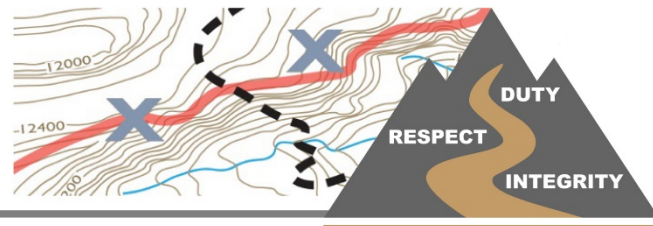


# Tactical Decision Games



Wildland Fire Leadership Development Program

## DECISION MAKING – NO-WHEEL-DRIVE PRESCRIBED FIRE

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### INITIAL FACILITATOR INFORMATION—NOT TO BE SHARED WITH STUDENTS

#### Author(s)

Travis Dotson, FUTA

#### Target Audience

Burn Boss

#### Training Objective

Given the following scenario, players will make decisions regarding public safety and prescription parameters during active ignition of a prescribed fire. Players should verbally communicate their decisions to the appropriate individuals.

#### Resources Referenced

- **Burn Boss Type II (Player Role)**
- Holding
- Refuge Manager
- Firing Boss
- Local Resident
- Zone FMO

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### SCENARIO INFORMATION TO BE SHARED WITH STUDENTS

#### Facilitator Briefing to Student(s)

Today is March 25th. You are the Burn Boss on the No-Wheel Drive prescribed fire at Bosque del Apache NWR in New Mexico. The refuge lies in the Rio Grande Valley in the south central portion of the state. This unit was burned two years ago and you are burning again at the request of the refuge biologist.

The unit is surrounded on all sides by roads, except for the north portion where a black line was established two days ago. New Mexico (NM) State Highway 1 is the western boundary. Up to 30

percent of the total area may be open water (depending on time of year). A large pond makes up the southern portion of the unit. The area to the north of this water has the highest density of cattails. Generally a fuel model 3. The northern portion of the unit is a Rio Grande riparian mix. Species inside the unit include; alkali sacaton, cottonwood, screwbean mesquite, saltbush, and NM olive.

The major resource concerns for this project are:

- Protect the large cottonwood trees in the unit.
- Pre-burn preparation included clearing brush/grass away from the trunks of live cottonwood trees in the unit.
- Protect a stand of Goodding’s willow just north of the pond adjacent to Highway 1. A mowed line with a temporary sprinkler system has been established around the Goodding’s willow area.
- There are power lines along the highway that are also a concern.
- It is a priority to keep smoke off of highway 1. The refuge headquarters and visitor center sits adjacent to the block just west of the display pond.

### Burn Prescription Elements

<b>Acceptable Range</b>	<b>Low</b>	<b>High</b>	<b>Desired</b>	<b>Outside @ Critical Holding</b>
Temperature	40F	85F	65F	85F
Relative Humidity	70%	20%	35%	20%
Wind Speed (mid-flame)	0	15	6	15
Slope	0	0	0	0
Wind Direction (any but east)				east
1-hr Fuel Moisture	15	3	4	3
10-hr Fuel Moisture	12	5	4	5
100-hr Fuel Moisture	14	7	10	7
Live Fuel Moisture	160	60	80	60

### Weather

- Temperature: 68 degrees
- RH: 22%
- Wind: NNW 0-5
- Skies: Mostly Clear

The IAP has been provided to all participants, an operational briefing has been conducted and test fire successful. Everything is going as planned. Ignition began just after 1000, it is now 1030.

The ignition crew started at the pond and has proceeded north ¼ mile along the road on both flanks. You observe momentary wind shifts coming out of the north and northeast with gusts up to 8 mph. Your Firing Boss radios you to inform you of these momentary wind shifts:

Take 5 minutes to decide your course of action and prepare any communication contacts you think are necessary.

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## ADDITIONAL INFORMATION FOR FACILITATOR ONLY

### Facilitator “Murphy’s Law” Suggestions

The “Murphy’s Law” suggestions listed below can be added as “What ifs” at any time during the scenario to raise the stress level of the leader. You can also use one of your own:

The use of the following will depend on the decisions made by the Burn Boss:

- Winds are inconsistent with occasional eastern component.
- Winds set up from the east and smoke is thick over Highway 1.
- Refuge manager requests the burn be shut down.
- Law enforcement unavailable/available for traffic control.
- Refuge Biologist pushing to complete burn.
- Traffic accident due to smoke.
- Interior of unit not drivable (staubs will puncture tires).

### Facilitator’s Notes

This TDGS should focus on making a decision regarding smoke on the road and the associated safety concerns. If the decision is made to shut the burn down based on prescription parameters, a decision on the safest way to do so should be made (is finishing the burn the best way?). Part of the dilemma the burn boss may face is the exposure involved in putting the fire out vs. “ringing” the whole thing to get it done (temporarily creating more smoke). The AAR may involve discussion regarding pre-planning “shut-down” procedures or starting a burn knowing that the most efficient way to “shut down” is completing the burn.

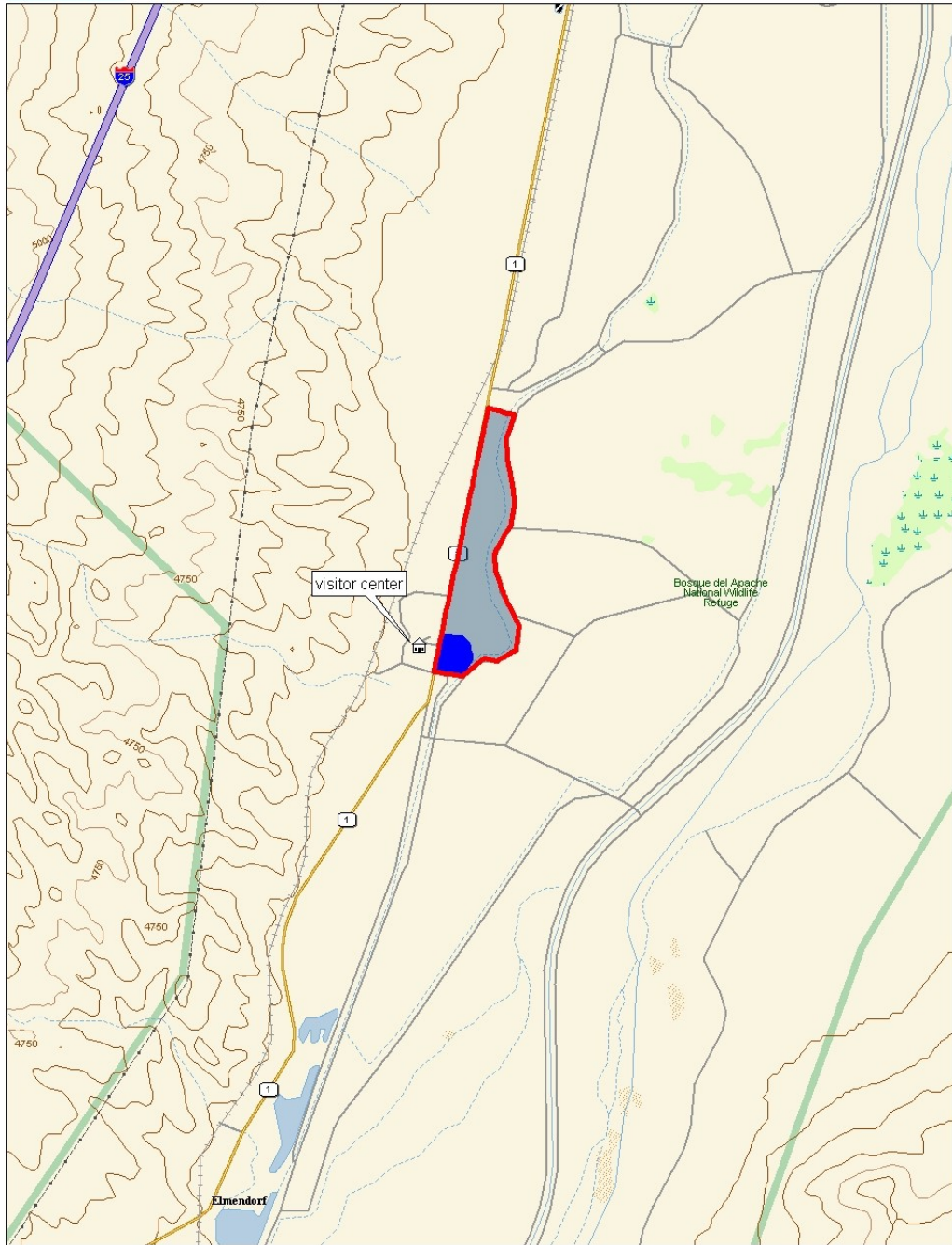
### After Action Review

Conduct an AAR with focus on the training objective. Use the AAR format found in the *Incident Response Pocket Guide* to facilitate the AAR. There are four basic questions in the AAR.

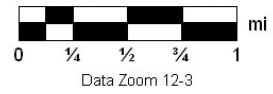
- What was planned?
- What actually happened?
- Why did it happen?
- What can we do next time?

TDGS shouldn’t have a single solution, keep the focus of the AAR on what was done and why.

\*Photos are taken from a high point directly west of the visitor’s center.



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## NO-WHEEL DRIVE PRESCRIBED FIRE



**Station:** Bosque del Apache NWR      **Project Account Number:** 9264-B200-22520-2F  
**Sub Station:** Units 19/Galen's Pond      **Name of Area:** Wetland Management Units  
**Acres to Be Burned:** 90/30      **County:** Socorro

### GENERAL DESCRIPTION OF BURN UNIT

#### Topography

The burn area is located within the Rio Grande flood plain. The area is flat and portioned by levees, roads and ditches. These features define the units and provide limits to fire spread.

#### Aspect

None, river runs north south land is flat within the burn area.

#### Slopes

No slope within the burn units, area is flood plain flat.

## Physical Features

Unit 19 and Galen's Pond are two of four blocks that make up the No Wheel Drive RX. The units follow an ancestral oxbow of the Rio Grande. The units are moist soil all year long and portions are often in standing water. Fire is the primary management tool in these units. Some site preparation has taken place to prepare Unit 19 and Galen's Pond for fire. Areas around mature cottonwood groves have been cleared. Grass fuels have been cleared around the base of individual trees. An area of Goodding's willow in the southwest corner of Unit 19 has been excluded. This area is potential habitat for the endangered Southwest Willow Fly Catcher. A grove of young Cottonwood trees in the southeast corner of Galen's Pond has been excluded.

## Vegetation Cover Types (Species, height, density, etc.)

The target fuel in all units is cattail and bulrush. This species dominates the marsh areas within the units. Species that are commonly found in the riparian cottonwood woodland portion of the units include: cottonwood trees, and willow. Various grasses such as alkali and Giant Sacaton, Tobosa, Dropseeds, and Saltgrass are common in these areas, often times mixed or in transition with shrub species like Fourwing saltbush, New Mexico Olive Wolfberry, False Indigo Bush, and Seepwillow.

## Primary Resource Objectives

- To provide feeding habitat for migrating waterfowl and Sandhill cranes.
- To expose shallow open water and mud flat areas as habitat for puddle ducks, geese, shorebirds, marsh birds and other wading birds.
- Provide habitat for bitterns and rails.
- To contribute to and enhance a natural diversity of habitat types on the refuge.

## Objectives of the Fire

- Ensure firefighter safety throughout all aspects of the operation.
- Remove temporarily 90 percent of the cattail, Phragmites, and bulrush stands within the burn unit boundary to facilitate use in the area by migrating waterfowl, cranes, and shorebirds.
- Rejuvenate 80 percent of the grasses and forbs by removing decadent vegetation and facilitate the recycling of nutrients.
- To set back the vegetation successional stage in the areas dominated by cattails in order to encourage plants more beneficial to the ecosystem.
- Protect 100 percent of the areas designated by the refuge staff as values at risk
- Reduce fuel loadings in the burn units by 75 percent.
- Complete the burning operation with minimal degradation of the airshed.

## Acceptable Range of Results

- Remove temporarily 70 to 85 percent of the cattail, Phragmites, and bulrush stands within the burn unit boundary to remove litter and open up the marsh area.
- Rejuvenate 60 to 75 percent of the grasses and forbs by removing decadent vegetation and facilitate the recycling of nutrients in the burn units.



- Protect 90 percent of the areas designated as values at risk (leave trees) in the burn area.
- Reduce fuel loadings in the burn units by 55 to 70 percent.

## Unit 19

**Size:** 90 acres

**Description:** Unit is ringed on all sides by roads. NM State highway 1 makes the western boundary. 30 percent of the total area is open water. A large pond makes up the southern portion of the unit. The area to the north of this water has the highest density of cattail. Generally a fuel model 3. The northern portion of the unit is a Rio Grande riparian mix. Species in unit include; Alkali sacaton, cottonwood, Screwbean mesquite, saltbush, New Mexico olive, and more.

**Resource Concerns:** Protect the large cottonwood trees in the unit. Power lines along the highway. Unit could be used as an educational showcase due to its close proximity to the refuge headquarters. Keep fire out of the northern 1/3 of the unit. Keep smoke off Highway 1. Do a cut stump herbicide treatment on the Russian olive trees before burning.

**Fire Operation Concerns:** The refuge headquarters is adjacent to the block across the road to the northeast. Traffic control will be necessary along the highway. Keep fire out of the northern 1/3 of the unit. Wind with a westerly component is preferred.

## Galen's Pond

**Size:** 30 acres

**Description:** Unit is ringed on all sides by roads. A drained pond makes up the southwestern portion of the unit. The area to the north of the dry pond has the highest density of cattail. Generally a fuel model 3. Species in unit include; Alkali sacaton, Phragmites, cottonwood, Screwbean Mesquite, saltbush, New Mexico olive, and more.

**Resource Concerns:** Protect the large cottonwood trees in the unit. Keep fire out of the southeastern 1/4 of the unit.

**Fire Operation Concerns:** The main tour loop road serves as the west and east boundaries of the unit and will need to be closed.

## INCIDENT COMMUNICATIONS PLAN

Each single resource will be assigned a handheld radio. Each engine will have a minimum of 1 mobile radio and 1 handheld radio. All personnel assigned to an ignition team should have a handheld radio or must remain in verbal and visual contact with ignition crew leaders. Dispatch will be handled locally. Communication between zone and the burn boss will be via cell phone. The BLM Socorro repeater will be used as command only for emergencies.

### Radio Communications

Channel	Function	Frequency	Remarks
1	Operation	164.625	On-site radio communication FWS Direct
2	Command/ Dispatch	RX 169.650 TX 167.900 Tone 100	Dispatch <==> Burn Boss BLM Socorro Repeater
3	Crew Net	168.050	Or other crew net Tac 1

Operations will be used as the primary communication channel (Channel1) on the fire. If air operations are involved, consider a specific air-to-ground frequency.

### Safety Plan

#### Firefighter Safety

**Safety Zones and Escape Routes:** Safety zones have been designated as the perimeter roads that enclose the units. Marsh areas levees, roads, black zones, and open water will also serve as safety zones and escape routes.

**Safety Hazards:** working along the highway, heat, dehydration, snakes, insects, footing, shift in wind direction, vehicle travel, poor visibility, communication problems, and maintaining control of resources are all potential safety problems.

**Mitigation of Safety Hazards:** A pre-burn safety meeting will be held to identify the above listed hazards to the burn personnel. LCES will be in place at all times and all personnel will have a radio or be in close contact with someone who does. A pre-ignition safety briefing will be performed for all personnel involved with helicopter operations

**Job Hazard Analysis:** A job hazard analysis identifying site and project specific hazards and mitigation measures is attached.

#### Public Safety

All roads leading into the area will be signed to keep public from entering during the burn. Traffic control will be set up along the NM state Highway 1 as needed.

## Medical Plan

Notify the prescribed fire Burn Boss of any accident or injury. The prescribed fire ***Burn Boss will initiate on-site response as needed and coordinate additional needs through Bosque del Apache and the Gila/Las Cruces Zone.*** The first option is to transport to Socorro General Hospital. If using an ambulance send someone to meet the ambulance at the nearest paved road to lead them in. If using an air ambulance communicate latitude and longitude of helispot and on-site radio frequency.

**On-site EMTs/First Responders:** None identified (will be identified at briefing).

**First Aid Kits and Burn Kit Locations:** First aid kits can be found in each vehicle. Burn kits can be found in the FWS engines.

### Transportation

Name	Phone	Address	Paramedics Yes/No
Socorro FD	911	Socorro	Yes
San Antonio FD	911	San Antonio	Yes
Life Guard 1 Air Ambulance	1-800-633-5438	Albuquerque	Yes

### Hospitals

Name	Address	Ground Time	Air Time	Phone	Helipad Yes/No	Burn Center Yes/No
Socorro General Hospital	W.Highway 60	1.5 hr.	30 min.	505-835-1140	Yes	No
University Hospital	Albuquerque	1.5 hr.	30 min.	505-272-2111	Yes	Yes

## MOP UP AND PATROL PLAN

Mop up in the No-Wheel Drive Bosque Wetlands fuel types is minimal due to the quick nature with which the fuels burnout. There are few 100- and 1000-hour fuels within the units. Intensive mop up is generally only performed to control the perimeter of the prescribed burn or to reduce smoke emissions. Because of the nature of the burn very little mop up is anticipated. If mop up is deemed necessary it will be accomplished by the fully staffed fire engines as directed by the burn boss and/or holding boss. The engine crew leaders will patrol the burn perimeter and mop up as necessary to ensure containment and/or lessen smoke production. The Burn Boss will determine when the fire is out and safe to leave the area. This will be based on predicted and extended fire weather forecasts.

If significant wind events are predicted which may threaten the perimeter of the burn, mop up will be done to control those perimeters. If the ventilation/mixing height is poor or if residual smoke is anticipated to be a problem in valleys, drainages, or near roads or residences, mop up will be done to limit smoke production.

Patrols of the burn will continue daily until no smoke is visible during the 1200-1600 time period.



## WEATHER AND FUEL PARAMETERS

Acceptable Range	Low	High	Desired	Outside @ Critical Holding
Temperature	40F	85F	65F	85F
Relative Humidity	70%	20%	35%	20%
Wind Speed (mid-flame)	0	15	6	15
Slope	0	0	0	0
Wind Direction (any but east)				east
1-hr Fuel Moisture	15	3	4	3
10-hr Fuel Moisture	12	5	4	5
100-hr Fuel Moisture	14	7	10	7
Live Fuel Moisture	160	60	80	60

**Note:** Wind direction and wind speed are important factors for this project. A westerly component to the wind is preferred to move smoke emissions away from NM Highway 1 and the Bosque visitor center. There are two types of adjacent fuel beds on this burn. One is other wetland units. This is modeled under the low, high desired categories. The other is a more open less fuel loaded restored Bosque. This is modeled under fuel model 9 outside at critical holding which are all high end of the prescription variables. Outputs at the lower variables are listed with BEHAVE.

**Acceptable behavior range\* see BEHAVE runs for variables.**

BEHAVE Runs	Low	High	Desired	Outside @ Critical Holding
Rate of Spread	2.9	654	170	72.1
Flame Length	2.2	32.3	16	8.5
Spotting Distance	0	.2	.1	NA
Probability of Ignition	13	82	70	82
Fireline Intensity	331	10799	2555	593
Heat per Unit Area	625	900	820	488

## Resources

### Onsite

- Engine 2241 Type 4
- Engine 2061 Type 6
- Engine 632 Type 6
- Water Tender
- Two 6 wheelers

### Contingency

- Bosque Dozer, 15-minute ETA
- San Antonio VFD Type 6, 30-minute ETA