UNIT 38 SOUTH

DECLARED WILDFIRE

REVIEW

FINAL REPORT
July 28, 2021

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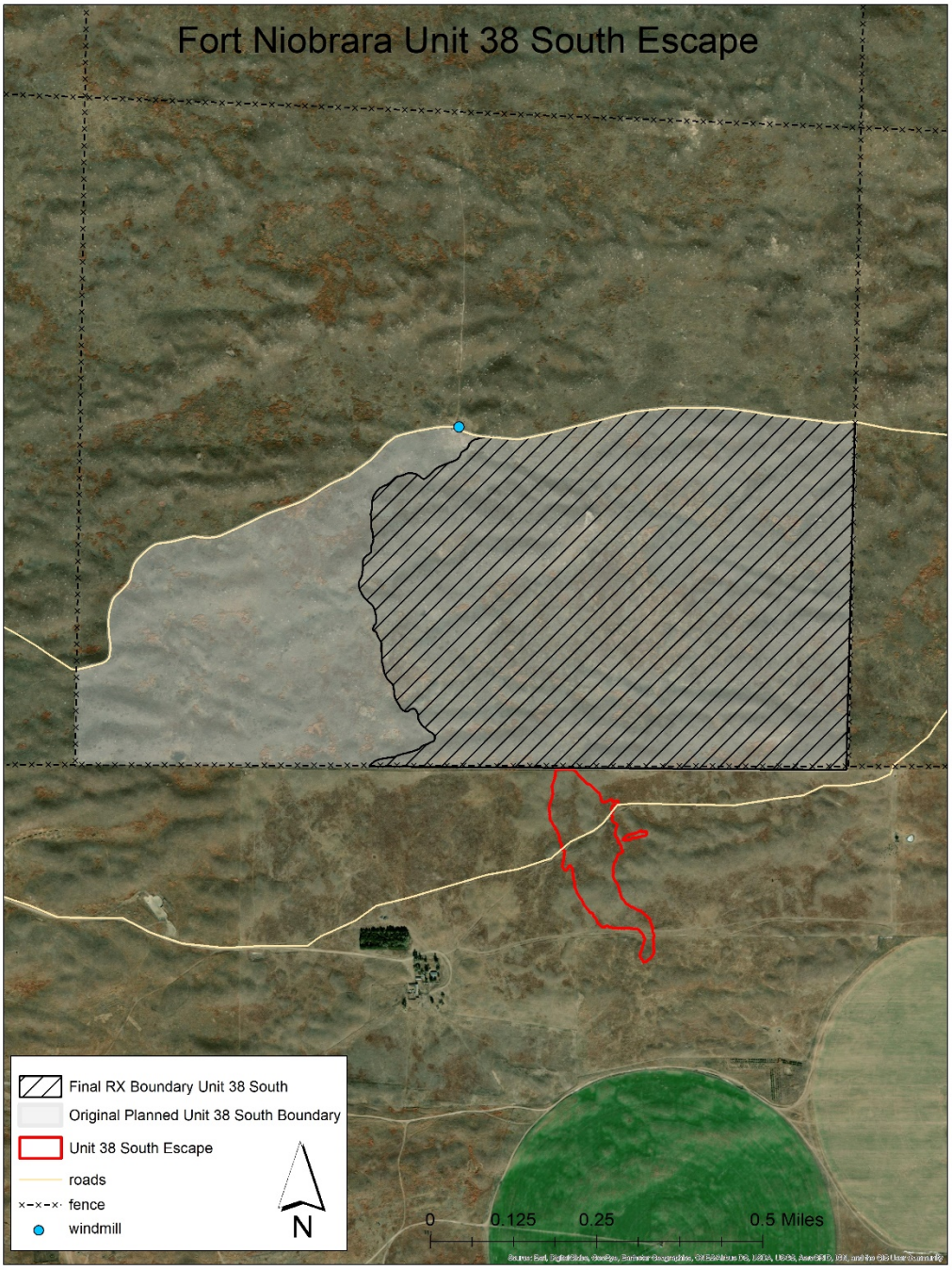
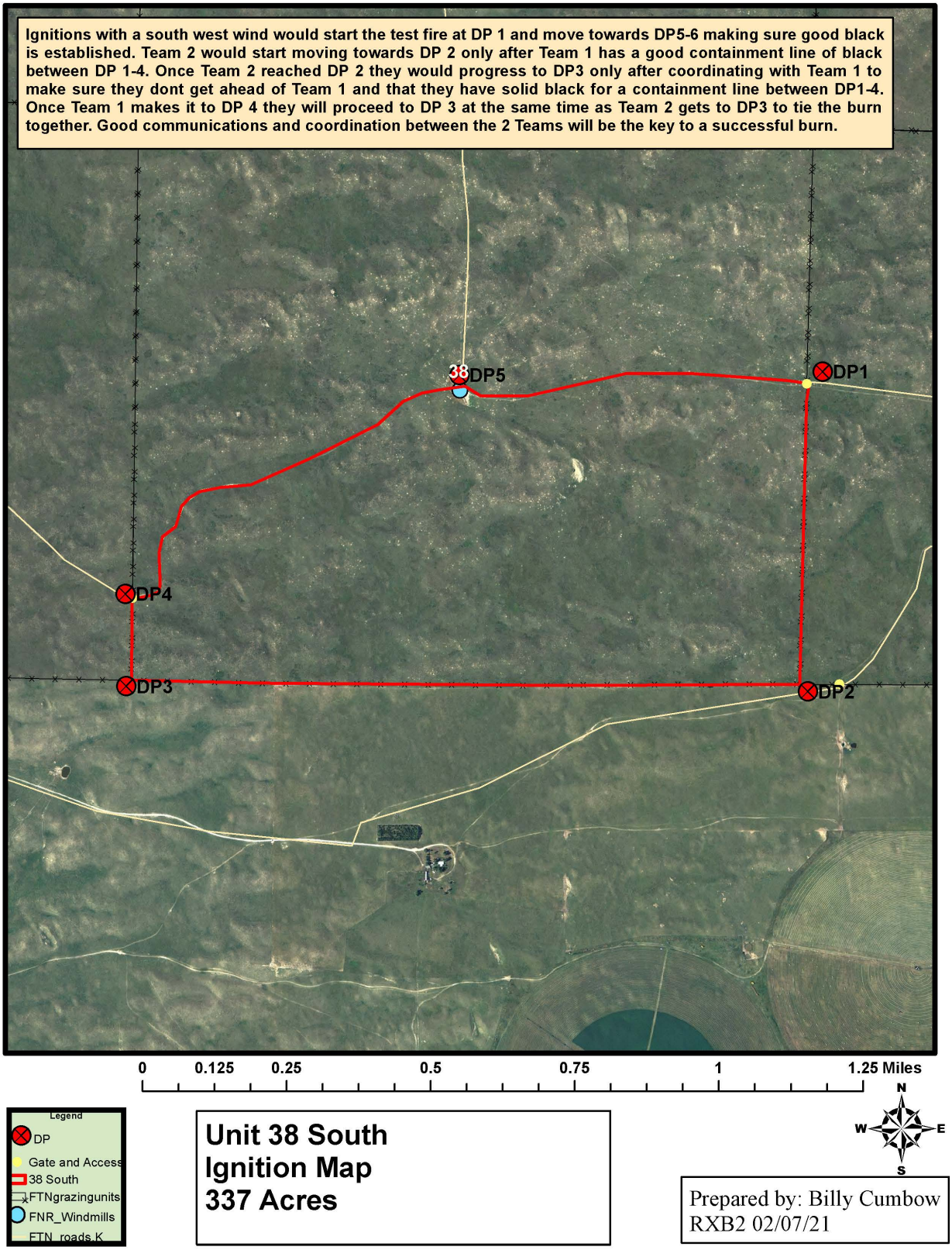
INTRODUCTION

On May 4, 2021 the Great Plains Fire Management Zone conducted a prescribed burn on Unit 38 South at Ft. Niobrara National Wildlife Refuge (Refuge), Nebraska. Unit 38 South is 337 acres of Fuel Models1 and 3. This unit was rated moderate complexity. There was a large fire whirl that traveled from the middle of the unit across the Southern holding line, resulting in a 12 acre slop-over on private land, causing the prescribed burn to be declared a wildfire.




Ignitions with a south west wind would start the test fire at DP 1 and move towards DP5-6 making sure good black is established. Team 2 would start moving towards DP 2 only after Team 1 has a good containment line of black between DP 1-4. Once Team 2 reached DP 2 they would progress to DP3 only after coordinating with Team 1 to make sure they dont get ahead of Team 1 and that they have solid black for a containment line between DP1-4. Once Team 1 makes it to DP 4 they will proceed to DP 3 at the same time as Team 2 gets to DP3 to tie the burn together. Good communications and coordination between the 2 Teams will be the key to a successful burn.
38
DP5
DP1
DP4
DP3
DP2
0
0.125
0.25
0.5
0.75
1
1.25 Miles
Legend
DP
Gate and Access
38 South
FTNgrazingunits
FNR_Windmills
FTN_roads.K
Unit 38 South
Ignition Map
337 Acres
N
W
E
S
Prepared by: Billy Cumbow
RXB2 02/07/21

The Review Team consisted of:

- Kathryn Sebes, Wildland Fire Module Supervisor, USFWS/Balcones Canyonlands NWR (Team Lead)
- Ryan Cumbow, Engine Captain, USFS/Fort Pierre Ranger District
- Rich Sterry, Regional Fire Management Specialist, USFWS/Region 6

SUMMARY NARRATIVE

On May 3, 2021, Prescribed Fire Burn Boss 2 (RXB2) and Prescribed Fire Burn Boss trainee (RXB2t) scouted three prescribed fire units on the Ft. Niobrara National Wildlife Refuge (NWR). All three units were determined to be good options for burning on May 4, 2021. Spot weather forecasts were requested for each prescribed fire from the National Weather Service (NWS) in North Platte, NE, and resources were told to be at the Fort Niobrara NWR fire cache at 0900 on May 4.

A second round of spot weather forecasts were requested at 0600 the morning of the 4th. Both forecasts came back with predicted winds from the South between 4 and 9 mph, sunny, maximum temperature 65° F, minimum relative humidity of 22%, mixing height 10,000 ft. Above Ground Level (AGL), and Haines Index of 5. It was determined that crews would start the day with Unit 38 South, and potentially move on to a second or third unit depending how the day progressed. Once all the resources had arrived at the Fort Niobrara NWR fire cache, the initial briefing was held at 1015. With the forecasted south winds, the plan for the two firing teams was to start at Drop Point (DP) 5 on the North line and have one taskforce (Zulu) work east, and the other taskforce (Alpha) work West. After remarks from the Agency Administrator and the Refuge Biologist, resources proceeded to scout Unit 38 South.

Resources arrived at the unit around 1100 and filled their equipment with water. Upon arrival at the unit, RXB2, RXB2t, Task Force Leader (TFLD) Alpha, TFLD Zulu, and TFLD Zulu trainee (TFLDt) met at DP5 to confer about the current observed weather. The winds at the time were mostly from the West, and light and variable. The RXB2t called the NWS to discuss the discrepancy in the forecasted weather and the actual on-site conditions. RXB2t was advised by the NWS that the South wind would show up around 1200 and remain Southerly throughout the afternoon. With this information it was decided to move the test fire location from DP 5 to DP 1 in the Northeast corner of the unit and re-brief indicating that Zulu would fire from DP 1 to DP 2 to DP 3, and Alpha would move from DP 1 to DP5 to DP4 to DP 3. TFLD Zulu and TFLDt Zulu scouted the line from DP 1 to DP 2, and noted a little Northwesterly direction in the wind, but predominantly from the West. It was determined that DP 1 would be the best location for the test fire, and at 1130 the test fire was initiated. The winds still had a slight Northwesterly direction in them at the test fire. Zulu carried fire up to the top of a hill on the East line to see if there was a different effect. At this point, they started to get a West wind with a little Southerly component, and the decision was made to continue with ignitions. On-site weather observations at 1200; temperature 59° F, RH 32%, wind 4 mph gust of 10 mph from the South/Southwest. Zulu proceeded South on the East line. About ¾ of the way down the East line, TFLD Zulu and TFLDt Zulu noticed it looked like the fire ignited by Alpha was occasionally pushing towards their line. They scouted back towards DP 1, decided the fire was being driven by the terrain, and was not an immediate threat.

At 1230, with the winds still being inconsistent, RXB2t called the NWS again, and was told that within the hour prevailing winds would be from the South. Zulu made it to DP 2 and sent igniters back to widen the black. Alpha had been slowly moving West on the North line during this time, keeping up with the fire. After TFLD Zulu was comfortable with the amount of black on their East line, they turned the corner at DP 2 and started to move West on the South line. TFLD Zulu communicated to TFLD Alpha that they had turned the corner and were comfortable with Alpha starting to proceed west as well. Alpha, having had to move to keep up with the fire was now in the area of DP 5. Zulu moved west about 100 ft. down their line. Fire behavior began to pick up within the unit, with some dust devils noticed, and TFLD Zulu became worried about being able to stay ahead of Alpha's fire, which was pulsing across the unit. RXB2, RXB2t, TFLD Alpha, and TFLD Zulu, discussed moving Alpha's resources around to DP 3 to work east towards Zulu with the thought of limiting the chance of escape on the South line. It was decided not to implement that plan with the forecasted South winds potentially arriving soon. Zulu's fire was currently pulling in so he instructed his igniter and lead holding resources to move quickly forward another 300 feet while using the UTV to fill in the interior unburned gap. At this time, RXB2 and RXB2t, were moving around the unit to the South line with a water tank to tie in with Zulu and help refill his holding resources.

At 1240 occurrence of a fire whirl was transmitted over the radio. TFLD Zulu communicated with his resources and at the time it appeared the fire whirl, (described as about 100 ft. in diameter at the base with flames about 60 ft. high), would parallel the line. There was about one chain of black on the South line. Seconds later, after communicating the fire whirl was paralleling the line, it rounded a hill and took on a Southerly direction. The fire whirl moved across the South line and onto the private land on the other side of the big game fence. Fort Niobrara NWR has big game (bison and elk) fencing that surrounds the perimeter of the Refuge. In briefing, it had been communicated to not cut this fence, so TFLD Zulu directed his resources start heading to the closest gate to gain access to the escaped fire. TFLD Zulu sized up the slop-over and advised RXB2 and RXB2t to call the contingency resources.

At 1300, the prescribed fire was declared a wildfire and TFLD Alpha was assigned as Incident Commander (IC) while calls were made to Agency personnel to notify them of the incident. Zulu's resources made it through the gate to the declared wildfire, and started to employ an anchor, flank, and pinch technique. The engine that had been sent from Alpha's side of the fire, determined that it was best to cut the fence for better access, and proceeded to take the other flank of the declared wildfire. The resources on the wildfire had the flames knocked down around 1305. The contingency resources, local Volunteer Fire Department (VFD), arrived shortly after. With the declared wildfire contained at 12 acres, the prescribed fire resources returned to the prescribed fire unit and the VFD remained at the declared wildfire to monitor the area. The RXB2 and RXB2t determined the best course of action would be extinguishing the prescribed fire, which was still flanking fire in the original burn unit. Zulu and Alpha's resources had the fire in the prescribed fire unit contained at 1325. Resources then mopped up and patrolled the prescribed fire. While mopping up the prescribed fire, Zulu's resources noticed a small dust devil within the wildfire perimeter, and alerted the VFD of a small spot fire it created outside the wildfire perimeter who quickly contained it. Resources continued to mop up the prescribed burn and wildfire until it was determined safe for all personnel to gather at DP 5 for an After Action Review (AAR) around 1600. The overhead from the prescribed fire met with the Agency Administrator after the AAR to discuss the events of the day.

PRIMARY FINDINGS & RECOMMENDATIONS

An analysis of seasonal severity, weather events, and on-site conditions leading up to the wildfire declaration. Include fire weather forecasts including any spot forecasts, Remote Automated Weather Station (RAWS) data and National Fire Danger Rating System (NFDRS) data:

- Findings
    - All parameters were within prescriptions, and no significant NFDRS indices caused concern.
    - The nearest Remote Automated Weather Station (RAWS) is the Valentine RAWS. This station stopped functioning May 3 at 2000, however; the burn plan states that a local RAWS "*can* be used" to "compare on-site observations collected by burn personnel..." One individual was assigned to collect weather observations.
    - ERC (Fuel Model Y) and Drought Indices were near average values for the time of year.

- Recommendations
    - Include special considerations for burning in light and variable winds into prescribed fire plans. Light and variable winds, combined with fire ignition patterns and subtle topography changes are more likely to generate fire whirls.

An analysis of the actions taken leading up to the wildfire declaration for consistency with the prescribed fire plan. This will include whether it was adequate and whether it was followed:

- Findings
    - The RXB2 and RXB2t recognized the differing onsite weather conditions compared to the forecasted conditions. The NWS was called multiple times to talk about the discrepancies.
    - The process for declaring the prescribed fire a wildfire were identified in the prescribed fire plan. The actions identified in the prescribed fire plan for declaration of a wildfire were followed and met.
    - FWS policy requires any prescribed fire burning off of Federal lands onto non-Federal lands without an existing agreement with the landowner(s) be declared a wildfire immediately. The wildfire was declared about 15 minutes after fire had crossed onto private land. However, this did not have any effect on management of the fires.

- Recommendations
    - Units need to be aware that once a prescribed fire crosses off of Federal lands and an existing agreement is not in place with the landowner(s), FWS policy requires it to be declared a wildfire regardless of size or timeframes.

An analysis of the prescribed fire plan for consistency with policy:

- Findings
    - Review for currency on the programmatic plan did not have the Agency Administrators signature. Behave runs were not included in the appendix for programmatic plan.
    - The Great Plains Fire Management Zone utilizes programmatic prescribed fire plans at the Refuge or County (for Wetland Management Districts) level. Individual unit plans described specifics for the individual units are then used for burn day operations.
    - Fire Behavior Modeling and Technical Review for the programmatic plan were not included in appendix.
    - All ignition units in moderate and high complexity programmatic prescribed fire plans are required to have site specific information included and undergo a technical review (FWS Fire Management Handbook). The programmatic prescribed fire plan (completed and technically reviewed in 2017) contains a general description of the Refuge but does not identify individual prescribed fire units. The Individual Unit Plan (IUP) was technically reviewed on 2/27/2021.

- Recommendations
    - Ensure the programmatic plan and all individual unit plans are reviewed annually for all needed information and have the proper signatures.
    - Prescribed fire units that are to be burned as part of the programmatic plan need to be identified in the programmatic plan. This is required so the person completing the technical review can evaluate the individual units and provide a more thorough review. The IUP does not need to be technically reviewed.
    - Ensure all appendices are attached to the programmatic plan.

An analysis of the prescribed fire plan and associated environmental parameters:

- Findings
    - The prescribed fire parameters were within prescription and all required resources were on-site to safely burn the prescribed fire unit.
    - Light and variable wind made ignitions/holding difficult. A fire whirl occurred within the prescribed fire that could not be predicted, but are common with light and variable winds.
    - Behave runs for the programmatic prescribed fire plan were completed using Behave Version 4.4 and the 13 Fire Behavior Fuel Models described by Anderson. There is more current fire behavior modeling software being used in addition to updated fuel models.
    - There is also a description in the prescription criteria of how green fuels affect fire behavior as well as wind correction factor.
    - The programmatic prescribed fire plan states a prescribed fire will be declared a wildfire if a slop-over or multiple slop-overs occur on private lands outside the burn unit greater than 1 acre in size.

- Recommendations
  - Consider changing low end wind prescription or adding verbiage regarding light and variable winds for RXB2 to consider.
  - While no single software program is required, Behave Plus is highly recommended since it: allows changing the wind correction factor, uses live fuel percentages to show fire behavior changes associated with fine dead-fuel moisture, and uses the 40 fuel models as described by Scott and Bergan.
  - Update programmatic prescribed fire plans regarding prescribed fire being declared wildfires when crossing off Federal lands without an agreement (per FWS policy in FMH).

A review of the approving line officer's qualifications, experience and involvement including adequate program oversight:

- Findings
  - Agency Administrator has not taken required M-581 (Fire Program Management, an Overview) class or applicable FWS supplemental training.

- Recommendations
  - The Project Leader/Refuge Manager, or principal acting, will meet required elements outlined in the *Management Performance Requirements for Fire* Operations table, located in the *Interagency Standards for Fire and Fire Aviation* within two years of appointment. Fire Program Management, an Overview, class M-581, is one of the required elements on that table.

A review of the qualifications and experience of key personnel involved:

- Findings
  - All key personnel were very experienced for the positions they were in.
  - Five FWS personnel did not show fully qualified in positions they were filling at the time of the prescribed fire and/or wildfire according to IQCS.
    1. TFLD Alpha - Fire Refresher (RT-130) and/or fitness rating had expired. A Work Capacity Test (WCT) (aka fitness test) was completed May 24, 2018 therefore expiration date would be May 24, 2019, however; a fitness test was not completed in 2019. In 2020, fitness tests from 2019 were "rolled-over" as part of Covid-19 mitigation (FMB Memorandum No. 20-001) and documented in IQCS as a manually awarded competency. This was documented manually as Arduous with a date of April 15, 2020 in IQCS; however, since the individual had not completed fitness test in 2019, this competency should not have been manually awarded.
    2. Mule operator (UTVO) - FWS requires Off-road Utility Vehicle Training for operating ATVs or UTVs and also has 3 year refresher requirements. The 3-year refresher is not tracked in IQCS because it is a non-fire requirement. The only fire specific requirement is UTVO meets "current certification as an operator per agency policy." If the 3-year refresher is not completed, it is possible for the responder to still show qualified as a UTVO even if they do not meet the agency non-fire requirements.
    3. All-terrain vehicle (ATV) operator – see bullet #2 above.

4. STOPt - Specialty Tracked Operation (STOP) is a FWS position with requirements listed in Federal Wildland Fire Qualifications Supplement (Pg. 18 of 2021 version). In STOP description, "Qualified STOPs and trainees must be current and certified operators per FWS Vehicle and Equipment policy (321 FWS 1) prior to working on wildland fires". Furthermore, it is understood that to be certified to operate the equipment (FWS Equipment and STOP training (SAF-2010 completed) before being assigned to a wildland fire as a trainee. This may have been the case, but was not documented in IQCS. Most wildland fire positions allow issuance of a position task book before all required training is completed. However, this appears to create an issue regarding the STOP position as the requirements to be Equipment certified and complete STOP training are really prerequisites. On the prescribed fire organization chart, the operator of the Scout (STOPt) was not identified as a trainee as all required training has been completed, and subsequently no STOP trainer was identified. Standards for Wildland Fire Position Qualifications (PMS 310-1) states: the primary criteria for qualification is a Trainee's performance as observed by an Evaluator through the [Position Task Book] PTB.
5. Firefighter Type 2 – fitness and refresher expired on February 21, 2021

- Recommendations
  - Ensure all responders are qualified and current for all wildland fire positions. This includes all required training and support documents are accurate and available in a consolidated location (hard copy or electronic), as per agency policy (pg. 283 of 2021 *Interagency Standards for Fire and Fire Aviation Operations*).
  - Trainees need to be observed by a qualified evaluator while certification is the responsibility of the agency's certifying official.
  - FW404 (ORUV Training) needs to be completed and tracked per regional policy regarding ATVO/UTVO qualification and operations. This includes the 3-year refresher requirement.

A summary of causal agents contributing to the wildfire declaration:

- Findings
  - Unexpected weather (light and variable winds).

- Recommendations
  - See previous comments about light and variable winds.

Determine the level of awareness and understanding of procedures and guidance of the personnel involved:

- Findings
  - All resources involved had great understanding and awareness of the policies with the exception of declaring a wildfire if a prescribed fire escaped onto private land. Policy was followed as the prescribed fire plan states for declaring an escape and informing those involved.

- Recommendations
  - Ensure all personnel, including non-fire staff, understand the policies associated with a wildfire declaration.

Establish accountability:

- Findings
  - A lack of currency and oversight of required training and documentation of such training was found for multiple USFWS employees participating in the prescribed fire.

- Recommendations
  - Better IQCS management is recommended. A training and certification documentation and entry system needs to be implemented, verified, and enforced.
  - Copies of training certificates, position task book completed, etc., should be uploaded to IQCS. Uploading to IQCS eliminates requirement of having hardcopy folders (p. 281 of 2021 Interagency Standards for Fire and Fire Aviation Operations).

Synopsis of Lessons Learned

After reviewing all prescribed fire plans for the Fort Niobrara NWR; the forecasted weather, NFDRS values for the area and the prescribed fire were all within prescription parameters to safely conduct the May 4, 2021, Unit 38 South prescribed fire. All personnel had the experience to fill the organizational chart, however; were not fully qualified in the IQCS system of record used by the USFWS fire program. Other individuals still showed trainee status in IQCS causing further questions for the investigation team. While these factors did not seem to have a direct effect on the prescribed fire implementation or how the declared wildfire was handled; it is recommended that administrative work be prioritized and appropriate staff hired and trained to perform this function. Through discussion with the Regional Fire Management Coordinator, if this function is not being completed it is the responsibility of the Zone FMO/RFMC to resolve the issue(s).

The fire whirl that formed during the prescribed fire was an unpredictable occurrence but they are common with light and variable winds which needs to be recognized. On-site personnel did a good job of handling the declared wildfire safely and efficiently.