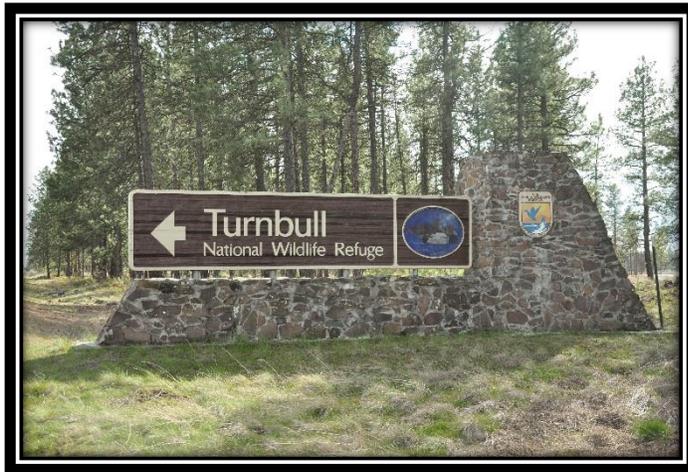




Using Prescribed Fire as a Management Strategy in the Turnbull National Wildlife Refuge¹

Project Report



Turnbull NWR was established in 1937 and today encompasses approximately 18,217 acres of Channeled Scablands. Early management focused on restoring wetlands for waterfowl while the ponderosa pine forests, which predominate many areas of the refuge (approx. two-thirds), were left unmanaged. With the advent of fire suppression policies during the 20th century, forests conditions at Turnbull NWR have changed dramatically.

Currently, stand conditions in many areas of the refuge have densities exceeding 400 trees per acre. These stands have excessive levels of understory fuel that could eventually contribute to an extreme wildfire.

Management strategies developed for Turnbull NWR call for the integration of a variety of techniques to restore natural stand conditions, reduce hazard fuels and improve wildlife habitat. These strategies include various types of thinning followed by the application of prescribed fire.

On April 14, 2015 the NW Fire Science Consortium sponsored a technical field tour to the refuge, led by Mike Rule, refuge wildlife biologist, and Doug Frederick, Assistant Fire Management Officer. The tour included five stops; starting at the Headquarters for an overview of the refuge and discussion on management strategies.

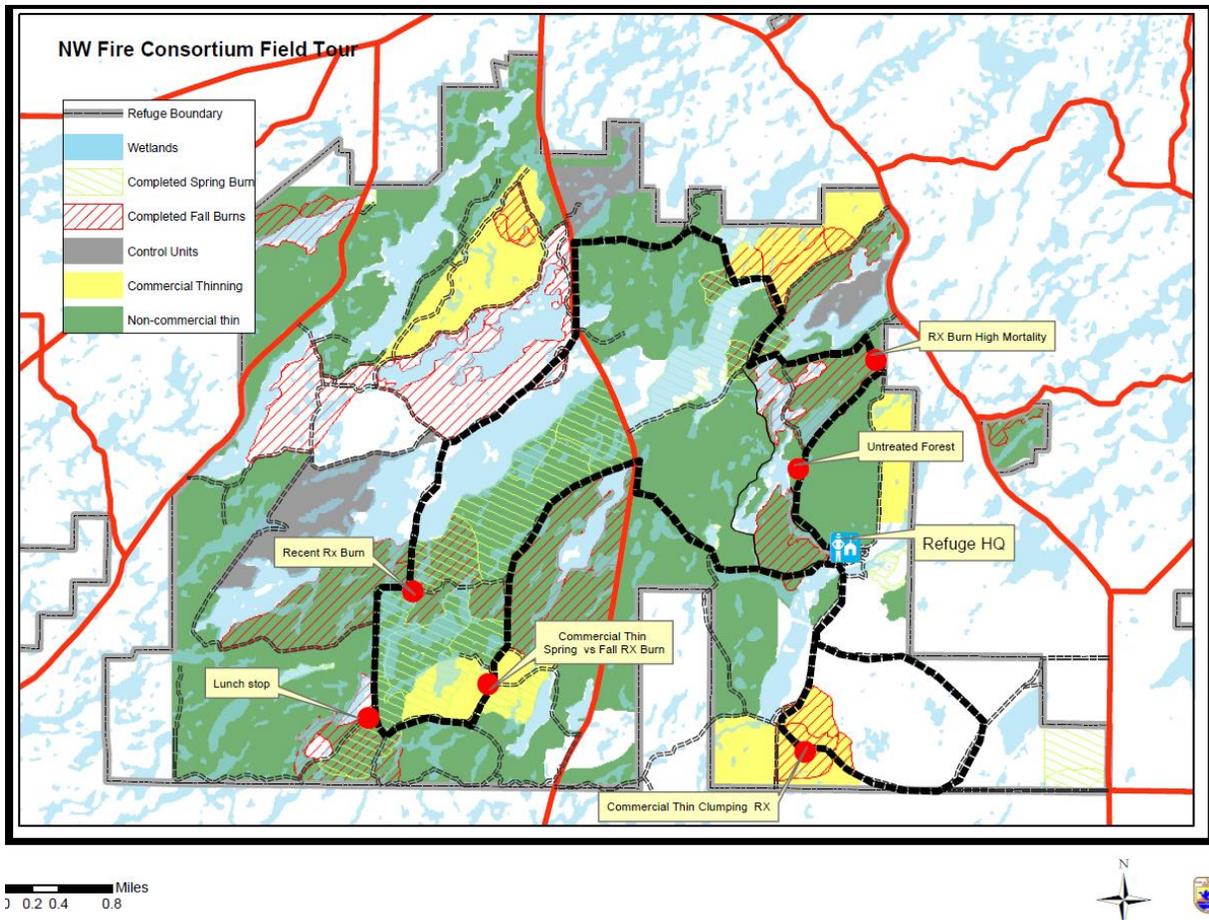
Stop 1: Untreated forest

Stop 2: Fall Rx burn with high pine mortality and subsequent hardwood re-establishment

Stop 3: Recent fall Rx burn (<2 years)

Stop 4: Commercial thin with Rx Burn – spring vs. fall burning

Stop 5: Recent commercial thinning with a clumping prescription with Rx burn



Discussion points included:

1. In the untreated forests, precipitation in the form of snow isn't reaching the understory and consequently, water is not flowing back into the system. This is very apparent in drought years. However in aspen stands, snow does reach the understory and recharge is not an issue. [Stop 1]
2. Under current refuge conditions, fall burning alone was only partially effective in reducing tree densities in overstocked size classes.
3. The mature size class (>50.8cm DBH) of ponderosa pine was vulnerable to fire, especially during drier than normal years. [Stop 2]
4. Manual thinning trees <=8" DBH, piling and burning slash, then conducting fall broadcast burn was not achieving reduction objectives in overstocked intermediate size classes. [Stop 3]
5. Managers tried commercial thinning to achieve a greater reduction in the small to intermediate size classes. [Stop 4]

6. The combination of non-commercial and commercial thinning followed by fire resulted in greater reductions of overstocked intermediate size classes, but results were variable among units.
7. Spring vs. fall burning – spring burns in patches and fall burns more uniformly. Timing of the burn is indicative of the results you get!
8. It's important to use a strategy that maintains a distribution of snags necessary to sustain breeding populations of cavity excavating wildlife species of the tree and snag bole breeding guild.
9. Turnbull NWR has a goal to provide at least two downed trees per acre, 15-17" in diameter at the large end and 20' or more in length, to support the members of the terrestrial covered surface breeding guild (salamanders, small mammals, snakes, etc.) requiring this habitat feature.
10. Turnbull NWR has begun managing for resilient spatial patterns using a science-based clumping prescription. [Stop 5]



Post thinning and Rx burn view of clump prescription.

11. Turnbull NWR has a small burn window in both the spring and fall, but the most limiting factor to getting fire on the ground is smoke issues.
12. Wildlife monitoring of small mammals, reptiles, amphibians, and landbirds in various forest treatment plots has included measures of 1) abundance, 2) species richness, 3) species diversity, 4) evenness.



Pitfall trap used to capture small mammals, reptiles, and terrestrial amphibians.

13. No significant change in abundance was found for the small mammal community, but they found greater species diversity in thinned and burned units.
14. Tree/bole and snag breeders generally increased in relative abundance with understory thinning, with the exception of pygmy nuthatches and chickadees.
15. Tree canopy breeders showed a variety of positive and negative trends to thinning and burning treatments.
16. Elk herbivory is a big issue for several riparian and hardwood tree and shrub species, including aspen and willow.

Take home messages:

1. Adaptive management is necessary!
2. When you burn matters – fall burning is generally more effective at reducing understory fuels than spring burning.
3. Smoke management is an ever-increasing challenge
4. Analysis is far from done – lots more to learn!

Evaluation results

Ninety-three percent of respondents indicated that they intend to use the information they received during the workshop in their work. When asked if they would recommend the tour to others, 93% said yes. When asked if they would attend another field tour on the subject, 60% of respondents said that they would attend.

Participants were asked to indicate the usefulness of the materials and information presented (where “5” is very useful and “1” is not at all useful):

Material overall

| <u>Rating</u> | <u>(n=15)</u> |
|-----------------------|---------------|
| 5 (very useful) | 40% |
| 4 | 53% |
| 3 | 7% |
| 2 | 0 |
| 1 (not at all useful) | 0 |

Level of specificity

| <u>Rating</u> | <u>(n=15)</u> |
|-----------------------|---------------|
| 5 (very useful) | 60% |
| 4 | 27% |
| 3 | 13% |
| 2 | 0 |
| 1 (not at all useful) | 0 |

Overall delivery

| <u>Rating</u> | <u>(n=15)</u> |
|-----------------------|---------------|
| 5 (very useful) | 60% |
| 4 | 40% |
| 3 | 0 |
| 2 | 0 |
| 1 (not at all useful) | 0 |

Participants were also asked to rate opportunities for networking (where “5” is great and “1” is poor):

Opportunities to engage with others

| <u>Rating</u> | <u>(n=15)</u> |
|---------------|---------------|
| 5 (great) | 53% |
| 4 | 27% |
| 3 | 20% |
| 2 | 0 |
| 1 (poor) | 0 |

Mix of people on the tour

| <u>Rating</u> | <u>(n=15)</u> |
|---------------|---------------|
| 5 (great) | 53% |
| 4 | 27% |
| 3 | 13% |
| 2 | 7% |
| 1 (poor) | 0 |

Overall satisfaction with the tour

| <u>Rating</u> | <u>(n=15)</u> |
|-----------------|---------------|
| 5 (satisfied) | 67% |
| 4 | 33% |
| 3 | 0 |
| 2 | 0 |
| 1 (unsatisfied) | 0 |

Participants were asked a series of open-ended questions. Below are the aggregated responses:

1. Comments about the materials:

- Excellent guides! Enjoyed the tour! Liked the moose the best!
- Quite helpful. I plan to use this in the future
- All good!

2. What did you find most useful on this tour?

- Procedures used treating stands before actual burning.
- Discussion of spring vs. fall burning
- Management techniques

- Interaction with other participants
- Visuals of different treatments
- Networking and sharing ideas
- Getting questions answered
- The discussions on burning in the pine stands
- The different prescriptions used and the effects which have resulted
- Learning what other people are doing. What works and what doesn't
- Actual examples of successful & not so successful burns not working with others
- Comparisons of burns & their negative effectiveness
- In van narrative

3. What would have made this tour more valuable to you and your work?

- Perhaps a short dissertation on the benefits of the 'clumping'
- It was all good!
- If more of my co-workers attended
- Warmer clothes
- Sound system for presenter
- More about costs of burning and preparation

4. Additional comments

- Thanks for putting this on
- Thank you!!