Gotier Trace Prescribed Fire

Equipment Loss - FLA

Introduction

On October 16th, 2017 a prescribed fire was conducted at Bastrop State Park (TX) by cooperating state agencies. The 209-acre unit is located within the 2011 Bastrop Complex fire scar where 34,000 acres of the "Lost Pines" were burned. The Bastrop Complex burned roughly 96% of the state park and dramatically altered the landscape. This change in the landscape has resulted in new challenges for natural resource managers and wildland firefighters. Fire managers have adapted by modifying management plans, burn-unit sizes, burn prescriptions, strategies, and tactics.

Additionally, constraints due to endangered species habitat, previous public wildfire sensitivity, and smoke management influence the prescribed fire program for the park. Two major roadways bound the park to the south (HWY 71) and to the north (HWY 21). Managing the prescribed fire so that the smoke does not impact traffic conditions is a major concern and requires that units be burned prior to heavy-traffic periods in the evening.

The objectives of the Gotier Trace prescribed fire were to reduce the fuel loading of live and dead fine fuels and 10-hour fuels (70%), reduce 100-hour and 1,000-hour fuels (30%), and kill less than 10% of the live over-story canopy. Fuels consisted primarily of young Loblolly Pine, Oak, and grasses with stringers of mature Loblolly.
During ignitions operations, several spot fires occurred with one resulting in the loss of a dozer transport.

Narrative

The week prior to the prescribed burn, the RXB2 requested an engine, dozer and any additional available resources that could be provided by the cooperating agency. The cooperating agency was able to provide a Type 4 Tractor Plow (DZ1) with bobtail transport and a Type 6 engine (ENG1). Equipment assignments were confirmed the day before the burn with five personnel. The lead agency provided a Type 6 Engine (ENG2), Type 7 engine, and seven personnel.

Prior to the burn on the morning of the 16th, the RXB2 made necessary notifications about the burn. After notifications were made, roads accessing the burn unit

were closed for safety of the public and those conducting the burn. A pre-briefing started at 09:00 and personnel were given the opportunity to scout the unit to gain situational awareness. At approximately 09:40 an operational briefing was given and then resources moved to Drop Point (DP) L for the test fire.

The test fire was initiated around 10:40. Following the test fire, ignitions began at 11:00 from DP-L to DP-O. At 11:30 firing continued from DP-O to DP-C. While this occurred, ignition operations continued at DP J-K-L-O to establish good black. The RXB2 encouraged ignitors working from DP-O to DP-C to increase their pace so that adequate depth was established prior to interior ignitions.

Transport parking location at spot fire #1

"Differing experience levels and expectations of fire behavior increased complexity of the firing operation."
-RXB2

Having finished at the test fire location, an ignitor began widening the black with interior ignitions from DP-J to DP-C at 12:15. Three spots occurred at 13:00 and were contained with ENG1 and ENG2. Ignitions from DP-C to DP-A began at 13:15. The RXB2 reemphasized the need to get good black established prior to interior ignitions. Shortly after, an ignitor was reassigned from DP-C to begin ignitions from DP-J to DP-G. There was a small spot fire near DP-H at 14:10 and was contained with ENG2.

Ignitions from DP-L to DP-A was completed at 14:20. Ten minutes later a spot fire (#1 on map) occurred near DP-O in needle cast. The contingency dozer (DZ1) was requested for the spot. The DZOP responded and parked in the green near the spot and unloaded. While unloading the dozer, the pavement on Park Road 1C was damaged. DZ1 bladed a line beside the transport in the grass, with the road on the opposite side. Fire activity was low, there were no containment issues, and the DZOP completed the line within 15 minutes. DZ1 loaded on the transport and was available for reassignment. Ignitions from DP-J to DP-G were completed at 15:00. Personnel met with the RXB2 at DP-A to discuss options for the remainder of the burn since ignitions were behind schedule. It was agreed that three igniters would conduct interior ignitions from DP-A to the DP-J/G line.

At 15:35, another spot fire (#2 on map) was reported near a previously mulched area by DP-A. DZ1 was mobilized for the spot. The DZOP recognized that the black in the burn unit was too hot for a parking location. The DZOP was also concerned with damaging the road by tracking across it. The decision was made to park in a sparsely vegetated area of the green, near the spot fire. ENG1 was nearby and the DZOP felt comfortable leaving the transport. Poor visibility due to smoke was also becoming a concern at this point.

"It was so smoky that it was hard to see the spot fires." –DZ1 Swamper

DZ1 unloaded and plowed a line around the transport before engaging spot fire #2. After DZ1 engaged the spot, the swamper returned to check on the transport and noticed mulch in the dirt of the plow line. At 15:40 the RXB2 requested an additional engine (ENG3) and personnel from the lead agency to assist with the burn. At 16:00, good progress was being made on the spot fire and it was nearly contained. An additional spot fire occurred near DP-J at 16:15 and was contained with ENG2 and hand tools.

At 16:30, containment was lost at multiple locations on spot fire #2. DZ1 notified the RXB2 that they were having issues with containment and requested additional resources. Additional dozer support was requested by the RXB2 through ENG1. Around 17:00 personnel reported hearing tires exploding. The RXB2 was notified by ENG1 that the transport was fully engulfed. Local fire department assistance was requested by the RXB2 for the transport fire.

At 17:15, another spot (#3 on map) was reported near DP-C. ENG2 was mobilized to suppress the spot. The local fire department arrived at 17:17 and began suppression on the transport fire. The additional lead agency engine (ENG3) arrived on scene but shortly afterwards experienced a pump malfunction. Interior ignitions continued at 17:30 from DP-A to DP-J/G line.

Cooperator equipment and personnel (DZ2 & ENG4) arrived on-scene at 17:45 and began suppression on spot fires #2 and #3. The RXB2 briefed the incoming ICT3 and ICT3(t) at 18:00 and transitioned the escape to a Type 3 incident. The ICT3(t) took command of suppression operations south of Park Road 1C and the RXB2 continued burn operations north of 1C. Final ignitions took place along Gotier Trace Road to finalize prescribed fire operations on the unit and were completed at 18:20. Two personnel were reassigned to monitor smoke impact on highways.

The local fire department completed suppression and left the scene at 18:50. The transport was reported as a total loss. Spot fires were lined by DZ1 and DZ2 around 19:40 and all resources continued mop-up and patrol. At 22:15, the escaped fire transitioned to a Type 4 incident and resources began clearing the scene. Mop-up and patrol continued for the next two days. The transport was recovered on the 19th.

Lessons Shared

- **Comfort Level**

  Some of the personnel on the burn expressed concerns about their comfort level with the tasks that they were assigned. Selecting personnel based on qualifications, experience, and comfort level can improve operational efficiency and ensure that objectives are met. Speak up if you are uncomfortable.

- **Clearly Defined Roles**

  Some personnel expressed confusion about the organizational structure of the burn and chain of command. Some roles were assumed while others were unclear. Clearly defined roles are critical in complex environments with multiple agencies. If these roles are not clearly communicated or understood, it's our responsibility to ask. "What is your responsibility? If you notice (or are unclear about) something, say something." – ICT3(t)

- **Evolving Fuel Type**

  The 2011 Bastrop Complex dramatically altered the landscape and presented new challenges with fuel loading and arrangement. The heavy dead/down and snags present major spotting and control issues for fire managers. Adding to the complexity is wide-spread flashy fuels (grass, young pine, oak brush). This requires us to adapt our prescribed fire and suppression strategies and tactics. "The fuel model is always changing from year to year. It never burns the same." – FFT1(t)

Lessons Shared - Continued

- **Crew Cohesion**

  Challenges were noted with integrating personnel who were unfamiliar with each other. In wildland and prescribed fire operations this is a common challenge and requires rapid team building among the group and is typically constrained by time. However, it's possible and worthwhile but it requires effort. "Working with other agencies is a positive, even if you have hiccups." – ENGB

"When you mix crews, you have challenges. You don't know each other and you may not trust each other. To mitigate these problems, we need to train together, adhere to NWCG standards, and work together as much as possible." – RXB2

- **Compounding Stress**

  Managing stress in a dynamic environment is a difficult task and the challenges of the day compounded on the firefighters. Workloads, resource constraints, challenging fuel models, and comfort levels added to the stress of personnel. Stress can greatly influence decision-making capabilities and performance. "My workload was a lot that day, more than I could handle. I felt comfortable but forgot to think about my transport." – DZOP

IN THIS PICTURE THERE IS AN ASH PILE AT THE TOP AND TO THE RIGHT OF THE ROAD (PR1C). THIS IS WHERE EMBERS WERE LOFTED ACROSS THE ROAD, IGNITING SPOT #2. THE DZOP IDENTIFIED THE PARKING LOCATION AS BEING SPARSELY VEGETATED AND CLOSE ENOUGH TO QUICKLY ATTACK THE SPOT. ENG1 WAS ALREADY ENGAGED IN SUPPRESSION ON PR1C. DZ1 PLOWED LINE AROUND THE TRANSPORT BUT DID NOT CONNECT IT TO THE ROAD. DUE TO ENG1 BEING NEARBY, CONCERNS OVER DAMAGING THE ROAD, AND THE RELATIVE EASE OF SUPPRESSING SPOT #1, THE DZOP FELT COMFORTABLE LEAVING THE TRANSPORT AND ATTACKING THE FIRE.

DZ1 TRACKED TO THE LEFT FLANK AND BEGAN BLADING LINE AROUND SPOT #2. THE SPOT PRESENTED CONTAINMENT ISSUES AND BEGAN JUMPING THE DOZER LINE. ENG1 WAS REQUESTED TO PROVIDE SUPPORT. THE SWAMPER RETURNED TO CHECK ON THE TRANSPORT AND NOTED MULCH IN THE PLOW LINE BUT FELT COMFORTABLE WITH THE LOCATION. DURING THIS TIME, MULTIPLE RESOURCES PASSED BY THE TRANSPORT AND FELT COMFORTABLE WITH WHERE THE EQUIPMENT WAS PARKED. WHILE WORKING ON SPOT #2, ENG1 HEARD TIRE EXPLOSIONS, RETURNED TO THE TRANSPORT AND FOUND IT ON FIRE.

IT IS STILL UNCLEAR IF ADDITIONAL EMBERS SPOTTED ACROSS THE LINE OR IF FIRE FROM SPOT #2 FLANKED THE FIREFIGHTERS AND IGNITED THE TRANSPORT.

Lessons Shared - Continued

- **Securing Equipment**

  Every piece of equipment parked on a fire needs to be secured. What is your standard for securing equipment?

  Similar to safety zones, there are various factors that influence how we secure equipment. Fuels, current and expected fire behavior, topography, land use considerations, and human factors should all be considered in the decision making process. Common practices include parking in cold black or a previously cleared location, building a safety zone for equipment or building a line around the equipment. If needed, transports can be relocated to a separate location once the dozer has been unloaded. Refer to page 8 in the IRPG for safety zone considerations.

  Other considerations are to ensure that equipment is free of debris, the size of the parking location is adequate for the equipment, is accessible and can be readily moved (i.e. Keys left in ignition, ramps put back up, chains left on deck, etc.).

What We Would Do Again

- **Situational Awareness**

  From the beginning of the day, personnel took the initiative to scout the burn unit and identified potential trouble spots. All of the personnel interviewed noted changes in fire behavior, challenges with fuels, and weather observations. When conditions became smoky and stressful, the DZOP ensured that the swamper was in a safe location away from the equipment.

- **Accountability**

  Safety of the crews was the highest priority and individuals provided leadership to ensure that everyone was safe. Crews worked together to maintain a consistent operational tempo for the burn. After the transport ignited, crews recognized the situation and realized that they still had a job to do. They continued their duties of suppressing the spot fires. Ignitions continued in order to finish the burn and mitigate smoke impacts on roadways.

- **Incident Complexity & Transition**

  The RXB2 and resources on-scene realized that the incident was becoming more complex. After the transport ignited, the decision was made to transition to a Type 3 management level due to the loss of equipment and stress of the individuals involved.

When a significant event happens, additional leadership can mitigate some of the stresses that personnel are facing. It allows personnel to transition back to their assigned roles and focus on the task at hand.

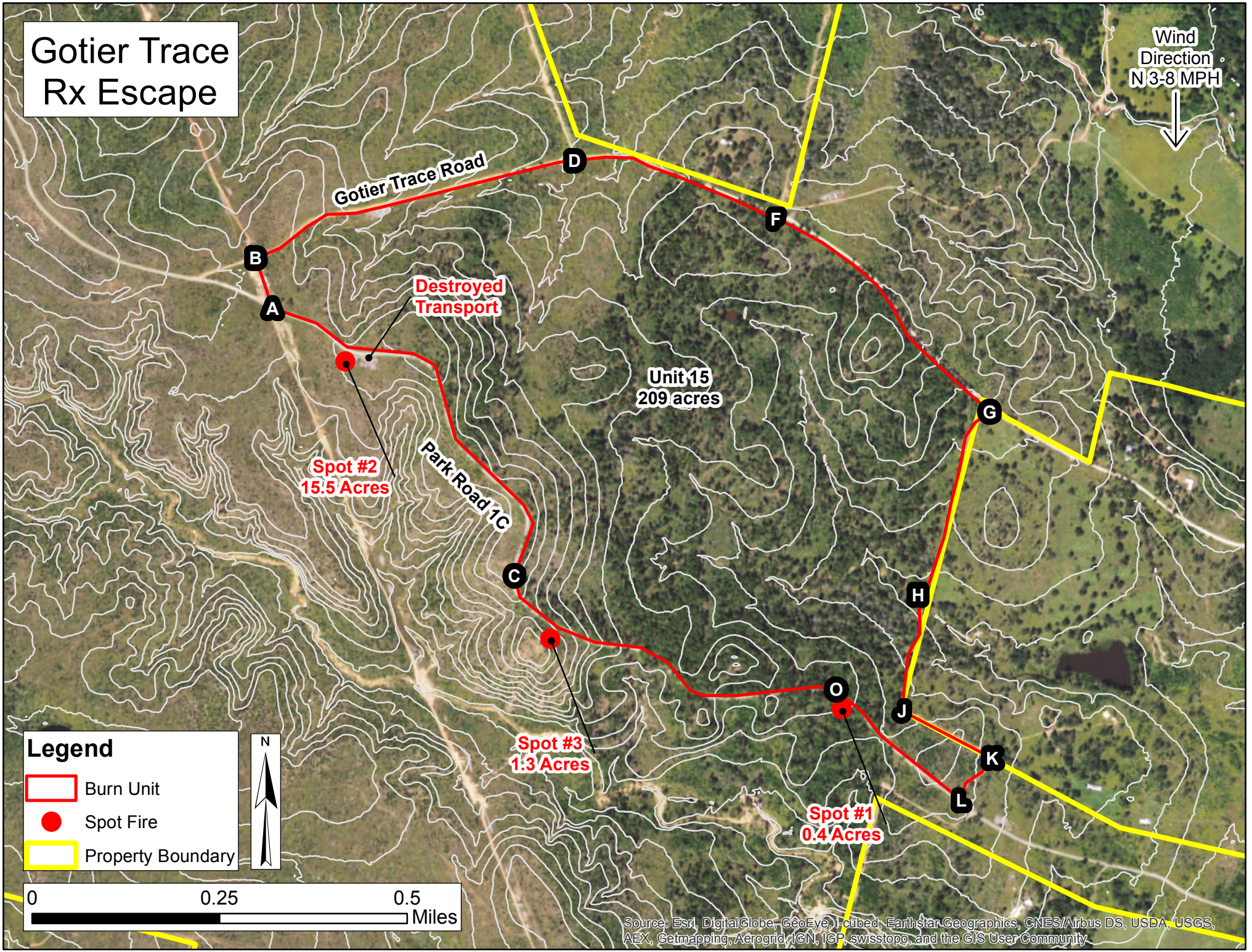
- **Support (Peer, Supervisor, Agency)**

  Peer support, supervisor support, and agency support were all discussed as being positive and reinforced that personal safety is the top priority. While it was a piece of equipment, the loss of the transport had an impact on the morale of the group. Providing support to the group helped to reassure them that it was going to be okay. "After the transport caught fire, morale just bottomed out." – ENGB

"It was just sickening to watch the transport burn and know that we couldn't do anything." – ENGB

Timeline of Events	
Time	**Event**
09:00	Pre-briefing & scout unit
09:40	Briefing at DP A/B
10:10	Made proper notifications
10:40	Test fire at DP L
11:00	Began ignitions from DP L to DP O
11:30	Continued ignitions from DP O to DP C
11:30	Continued ignitions at DP's J, K, L, O
12:15	Begin adding depth to black-line from DP J to DP C
13:00	3 spots found west of DP O; contained by the engines 1 & 2
13:15	Continued ignitions from DP C to DP A
13:45	Interior ignitors pulled from DP C to begin ignitions from DP J to DP G
14:10	Spot fire near DP H; contained with engine 2
14:20	Completed ignitions from DP L to DP A
14:30	Spot fire near DP O; mobilized contingency dozer (DZ 1)
14:45	Spot fire contained with contingency dozer (DZ 1)
15:00	Ignitions completed from DP J to DP G
15:10	Assembled crew at DP A to discuss options for remainder of burn
15:20	Sent 3 igniters from DP A through interior of unit to J-G line
15:35	Spot fire in mulch pile near DP A; mobilized contingency dozer (DZ 1)
15:40	Mobilize additional personnel to help with spot
16:00	Good progress on spot; almost contained
16:15	Spot at DP J; contained with engine 2 and hand tools
16:30	Lost containment at multiple locations on the spot fire near DP A
16:30	Requested additional dozer through on-site representative
17:00	Heard explosions and notified via radio that transport was on fire
17:00	Request fire department for transport fire
17:15	Another spot reported near DP C; engine 2 mobilized
17:17	Fire department arrives and begins suppression on transport fire
17:20	Additional Type VI engine arrives on-scene; subsequently breaks down
17:30	Continue interior ignitions from DP A to J-G line
17:45	Additional dozer and engine arrive on-scene for suppression of spots
17:50	Begin ignitions along Gotier Trace Road
18:00	Briefing with incoming ICT3 & ICT3(t); transition to Type III incident
18:00	ICT3(t) takes operations south of Park Road 1C; RXB2 north of 1C
18:20	Ignitions completed
18:25	Reassigned two firefighters to monitor smoke on highways
18:50	Fire department departs from scene; transport is total loss
19:38	Spot fires are lined by dozers; continue mop-up and patrol
22:15	Transition to Type 4 incident; resources clear the scene

The FLA Team would like to thank all of the participants for their willingness to share.


Gotier Trace
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Wind
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Destroyed
Transport
Unit 15
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Spot #2
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Park Road 1C
Spot #3
1.3 Acres
Spot #1
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