Fire not scouted and sized up.		X		
2 – In country not seen in daylight.	X			
3 – Safety zones and escape routes not identified.			X	
4 – Unfamiliar with weather and local factors influencing fire behavior.			X	
5 – Uninformed on strategy, tactics, and hazards.			X	
6 – Instructions and assignments not clear.			X	
7 – No communication link with crewmembers or supervisor.	X			
8 – Constructing line without safe anchor point.			X	
9 – Building fire line downhill with fire below.	X			
10 – Attempting frontal assault on fire.			X	
11 – Unburned fuel between you and fire.			X	
12 – Cannot see main fire, not in contact with someone who can.	X			
13 – On a hillside where rolling material can ignite fuel below.	X			
14 – Weather becoming hotter and drier.	X			
15 – Wind increases and/or changes direction.			X	
16 – You are getting frequent spot fires across the line.	X			
17 – Terrain and fuels make escape to safety zones difficult.	X			
18 – Taking nap near fire line.	X			

Evaluation of adherence or consideration of the 18 Watch-Out Situations

The 18 Watch-Out Situations were not appropriately considered. Any direct efforts on the fireline in these fuels with given weather conditions require solid anchor points with one foot in the black. An observation of personnel and equipment with unburned fuel between them and the fire was observed. The strategy, tactics and hazards were not clearly identified/communicated with all personnel. Size up of the fire did occur; however, some personnel only received bits and pieces of information prior to hitting the fireline.

FINDINGS

Lincoln County has typically been a low fire occurrence county for the past several years. The average size fire for the past 5 years in the county has been approximately 3.09 acres. The dedication of the Volunteer Fire Departments responding to this fire is invaluable and much respected. The initial attack of this fire with given fuels and winds cannot be safely attempted without solid anchor points. The rate of spread on this fire made an attack with engines and knockers unsuccessful. The need for tractor/plows to secure the fire while engines and knockers set up structure protection was recognized by some resources. As fire weather and fuel conditions change and promote increased fire behavior in the area, it is going to be imperative to dispatch GFC resources as early as possible. It is recommended that the Fire Departments utilize the Incident Command Structure for Wildland fire responses and ensure all responding members of department receive Wildland Firefighter Training to include the following:

- Basic Wildland Firefighter
 - S130 Firefighter Training
 - S190 Introduction to Wildland Fire Behavior
- Incident Command System 100, 200
- LCES S134 Lookouts, Communications, Escape Routes & Safety Zones
- S215 Wildland Urban Interface
- Annual Firefighter Refresher Training



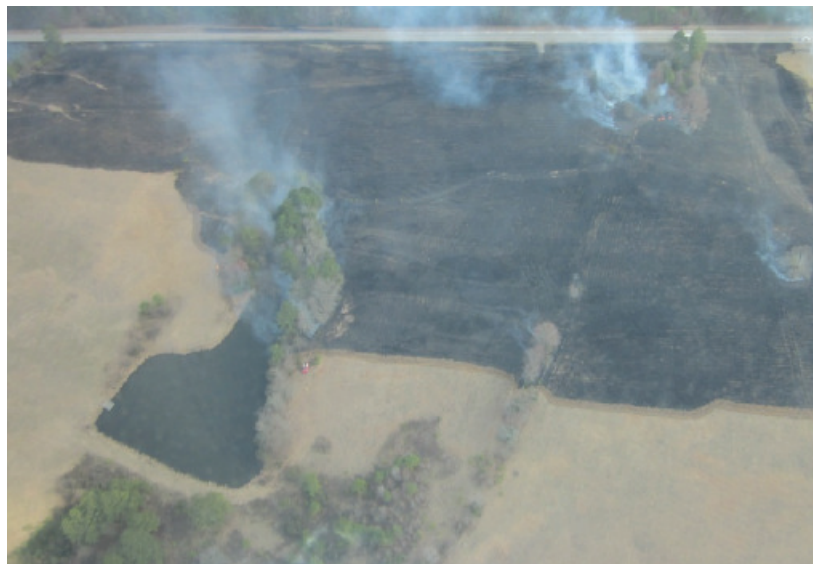
Area of Origin



Active Left Flank



Left Flank Control lines



Head of fire.



Scene of burnover.



Water treatment plant behind pines.



Structures threatened....



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