

MEMORANDUM

To: All Concerned
From: Drew Daily, Assistant State Fire Coordinator
Subject: Dunes State Park Escape Fire
Date: April 26, 2006

**FIRE CONTROL HEADQUARTERS
IDNR – DIVISION OF FORESTRY
6220 MAIN FOREST ROAD
MARTINSVILLE, IN 46151
PHONE: (765) 342-4701
FAX: (765) 342-4760**



The following is somewhat of a lesson learned that we, at Fire Headquarters, developed from the escape fire at Dunes State Park this spring. This is not an “official” debriefing summary, however I will highlight some issues that were brought up in the after action review, debriefing and professional introspect.

As you consider some of the topics discussed below consider the fact that I have been involved in wildland fire for fourteen years, participated in nearly 200 prescribed fires and burn bossed 78 of those. During this time, I have been on three burns that required suppression efforts related to prescribed fire. None of those were significant, nor required any assistance from off-site resources. My training and experience substantiate my national qualifications as Prescribed Fire Burn Boss Type II and Incident Commander Type IV.

While all fires, whether prescribed or wild, are executed and/or suppressed as a collaborative effort between all assigned resources there is always one individual who carries the brunt of the responsibility, accountability and liability. I was not designated as the burn boss on this particular fire; however the lion’s share of the aforementioned load lies on my shoulders due to qualifications, position and experience. With that said, please take what is mentioned below as an open book to the happenings of the incident from my perspective.

Background:

The planned burn was the Trail 3 burn to encompass 26 acres in the Northwest corner of Dunes State Park. The unit was a somewhat regular shaped unit with rolling topography. Fuels consisted of dune grass, hardwood leaf litter and wetland grasses. Weather at the time of ignition was within prescription with winds South at 3-4, temperature in the mid 60’s, sky cover 0-10% and Rh 34%. The NWS did not expect the lake breeze to set up however it could not be ruled out for the course of the day. Throughout the burning period, winds were expected to increase slightly, temperature was expected to increase and Rh to decrease. Resources committed to the fire were 10 persons from Dunes State Park, Fire Control Headquarters and Nature Preserves, and 5 ATV’s four with water capability. 2 Engines were staged as contingency resources and a waterfill site was set up approximately 200 yards from the point of ignition.

Other units burning in the area included Indiana Dunes National Lakeshore with their personnel and equipment as well as Nature Preserves burning at Hoosier Prairie with Fire Control Headquarters personnel and equipment. Prior to the burns, I coordinated with the FMO from Dunes National Lakeshore to establish communications and a notification method in case of either of the burns requiring suppression action.

Ignition and Line Holding

With a South wind, ignitions were initiated on the North line in dune grass. Two crews were working the North lines to blackout the baseline of the burn. I had one of the ignition crews and was assigned to work the baseline heading east from the dune grass into a downhill slope with mixed hardwood. At the point of ignition, there was a small spot fire across the line that was quickly contained. Both crews proceeded with ignitions once that spot was controlled.

As my ignition / holding crew progressed down the slope into the hardwood stand we ignited on the line following with a 2-foot strip. Once the strip burned together, we worked on widening the line with another 2-3 foot strip. While the second small strip was burning together, I ignited a 5- 10 foot strip in order to observe the change in fire behavior in the transition between the dune grass and the hardwood leaf litter. As this burned together I observed a fire whirl mid-slope in the leaf litter as well as a tendency for the fire to climb the bittersweet vining. Both the fire whirl and the fire working into the ladder fuels concerned me, however I looked at the area and considered it only a difficult corner to work out. Looking at the fuels deeper into the block, I observed much less bittersweet and knew that we would be transitioning out of the dune grass, therefore proceeded with ignitions.

My ignition assignment was progressing at a faster rate than the other crew could maintain, so we slowed our side to let the baseline ignitions even out. The other ignition crew was having some difficulties holding line due to a fully exposed rise in the dune grass and a thin control line around that rise. There were a couple of small spot fires that they tended to with the assistance of the personnel assigned to ATV's.

Escape Fire

As the other crew began to make progress, my crew worked to a corner and began to widen the black at that corner back to the point of ignition. We had worked in 50-60 feet of black along the North line from the point of ignition when a spot fire burning in dune grass was reported about 5 foot square near the point of ignition. The holding personnel assigned to my line immediately jumped on the spot and worked it with handtools until an ATV with water arrived. At this time, the spot, approximately the size of the hood on a pick-up, was anchored to the control line, flanked and hooked. As the ATV operator was working down the flank back to the control line, the pump on the water unit stalled. There was only 2-3foot of active fireline remaining on the spot, however I observed an increase in wind velocity and a quartering shift in wind direction. The spot fire quickly grew to the size of a pick-up and began to spot ahead of itself. The rate of spread was very quick and spot fires were observed 25 feet ahead of the fire. At this time, we determined that suppressing the fire was out of the capabilities of the resources that we had assigned to the prescribed fire. Dunes State Park personnel notified emergency dispatch to request fire resources from the local departments, and I contacted the FMO from Dunes National Lakeshore to request assistance from them. Porter Fire and other Departments were dispatched and responding. The National Lakeshore suspended their burning operations and released personnel and equipment to respond and assist.

Suppression

While resources were responding to assist us with the escape fire, Dunes State Park personnel began to work the backing and flanking fire that was progressing toward four residences west of the escaped fire. I observed that the Treatment Plant for Dunes State Park was threatened and got another person to assist me with operating an engine to attack and redirect the fire around the treatment plant. We quickly realized that we would not be able to take the engine off of the road due to the loose, sandy soil. I pulled the hardline up to the structure, ensured that the engine was in a safety zone and attacked the head fire from a gravel drive. Once this fire was redirected, I was able to do a size up of the situation at hand.

Fire Department resources were arriving and establishing structure protection on the residences to the West of the fire. A National Lakeshore engine arrived and provided me a radio so that I could establish communications with the fire departments. I made contact with a second National Lakeshore engine and advised them to assist the departments with structure protection and keep me informed of status on the West side of the fire. The West flank and the Northwest corner were the areas of most concern due to residences and the State Park's water tower. In addition there was a high and tight chain-linked fence to the West that restricted our access from the fire to the residences. To the immediate North was fairly contiguous dune grass and pockets of Jack Pine that ran to open dune along Lake Michigan. To the east was mixed fuels of dune grass, jack pine and hardwood that tied into paved roads and parking lots. To the south, the crews had extinguished most of the backing fire from the original prescribed fire.

The transition from the prescribed fire to the suppression action was very difficult and hard to organize due to several issues. 1. The rate of spread in the dune grass was very fast and spotting was occurring along the flanks and head fire. 2. Winds were 7- 8 mph shifting from Southwest to Southeast and back again several times. Most of these wind shifts were directly related to changes in topography. 3. The immediate threat to the Treatment Plant. 4. Limited resources initially.

The FMO and the AFMO from the National Lakeshore arrived and I was able to meet with them to formulate a plan. The fire departments and the National Lakeshore Heavy engine were establishing structure protection for the residences to the West and North West. The DNR Engine was maintaining protection near the water tower. The Dunes State Park personnel were completing suppression of the backing fire and assisting with the West flank. The National Lakeshore personnel were working the West flank with handtools and ATV's moving toward the head. The dune grass was difficult to extinguish due to frequent rekindles and the crews working the West flank had to bump back to grab the rekindles. One of the rekindles grew and made a run to the West, which resulted in two heads complicating the suppression efforts.

Observed fire behavior at this time was 4-10 foot flamelengths on the flanking fire in the dune grass and 8 – 16 foot flamelengths on the head. Spotting from the head fire was observed at 30 – 50 feet. There was a pocket of Jack Pine on the head of the fire that that torched resulting in 60 foot+ flamelengths within 100 feet of a residence. The torching pocket of Jack Pines and accompanying black smoke caused me to believe that the structure had also ignited. However, the structure protection implemented by both the fire departments and the National Lakeshore engine and staff prevented structure ignition and damage.

All crews continued to flank and hold the fire concentrating on the West and Northwest. When the head of the fire was hooked, some resources were redirected to the East flank to tie that fire into the paved roads and parking lots. Once the fire was tied into the paved areas, it was declared controlled. The fire was patrolled and mopped up for several hours following, with some snagging and working of hotspots.

The final acreage for the fire was 26 acres with approximately 5% of the original prescribed fire being burned. The burn was contained to government ground (State and Federal). Agencies involved in the suppression effort include Dunes State Park, DNR Fire, Indiana Dunes and 7 local fire departments.

After Action

The observations and comments below are a result of the After Action Review conducted after the fire was controlled, the debriefing with Fire Control Headquarters staff and my own observations.

After Action -

- Establishing contact with other resources (National Lakeshore) prior to burning was a beneficial action.
- Radio Communication between resources from different agencies was difficult to establish and a hindrance to organization, command and firefighter safety.
- The transition from prescribed fire operations to suppression operations is a difficult transition. The individual responsible for suppression command needs to take command immediately and disengage from other operational functions.
- There were not enough suppression qualified personnel on hand to adequately handle the suppression action.
- The fire should have been shut down with the occurrence of frequent spot fires and the observance of the fire whirl with only minimal fire on the ground.
- Firefighters need to watch their “backdoor” due to the fire rekindling frequently.
- The original firelanes need to be improved.
- Do not rely on equipment, and have back-up plans in place. It was suggested that a hoselay be set so that there would not have been such a reliance on the ATV’s and their limited water source.

Debriefing –

- Separating the Fire Headquarters Staff and resources when we are asked to complete complex burns in urban areas on the same day should be considered carefully.
- When assuming command, the Incident commander should not engage in operational duties.
- Ensure that all area fire departments are fully informed of fire operations. Contacting their central dispatch does not always get the information to the departments.
- The designated suppression IC should be familiar with the site and take the time prior to the burn to note values in the area, suppression hindrances, fire breaks, access, etc.

Personal / Professional Introspective –

These are my thoughts and some of the lessons that I took away from this escaped fire. Most of them are basic (even elementary) which means that I (we) may have developed a case of complacency. I mention these so that others will know what has gone on in my head since then and how I will apply the lessons learned in the future...

- The proposed size of a prescribed fire, even when it is relatively small, is only one factor in complexity. In fact small, urban fires can be just as or more complex than large burns.
- Trust your gut not your bravado – The fire should have been shut down after the spot fires and fire whirls were observed. When you see fire behavior that indicates the possibility of heightened intensity with only a relatively small amount of fire on the ground, you had better consider what your resources can handle and what type of fuels are outside of the burn block.
- Command. Command. If you are going to command the incident, then you had damned well better command the incident. My command developed rather slowly. It may have taken only 10 minutes to transition, however that first 10 minutes is very valuable! It took me some time to transition out of the operational role that I held on the prescribed fire into the command role on the suppression fire.
- Know and determine the ability of the resources that you have available. What are their qualifications – and more importantly what is their experience and knowledge.
- Establish communication with other resources that may be ordered in to assist if a suppression action occurs.

- Do not rest on your laurels. Laurels do not get a job done; they are just an indicator of what you have done in the past to get to this point. My track record for burning is pretty good. I had developed the “ain’t gonna happen to me” attitude. Many firefighters who engage in prescribed fire operations will say “It is not a matter of losing a prescribed fire; it is a matter of when and how bad it is lost.”
- Ensure that you have adequate resources on hand.
- It had been 13 years since I had burned in dune grass and Jack Pine. I should have reflected a little more on history.

Looking at the Standard Fire Orders and the Watch Out Situations...

I took a good look at the 10 orders and 18 watchouts. Here is what I came up with after I reviewed them. Yes, I violated some orders and had to backtrack in my command to mitigate those deficiencies to ensure for firefighter safety. Yes, watchouts were shouting watchout!

Fire Order #2 – Know what your fire is doing at all times.

- I observed fire behavior at the beginning of the prescribed fire, but I did not act appropriately. With the spots and other fire behavior indicators observed, the fire should have been shut down in retrospect.

Fire Order #6 – Be alert. Keep calm. Think clearly. Act decisively.

- During the transition into a suppression action, I did not give clear instructions to the forces under my command. I **assumed** that they would act appropriately and go where they were needed. For all intents and purposes they did go where they were needed. However, given a different crew in this circumstance the situation could have been dramatically different.

Fire Order #7 – Maintain prompt communications with your forces, supervisor and adjoining forces.

Watchout #7 – No communication link with crew members or supervisor.

- Intra-crew communications were established and utilized very well. When adjoining forces arrived, communications with them were very limited and difficult to establish until a National Lakeshore unit provided me with a radio programmed accordingly.

Fire Order #9 – Maintain control of your forces at all times.

- My span-of-control was way out of whack. I had the opportunity to divide the forces up into functional units and did not until the fire was nearly contained. I could have divided command into structure protection, West Flank Operations, Mop-up and Holding, etc.

Watchout #5 – Uninformed on strategy, tactics, hazards.

- My proposed strategy was to flank any fire in the dune grass and hook it working back down the opposite flank. That was all well and good, except that is as far as I took the tactic. I did not indicate that I wanted ATV’s to knock the heat out of the fire and then follow up with handtools to secure the line. A lot of time was wasted until The National Lakeshore crew began implementing this tactic.

Watchout #10 – Attempting frontal assault on fire.

- While trying to protect the Treatment Plant from direct flame impingement, I grabbed a hose and got between the structure and the head of the fire. I had not established an acceptable anchor point and had a marginal escape route for myself.

Watchout #14 and 15 – Weather and Wind.

- These were out of my control, however both increasing temperatures and falling Rh’s combined with shifting winds contributed to the incident.

Watchout # 16 – Getting frequent spot fires across the line.

- Again, listen to your guts. I have come to realize that they are typically right in these types of situations.

Conclusion

I submit this information, so that others may benefit from these experiences. The total escape was only 26 acres. I guarantee that it looked like 1,000 acres while it was actively burning. Remember that the size is only one factor in complexity.

No, I am not beating myself up over this, however I do have in the back of my mind that this could have been much worse. No structures were lost and no private property burned. Most importantly, no firefighters were injured!

Most of these topics are pretty elementary when it comes to command and firefighting in general. In fact, I think about every refresher that we do and how we review situations just like this in order to prepare for situations just like this! The initial suppression began with the hiccup of a pump motor, but what transpired from that point is all in the actions of firefighters and command personnel. Allow me to ask this question... How many times have you been in a situation and knew that you did not have all of the bases covered? Please share this information with your fire personnel and others that are involved with fire operations as you see fit.

As I stated earlier, this could have been much worse. It was due to the hard-work and dedication of all involved that this incident did not grow into a much larger and more complex incident. Many thanks are appropriate and deserved:

- The local fire departments working to protect the structures.
- The Dunes staff working all aspects of the fire.
- The National Lakeshore personnel responding with personnel and other resources that gave structure, order and efficiency to suppressing the fire.

Finally, there are several people that have had open and candid conversations with me regarding this incident. I thank all of you for your honesty, constructive criticism and sharing your escape fire experiences. This is how we improve and fight fire or use fire more effectively, efficiently and in a more safe manner the next time.