



GROUND COVER FIRE SUPPRESSION

SCOPE

This guideline shall apply to all members of the Stoney Point Fire Department and shall be adhered to by all members.

PURPOSE

To establish procedures for suppressing ground cover fires within the Stoney Point Fire District.

DEFINITIONS

Attack - act on a fire to slow down or stop the spread of fire by cooling, smothering, removing, or otherwise treating the fuel around its perimeter

Backfire - technique used in wildland firefighting that involves setting a fire between the control line and the advancing fire, the intent is for the backfire to meet the advancing fire some distance from the control line

Contained – wildland fire term to describe that a defensive line has been placed around the fire, usually through removing fuel via hand tools and/or tractors, preventing fire spread

Control Line - term for all constructed or natural fire barriers and treated fire edges used to stop or control a fire

Crown - fire that leaps rapidly through the tops of trees and brush creating its own wind in addition to surface wind

Direct Attack - all control action is carried on directly against or near the fire's edge

Duff - matted decomposed leaves, twigs, and bark beneath the trees and brush

Environment - anything surrounding an individual or community of plants or animals, including man, that influences it in any way

Extinguished – (Out) all flames are removed, hot spots cooled

Finger - long narrow extension from the main body of a wildland fire

Fire Flank - Sides of a ground cover or wildland fire

Fire Perimeter - outer edges of the fire

Guideline - a general rule, principle, outline of a policy

Head – Leading edge and active part of a ground cover fire

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Programs

Standard Operating Guidelines (SOG)

Heavy Fuels - dense fuel such as logs, and limbs not easily ignited but burn hot and slow

Indirect Attack- control action is conducted at a distance from the edge of a fire in making a break in the fuel and halting further progress

Light Fuel - fine fuels, grasses, most dangerous because of rapid spread they serve as kindling for heavier fuels

Member – any career, volunteer, staff, and auxiliary personnel affiliated with the department

Rear - the part of the fire opposite the head, also Foot

Shall - indicates a mandatory requirement

Spotting - fire spreading by the setting of spot fires

Surface Fire - fire burning the surface fuels such as leaves, duff and grass

Topography – natural and manmade physical features of the land surface (rivers, mountains, roads)

GUIDELINES

The Stoney Point Fire District contains many areas of wooded and brush land, as well as wildland urban interface. These types of ground cover fire, also called brush fires, present a unique challenge to firefighting operations. Among these challenges are access with fire apparatus, water supply, safety concerns and exposures to residential and commercial structures. It is important for all fire operations personnel to understand the complexities of this type of fire and how to best manage it. The three priorities of emergency services remain in effect, life safety, incident stabilization and property conservation.

Command

Incident Command shall be established immediately upon arrival to the scene. Geographical Divisions shall be assigned to simplify communications and task assignments. The Incident Command Post shall be established in a safe location to mitigate any dangers should the fire direction shift. Additional resources may be required to control and extinguish the ground cover fire, the Incident Commander shall survey the incident and request resources early as some may take lengthy periods of time to arrive, such as North Carolina Forestry tractors or additional brush units.

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Fire Behavior

Understanding the factors that affect the behavior of a ground cover fire is important to every member of Stoney Point Fire Department. These factors are fuels, weather, and topography. Fuels refer to the matter that the fire is consuming, such as vegetation, rubbish, or structures. The weather not only affects how the fire may behave but also how the Firefighters will behave. Finally, the terrain, or topography, affects how a fire will spread and how Firefighters can operate at the incident.

The following questions shall be continually reassessed throughout the length of the operation, while taking into consideration the fuels that are present, the prevailing weather conditions and the terrain that operations are being conducted on.

- How fast is the fire spreading?
- How high are the flames?
- Is the fire spotting?
- Is the fire hotter than usual?
- Is the fire crowning?

Fuels

There are several classifications of fuels for ground cover fires. Each fuel classification is composed of different materials and found in different locations on the fire ground. Each fuel classification presents different challenges and require a different type of control and extinguishment method.

- What is the classification and arrangement of the fuel?
- What fuels are in the path of the fire

Ground Fuels are also referred to as duff fuels. These fuels are located below the ground surface into the duff, peat, and roots, which makes a fire in these fuels more difficult to extinguish due to the smoldering characteristics. These duff fires require Firefighters and Officers to dig and rake down through the duff to prevent reignition.

Surface Fuels are simply grass, brush, low vegetation, and nonliving surface materials. These fuels represent the most common ground cover fire materials and can quickly spread into large fire. This type of fuel usually burns hot and fast and is easily influenced by the wind. The ability of surface fuel fires to rapidly change direction and intensity require constant vigilance by Firefighters and Officers to prevent safety and exposure issues. Removing fuel from the area surrounding a surface fuel fire is an important task for controlling fires fueled by surface fuels.

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Crown Fuels are suspended and upright fuels, common in dense heavy fueled forested areas. Crown fuels are considered very dangerous because of their location above Firefighters and their ability of a crown fuel fire to rapidly spread through the tops of brush or trees. The higher elevation provides greater access to wind which aids in the intensity and spread of crown fuel fires. The safety of Firefighters and Officers operating in the vicinity of a crown fuel fire is paramount, removing fuel in the path of a fire fueled by crown fuels is an important task in controlling fires fueled by crown fuels.

Weather

Ground cover fires are most common in the fall and early spring months in the Sandhills Region of North Carolina. Precipitation is relatively low during these months, making the fuels dry and more readily ignited. Two weeks without rain produces conditions favorable to ground cover fires that could spread rapidly and burn hotter. Whenever the humidity falls below 30% the likelihood of spot fires increases and shall be considered by the Incident Commander. The Incident Commander may request current weather conditions from Dispatch to obtain current and forecasted conditions or utilize a weather application on the IPAD or a smart phone to obtain this information.

Fire Officers and crew shall refer to the current fire conditions provided by North Carolina Forestry upon arriving for duty. Several weather conditions affect how likely a ground cover fire would be, how dangerous a ground cover fire would be and the conditions that Firefighters would experience. The following factors shall be considered for ground cover fire operations:

- Relative humidity
- Temperature and Heat Index
- Wind Speed and Direction
- Weather Events (drought, rain, tornadoes, etc.)

Hot, dry, and windy periods are extremely favorable for ground cover fires and their rapid spread. High winds and dry conditions are favorable to spot fires far from the head of the fire. Hot and humid conditions increase the likelihood of Firefighter heat related injuries and must be taken into consideration by Fire Officers and Incident Command.

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Topography

The terrain upon which the ground cover fire is currently or may spread to is referred to as topography. The slope of the terrain, any geographical obstacles, or natural or manmade boundaries are all topographical considerations for ground cover fire operations. These considerations affect the fire and the Firefighters.

- Fire typically spreads faster uphill due to wind currents and proximity to fuel
- Fire spreads slower downhill
- Heat convection from the fire causes updrafts and dries fuels further uphill
- Burning fuels may roll downhill and spread the fire away from the head
- Steep and rugged terrain, or densely vegetated terrain is difficult for Firefighters to operate in

Strategy

Ground cover fires often present a large area of rapidly spreading fire. The critical first step is determining the direction of spread, finding the leading edge, referred to as the head of the fire. Aggressive action shall be taken to prevent the forward progress of the fire and protect any exposures. Incident Command shall remain prepared to adjust strategies as conditions may rapidly change. There are two primary methods of attack for ground cover fires, direct attack, and indirect attack. The following items shall be considered when determining to utilize Direct or Indirect Attack strategies and tactics:

- Location of the head or heads of the ground cover fire
- Weather conditions and time of day
- Classification and amount of fuels involved (heavy, light, duff, surface, crown)
- Location and type of exposures (buildings, crops, etc.)
- Size of fire and the rate and direction of spread
- Special hazards (spot fires, hazardous materials, or terrain, etc.)
- Manpower and resource requirements (request early)
- Accessibility to the fire
- Water supply (hydrants, water shuttle, etc.)
- Safe line of retreat

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A direct attack is utilized to cool or smother the flames of a ground cover fire. The primary focus of a direct attack is upon the head and flanks of a ground cover fire. Cooling is achieved by the application of water or educted .01% Class A Foam from hose lines. The smothering of flames is achieved by utilizing forestry rakes and shovels to remove fuels and cover flames with dirt removing oxygen from the fire. Additional available manpower shall be utilized to contain the fire by removing fuels from around the fire perimeter, establishing a control line to limit its spread.

Indirect attacks utilize natural fire breaks and barriers or the construction of a control line well in advance of a ground cover fire whenever the fire is considered too hazardous for a direct attack. The control line, or fire break, shall be constructed wide enough to prevent flame contact or radiant heat igniting fuels on the opposite side of the barrier. These control lines may be constructed by Firefighters utilizing hand tools or by a bulldozer or plow such as those employed by North Carolina Forestry. Roadways, rivers, and plowed farm fields are examples of natural barriers that may be considered for use as control lines.

Tactics

The individual tactics utilized at a ground cover fire may vary depending upon the weather, topography, fuels, and hazards observed upon arrival. The following list of tactical assignments shall be combined in the most appropriate format to best stabilize the incident and extinguish the ground cover fire:

- Identify escape routes and position lookouts for Firefighter safety
- Attack the head of the fire first, then work around the fire flanks
- Utilize forestry rakes to remove fuels and smother fires around the fire perimeter
 - Pull fuels from the unburned area into the burned area (green to black)
 - Create a three buffer between fire and fuel around the entire burned area
 - Never pull from the burned area (black) to the unburned area (green)
- Utilize hose lines to suppress large, hot fires and to protect Firefighters and exposures
- Call for North Carolina Forestry to assess for a Dozer or Plow
- Use saws or axes to remove large fuels
- Clear control lines using had tools or Forestry equipment
- Post Firefighters downwind of fire to extinguish spot fires

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Overhaul

The task of overhaul is equally important for a ground cover fire as it is for a structure fire. Overhaul ensures that the fire is extinguished and unlikely to rekindle into a fire. This task shall be assigned as personnel become available; the Incident Commander shall not wait until the fire is contained to begin this task. The fire is not out until all embers are cold. The following tasks shall be utilized during overhaul operations:

- Utilize hand tools (rakes and shovels) to remove fuels and extinguish and cover embers
- Utilize water to cool hot spots (use hand tools to stir and expose duff) black is cool, red, and white are hot
- For large fires, overhaul at least 100 feet from the fire perimeter

Safety

Aggressive Firefighting is the key to successful ground cover fire suppression operations; however, these operations must be conducted without violating safety procedures. The safety of the Firefighters is the first priority of all personnel. The following safety guidelines shall be implemented at all ground cover fires:

- Be aware of weather conditions and forecast
- Continually reassess fire conditions for current and future behavior
- Identify escape routes and lookouts
- Maintain communication with all personnel
- Wear appropriate Personal Protective Equipment
- Rotate personnel for rehabilitation to prevent dehydration and exhaustion
- Inform all personnel of North Carolina Forestry operations
- All personnel exit the area prior to Dozer or Plow operations and remain 500 feet away from any moving Dozer or Plow

Both Station 13 and Station 19 are assigned Brush Apparatus to respond to ground cover fires. 1341 and 1941 are the first out apparatus for any ground cover fire within their assigned district. An Engine Company from the opposite station shall respond second out to provide water supply and manpower.

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Brush Unit Personnel Assignments

Driver Operator/Engineer

Responsibility: Responsible for the safe operation of apparatus responding to and from the incident, safe operation of apparatus while off road, and operation of the pump and equipment as needed for effective operations.

Company Officer/Firefighter

Responsibility: Responsible for incident command, to direct suppression operations, to ensure effective overhaul, and Firefighter safety

North Carolina Forestry Service Fire Readiness Plans

The State of North Carolina assesses the likelihood of ground cover fire danger for every Forestry District across the state. Stoney Point Fire Department is located within the Second Readiness Plan or RP-2. These assessments are conducted on a daily basis as determined by current and past weather conditions, expected fire danger and Forestry personnel staffing. The following are the determinants:

- #1 Little or no fire activity
- #2 Below normal fire activity
- #3 Normal fire activity
- #4 Above normal fire activity
- #5 High fire activity

References

NFPA 1001

NFPA 1143

PMS 437 Fire Behavior Field Reference Guide

North Carolina Forestry Service Readiness Plans

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