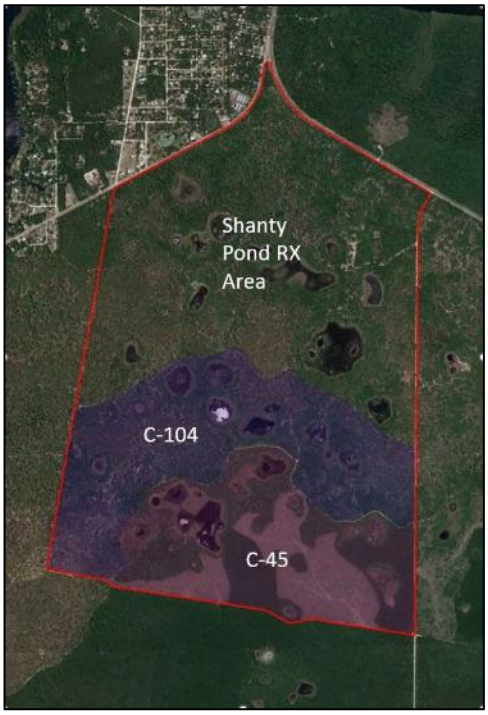
Rapid Lesson Sharing

Event Type: Vehicle accidents adjacent to the Shanty Pond Prescribed Fire

Date: January 19, 2023

Location: Ocala National Forest, Florida



The Shanty Pond Prescribed Fire area is outlined in red. The C-104 Unit is represented in the darker color shade; the C-45 Unit in the lighter shade.

Background

The Lake George Ranger District on the Ocala National Forest began the 2023 burn season by planning and treating the area with prescribed fire on the Shanty Pond Prescribed Fire (Rx) units located southwest of Salt Springs, Florida.

This entire prescribed fire area covers approximately 1,400 acres of mixed grass, scrub oak, and sand pines that had been mechanically treated over much of the area. These mechanical treatments were primarily used to "mow" or "cut" the open areas of grass and smaller vegetation to prepare for the prescribed fire treatments.

Experience, education, and local knowledge indicated that the District would have approximately six weeks to implement prescribed fire in the "cut" areas. The longer these cut fuels were left to cure, the greater the likelihood they would add excessive amounts of smoke during the prescribed fire.

Although the highways to the north were a consideration for potential smoke impacts, the Rx area needed a southern wind component to decrease the spotting potential in the receptive fuels to the south, which is covered with thick sand pine and vegetation.

The 1,400-acre Shanty Pond Rx was subdivided into multiple units to reduce the overall complexity, especially the smoke impacts. The first area burned was the C-104 Unit, the second was the C-45 Unit. By burning C-104 first, there would be a "catcher's mitt" for C-45 to burn into. C-45 could then be burned with less holding concerns and hot enough to "lift the smoke out" and meet the fire effects indicated in the burn plan.

Narrative

January 17 (C-104 Unit, 379 Acres)

Planning for the C-104 began early on the morning of January 17. Crews arrived at the Lake George Work Center around 0730 as the Burn Boss (RXB2) was finalizing the burn plan supplements needed for the day. Because C-104 was the first Rx on the District since the USDA Forest Service National Prescribed Fire Program Review, the RXB2 was running through the checklist developed by the Forest Fuels Planner. The RXB2 obtained the Agency Administrator Ignition Authorization (2A), then proceeded to C-104 to begin operations.

The C-104 Unit after ignition operations on January 17.

On their way to the on-site Shanty Pond Rx briefing, crews placed electronic programmable message signs to warn of possible smoke in pre-designated areas. The RXB2 determined that the C-104 Unit was within prescription and all the required personnel and contingency resources were on scene before lighting a successful test fire.

Throughout the day, the RXB2 communicated hourly with the Agency Administrator (AA) and Dispatch through radio, phone calls, and text messages, which aligned with the new "check-in" requirements for AA and Duty Officer communication based on the National Prescribed Fire Program Review.

Assigned personnel patrolled the adjacent roadways (Highway 314 and State Road 19) and neighborhoods for smoke throughout the day. All ignition and holding operations were completed by approximately 1700. The RXB2 conducted a thorough AAR and resources were released to rehab equipment with plans to burn again in the morning.

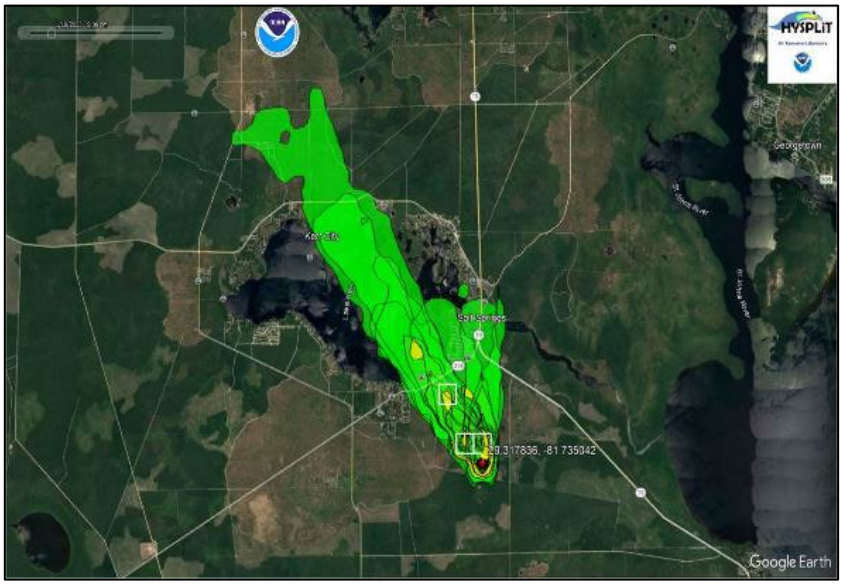


Image shows the projected HySplit analysis for the C-45 Unit on the morning of January 18. The light green area indicates the potential very light smoke dispersing during daytime operations.

LVORI – This index gages the probability of visibility restrictions in fog or smoke. There are 10 LVORI categories, ranging from 1, indicating the lowest probability of visibility restrictions, to 10, indicating the highest probability of visibility restrictions.

PB Piedmont – This is a numerical model designed to simulate near-ground smoke movement at night under clear skies and near calm winds over irregular terrain characterized by ridge/valley elevation differences.

HYSPLIT – This is a complete system for computing simple air parcel trajectories, as well as complex transport, dispersion, chemical transformation, and deposition simulations.

January 18 (C-45 Unit, 322 Acres)

At 0600, the RXB2 assembled the daily supplements and prepared for a conversation with the Agency Administrator to discuss and sign the 2A. Portions of the burn plan and the R8 Smoke Management Guide require a Spot Weather Forecast and a HySplit analysis (a complete system for computing simple air parcel trajectories) to predict smoke impacts to the highway.

The AA and RXB2 determined that because the Spot, HySplit, and general forecast were like the day before, the smoke mitigations used then would be adequate. No nighttime Spot Weather Forecast was required. As the RXB2 recalls, "the conditions were good enough through the evening that we could have burned at night under the Florida State burn guidelines."

Based on the general daytime forecast, the National Weather Service (NWS) reported the Low Visibility Occurrence Risk Index (LVORI) at "7", which would not have accurately matched a nighttime Spot forecast for the area, had one been requested.

All other weather conditions were within parameters to burn. The 2A was signed, resources proceeded to the Rx area with all elements in place and successfully burned the C-45 Unit.

Throughout the day, there were fewer smoke impacts than the previous day. The crews checked the electronic smoke signs and conducted smoke patrols. The RXB2 made the check-in calls with Dispatch and the Agency Administrator. The C-45 Unit had more sand pine and less fuel loading, which led to a slower start. However, once crews were able to establish fire, the effects were "excellent" and the burn went well.

Because of the success the previous day, management felt comfortable assigning multiple trainee roles (RXB2, Firing Boss, and others). The burn met fire effects objectives and provided a valuable training experience for personnel. The crews finished operationally at approximately 1600, conducted an AAR, and were released to rehab their equipment.

The RXB2 would continue to assess the weather conditions over the next few days in anticipation of burning the remaining Shanty Pond Prescribed Fire units.

January 19 – Highway 314 Accidents
Based on the burn plan, the highway signs remained on the Shanty Pond Prescribed Fire—for the C-104 and C-45 units—through the morning of January 19. Due to limited visibility, at approximately 0744 that day, four vehicles (one towing a boat), traveling east on Highway 314, were involved in a "pile-up" collision. Roughly 10 minutes later, an ambulance, that had parked on the eastbound lane of Highway 314, was rear ended—also due to limited visibility—by a truck.

Although there were several accidents and there was damage to vehicles, no airbags deployed and there were no reported injuries. Due to visibility concerns, Highway 314 was closed that morning. In addition, a public-facing news flash was sent out by the media for Marion County residents.

As the Florida Highway Patrol responded and began working the accident scenes, the Florida Forest Service (FFS) Forest Area Supervisor (FAS) for Marion County called the RXB2 to let him know about these accidents. The RXB2 arrived on scene at approximately 0825. He recalled that while he could see "thick smoke right up to the grant line (Forest Service Boundary) on the west side," it was lifting. He could clearly see both accidents.

The RXB2 remained on scene to answer any questions. The Florida Highway Patrol issued no citations related to the Shanty Pond Prescribed Fire.

Lessons Shared and Lessons Learned

I. Cooperators Smoke Meeting – Consider holding a "Cooperators Smoke Meeting" in September/October of each year as part of preseason outreach. On other national forests, this has proven to be an important tool for both gathering and sharing information regarding smoke. Below are some key insights and tips for ensuring that these meetings achieve their objectives and have successful outcomes.

A. Invite all the key players

1. Forest employees: District Ranger, Forest Management Officers, Public Information Officer, Forest Law Enforcement Officers
2. State forest service
3. Local fire departments
4. Law enforcement agencies: highway patrol, local police, county sheriffs
5. Local weather service
6. Dispatch (local emergency services, interagency dispatch, Florida Highway Patrol Dispatch
7. Others (media, highway department, power company, etc.)

B. Consider the following in your discussions

1. Define and standardize language that may be misleading. For example, "super fog," "smoke-induced fog," and "smoke on the highway" are phrases that are sometimes used interchangeably. Although they may seem like similar sounding events to the public, they require different protocols from various agencies. The standardization of these terms should be discussed in these meetings.

2. Discuss expectations and any requirements for roadway sign use in varying areas. Will you use signs? What kind of signs will be used? What exactly do the signs need to say?

3. Set expectations about communicating with Dispatch, PAO/PIO, and cooperators regarding changing smoke conditions. As agencies receive calls from the public, more frequent and thorough updates may be required. This will also ensure that proper notifications are made and fire information is conveyed to the public and media to streamline communication and decrease inaccurate communication.

4. Identify who the Forest Service needs to contact directly for road closures. Work with the highway patrol to identify when they need to be notified.

5. Work with weather service personnel concerning how to write the "discussion" section of weather reports so that it highlights the weather that would create "super fog" formation for fire resources. For example, highlighting temperatures below 55°, RH above 90%, winds below 4 mph, and cloud cover below 40% in the discussion would increase "super fog" awareness.

6. Discuss the pros and cons of one-way notification systems. One-way notification systems (or mass notification systems) are valuable for reaching a large amount of people quickly. To be effective, the recipient list needs to be updated frequently. New additions need to be made AND you need to check that the people/organizations you think are on these recipient lists are actually on them. Additionally, sometimes two-way communication is necessary to ensure the message was received.

C. Give everyone the task of determining how the information shared during your Fall "Cooperators Smoke Meeting" will be disseminated. How will this information be shared with those not in attendance at the Cooperators Smoke Meeting? How will information be shared throughout the burn season? Don't let the information get "stuck" solely in the meeting.

II. Ensure you have the most accurate weather data and run the required atmospheric dispersion models.

A. When requesting a Spot Weather Forecast, check all the boxes to get the required information, including the nighttime weather. Although a nighttime Spot Weather Forecast may not be *required* in your burn plan, you need it to determine if a Planned Burn (PB) Piedmont analysis will be required. Also, provide feedback immediately to the National Weather Service about deviations from the forecast and request updates if needed.

B. If a PB Piedmont is required due to temperatures below 55°, RH above 90%, winds below 4 mph, and cloud cover below 40%, contact your smoke management specialist.

C. Each national forest has a designated Zone Smoke Management Specialist. These specialists can assist RXB2s with obtaining smoke models for the day of the burn. Building a relationship with these specialists before the burn season may help RXB2s share the workload on the day of the burn.

III. Make sure you have the latest smoke management tools

In case you do not have a copy or were working from an older draft, click here for the most recent copy of the ***R8 Smoke Management Guide***. Also, be sure to refer to this ***"Nighttime Smoke Management Conversation Tool for Roadways"*** safety bulletin (on page 6) for specific guidance regarding smoke and roadways.

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Region Eight Fire Risk Management

Safety Bulletin

Date: February 1st, 2023 **R8-FAM-RM-2023-10**

Subject: Nighttime Smoke Management Conversation Tool for Roadways

The Region 8 Smoke Management Guide should be used when planning, deciding, and implementing prescribed fire. Nighttime Smoke Consideration may need to be discussed in depth prior to the authorization of the prescribed fire. Below are the elements from the R8 Smoke Management Guide regarding smoke on roadways, as well as nighttime smoke considerations:

Burn Bosses (RXB2s) and Agency Administrators (AAs) need to answer these questions prior to signing the 2A:

A. *Will there be active fire or smoldering one hour before sunset and/or one hour after sunrise?*
B. *Are there roadways within 10 miles of the fire? If yes, then nighttime smoke is a concern. If roadways are < 3 miles then these concerns are deemed critical.*
C. *Can surface winds transport the winds towards the roads?*
D. *Can topographic features (drainages) lead smoke from the burn unit to any roads?*

Very few prescribed fire units are planned without answering "Yes" to these questions. If roadways are expected to be impacted during operations, or post burn, AAs and RXB2s need to discuss the mitigations to smoke impacts on roadways (e.g. extinguish smoldering materials near roadway, put up more smoke signs, use of Portable RAWS, increase smoke patrols, road closures, etc.)

*If the answer is **No** for A through D then there is a low potential for smoke to reach roadways. Continue to monitor the smoke and skip to Step 9.*

*If the answer was **Yes** to A **and** B then continue with the following screening criteria:*

E. *Is predicted (or forecasted) low temperature $<70^0$ F (watch out) or $< 55^0$ F (critical)?*
F. *Is predicted (or forecasted) relative humidity >70% (watch out) or >90% (critical)?*
G. *Is predicted (or forecasted) wind speed < 7 mph (watch out) or <4 mph (critical)?*
H. *Is predicted (or forecasted) cloud cover < 60% (watch out) or <40% (critical)?*

*If **No** for E through H then smoke could still reduce visibility along roadways and a PB- Piedmont analysis may be useful to identify were smoke could impact roadways. However, a PB-Piedmont analysis is not required. If **Yes for all criteria in E though H then a modeling analysis using PB- Piedmont is required to be completed** because there is a high potential for reduced roadway visibility during the overnight hours.*

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Nighttime Smoke Conversation Tool for AAs and RXB2s

The following table may be useful for AAs and RXB2s to determine the impacts of nighttime smoke:

	Low Probability: Low impacts from nighttime smoke.	Moderate Probability: Likely impacts from nighttime smoke (Watch out).	High Probability: Predicted Impacts from nighttime smoke (Critical.)
Temperature	Above 70^0 Fahrenheit	Below 70^0 Fahrenheit	Below 55^0 Fahrenheit
Relative Humidity	Below 70% Humidity	Above 70% Humidity	Above 90% Humidity
Wind Speed	Greater than 7 MPH	Less than 7 MPH	Less than 4 MPH
Cloud Cover	Greater than 60%	Less than 60%	Less than 40%

***This is a conversation tool. Borderline numbers such as 70^0 F or 70% RH should trigger more conversation. Only when all areas are "High probability," is a PB Piedmont Analysis required.**

1. To use the table, obtain the following:
    a. Operational RX map
    b. Current daytime and nighttime SPOT forecast for the RX area
    c. HySplit model.
2. Determine the following predictions through the night (1800 to 0500):
    a. Minimum Temperature
    b. Maximum Humidity
    c. Minimum Windspeed
    d. Minimum Cloud Cover
3. If **ALL** categories are High/Critical (as listed on the table), a PB Piedmont analysis is required and hazards mitigations should be discussed between RXB2s and AAs.
4. If **ANY** category is mix if High and Moderate, a PB Piedmont is suggested. Hazards and mitigations should be discussed between RXB2s and AAs.
5. If **ANY** category is Low but one or more Category is Moderate or High, impacts to roads indicated by the HySplit Model, hazards, mitigations, and impacts should be discussed bewtween AAs and RXB2s, and PB Piedmont considered.
6. If all the categories are Low probability, RXB2s should proceed with the required elements described in their burn plan, and smoke considerations from the HySplit Model before obtaining the Agency Administrator Ignition Authorization ("2A").
7. If any conditions change during operations, RXB2s should consider discussing the impacts and mitigations with AAs.

Links:

R8 Smoke Management Guide
NWCG Nighttime Smoke Pocket Card
PB Piedmont Web Application