BP11 Escaped Prescribed Fire Review

National Key Deer National Wildlife Refuge

Monroe County, FL

BP11-Project Map

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September 15, 2011

EXECUTIVE SUMMARY

The National Key Deer National Wildlife Refuge (NKD) conducted a prescribed burn in unit BP11 that escaped on September 15, 2011 and was converted to a wildfire. The actions of the prescribed burn team contained the escape within the refuge boundary, however the Pine Heights Subdivision located downwind of the fire was temporarily evacuated as a precautionary measure. The fire was contained at approximately 100 acres during the same burn period. There were no injuries or damage to private property recorded.

Through policy identified in the *Interagency Prescribed Fire Planning and Implementation Guide 2008,* a review was conducted to examine the causal factors of the escape and identify recommendations to improve future Rx fire planning and implementation.

NARRATIVE

Unit BP-11 of NKD was prescribed burned on September 15, 2011 on Big Pine Key, Monroe County, FL. Because the National Preparedness Level was at 4, National approval was required for burn authorization. Both National and Regional approval was obtained on September 13.

Time line:

Wednesday, September 14

- Resources mobilized to the burn site and began the pre burn preparations (equipment check, hose lay, tank setup and fill, public notification).
- Notifications for the burn were distributed to the public via a press release, social media postings, and flyer distribution. Prior to this date, radio interviews had been issued beginning in August and ending Wed PM to notify the public of upcoming prescribed burns.

Thursday, September 15

- A spot weather forecast was requested and received, contacts were made and state authorization acquired.
- **0730** - The briefing was conducted by the Burn Boss Type 2 trainee (RXB2(t)).
- **1025 -** Equipment was double checked, prescribed parameters met and test fire ignited at DP3.
- RXB2(t) called the test fire a "go decision" and started firing with 2 igniters 15' apart
- Because of minimal fire behavior, 2 more igniters were inserted in the ignitions crew
- Igniters were halted when fire activity increased in combination with embers crossing the line
- Due to increased fire behavior, ignition slowed, igniting only small sections at a time
- **1130** – Weather and fire behavior change, **1140** multiple spots reported
    - Spot that eventually escaped started >100 ft outside the line
- **1142** - Florida Forest Service firefighter experienced heat related symptoms and was transported via ambulance to local hospital for evaluation and treatment.
- **1210** - It was decided that the spot could not be suppressed and all personnel were pulled from the line. Command of suppression activity transitioned to the Incident Commander (IC) identified in the Incident Action Plan (IAP). Three personnel were left on the original burn unit while everyone else gathered at the 'Blue Hole' to discuss strategy and tactics.
- **1500 -** Lines were mowed in prep for burnout operations
- **1600 -** Evacuation was ordered and the prescribed fire was converted to a wildfire
- **1900 –** Evacuation was lifted
- **2000 –** Fire was contained at approximately 100 acres

INVESTIGATIVE PROCCESS

An independent interagency review team was assembled and traveled to National Key Deer NWR on Saturday, September 17th. The review team met with the Agency Administrator (AA), Incident Commander (IC), Burn Boss Type 2 (RXB2) and RXB2 trainee (RXB2(t)) to discuss the process and intention of the review then toured the burn unit. The team received a thorough in-briefing on September 18th by the persons holding the following positions on the prescribed fire: AA, RXB2, RXB2(t), Firing Boss (FIRB), Holding Boss and ICT3. Human and environmental factors were both considered to play a role in the incident. Material factors were considered but were not found to contribute

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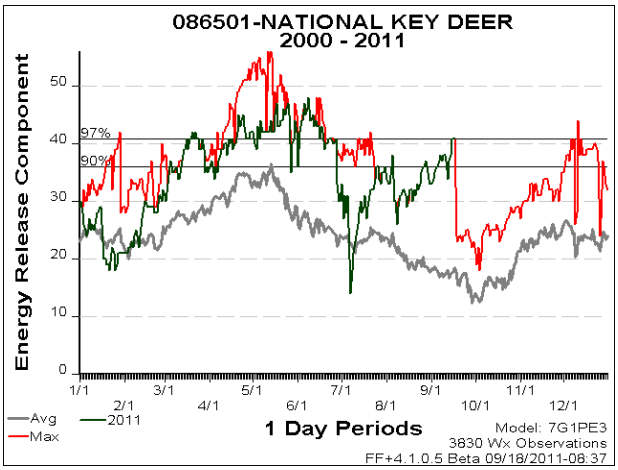
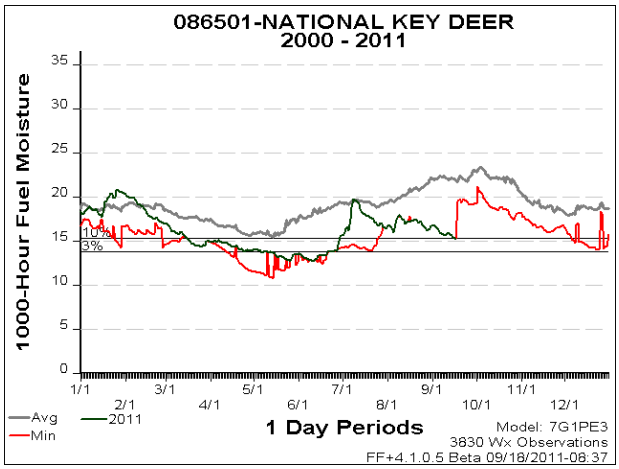
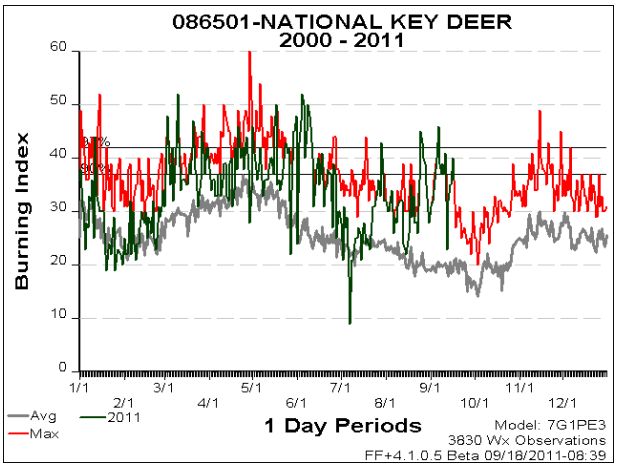
Unit BP11 looking towards the south

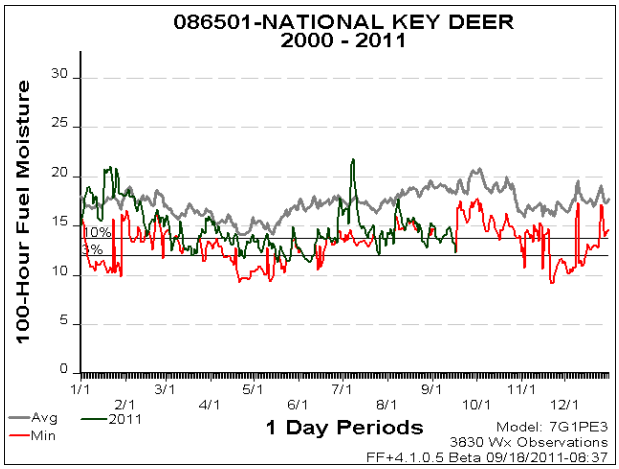
FINDINGS

Finding #1: NFDRS values indicated that the fuels were very dry.









Discussion: The NKD weather Station is located approximately 0.5 miles to the north of the burn unit. This station is maintained to national specifications through a contract with Forest Technology Systems. The NFDRS graphs depict the environmental conditions in which the prescribed fire was conducted. The relative humidity (RH) dropped below forecasted levels, however this was only part of the environmental conditions contributing to the escape. The review team considers the overall dry conditions as a contributing factor to the escape.

Supporting factors:

- Weather data from NKD weather station showed RH was at 43% at time of test fire, onsite measurements were 61%
    - Minimum RH was recorded at 36% (NKD weather station at 12:38and 47% (onsite 12:30)
- Observed Fire behavior and char heights
- Significant amount of substrate exposed due to effective consumption of surface fuels.
- NFDRS graphs above showed fuels were above the 95th percentile for ERC and BI lower than the 10th percentile for 100 and 1000hr fuels.

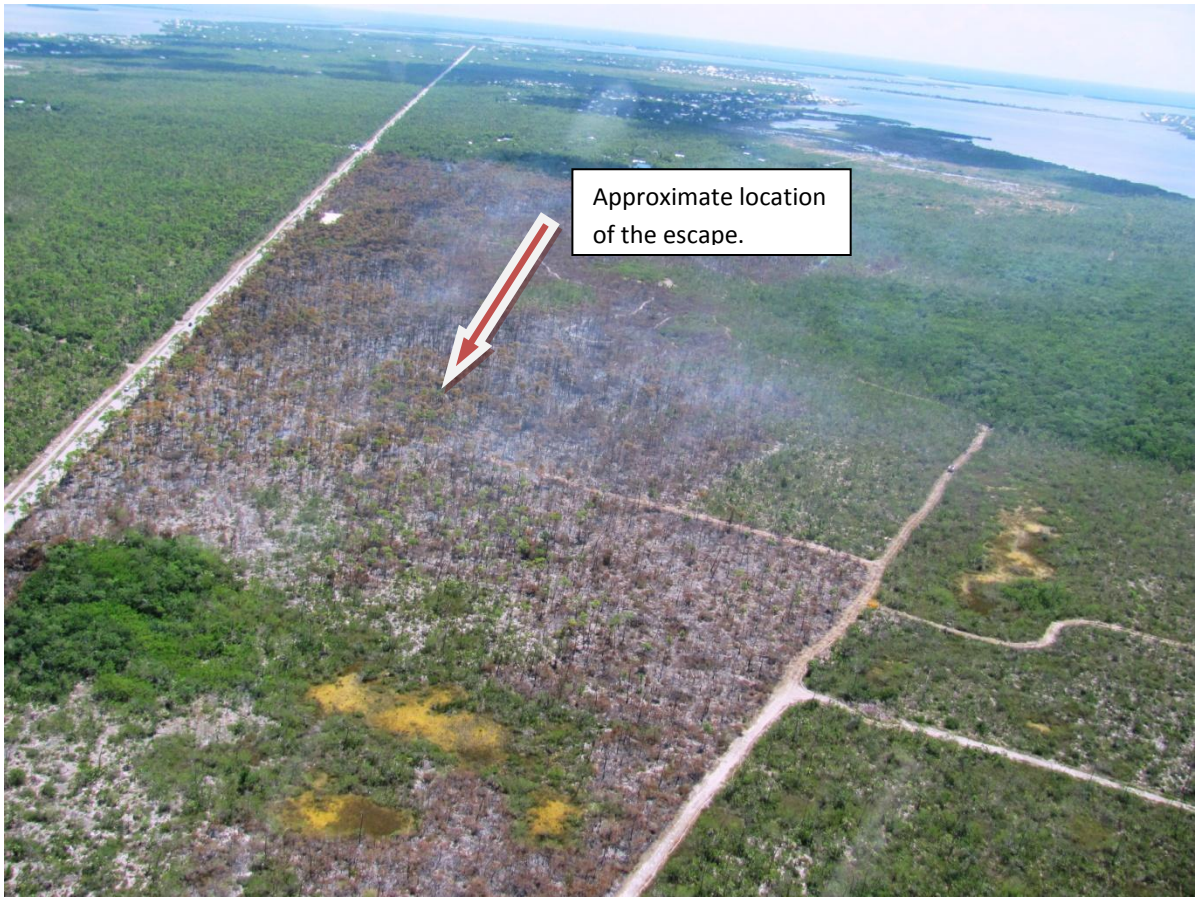
Recommendations:

1- Include 10, 100 and 1000 FM (utilizing Nelson dead fuel models) in the prescribed fire plan's (PFP) Environmental Parameters Element 7. Parameters should be base on analyses of past burn successes and problematic burns.
2- Consider all available fire danger/behavior tools (e.g., Fire Family Plus, FLAMMAP, Behave) to identify ideal burning windows and potential problem areas on burns.
3- Adjust in Environmental Parameters Element 7- "Burn within 24hrs of 0.5" rain".
4- Adjust Environmental Parameters Element 7 wind parameters to incorporate: >0 – 6 mph mid-flame wind speeds.
5- Adjust Environmental Parameters Element 7 minimum relative humidity values to > 50%.

Finding #2: Experience Levels of Persons in Key Positions

Discussion: Pine rocklands on National Key Deer NWR are some of the most challenging fuels to successfully conduct prescribed fires due to the fuel volatility, fuel loading, values at risk and public interest. The majority of this 22 person burn crew had limited experience burning together in pine rockland fuels. While more than one third of the personnel had qualifications of single-resource boss or above, few work together operationally on a regular basis. Two of the crewmembers had no previous burn experience. Use of an RXB2(t) on the RXB2's first fully qualified burn reduced the experience ratio further. These factors contributed to the failure to recognize and communicate critical changes in fire behavior, due to critical fuel conditions. The review team considers the limited experience of key personnel in these fuel types was a contributor to the escape.

Wildfire boundary adjacent to the Pine Heights Subdivision and "Blue Hole" Visitor Use Area



Supporting factors:

- First qualified burn of RXB2
- The necessity of all crewmembers needing radios was recognized but not mitigated effectively
- Firing pattern was not adequately adjusted to modify fire behavior
- Decision to use 4 igniters with limited to no inexperience in this fuel type
- Available equipment was not utilized (e.g., tracked engine and sprinklers)
- Complexity analysis misidentified critical risk

Recommendations:

1- All burns on National Key Deer NWR should be conducted as Type I burns.
2- Use experienced personnel in key positions when burning in this fuel type.
3- Use only arduous personnel in operational positions.

Finding #3: The Contingency plan implementation was successful due to preplanning with cooperators.

Discussion: When the spot fire exceeded capabilities of onsite forces, additional contingency resources were ordered and a suppression strategy was implemented. The success of this suppression response is a result of the

interagency relationships built in planning efforts over the last several years. The review team considers this the primary factor of the successful containment of the escaped Rx fire thus preventing a catastrophic event.

Supporting factors:

- Not all 'Additional Contingency Resources' were properly notified of their role as contingency
- On-site contingency resources roles and responsibilities were not clearly identified on the Incident Action Plan (IAP)
- Roles and responsibilities of key command positions were not clearly defined in the IAP for transition to suppression.

Recommendations:

1- Follow PFP's direction and ensure contingency resources understand they are contingency.
2- The PFP and IAP needs to clearly define which resources are 'contingency' vs 'holding'.
3- Identify the RXBB as the IC of a converted Rx fire to maintain continuity of the command structure.
4- Include a dispatcher as part of the burn personnel (contacts, dispatch log and ordering).
5- Continue to develop and grow relationships with cooperators and the surrounding community.

CONCLUSIONS

The team commends the refuge for undertaking the monumental efforts needed to reintroduce fire to the pine-rocklands. The refuge staff has worked diligently to develop relationships and build confidence with interagency cooperators and the public.. Fish and Wildlife Service firefighters should make up the core organization of future prescribed burns. Efforts to train militia resources and integrate interdisciplinary refuge staff will continue to be instrumental in the future success of the fire program at NKD.

While the refuge's pre-burn public notification was far more than the average prescribed burn in the Region, the sensitivity of burning on NKD dictates that additional methods should be considered. The refuge did an outstanding job keeping the public adequately informed once the fire escaped, by ordering a Public Information Officer to coordinate media interest and a timely neighborhood meeting with evacuated residents. These attempts to positively communicate with the public will play an important role in building a successfully program at NKD.

While the fire did escape the original burn unit because of the findings listed above, the burn crew did a commendable job faced with the challenges that were presented. The crew adapted to the loss of one key person due to heat related problems and recognized when the fire exceeded their capabilities. They constantly maintained firefighter safety and acted decisively when the fire escaped.

The team believes that the recommendations above as well as continuing fuels treatments and outreach efforts will ensure continued success of the fire management program.

BP11 Prescribed Fire Review Team:

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