Prescribed Burn Handbook

DEPARTMENT OF NATURAL RESOURCES

STATEWIDE PRESCRIBED BURN COMMITTEE

2020

(2024 revisions)

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Introduction

Prescribed burning is a tool that is used by resource managers to achieve various land management objectives. Minnesota Department of Natural Resources (MN DNR) policies and procedures relating to prescribed burning are contained in Operational Order 47, Prescribed Burning. The MN DNR Prescribed Burn Handbook is intended to supplement the policy found in the Operational Order 47 with specific instructions, forms, examples, and tools the fire or resource manager can use.

Prescribed Burn Responsibilities

Responsibility and oversight for the MN DNR prescribed burn program is handled by teams at four operational levels. The members of these committees are listed on the MN DNR Prescribed Fire web page.

A. Interdivisional Operations Managers

The operations managers from divisions that have prescribed burn programs provide operations manager level leadership and oversight to prescribed burning operations by MN DNR employees. They also provide direction to the Statewide Prescribed Burn Committee. The group is comprised of operational managers from divisions with a vested interest in prescribed burning.

B. Statewide Prescribed Burn Committee (SPBC)

The Statewide Prescribed Burn Committee is a self-directed work team that provides the leadership and support necessary to foster a safe and effective prescribed burning program to manage fuels or restore and maintain ecosystems.

Responsibilities of the Statewide Prescribed Burn Committee include:

1. Employee training and qualifications
2. Safety standards
3. Coordination and collaboration across divisions and program
4. Recordkeeping, review, and reporting
5. Program standards including following department policy

The committee is comprised of four division representatives, one member from each of the four Regional Prescribed Burn Committees, the Minnesota Interagency Fire Center (MIFC) Predictive Services Coordinator, the MIFC Advanced Wildland Fire Training Specialist, one MN Dept or Transportation representative, and at large members as needed.

C. Regional Prescribed Burn Committees

The Regional Prescribed Burn Committee is a work team that helps to facilitate and coordinate prescribed burns occurring in a respective region. Each committee is comprised of divisional representatives with a vested interest in

prescribed burning in the region. Committee members may not necessarily be regional staff.

Responsibilities of the Regional Prescribed Burn Committees include:

1. Coordinate prescribed burning at the regional level, prioritize those of higher complexity that compete for resources.
2. Maintain a regional list of prescribed burn resources, contact numbers, and qualified personnel to better coordinate and share resources among the prescribed burners in the region.
3. Coordinate and advance the science of prescribed burning and monitoring.
4. Serve as contacts for the regional fire team leader to provide the availability of personnel and equipment from all divisions for suppression during periods of very high to extreme fire danger.
5. Coordinate interdivisional regional burn teams that may be initiated within a region.
6. Actively enhance communication and coordination between divisions and agencies on prescribed burning.
7. Initiate, coordinate, and implement escaped burn reviews (as delegated by the Regional Management Teams).
8. Review regional prescribed burn accomplishments annually.
9. Develop and maintain a regional burn committee charter.

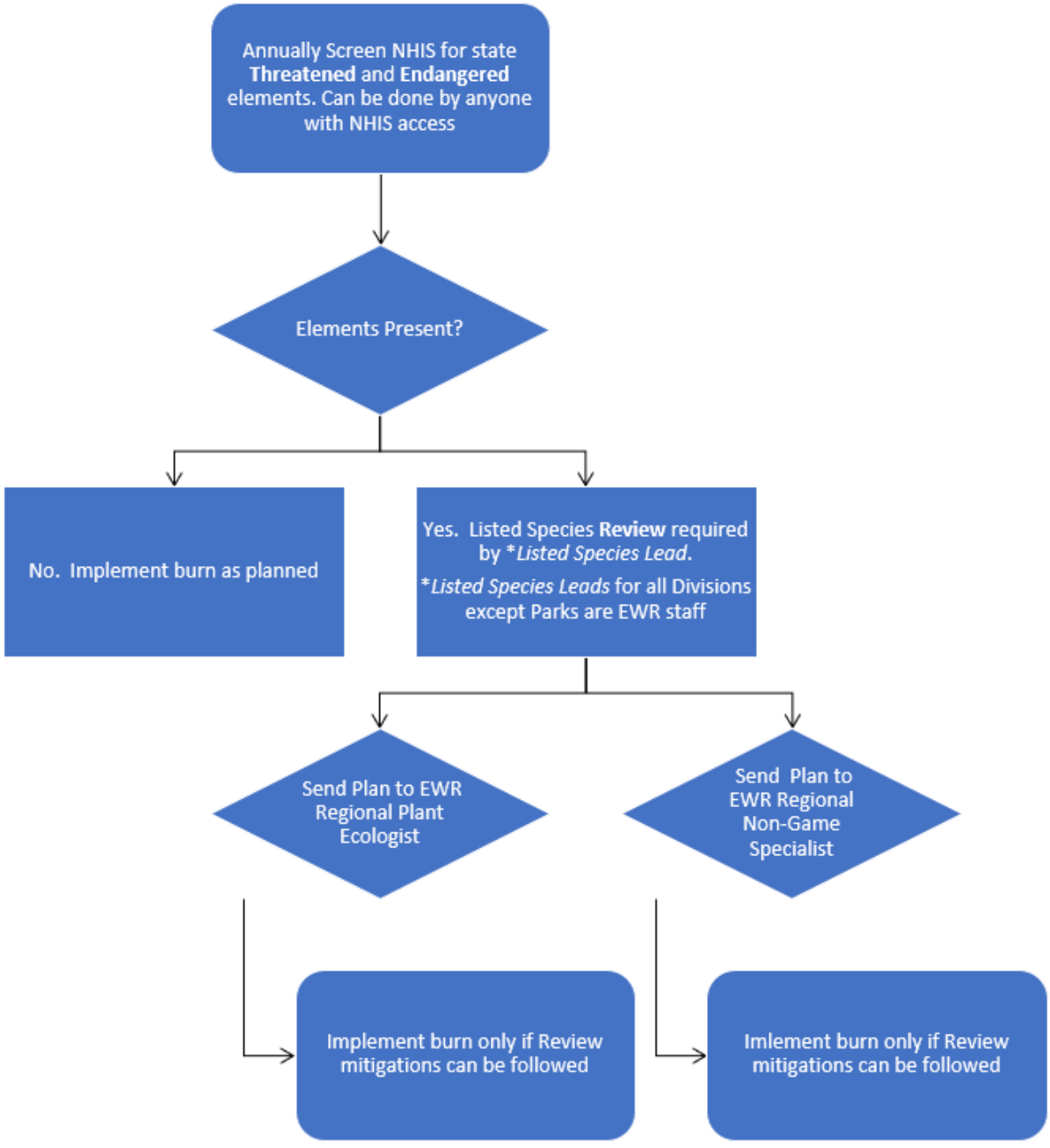
Burn Planning

The Prescribed Burn Unit Plan is a document that provides the prescribed burn boss all the information needed to implement the project. This plan could be used as a document for legal proceedings. Prescribed burn projects must be implemented in compliance with the written plan. At a minimum, the plan must address the elements outlined in the sections below. The complexity of the burn will determine the level of detail in the plan.

The Prescribed Burn Unit Plan form was designed to be an electronic document. This format allows a burn boss or burn planner to easily expand the plan cells to meet the needs of the unit. The MN DNR Burn Unit Plan is to be used for burns conducted on MN DNR lands. Exceptions to using this form may include a burn that includes all the plan elements, or when a partnering government agency (e.g., U.S. Fish and Wildlife Service) is conducting a burn that may include MN DNR land. The length of the prescribed burn unit plan will vary according to the size and complexity of the unit. A blank version of the Prescribed Burn Unit Plan and example burn plans can be found on the MN DNR internet. Refer to the appendix for an example of a completed burn plan.

The individual who develops the Prescribed Burn Unit Plan is responsible for soliciting the appropriate input from other MN DNR disciplines, landowners, and area forestry offices. Input or review may be solicited when there is a potential concern for negative effects to timber resources, threatened or endangered species, or other sensitive natural or cultural resources as a result of a prescribed burn.

The Natural Heritage Information System (NHIS) screening is a required element in the development of a Prescribed Burn Unit Plan. Prescribe burn practitioners are responsible for knowing and following state statutes, MN DNR rules, and other policies that pertain to the protection and management of state and federally listed threatened and endangered species. Burn plan preparers will complete NHIS training in order to access the data or to ensure that an NHIS screening is completed. NHIS screenings are good for one year and should be completed for all the burns planned in that year.



The resource manager is also responsible for obtaining an Open Burning Permit for the burn.

> **Open Burning Permit:** a permit issued for open burning as allowed in Minnesota Statute 88.17 PERMISSION TO START FIRES.

The Division of Forestry is responsible for the issuance of Open Burning Permits. Since the issuance of a burning permit hinges on having an adequate Prescribed Burn Unit Plan, it is the responsibility of the Division of Forestry to provide timely input to the resource manager during the plan development.

The completed burn plan will remain in effect until it is determined an update is required based on changes to the resource, safety, or other conditions. Burn plans must be reviewed and updated, at a maximum of ten-year intervals, or when there are critical changes to the DNR Burn Plan format (such as prescription window parameters or complexity). Burn plans must be reviewed for currency and accuracy whenever submitting a plan for a burn permit.

Changes in the burn plan must be reviewed, and the signature page re-signed by the appropriate level burn boss, contingency reviewer, and the agency administrator. Examples of when a modified burn plan requires a review may include: changing the shape, increasing the size, changes to fire break location or type, fuel models change, prescriptions are changed to accommodate increased fire behavior, complexity increases, significant changes to the contingency plan, etc. When in doubt, have the plan reviewed. If the project has a permit, notify the issuing area of the new signed plan. Minor changes to ignition procedures or burning only a part of the unit on the day of the burn do not constitute or require changes to the burn plan. The burn may proceed as long as it is in prescription.

Multiple burns plans, prescriptions, action (i.e. trigger) points and mitigations can be written for the same burn unit. This can be done to address potential changes in adjacent fuels, firebreaks, environmental parameters, fuels, objectives, personnel and equipment needs, etc. Each burn plan must be completed as identified in this section.

A. Specific Instructions for Completing a Prescribed Burn Unit Plan

1. Burn Unit Name and ID

   Record the name of the burn, for example, *Buffalo River.* The ID number is specific to each division and is optional unless required by the division administering the project.

2. Location Information

   County Name: Enter the name of the county or counties where the burn will be conducted.

   Lat/Long: Enter the latitude and longitude (degrees-decimal minutes) of the burn unit. This information can be determined using Landview or other software programs.

Section/Township/Range/Forty: Enter the legal description for the burn area.

Management Unit Name and Number: Name and number (if applicable) of a wildlife management area, aquatic management area, state park, state forest, scientific natural area, etc.

Administrator: List the division(s) or unit(s) with administrative responsibility for the burn unit.

3. Burn Unit Description

Fuel Model*: List the primary and secondary fuel model using one of the forty Standard Fire Behavior Fuel Models (Scott, Burgan 2005), or one of the Canadian Fire Behavior Prediction system fuel models (Taylor, Alexander 2017). A brief description of the Anderson 13 and Scott and Burgan 40 fuel models can be found in the appendix. Additional fuel models can be listed as needed.

Native Plant Community Class*: Enter the Minnesota Native Plant Community Classification class if used in your area. A copy of the classifications can be found in the appendix. An ArcMap layer of the MNDNR Native Plant Communities can be found in the Quick Layers Land Cover folder or by typing “MNDNR Native Plant Communities” in the quick find window.

Size of Burn*: Record the acres involved in the burn. This can be total acres, or it can be broken down by fuel model.

Fuel Loading*: Record the fuel loading in tons per acre. Also, state whether this information is an estimate or an actual measurement. Fuel loading estimates can be determined using “Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel’s Surface Fire Spread Model” or “Aids to Determining Fuel Models for Estimating Fire Behavior” or using the Stereo Photo Series for Quantifying Natural Fuels. These publications are available from the National Interagency Fire Center and the USDA Forest Service Rocky Mountain Research Station.

Additional Burn Unit Descriptors: Examples burn unit descriptors include land management goals, the overstory and understory on the burn, adjacent fuel types, occupied structures, soils (especially organic) present on the burn, water resources, roads, power lines, pipelines within or adjacent to the burn area and other ownerships or administrative units within or adjacent to the burn area.

** Required element for the Minnesota Smoke Management Plan.*

4. Objectives

   Write SMART objectives:
   - Specific
   - Measurable
   - Attainable
   - Relevant
   - Time oriented

   Purpose of the Burn: Describe your measurable short term treatment objectives (e.g., to reduce fine dead fuels by 90% or top kill 75% of the buckthorn sprouts). Try to achieve these results with the given prescription.

   Long Term Resource Objectives: Describe your overall goal for the site (e.g., to maintain fire-dependent prairie, reduce exotic competitors, or to improve sharp-tailed grouse habitat). Describe other management actions such as shearing, restoration plantings, or herbicide treatments that prescribed burning ties into, is contingent on, or is a preparation tool for other management actions.

   Range of acceptable results: The range of acceptable results ties back to the purpose of the burn. If the purpose of the burn is to reduce fine dead fuels by 90%, then determine what the minimum fine dead fuel reduction would be for the burn to be successful (e.g., the range of acceptable results may be 75-100% fine fuel reduction).

   Timing of Treatment in both calendar and phenology terms: Describe the time of the year the burn will be conducted (e.g., spring, summer, or fall of the year 2020). Also, describe the desirable time period in phenological terms. Phenology is defined as the study of periodic biological phenomena such as flowering, breeding, and migration. (For example, the burn may be conducted when sweet clover has sprouted and after green-up or the burn may need to be conducted prior to indigenous bird nesting.)

5. Burn Complexity

   The NWCG Prescribed Fire Complexity Rating System Guide PMS 424 (there is a training webinar available at this site) is the MN DNR standard for rating prescribed burn complexity. Periodically check the NWCG website to ensure you are using the latest version of the worksheet. The analysis provides a focused, subjective assessment by qualified prescribed fire burn bosses. The analysis is evaluated and approved by agency administrators and provides insight and improves understanding of the significant risks associated with prescribed fire. The analysis:

   - Provides decision support that highlights the risk to values associated with prescribed fire implementation.

- Identifies the technical difficulty (complexity) of managing the risk to values.
- Informs the complexity rating determination of high, moderate, or low for a prescribed fire.
- Identifies prescribed fire plan elements that may pose special problems or concerns.

A current version of the complexity rating analysis must be completed for each prescribed burn project. Determination of complexity is based on fire complexity factors: (1) Values; what is at risk, (2) Pre and Post-Plan Risk; the probability or likelihood that an adverse event or situation will occur, and (3) Technical Difficulty; the skills needed to implement the project and deal with unexpected or adverse events.

An initial complexity rating must be completed during the project development stage to identify items requiring mitigation. These items can then be addressed during the development of the Prescribed Burn Unit Plan. Once the Prescribed Burn Unit Plan is near completion, a final complexity rating is determined, and the summary rating is entered on the first page of the unit plan.

The Summary and Final Complexity Worksheet must be signed and dated by the prescribed fire plan preparer, the technical reviewer, and the agency administrator (or designee). The signed Summary and Final Complexity Worksheet will be attached to the prescribed fire plan. The final rating takes into account any mitigation factors identified in the unit plan. The final complexity determination identifies the minimum required burn boss qualification level.

The final complexity determination rationale will be completed. The prescribed fire plan preparer manually selects the complexity and documents the rationale for determining the complexity. The rationale will clearly justify the rating for the prescribed fire. At a minimum, complexity analysis elements rated high that cannot be mitigated in the prescribed fire plan must be discussed.

Note: In the case of adjacent fuels, the annual land cover needs to be addressed where it may change the complexity rating, (e.g., bare soil, agricultural fields, logging operations, agricultural residue, cut hay field, etc.).

Rating descriptors guide the risk and technical difficulty element rating process.High, moderate, or low rating levels are assigned for each of the complexity analysis elements. For each complexity element, descriptors are provided to help determine a rating level. The descriptors are broad enough to capture common situations and assist the preparer in determining the best, most appropriate rating for risks and technical

difficulties associated with the values identified in and around the project. The descriptors are not exhaustive; local insight, empirical evidence, and site-specific information, guidance, and policies should also be used to assist the prescribed fire plan preparer in determining the appropriate rating.

The prescribed burn complexity system does not tie directly to the qualifications system. However, all burns rated as high complexity will require a Minnesota Burn Boss Type 1 or NWCG RXB2 and all burns rated as moderate will require a Minnesota Burn Boss Type 2, NWCG Burn Boss 2 or Certified MN Prescribed Burner 2 (see Contract Burning section for more info), or higher qualification. Minnesota Burn Boss 3 (MRXB3) may only boss low complexity burns. A Minnesota Firing Boss (MFIRB) and NWCG Firing Boss (FIRB) may conduct firing operations on all burn complexities.

The NWCG Prescribed Fire Complexity Rating System Guide (NFES 424) and Worksheet are available on the MN DNR Prescribed Fire web page. An example of a completed Complexity Rating Summary can be found with the burn plan example in the appendix.

6. Burn Prescription Window

The burn prescription is a range of fuel, weather, and site variables that produce the type of fire behavior necessary to meet the burn objectives. The outline below gives a brief description of the process of developing burn prescriptions. Several training courses are available that provide greater detail on this subject matter (RX-341 Prescribed Fire Burn Plan Preparation, Behave Fire Prediction Software Online training, RX-301 Prescribed Fire Implementation, RX-310 Fire Effects, RX-410 Smoke Management Techniques).

Steps in developing a burn prescription:
1) Identify the resource objectives, constraints, and other considerations for the burn unit. Constraints may include: smoke management parameters, holding or contingency concerns, adjacent fuel types, nearby structures, land ownership, roads, etc.

2) Define desired fire behavior necessary to accomplish the resource objectives and address any of the identified constraints.

- What flame lengths, fuel consumption, or fire intensities are necessary to achieve resource objectives, or will they cause undesired effects or risks?
- Will backing fire or flanking fire produce the desired effects, or is a head fire needed?

- Are resources adequate to handle the desired fire behavior, or do you have to modify ignition patterns to address safety or holding concerns?

3) Use one of many available tools to determine the guidance parameters that will result in the desired fire behavior. Computer-based models like Behave Plus, Rx Window, or the Interagency Fuel Treatment Decision Support System (IFTDSS) can be used to determine the range of guidance variables that will result in the desired fire behavior. The tables in the Fireline Handbook or nomograms will provide similar results.

The burn prescription window is split into a maximum and minimum prescription. The maximum prescription is the maximum fire behavior output required to achieve burn objectives while accounting for any constraints that were identified. The minimum prescription describes the lowest fire behavior output required to achieve burn objectives.

It is important to focus on the 'output prescription parameters'. The outputs determine if burn conditions fall within the prescription. The prescription will describe how fire behavior will meet objectives and include the weather or fire behavior parameters along with fire modeling or empirical documentation.

Shaded tables provide an easy way to indicate the appropriate window for input parameters to achieve the desired fire behavior outputs. Caution should be used if burn plan implementation is scheduled on the very wet or very dry side of the tables. Fine dead fuel moistures at or below 5% can be difficult to control with subtle increases in wind speed at mid-flame. Attach the shaded tables to the burn plan.

For example, high winds when fuel moisture is high may be within the determined output parameters; however, high winds when fuel moisture is low may not be within predetermined output parameters, thus may increase the chances of slop-over or an escape.

Burn planners must match current or expected weather variables with fuel conditions to verify that resulting fire behavior will be within the 'output prescription parameters.' It is common for burn plan writers to list a range of variables (Max & Min) they may encounter when conducting a burn. Rarely will a burn be conducted when all parameters are at extreme values (i.e., highest wind speed and temperatures, and lowest humidity) ***unless*** the burn planner describes how they plan to mitigate the extremes.

For example, a permit issuer may be hesitant to activate a permit for a tallgrass prairie burn next to woodland with fine dry fuels when all parameters are at their extreme values.

Plan writers must describe in the plan (unit description, firing plan, additional considerations, etc.) how to mitigate extremes such as:

- using a backing fire adjacent to plowed break instead of head fire to allow direct attack with hand tools, or
- using increased staffing and equipment, or
- reduce fuel height inside the fire breaks, or
- improve the firebreak by widening or reducing fuels inside the firebreak.

Essentially, a wide range of guidance prescription variables may be used to achieve the desired fire behavior and fire effects. However, the extremes of each guidance variable cannot exceed the maximum output prescription parameters that were determined necessary to achieve burn objectives and burn safely within all constraints.

Wind direction should specify acceptable wind directions (degrees or cardinal directions) to address smoke management, ignition patterns, and other issues.

1000-hour fuel moisture, drought codes or other indicators of extended drought conditions should be used when appropriate to address concerns with long-term dryness, mop-up, holdover fire, etc.

Slope and aspect can be significant factors in developing burn prescriptions and should be described in the 'Burn Unit Description' section. Slope is an important input in the models used to determine guidance parameters.

7. Additional Considerations

   These considerations or values, if present, may require the burn boss to mitigate prior to the implementation of the plan.

   Maximum Probability of Ignition – The maximum probability of ignition you should consider burning under for fuels within and adjacent to the burn unit. An upper limit of 65% PIG should be considered for adjacent fuels unless mitigation factors are incorporated.

   Indices to meet objectives – Consider reviewing the Fire Danger Indexes to help determine the acceptable range necessary to meet your burn objectives.

   Cultural sites - If a cultural site is present at the burn location, list what the cultural site is, and indicate how you plan to mitigate the site risk (e.g., avoid the use of heavy equipment or the use of digging tools) and, per Operational Order 129, consult with local tribes as needed.

Natural Heritage Elements – Natural Heritage Information System screening- If natural heritage elements are present, list the **T&E** elements and send for an NHIS review by a Listed Species Lead, usually EWR Regional Ecologist or Non-Game Specialist. Indicate how you plan to mitigate the risk to the element (e.g., avoid burning all nesting habitat at the same time) and reach consensus with the Listed Species Lead. Where consensus is not reached, the burn may not be implemented until there is consensus.

Adjacent land concerns – If adjacent landowners are present, create a list of each landowner and note their proximity to the burn. If necessary, indicate how you would mitigate the risk to the adjacent landowner (e.g., contact the owner of the turkey farm prior to the burn so that ventilation can be adjusted to the barns or advise to close windows).

Peat or wet soils – Indicate if peat (partially decomposed vegetative matter) or wet soils are present, their extent, and the location in the burn unit. If necessary, indicate how to mitigate rutting, getting stuck, or ignition of peat during the burning operation.

Other – Indicate any other considerations that need to be accounted for during the burn (e.g., park users, hunters, railroad, history of arson, etc.).

8. Emergency Telephone Numbers

   List telephone numbers for all individuals, agencies that are part of your contingency plan, and emergency medical contacts.

9. Burn Activity Contacts

   List the names and telephone numbers of people who need to be contacted the day the burn will be conducted. This could include names and numbers for adjacent landowners, fire department or sheriff's offices, MN DNR forestry office, electronic burn permit activation number and other cooperators. To reduce unnecessary *wildfire* report calls to emergency services, it is recommended to contact nearby residents and landowners about the burn.

   If the local Forestry office requests notification the day of that a prescribed burn is going to be executed abide by these requests regardless of the permit being activated. Open lines of communication are always important.

10. Personnel Needs

    Enter the level of burn boss necessary to complete the burn based on the final complexity analysis. The choices available include:

    - Minnesota Burn Boss Type 3 (MRXB3)

- Minnesota Burn Boss Type 2 (MRXB2)
- Minnesota Burn Boss Type 1 (MRXB1)
- NWCG Prescribed Fire Burn Boss Type 2 (RXB2)
- NWCG Prescribed Fire Burn Boss Type (RXB1)
- Certified MN Prescribed Burner 3 (CMPB3)
- Certified MN Prescribed Burner 2 (CMPB2)

Personnel qualification requirements are covered later in this document.

Indicate the number of each fire position required to accomplish the burn. For example: seven firefighters, one firing boss, and one burn boss. You may include a range of personnel. For example: seven firefighters are needed at the low end of the acceptable prescription, but twelve are needed at the high end to hold the burn lines adequately.

Former employees and retired staff may work on a burn as a Volunteer. They may fill in a position up to and including the position for which they are qualified and current, except for positions (e.g., burn boss) that require the supervision of MN DNR staff. Volunteers may not supervise MN DNR staff (reference MN Statutes 84.089 subd. 3, and 179A.10 subd. 2). The division utilizing volunteer personnel is responsible for confirming qualifications and completion of the Annual Fireline Safety Refresher Training (RT-130).

11. Equipment Needs

    Indicate the type, quantity, and source of equipment needed to accomplish the burn.

12. Operations Plans

    Pre-Burn Site Preparation Plan – Outline any site preparation that must take place in advance of the burn day. This may include plans for fireline preparation, pre-treatment around utility poles, signs or trail markers, and preparation for helispots.

    Ignition/Firing Plan - Outline the ignition or firing plan that will be executed on the day of the burn. The ignition plan should indicate the firing pattern that will be used, the type of firing device that will be utilized, the preferred wind direction, and any hazards or special considerations. . On the day of the burn, monitor initial ignition (test burn) to determine fire behavior on the site. This can be used to determine if the burn should be delayed or canceled.

    Holding Plan - Indicate where resources will be staged and what resources and positions will be used for holding the fireline.

Patrol/Mop-up Plan – Outline the mop-up plans. Provide instructions for patrols. Indicate all safety concerns. Post the fire weather monitoring and site rehabilitation plans. Describe how lingering or carry over fire will be addressed.

13. Contingency Plans

The contingency plan is the portion of the prescribed burn plan that considers low probability but high consequence events and the actions needed to mitigate them (NWCG PMS 484).

Contingency planning is the determination of the additional actions or additional resources (or both) that are necessary to keep the prescribed fire within the scope of the prescribed fire plan. At a minimum, this element will address contingency options related to maintaining the prescribed fire within the ignition unit and or prescribed fire project area (NWCG PMS 484).

Contingency planning can also address not meeting prescribed fire objectives, critical holding points, smoke management considerations (i.e., impacts to critical smoke receptors), staffing accidents, "incidents within incidents," and other unanticipated events. More detailed information on developing contingency plans can be found in the NWCG Interagency Prescribed Fire Planning and Implementation Procedures Guide PMS 484.

Develop contingency plans to accommodate the potential for an escaped prescribed burn, equipment failure, or an Incident-Within-Incident.

Examples include:

- For equipment failure - list sources of contingency resources you may draw from.
- For an escape - indicate the secondary control lines for the burn, trigger points for termination of ignition procedures, and summoning or assigning contingency resources.

In the plan state the following:

- The contingency resources for the project,
- The location of the contingency resources (indicate on-site or off-site contingency resources, or both).
- The approximate response time.

This list must be referenced when executing the Go/No Go Checklist. Contingency resources must be verified, available, committed, and under the command and control of the burn boss for all operational periods applicable to the burn. Contingency resources must be released by the

burn boss before taking action on another incident. It is not advisable to have a primary fire line or holding resources and contingency resources serving as the same function.

It is advised to run Behave models for adjacent fuels, particularly downwind fuels, if they are different than those in the burn unit. This will provide a more accurate depiction of the fire behavior if an escape (running fire) should occur. Contingency resources must be sufficient to handle the fire behavior of a running fire based on the shaded table outputs.

Contingency map(s) should depict adjacent fuels, primary and secondary contingency lines, structures at possible risk, water resources, access routes, helispot location, major roadways, etc. At least one map should cover an area at least one mile in each direction of the burn unit and secondary contingency lines.

Specific guidance may need to be written into the contingency plan to address when suppression methods should be "light on the land" while not compromising personnel safety. This may be necessary to avoid undesirable impacts where natural heritage elements, designated old-growth forests, and other similar rare ecological features occur (see Wildfire Suppression in Peatland SNA and Minimum Impact Suppression Tactics).

Contingency plans will be reviewed and approved by the forestry area supervisor (or designee) for all planned burns. Contingency reviewers will be qualified as an Incident Commander Type 4 (ICT4) or Task Force Leader (TFLD). At Area Fire Preparedness Level 4 or higher, contingency plans in the prescribed burn plan must be reevaluated prior to the issuance or activation of the burning permit by the forestry area supervisor (or designee) at ***least*** 48 hours prior to the anticipated burn date. It is the responsibility of the burn boss or land manager to ensure the re-evaluation of the contingency plan is completed when at Preparedness Level 4 or higher. Current area, region, and statewide Preparedness Levels are posted on the MN DNR intranet Wildland Fire Information page.

14. Smoke Management Plan

Specific information on smoke management is contained in the Minnesota Smoke Management Plan. The MN DNR is one of the signatory agencies to this document and must follow the recommendations found within the plan.

Smoke Dispersion Category – To ensure dispersion of smoke emissions during prescribed fires, the atmospheric mixing layer must be deep enough and have sufficient transport wind speed. The Dispersion Index multiplies mixing height and transport wind speed to produce an index that

describes the ability of the atmosphere to disperse emissions. The National Weather Service morning fire weather forecast includes a smoke dispersion index forecast for the afternoon at 1300 hours. If the burn will occur in the morning, burn bosses should contact their nearest National Weather Service office to determine the anticipated dispersion index at the time of ignition.

The Dispersion Index relates to the dispersion category. Each burn should have a dispersion category of fair or better to burn.

Dispersion Index	Dispersion Category
Less than13,000	Poor
13,000-29,999	Fair
30,000-59,999	Good
60,000 or greater	Excellent

Distance and Direction from Smoke Sensitive Areas – A smoke sensitive area is a location where someone or something is located that could be at risk due to smoke impacts. In most cases, a 2 to 3-mile radius from the burn should cover your smoke sensitive area, although burn size, smoke production, smoke dispersion, and wind direction all need to be considered. List the developments such as livestock barns, airports, residences, and towns along with their distance from the burn unit and the cardinal direction from the burn unit.

Smoke Management Plan – Describe how you intend to mitigate the effects of smoke on roads, firefighters, neighbors, and other sensitive receptors. The Minnesota Smoke Management Plan outlines two methods for utilizing the dispersion index for mitigating smoke impacts during burn plan formulation. Consult the plan for specific instructions. Any receptors that are within the area of the map should be identified and labeled.

15. Safety Plan

    The safety of firefighters and the public is the number one priority when planning and implementing a prescribed burn project. The prescribed burn unit plan should identify safety zones and escape routes for the burn. A communications plan should also be included outlining radio frequencies or cellular phone numbers that ensure adequate communications with burn staff and emergency resources. If burning adjacent to roads, consider developing a traffic control plan or consulting with local road authorities to help with traffic control. Consult the safety section of this handbook for more in-depth safety considerations.

16. Medical Plan

    A medical plan is required in the event of a medical emergency on the burn. The burn boss needs to ensure that the medical plan will provide for

Advanced Life Support medical care within an hour of the injury (often referred to as the “Golden Hour”). The nature and extent of injuries can vary, but the burn boss needs to plan for a life-threatening injury.

Planning needs to include the travel time it may take to get the injured person off the line and into Advanced Life Support medical care. Advanced Life Support medical care may mean the nearest hospital or a properly equipped and staffed ambulance service. The Minnesota Emergency Medical Services Regulatory Board website provides information on what constitutes Advanced Life Support ambulance services, a search function for ambulance service, and a directory of ambulance services in Minnesota. Please note that not all ambulance services are equipped with Advanced Life Support equipment and personnel.

In remote locations, where travel time may prohibit getting an injured person into Advanced Life Support care within an hour, the Burn Boss may need to have an Advanced Life Support capable ambulance on site. Planning for air medical services may also be a possibility. In this case, landing zones will need to be identified (site preparation may be necessary), and GPS coordinates recorded on the burn plan and provided to burn personnel. More information on available air medical services can be found on the Emergency Medical Services Regulatory Board website under Ambulance Services in the Ambulance Service Directory and Mailing List section. Response times for specific services can be found on the provider’s website or by contacting the service directly. An internet search for air ambulance resources for your burn location may also provide useful results. You can also contact your local Sheriff dispatch via a non-emergency number for information on air ambulance resources.

Procedures and guidance for dealing with medical situations on the fire line can be found in the back of the current Incident Response Pocket Guide (IRPG). The ICS 206 Medical Plan can be used for larger more complex burns, and the primary medical on-site protocols should be entered directly into the burn plan.

In addition to notifying the 9-1-1 dispatcher, identify the nearest ground and air ambulance and location of the nearest hospital. Also, create a list of the first aid supplies available at the burn site, the person or equipment the supplies are assigned to, and who prescribed fire personnel can contact if first aid supplies are needed.

17. List of Attachments

    Required:

    - Maps (operational and contingency)
    - Complexity rating summary and rationale

- MN DNR form NA-1973 Grant of Permission to Burn Lands Not Administered by the MN DNR if the burn is to be executed on non-MN DNR lands by MN DNR staff and equipment.
- Behave Plus or other fire behavior processor runs used to develop the prescription, including shaded tables.
  - Table shading for acceptable fire conditions is designed to display conditions that contribute to acceptable fire behavior, for example, developing a prescribed fire prescription to meet certain objectives. See the Appendix for instructions or the Behave Fire Prediction Software Online training.

Optional:

- Traffic control plan
- Organizational chart

18. Distribution to Area Forestry Office

    All burn plans must be provided to the appropriate area forestry office (by February 28 if possible or target date set by the Regional Prescribed Burn Committee or other policy) with the current Prescribed Burn Unit Plan prior to obtaining a burning permit. Use this section of the burn plan to document when completed plans have been sent to the Division of Forestry. Each time an existing burn plan is modified, it should be re-sent to the Division of Forestry. Examples of when a modified burn plan should be re-sent to the Division of Forestry for review may include: changing the shape, increasing the size, fuel model change, changes to fire break location or type, when prescriptions are changed to accommodate increased fire behavior, complexity increases, the contingency plan is changed significantly, etc. When in doubt, resend to the Division of Forestry for additional review.

    Plans submitted before February 28 of each year will be returned with an assigned burning permit or specific recommendations to ensure contingency planning is adequate for the project. Generally, there will be a three week review period unless otherwise agreed upon at the Area level or as established by regional policy. Plans submitted after February 28 of each year will be reviewed as time permits; however, a specific date for the return will be established at the time the plan is received by the Division of Forestry.

19. Signatures

    Prepared by: The person who prepares the prescribed burn unit plan must sign the document signifying accuracy and completion. Plan preparers must have taken S290 – Intermediate Fire Behavior received Natural Heritage Information System training and have access to the natural heritage data. It is recommended that the plan preparer complete S-390, Fire Behavior Calculations and RX-300 Prescribed Fire Burn Boss.

Reviewed by: All burn plan elements must be reviewed and signed by a burn boss 1 or burn boss 2 that is qualified for the complexity and experienced in the fuel type indicated in the plan. If the author is a burn boss 1 or 2 they need to have another burn boss 1 or 2 review the plan. Reviewers need to include their prescribed burn qualification title with their signature. Moderate complexity burns over 1000 acres, and all high complexity burn plans must be reviewed by an appropriate level NWCG burn boss, burn boss 2 or higher.

Reviewed by: Plans may receive additional review and approval as required by the individual Division policy.

Division of Parks and Trails (PAT) - Regional Resource Specialist review and sign off is required on all PAT prescribed burn plans for f that region.

Division of Forestry (FOR) – Silviculturist will submit proposed prescribed burns to the Area Fire Team Leader.

Division of Ecological and Water Resources (EWR) – For more complex burns consider additional review by a qualified burn boss or the Scientific and Natural Areas (SNA) Statewide Management Coordinator.

Division of Fish and Wildlife – high-moderate or high complexity burns should consider additional burn boss review.

Contingency Review: The contingency sections will be reviewed by MN DNR Forestry personnel that have experience in wildland fire suppression. Personnel reviewing contingency plans will be qualified at an Incident Commander Type 4 (ICT4), Task Force Leader (TFLD), or higher.

Approved by: Approval authority is by a divisional administrative position who confirms the plan has been created and reviewed by qualified personnel and is in accordance with resource management and operational objectives. Designated approval authority varies between MN DNR Divisions. Consult with your Division's Program or Regional Manager for direction.

Division of Parks and Trails – Regional Manager

Division of Forestry – Area Forest Supervisor or Designee (with budget/work planning authority)

Division of Fish and Wildlife – Regional Wildlife Manager or Designee (likely Asst. Regional Wildlife Manager).

Division of Ecological and Water Resources – EWR Regional Manager or Designee (likely the Asst. Regional Manager or the Prairie Ecologist)

Signatures may be handwritten, electronic (digital), typed or a typed signature preceded by "/s/". An email from the approver confirming that the plan(s) is acceptable and approved. In this case, the approver should list the burn names and identification numbers (if applicable) of all the

burns they are approving. The burn plan preparer should then type that person's name and title in the approval line and include a copy of the email with the approved burn plan(s).

20. Go/No Go Checklist

    The Go/No Go checklist must be completed on the day of the burn prior to the execution of the burn. All elements must be answered in the affirmative prior to ignition. A new Go/No Go checklist has been added to the revised Burn Plan (see Prescribed Burn Forms).

B. Specific Instructions for Completing the Prescribed Burn Unit Log

The Prescribed Burn Unit Log is completed on the day of the burn, and post-burn information is included in the log. The report provides a record of forecasted and observed fire weather, observed fire behavior, and final burn acreage accomplishments. The log can be used to document when the burn is called out. The log should be kept for a minimum of 2 years, although the period should be expanded to 6 years in the event that the burn escapes or if there is reason to believe that there could be a tort claim in the future.

Weather: Record forecasted fire weather, spot weather forecast, and observed fire weather. Include the time of the forecast or observation along with the wind speed and direction, temperature, and relative humidity.

Observed Fire Behavior: Record actual fire behavior observations such as spread rate, flame length, and scorch height. If multiple observations are made, record the time they were made.

Acres Burned by Fuel Model and Native Plant Community (NPC) Type/Subtype: Once the burn is complete, record the actual acres burned by fuel model and record acres burned by NPC Type or Subtype whichever is applicable. This should mirror the NPC Type listed in the burn unit description section of the burn plan.

Post-Burn Observations: Post-burn observations should include the extent to which you met your objectives. For example, if one of your objectives for the burn is to reduce fine dead fuels, then you may state "dry conditions were present at the time of the burn, and duff was completely consumed". Also, consider including all notes on control, which can be helpful for future burns.

Recommendations: List any information that may help in future burns at this location or others like it. For example, you may state "additional resources needed on the east side of burn due to poor access and slow progress" or "this unit should only be burned when drought conditions are not present (1000 hour fuels greater than 23%) to avoid mop up and holdover in 1000 hour fuels".

C. Items to Consider When Calling the Prescribed Burn Out

State Law 88.17, Subd. 1b states that “The permittee shall remain with the fire at all times and before leaving the site shall completely extinguish the fire”.

However, State Law 88.171 states: Fires must not be allowed to smolder with no flame present, *except* when conducted for the purpose of managing forests, prairies, or wildlife habitats.

There may be instances when the burn boss feels the prescribed burn is contained and controlled to his/her satisfaction. They may leave the site in the evening when *all threats are mitigated* and return early morning to continue monitoring or mop up the fire. These circumstances may include having a number of smoldering snags or brush piles well inside the interior with no threat of escape, smoldering green material away from the control line or others. If there has been a history of arson issues, it is strongly recommended that personnel remain on site until the burn is declared out.

Burn bosses should use **additional care** if they leave a prescribed fire before it is formally called “out.” They should also determine if there are any local municipal ordinances that preclude leaving the prescribed fire before it is called out.

In these instances, the burn boss must consider and note on the burn plan or the Prescribed Burn Unit Log his/her intentions, such as:

1) Contacting affected parties with a phone number at which you can be reached overnight.
   a. County Dispatch Center (for fire and law enforcement)
   b. Local MN DNR Forestry Office
   c. Neighbors
2) Determining if the fire is controlled.
   a. Is there a secure control line around the fire?
   b. Are there fuels that could contribute to spotting?
   c. Are any unburned fuel islands secure from additional fire threats?
   d. Have potential snags near the control line that might still burn been dropped or extinguished?
   e. Have any hot spots that are an immediate threat of causing an escape been cooled down or put out?
   f. Are there duff or peat layers that could allow the fire to crawl over the control line?
3) Analyze overnight weather forecast.
   a. Will fire hold in containment until an early morning monitoring visit?
   b. Are relative humidity, temperature, and wind expected to be favorable?

4) Determining the probability of ignition for surrounding fuels.

5) Determining if signs should be posted for Controlled Burn or Smoke on Road.
   a. Can lingering fire be seen from the road?
   b. Will smoke create a public safety hazard?

D. Prescribed Burning on Lands not Administered by the MN DNR

The question of liability is often raised when the MN DNR burns private lands. This should be looked at in the same light as burning state land. Take the same precautions and preparations. Fill out the same MN DNR Prescribed Burn Unit Plan form. If the fire escapes and does damage to adjoining property, the State may be subject to the same liability risk as if the fire is on State land and escapes.

MN DNR employees are allowed to burn lands not administered by the MN DNR when the objectives achieved fall within the goals of the local MN DNR unit. Some examples of past private land burning include: burning a key tract of wildlife habitat, burning a private parcel that lies within or adjacent to state land, burning in the road right of way, and burning a tract of native prairie. Another example is the MN DNR conducting a burn on land owned by a county or private conservation organization such as The Nature Conservancy.

In some instances, the MN DNR provides all the resources and conducts the entire burn, or one or more MN DNR staff may lead or participate in a burn on land not administered by the MN DNR. In instances where MN DNR personnel lead the burn, the “Grant of Permission to Burn Lands not administered by the Department of Natural Resources” form (NA-1973) must be completed and retained by the burn boss. In this instance, a completed burn plan must be submitted. When burning in MNDOT right of ways a MNDOT permit is not required. Consult with your local MNDOT road authority for guidance on burning on MNDOT property by contacting a MNDOT district office.

There may be instances when the MN DNR involvement is loaning equipment such as bladder bags, drip torches, or assisting as firefighters for another agency or organization to complete a prescribed burn. In these cases, it is not necessary to complete a burn plan or permission form.

Burning permit regulations only allow permits to be issued for vegetative materials. The landowner or the burn boss must assure that only vegetation material is planned for the burn, and no building structures or other personal property exists within the burn area. If structures or personal property is in existence within the burn area, the burn plan must identify specific measures of how the structures or personal property will be protected during the burning operation.

E. Liability

State Of Minnesota Employee Liability

MN State Statute “3.736 Torte Claims” addresses the responsibilities and coverages provided for State of Minnesota Employees while conducting business on behalf of the state. While working within the scope of employment, following operational orders and policies, this statue provides liability coverage while working for the Department of Natural Resources. Refer to MN statute 3.732 subd.1 for definitions of “state”, “employee of the state” and “Scope of employment”.

3.736 TORT CLAIMS.

Subd. 9.Indemnification.

The state shall defend, save harmless, and indemnify any employee of the state against expenses, attorneys' fees, judgments, fines, and amounts paid in settlement actually and reasonably incurred by the employee in connection with any tort, civil, or equitable claim or demand, or expenses, attorneys' fees, judgments, fines, and amounts paid in settlement actually and reasonably incurred by the employee in connection with any claim or demand arising from the issuance and sale of securities by the state, whether groundless or otherwise, arising out of an alleged act or omission occurring during the period of employment if the employee provides complete disclosure and cooperation in the defense of the claim or demand and if the employee was acting within the scope of employment. Except for elected employees, an employee is conclusively presumed to have been acting within the scope of employment if the employee's appointing authority issues a certificate to that effect. This determination may be overruled by the attorney general. The determination of whether an employee was acting within the scope of employment is a question of fact to be determined by the trier of fact based upon the circumstances of each case:

(i) in the absence of a certification,

(ii) if a certification is overruled by the attorney general,

(iii) if an unfavorable certification is made, or

(iv) with respect to an elected official.

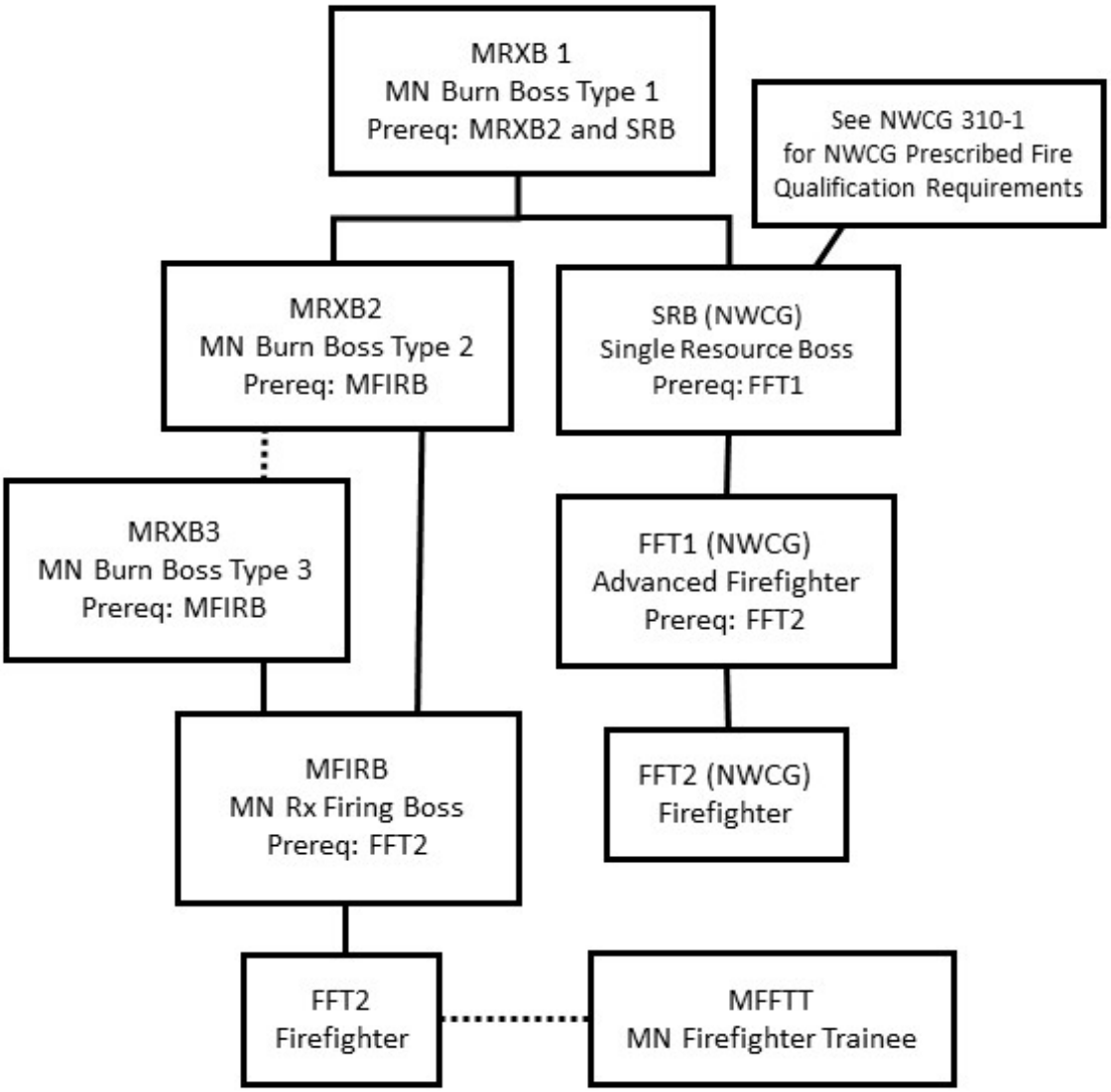
The absence of the certification or an unfavorable certification is not evidence relevant to a determination by the trier of fact. It is the express intent of this provision to defend, save harmless, and indemnify any employee of the state against the full amount of any final judgment rendered by a court of competent jurisdiction arising from a claim or demand described herein, regardless of

whether the limitations on liability specified in subdivision 4 or 4a are, for any reason, found to be inapplicable. This subdivision does not apply in case of malfeasance in office or willful or wanton actions or neglect of duty, nor does it apply to expenses, attorneys' fees, judgments, fines, and amounts paid in settlement of claims for proceedings brought by or before responsibility or ethics boards or committees.

Qualification and Training Requirements for Prescribed Burn Personnel

The MN DNR adheres to a two-track system with regard to prescribed burn qualifications: the MN DNR Prescribed Burn Qualification track and the National Wildfire Coordinating Group (NWCG) track as described in the National Incident Management System-Wildland Fire Qualification System Guide PMS 310-1. The track chosen by the individual will depend upon the prescribed burn complexity and level of interagency cooperation. Interagency burns involve both the MN DNR and federal agencies. All interagency prescribed burns will adhere to NWCG qualification standards unless local agreements dictate otherwise. Consult with your supervisor or a member of your statewide or Regional Prescribed Burn Committee to determine the appropriate track.

A. MN DNR Prescribed Burn Qualification Track



1. Principal MN DNR Prescribed Burn Positions

Minnesota Firefighter Trainee (MFFTT)

Firefighter trainees may be used to assist in prescribed burn operations such as preparing line, holding line, assisting with water transport, traffic control, etc. These individuals might include employees, volunteers, and Sentence to Serve Crews.

Required training:

- RT-130 Annual Firefighter Safety Refresher
- Personal Protective Equipment Briefing

Conditions for use:

- FFTT may be used only under the direct oral and visual control of a qualified firefighter (i.e., FFT2 or higher)

MN DNR Volunteers must be signed up using the proper MN DNR procedures. Volunteer management will be similar to regular employee management in regard to safety issues and training.

Firefighter Type 2 (FFT2)

An individual who is qualified at the FFT2 level may be used in a variety of prescribed burn tasks, including preparing, firing, and holding lines. They may also perform duties in support of engines, pumps, and other suppression equipment. They have no supervisory duties.

Reference the most recent version of the NWCG Wildland and Prescribed Fire Qualifications System Guide PMS 310-1 for the current training requirements for a Firefighter Type 2. MN DNR does not have its own requirements for an FFT2 position. The requirements are the same as NWCG except for physical fitness. Moderate fitness testing qualifies the individual for Minnesota non-federal assignments only. PMS 310-1 requirements must be followed to be qualified at the NWCG FFT2 level for out-state or in-state federal assignments.

Minnesota Firing Boss (MFIRB)

MFIRB is qualified to direct the ignition of low to high complexity burns under the supervision of a burn boss. The MFIRB typically directs a group of 3-5 igniters and/or holding crewmembers and may be responsible for the use of a variety of ignition devices. They may also be responsible for monitoring weather and burning conditions to meet the desired fire effects and the necessary level of control.

Required Training and Experience

FFT2 training plus:

- S-131 Firefighter Type 1
- I-200 (or IS-200a) Basic Incident Command System (Homeland Security requirement)

- S-219 Firing Operations
- S-290 Intermediate Fire Behavior

Recommended training to support knowledge and skills:
- S-211 Portable Pumps and Water Use
- S-212 Power Saws
- L-280 Followership to Leadership

Position Task Books
- MFIRB Minnesota Firing Boss

Physical Fitness
- Physical fitness requirements in accordance with MN DNR Operational Order 133 Fitness Requirements for Wildfire and Prescribed Fire Operations.

Other positions that maintain currency for MFIRB
- MRXB3/2/1 Minnesota Burn Boss Type 3, 2 or 1
- RXB2/1 NWCG Prescribed Fire Burn Boss Type 2 or 1
- FIRB NWCG Firing Boss

Transition
- Personnel qualified and current in MRXI1 or MRXI2 position prior to the issuance of this handbook will remain qualified unless their Division certification process recommends the completion of additional training or experience. Qualified MRXI1 or MRXI2 personnel will be awarded MFIRB qualifications.

Minnesota Burn Boss Type 3 (MRXB3)

MRXB3 is qualified to direct a prescribed burn of low complexity on MN DNR or non-MN DNR lands. Personnel have demonstrated proficiency in the fuel type(s) they are burning. Typically an MRXB3 would execute small to medium grassland, oak savanna, or hardwood understory burns with roads or plowed breaks around them.

Required Training and Experience

MFIRB training plus:
- Same as MFIRB

Recommended training to support knowledge and skills:
- S-211 Portable Pumps and Water Use
- S-212 Power Saws
- S-390 Fire Behavior Calculations
- L-280 Followership to Leadership
- RX-341 Prescribed Burn Plan Development
- RX-301 Prescribed Burn Implementation
- RX-410 Smoke Management

Position Task Books
- MFIRB Minnesota Firing Boss *AND*
- MRXB3 Minnesota Burn Boss 3

Physical Fitness

- Physical fitness requirements will be in accordance with MN DNR Operational Order 133 Fitness Requirements for Wildfire and Prescribed fire Operations.

Other positions that maintain currency for MRXB3

- MFIRB Minnesota Firing Boss
- MRXB2/1 Minnesota Burn Boss Type 2 or Type 1
- RXB2/1 NWCG Prescribed Fire Burn Boss Type 2 or Type 1
- FIRB NWCG Firing Boss

Minnesota Burn Boss Type 2 (MRXB2)

MRXB2 is qualified to direct a prescribed burn of moderate or lower complexity (as per the NWCG Prescribed Fire Complexity Rating System Guide PMS 424) on MN DNR or private lands. Personnel have demonstrated proficiency in the fuel type(s) they are burning and can burn with complexities such as wildland-urban interface and roads. Typically an MRXB2 would handle medium to large grassland, oak savanna or hardwood understory burns, small to medium slash, and small pine understory burns that have a duration for one burning (active fire) period (not to exceed 24 hours).

Required Training and Experience

MFIRB or MRXB3 training plus:

- S-390 Fire Behavior Calculations
- RX-341 Prescribed Fire Plan Preparation
- RX-301 Prescribed Fire Implementation

OR

- RX-300 Prescribed Fire Burn Boss (replaced RX-301 and RX-341 in 2023)

Recommended training to support knowledge and skills:

- S-270 Basic Air Operations
- S-211 Portable Pumps and Water Use
- S-212 Power Saws
- S-215 Fire Operations in the Urban Interface
- L-280 Followership to Leadership
- RX-310 Introduction to Fire Effects
- RX-410 Smoke Management

Position Task Books

- MFIRB Minnesota Firing Boss AND
- MRXB2 Minnesota Burn Boss 2

Physical Fitness

- Physical fitness requirements will be in accordance with MN DNR Operational Order 133 Fitness Requirements for Wildfire and Prescribed fire Operations.

Other positions that will maintain currency for MRXB2

- MFIRB Minnesota Firing Boss
- MRXB3/1 Minnesota Burn Boss Type 3 or Type 1
- RXB2/1 NWCG Prescribed Fire Burn Boss Type 2 or Type 1
- FIRB NWCG Firing Boss

Minnesota Burn Boss Type 1 (MRXB1)

MRXB1 is qualified to direct prescribed burns of high (or lower) complexity (as per the NWCG Prescribed Fire Complexity Rating System Guide PMS 424) on MN DNR or private lands. Personnel have demonstrated proficiency in the fuel type(s) they are burning. Typically, an MRXB1 Burn Boss handles prescribed fire burns with higher complexity, such as wildland-urban interface and busy roads, large grass/brush, oak woods/savanna, hardwood understory, large slash, medium to large pine understory burns and public or political concerns. These projects may require multiple operational periods and/or reducing the span of control through additional supervision. MRXB1 must meet the prerequisite qualifications of both an MRXB2 and an NWCG single resource boss (engine, crew, etc.).

Required Training and Experience

MRXB2 and NWCG Single Resource (any) training plus:

- S-270 Basic Air Operations
- S-490 Advanced Fire Behavior Calculations
- RX-410 Smoke Management

Recommended training to support knowledge and skills:

- I-300 Intermediate ICS
- S-211 Portable Pumps and Water Use
- S-212 Power Saws
- S-215 Fire Operations in the Urban Interface
- S-231 Engine Boss
- RX-310 Introduction to Fire Effects

Position Task Books

- MFIRB Minnesota Firing boss AND
- MRXB2 Minnesota Burn Boss 2 AND
- MRXB1 Minnesota Burn Boss 1 AND
- FFT1 Advanced Firefighter/Squad Boss AND
- Any Single Resource Boss (ENGB or CRWB or FIRB or HEQB)

Physical Fitness

- Physical fitness requirements will be in accordance with MN DNR Operational Order 133 Fitness Requirements for Wildfire and Prescribed fire Operations.

Other positions that will maintain currency for MRXB1

- MRXB2 Minnesota Burn Boss Type 2
- MFIRB Minnesota Firing Boss
- RXB1/2 NWCG Prescribed Fire Burn Boss Type 1 or Type 2
- FIRB NWCG Firing Boss

2. Transition

   Personnel qualified and current in a position prior to the issuance of this version of the handbook will remain qualified unless their Division certification process recommends the completion of additional training or experience.

3. Position Task Books

   Becoming qualified for most positions in the MN DNR Prescribed Burn Qualification Track requires completing a position task book. Task books are a means for evaluating the performance of an individual who is in training for a new position, or for recertifying individuals whose currency in the position has lapsed. They contain critical tasks that are required to perform the job. The task book can be used as a teaching and/or mentoring tool for trainees to learn job skills under the guidance of qualified individuals. The trainee must perform each task while being observed by an evaluator or person who is already qualified in that position. It is strongly recommended that each task book have more than one evaluator and more than one assignment. See the NWCG Wildland and Prescribed Fire Qualifications System Guide PMS 310-1 for more detailed information.

   Trainees must complete all prerequisite experience and qualifications **prior** to obtaining and initiating a position task book. A task book may be initiated prior to the completion of all the required training for that position.

4. Training

   Each prescribed burn position has identified required training and recommended training to support knowledge and skills. Required training must be completed prior to the final certification in that position. Training that is recommended to support knowledge and skills is not required; however, if the training is not completed, the employee must be able to demonstrate they have the knowledge and skills contained in the recommended coursework.

   RT-130 Annual Fireline Safety Refresher is the required annually for all positions.

5. Physical Fitness

   Physical fitness requirements will be in accordance with MN DNR Operational Order 133 Fitness Requirements for Wildfire and Prescribed

fire Operations. A moderate fitness level is the standard for fitness evaluation of MN DNR staff involved in on-the-line assignments for prescribed fire operations for employees mobilized outside of their assigned region or when working with other divisions.

Employees are responsible for informing their immediate supervisor (e.g., supervisor, burn boss, or incident commander) of any condition that may preclude them from performing a job on a wildfire or prescribed fire. In addition, it is the responsibility of the employee's immediate supervisor to take preventative action in situations where an employee appears physically incapable of performing without risk of physical injury due to work demands. It is recommended that anyone functioning on the fireline (prescribed burn or wildfire) meet a moderate fitness standard. Those staff assigned as traffic control, water tenders, or weather collectors, etc. would not need to meet such a standard.

6. Evaluation, Certification and Re-certification

   The evaluator is the person who observes the trainee and associated task(s) being performed and documents the successful performance in a position task book (PTB). The evaluator must either be qualified in the position being evaluated or be the direct supervisor of the trainee.

   The final evaluator will complete the Final Evaluator's Verification section on the inside front cover of the PTB as well as recommending the trainee for certification. The final evaluator must be fully qualified in the position that is being evaluated.

   Minnesota track qualified personnel may not serve as task evaluator or final evaluator for NWCG positions. NWCG qualified personnel may serve as task evaluator and final evaluator for MN positions as long as their qualification level is equivalent to or higher than the MN position being evaluated. Reference the most recent version of the NWCG Wildland and Prescribed Fire Qualifications System Guide PMS 310-1 for evaluating and certifying NWCG positions.

   To be a certifier, the designee must have an understanding of performance-based qualification systems and task book administration.

   Certification in a position is based on the completion of required training, experience, and evaluation from the certifier that the individual is capable of performing in the specific position. The certifier needs to evaluate the quality as well as the quantity of the experience the individual has in a specific prescribed fire position. The quality of experience an individual receives in a position relates to the size of the burn in terms of acreage and equipment and personnel resources on the burn, the number of fuel types the individual has experienced and the complexity of the burn. The certifier has the latitude of recommending that an individual complete

additional training or acquire additional experience in different fuel types or incident complexity.

Task books should not be certified with only one incident evaluation record unless the length of the assignment and the complexity of the assignment were able to provide the trainee a firm grasp of the position responsibilities. Evaluation records that are labeled Misc. ABC Fires or Misc. ABC Rx Fires should be accompanied with documentation about the specific incidents the trainee completed.

Division certifiers (see below) may only certify MN Track positions. The certifier should verify that all required course work and experience requirements have been completed prior to certification. The certifier should verify that all the additional training supporting further position development is complete. If the trainee does not have the knowledge and skills contained in the additional training listed for that position, the certifier should consider recommending the individual to complete the training prior to certification.

All NWCG positions must be certified by the MN DNR Fire Training/Certification Coordinator at the Minnesota Interagency Fire Center (MIFC). Division certifiers shall review and confirm the completion of the trainee's NWCG PTB and that all NWCG coursework and experience requirements have been completed prior to forwarding the NWCG PTB to the MN DNR Fire Training/Certification Coordinator for agency certification. Reference NWCG PMS 310-1 for coursework and experience requirements.

All Division certifiers are responsible for maintaining qualification records for their personnel. The Division of Forestry will maintain a centralized record-keeping system for each individual's qualifications.

When recertification is necessary due to a lack of currency in the position, it is recommended that the individual complete a minimum of three burns under the supervision of a qualified evaluator before recertification is granted. This can be documented using a position task book. The Division certifier has the latitude of also recommending the completion of additional training, new tasks, or assigned tasks for the individual if qualification standards have changed since the individual was originally qualified.

Certifiers – Division of Ecological and Water Resources
Division of Ecological and Water Resources, EWR Statewide Burn Committee Member or designee has the authority to certify an individual's qualifications for MN Track prescribed burn positions. A certifier must have an understanding of performance-based qualification systems and task book administration.

NWCG position task books must be reviewed for completeness then forwarded to the Fire Training/Certification Coordinator at MIFC for agency certification.

Electronic copies of the completed MN task book should be sent to the SNA Coordinator or designee for certification. The certified electronic copy should then be sent to MIFC Training for updating the employees IQS records. The signed and certified position task book should also be returned to the individual.

Certifiers – Division of Forestry
Division of Forestry, Area and Region Fire Team Leaders have the authority to certify an individual's qualifications up to the following levels:

Command and General Staff: ICT5, ICT4, PIOF, SOFR
Operations: FFT2, FFT1, ENOP, DOZ1, TVOP, CRWB, ENGB, DOZB, FIRB, STAM, MFIRB.
Air Operations: none (all task books must be sent to MIFC)
Plans: SCKN, DPRO, RESL, SITL, DOCL, DMOB
Logistics: RADO, ORDM, RCDM, BCMG, EQPM
Finance: EQTR, PTRC,
Dispatch: EDRC, ARDP

Any task books for positions not listed above must be forwarded to the Fire Training/Certification Coordinator at MIFC for certification.

Fire Team Leaders can forward completed task books for certification to the Fire Training/Certification Coordinator for collaboration on verification and certification. The original signed and certified task book should be returned to the individual. Two copies should be made of the task book, one for the local Fire Team Leader's records and one for the records at MIFC.

To be a certifier, the Forestry Fire Team Leaders must have completed training in performance-based qualification systems and task book administration.

Certifiers – Division of Parks and Trails
Division of Parks and Trails, Regional Resource Management Specialists, have the authority to certify an individual's qualifications for MN Track prescribed burn positions. A certifier must have an understanding of performance-based qualification systems and task book administration.

Regional resource management specialists can forward task books for certification to the Division of Parks and Trails representative(s) on the MN DNR Statewide Prescribed Burn for verification and certification.

NWCG position task books must be reviewed for completeness then forwarded to the Fire Training/Certification Coordinator at MIFC for agency certification.

Electronic copies of the completed MN task book should be sent to the Regional Resource Specialist for certification. The certified electronic copy should then be sent to MIFC training for updating the employees IQS records. The signed and certified position task book should also be returned to the individual.

Certifiers – Division of Fish and Wildlife, Section of Wildlife
The Section of Wildlife Regional Managers or their designees have the authority to certify an individual's qualifications for MN Track prescribed burn positions. A certifier must have an understanding of performance-based qualification systems and task book administration.

NWCG position task books must be reviewed for completeness then forwarded to the Fire Training/Certification Coordinator at MIFC for agency certification.

Electronic copies of the completed task book should be sent to the Regional Wildlife Manager or designee for certification. The certified electronic copy should then be sent and to MIFC Training for updating the employees IQS records. The signed and certified position task book should also be returned to the individual.

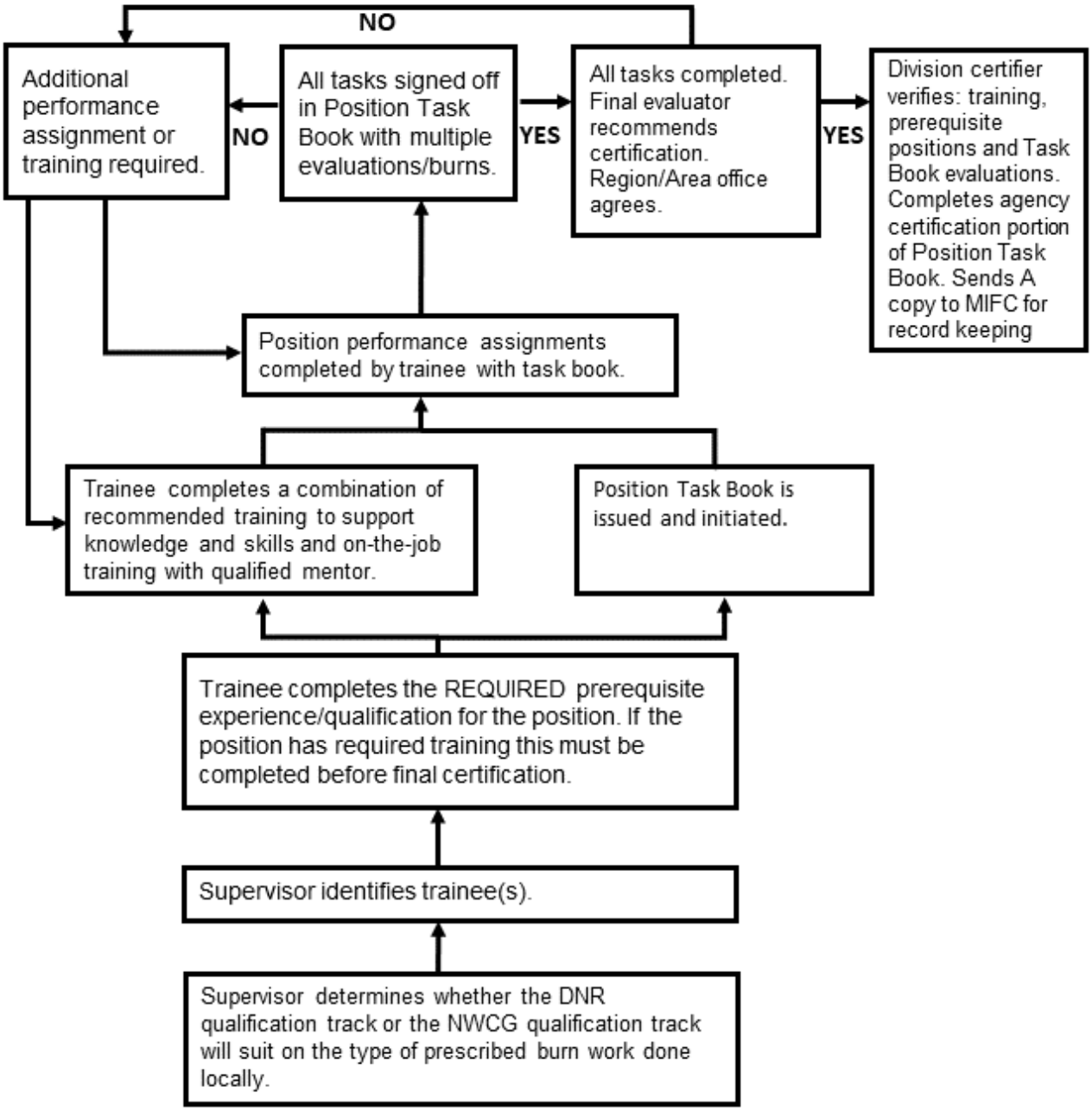
7. Position Currency

   The maximum time allowed for maintaining the currency of prescribed burn positions without performing at that position or equivalency is five years.

   Currency can be maintained in the following ways:

   - Performance in the position qualified for within the five year period.
   - Performance in a higher position for which that position is a prerequisite within the five year period.
   - Position identified as "Other position assignments that will maintain currency" in the Qualification and Training Requirements for Prescribed Burn Personnel section above. For example, currency as a MFIRB (Minnesota Firing Boss) would be maintained by either performing as an MFIRB once in a five year period or performing as an MRXB3 or MRXB2 (if qualified) in a five year period. If the currency has expired, refer to the certification and re-certification section above for recommendations.

Qualification and Certification Flow Chart



B. NWCG Prescribed Burn Qualifications
See the National Incident Management System-Wildland Fire Qualification System Guide PMS 310-1

1. Position Task Books

   Becoming qualified for most positions requires completing a task book. Task books are a means of evaluating the performance of an individual who is in training for a new position or for recertifying individuals whose currency in the position has lapsed. They contain critical tasks that are required to perform the job. The task book can be used as a teaching and/or mentoring tool for trainees to learn job skills under the guidance of qualified individuals. The trainee must perform each task while being observed by an evaluator or person who is already qualified in that position. It is strongly recommended that each task book has more than one evaluator and more than one assignment. See the Wildland and Prescribed Fire Qualifications System Guide PMS 310-1 for more detailed information.

   Trainees must complete all prerequisite experience for a particular qualification prior to obtaining and initiating a position task book. Completion of a MN DNR Position Task Book does not qualify a person for an NWCG position. NWCG Task Books can be downloaded at the NWCG task books website.

2. Training

   Each prescribed burn position has identified the required training and recommended training to support knowledge and skills. Training that is recommended to support knowledge and skills is not required; however, if the training is not completed, the employee must be able to demonstrate they have the knowledge and skills contained in the recommended coursework.

3. Physical Fitness

   Physical fitness standards for NWCG prescribed burn positions are established at the national level. Agencies may determine the method of evaluating the physical fitness level of their personnel, and the MN DNR uses the Work Capacity Test.

Work Category	Work Capacity Test
Arduous	**Pack Test** – 3 miles walking with a 45-pound pack in 45 minutes or less.
Moderate	**Field Test** – 2 miles walking with a 25-pound pack in 30 minutes or less.
Light	**Walk Test** – 1 mile walking with no pack in 16 minutes or less.

4. Certification and Recertification

   Refer to the National Incident Management System-Wildland Fire Qualification System Guide PMS 310-1.

5. Position Currency

   The maximum time allowed for maintaining the currency of prescribed burn positions without performing in that position or the equivalency is five years.

   Currency can be maintained in the following ways:

   - Performance in the position qualified for within the five year period.
   - Performance in a higher position for which that position is a prerequisite within the five year period.

   Position identified as “Other position assignments that will maintain currency” refer to the National Incident Management System-Wildland Fire Qualification System Guide PMS 310-1.

   For example, currency as a Firing Boss (FIRB) would be maintained by either performing as a FIRB once in a five year period or performing as an Incident Commander Type 4 (ICT4), any Single Resource Boss (Engine Boss, Crew Boss, etc.) or performing in a higher position than FIRB is a prerequisite for such as Prescribed Fire Burn Boss Type 2 (RXB2).

Obtaining Prescribed Burn Supplies and Equipment

A. Private Vendors

   Prescribed burning supplies and equipment may be purchased from private vendors. Department of Administration Authority for Local Purchase guidelines and requirements must be followed. All supplies and equipment must meet National Fire Protection Association (NFPA) Guidelines.

B. Northeast Interagency Fire Cache

MN DNR Divisions can also acquire prescribed burning supplies and equipment from the Northeast Interagency Fire Cache (cache) located in Grand Rapids, Minnesota. The USDA Forest Service and the MN DNR jointly operate the cache. The cache services state and federal firefighting agencies in the 20 northeastern states. The cache stocks over 1000 items related to wildland fire and prescribed burning. A complete listing of available items is listed in the NWCG National Fire Equipment System Catalog. The catalog is accessible online at NWCG Publications-Catalog.

MN DNR Divisions have two methods for acquiring specialized prescribed burning supplies and equipment from the Northeast Interagency Fire Cache.

1. Purchasing

   MN DNR Divisions may purchase certain supplies by sending a Department Purchase Order directly to the Northeast Interagency Fire Cache in Grand Rapids. Personal Protective Equipment (PPE) such as: fire clothing, fire shelters, hard hats, gloves, military web gear, safety glasses, headlamps, first aid kits, and canteens, can be purchased from the cache. Orders can be faxed to the cache at 218-327-4581, or emailed to sm.fs.nekfirecache@usda.gov , followed up by a phone call to confirm the order was received. Questions on specific orders can be answered by calling the cache at 218-322-2764 or 218-322-2775.

2. Borrowing

   Supplies and equipment can also be acquired on a short-term loan basis by sending a resource order to the Northeast Interagency Fire Cache. These materials should be ordered two weeks before they are needed and returned immediately after their last use. Since the main emphasis of the cache is suppression, limits may be placed on what can be borrowed and for how long. There may be a charge for radio use to cover fleet costs. There may also be a refurbishment charge for some of the equipment. Gloves, canteens, and other consumable items are not returnable and must be purchased.

   Use a supply resource order form when ordering supplies and an equipment form when ordering equipment. When filling out a resource order items to consider include:

   - Use a street address instead of a post office box number.
   - Include a contact name and phone number.
   - Provide the date needed, not “as soon as possible”.
   - Use the correct unit of issue for the item you are ordering. For example, enter **ea** for each, or **bx** for box. This is listed under “order by unit of issue” in the cache catalog.
   - Use the four digit National Fire Equipment System (NFES) number. This is necessary for the order to be filled.

- Do not assume the item comes with everything necessary to operate the item. Headlamps require batteries. Tents require ordering poles and stakes in addition to the tent.
- Chainsaw, pump, and generator kits are considered supplies. Tags are included in these kits. If the chainsaw, pump or generator breaks down or does not operate in a satisfactory manner, note the problem on the tag.
- Follow the current process your division leadership has provided when resource ordering radios.

Resource orders for supplies can be faxed directly to the Northeast Interagency Fire Cache at 218-327-4581 or emailed to sm.fs.nekfirecache@usda.gov . Order forms can be found at NIFC forms or the MN DNR Prescribed fire web page.

Complete an equipment resource order when borrowing anything with wheels or antennae. Examples of equipment include radios, J-5's and engines. Orders for equipment must be processed via the Minnesota Interagency Coordination Center (MNCC). Fax orders to 218-327-4528. Questions on equipment orders can be directed to MNCC at 218-327-4558.

Every order filled by the Northeast Interagency Fire Cache will be documented on a warehouse receipt. Two copies will be provided to the ordering unit. One copy is to be signed upon receipt and returned to the cache. The other copy should be kept by the ordering unit for its own records and can be used as a return manifest. Resource orders for supplies should be picked up at the cache.

Obtaining Prescribed Burn Personnel

Similar to divisions requesting to borrow supplies and equipment to accomplish their burn objectives, there may also be a need for additional trained and qualified prescribed burn personnel. Burn bosses and managers have several options available when seeking additional personnel support.

Burn bosses may ask for the assistance of qualified personnel from the local vicinity, from within their own division, or from another division within the MN DNR. Regional Prescribed Burn Committees have the responsibility of coordinating prescribed burn resources that can be shared throughout the region. Resources may also consider borrowing personnel resources from other agencies such as U.S. Fish and Wildlife Service, USDA Forest Service, and The Nature Conservancy. If resources are requested from outside the local area, a resource order may need to be placed through the MNCC. Burn bosses also need to be aware that if federal personnel is used on a burn, NWCG training and qualification guidelines may need to be adhered to unless a local agreement exists that specifies otherwise.

On large complex burns that require aviation, resources may be sought from multiple regions and from other agencies. For this reason, the Minnesota Incident Command System (MNICS) Prescribed Fire Working Team holds an annual meeting in the spring of each year to review any large, complex burns that are planned by federal and state agencies. Since many of the burns in this category may be competing for similar resources, the working team considers the timing of each burn and develops a priority listing of burns to be accomplished based on the resources available.

Contract Burning

There are instances where resource managers will hire contractors to burn MN DNR and non-MN DNR land. The Statewide Prescribed Burn Committee recognizes the value of maintaining consistent language across Divisions who hire contractors. The appendix *Standard Prescribed Fire Contract Provisions – Minnesota* for this section contains a generic template of contract language to serve as a guide for including in contract specifications. Each Division may have other items they wish to add or address in contract specifications (e.g., communication needs with local fire departments or between contractors and MN DNR personnel, bid processes, evaluation, etc.). Regional business offices may require additional items or request a specific formatting style for bid solicitations. Regardless of the language contained within the bid solicitation or vendor contract, Operational Order 47 requires that all prescribed burns must be implemented in compliance with an approved burn plan. An approved written burn plan must be included as part of the bid solicitation and contract.

In 2017 the Minnesota Prescribed Fire Council (Council) was formed. The Council is an organization comprised of prescribed and wildland fire professionals who are working together to protect, conserve and expand the safe use of prescribed fire on Minnesota's landscape to meet both public and private objectives. The Council also promotes public understanding of prescribed fire and its purpose.

The Council works to build relationships with the fire departments across the state. Through these relationships, the Council plans to streamline the fire permitting process to make prescribed fire a more attainable management tool.

The 2010 version of this handbook and Operational Order 47 required that vendors and their employees meet the same training and position qualifications as the MN DNR personnel in order to conduct a state-contracted prescribed burns. Private practitioners on the Prescribed Fire Council Working Group recognized that following the MN prescribed burn qualification track and all the training requirements were not meeting their specific needs. The Council created a qualification track that will be used to certify qualifying members. The Council's qualification track resembles the MN DNR qualification track with a few distinct differences (see comparison table below). In regard to contracting burns with certified and qualified Council members, the Certified MN Prescribed Burner 3 (CMPB3) can now be accepted to boss low complexity burns. The Council's Certified MN Prescribed Burner 2 (CMPB2) can now be accepted to boss moderate or low complexity burns. Burn plan review and approval may only be completed by MN DNR personnel at the appropriate qualified or administrative level.

MN DNR Divisions contracting prescribed burns with Council members may utilize a Certified MN Prescribed Burner in place of a MN Burn Boss. Burn plans will be written to specify CMPBs at the level necessary for the complexity of the burn. Prescribed burn contractors and their employees who do not hold certification as fire qualified members of the MN Prescribed Burn Council must meet the same training and qualification requirements as MN DNR personnel. This includes employees of Conservation Corps Minnesota and similar organizations or vendors.

Each Division and the contract proposer will determine whether or not the burn unit and complexity is appropriate for contracting.

MN Prescribed Fire Council qualification track training comparison to the MN DNR qualification track.

MN DNR MRXB3 (MN Burn Boss 3)	Prescribed Fire Council CMPB3 (Certified MN Prescribed Burner 3)	MN DNR MRXB2 (MN Burn Boss 2)	Prescribed Fire Council CMPB2 (Certified MN Prescribed Burner 2)
S-130	S-130	S-130	S-130
S-190	S-190	S-190	S-190
L-180	L-180	L-180	L-180
S-290	S-290	S-290	S-290
S-219	S-219	S-219	S-219
I-100	I-100	I-100	I-100
IS-700	IS-700	IS-700	IS-700
I-200	8 hr. field course	I-200	8 hr. field course
	16-24 hr. Rx burner course	S-390	16-24 hr. Rx burner course
		Rx-301	
	MRXB3 task book	Rx-341	MRXB3 task book
MFIRB task book			MRXB2 task book
MRXB3 task book		MFIRB task book	
		MRxB2 task book	

Safety

The safety of firefighters and the public is the top priority when planning and implementing a prescribed burn project. Every person involved in a prescribed burn project is responsible for identifying and communicating safety issues and concerns.

Prescribed fire is a natural resources management tool that presents many potential issues related to personal safety for staff and the public and the protection of off-site resources and facilities.

Every individual who participates in prescribed burn activities has the responsibility to notify the burn boss when they do not understand their assignment or have a safety concern related to the assignment.

Communication Responsibilities: From the Incident Response Pocket Guide (IRPG)

Brief others as needed.
Debrief your actions.
Communicate hazards to others.
Acknowledge messages.
Ask if you don't know.

A. Burn Plans

Actions to provide for safety must be identified on every burn plan and followed during burn operations.

It is required that another qualified person, other than the one writing the plan, review the plan. This provides additional oversight for safety issues and their mitigation. The reviewer should be a Burn Boss 1 or 2 that is qualified for the complexity level and fuel type of the burn. (Example: Burn plans written by a Minnesota Burn Boss Type 3 (MRXB3) are required to be reviewed with a Minnesota Burn Boss Type 2 prior to execution.)

Exposure to smoke during prescribed burn operations is a significant safety concern. Research has shown that direct smoke exposure during prescribed burns, especially in the holding and ignition positions, often exceeds smoke exposure found on wildfires.

Prescribed burn planners or burn bosses should reduce the impact of smoke on personnel, whenever possible. Methods to decrease smoke exposure include:

- Establishing firelines in areas of lighter fuels or moving firelines to roads or other barriers that will require less holding, patrol or mop up will reduce smoke exposure to personnel.
- The pre-burn briefing should include anticipated smoke issues, including hazards like toxic materials, poison ivy, etc., in the burn unit and adjacent areas.
- Rotating people out of the heaviest smoke.
- Factoring smoke exposure when developing ignition plan.
- Altering black lining establishment rate to manage smoke volume.
- Selecting burn timing to match desired fire effects.
- Manage workload and exposure time for holding crews. This may require the burn plan to include additional staffing if high smoke exposure may occur.
- Provide specialized PPE.

Burn plans must include a contingency plan. A contingency plan states what actions will be taken, such as when fire environment conditions change, or a switch from prescribed fire to fire suppression is necessary. For example, the burn exceeds the prescription, equipment breaks down, fire staffing levels change, additional resources are required, or an incident within an incident occurs.

Burn plans will also include a medical plan that defines the actions to take if a person is injured during the prescribed burn. Medical plans are detailed in the burn planning section.

Prescribed burns can impact local law enforcement dispatch centers and emergency response organizations with increased call volume from people reporting smoke or fire. The burn planner should address this concern in the burn plan and establishing a protocol for early notification of planned fire activity to local law enforcement an emergency dispatch centers.

B. Safety Responsibility, Policy, Analysis and Briefing

All fireline personnel assigned to the prescribed burn are responsible for safety during the course of a prescribed burn. The burn boss holds the responsibility to supervise safety on all burns. It is encouraged to include a Safety Officer, whose sole responsibility is fireline safety, as a fireline personnel. The need for a Safety Officer increases with fire operation complexity and the number of fire line personnel.

Burn bosses and supervisors are encouraged to review the MN DNR Safety and Health Manual to ensure that all safety policies and requirements are followed. Completed Job Safety Analyses (JSA) should be reviewed. A complete listing of JSA's is available on the MN DNR Intranet. JSA's of specific interest to prescribed burning may be drip torches, chainsaws, and utility trailers.

It is recommended that individuals who oversee safety during a prescribed burn complete an analysis of risk and mitigation and conduct a briefing about safety concerns. Incident Action Plan Safety Analysis (ICS 215A) is an example of a form that can be used for risk analysis.

The burn boss or designee will ensure that emergency equipment is available, including first aid kits, fire extinguishers, eyewash bottles, sanitizer, potable water, etc.

The burn boss or designee must conduct a briefing before each burn to communicate safety concerns. The briefing will include communications, predicted weather and fire behavior, planned operations, and other safety concerns. The IRPG has a briefing outline that may be used.

C. Personal Protective Equipment (PPE) Required for Prescribed Burning

The following items must be worn on any prescribed burn conducted by MN DNR personnel, or by anyone working on MN DNR prescribed burns. Upper body exterior garments must be standard yellow or another high visibility color.

- Fire-resistant shirt and pants, coat or coveralls (NFPA 1977 compliant flame resistant or other federally approved material).
- 100% cotton T-shirt.
- Leather or leather/flame resistant combination gloves.
- Hard hat (NFPA 1977 compliant).
- DOT-approved helmet or hard hat with chin strap when operating all-terrain or side-by-side vehicles (see Fleet Policy).
- Safety goggles or safety glasses with side shields.
- Fire shelter and belt or web gear harness
- Footwear-When working in association with motorized equipment, trailering, crush/roll exposure, etc—footwear should be 8 inch tall (measured from the base of heel to the top of the upper), composite safety toe (ASTM-F2412-2005 and ASTM F-2413-2005 compliant), lace style, all leather exterior with melt and slip resistant lug style sole. OSHA compliant safety toed rubber boots are allowed in wet terrain but not for chainsaw operation unless meeting the PPE requirements stated in the DNR chainsaw operation policy.
- Footwear-When ***not*** working in association with motorized equipment, trailering, crush/roll exposure, etc—8 inch tall (measured from the base from the heel to the top of the upper), lace style, all leather exterior, melt and slip resistant lug style sole. This footwear should be NFPA 1977 certified. Rubber boots are allowed in wet terrain but not for chainsaw operation unless meeting the PPE requirements stated in the DNR chainsaw operation policy.

Please see the Wildland Fire PPE Hazard Assessment for more information on wildland fire PPE needs.

Where activities on a burn involve the use of a chain saw, the operator will follow the MN DNR Power Saw Policy, including PPE requirements. To qualify as a cut-resistant boot, cut-resistant material can be incorporated in or on the boot. Examples include a cut-resistant sock that can be inserted inside the boot, cut-resistant material that can cover the boot or any other means as approved to comply with being cut-resistant.

All employees must carry a fire shelter unless specifically assigned to an engine, in which case they must carry a shelter when away from that vehicle or when beyond the protective reach of the vehicle's water hoses.

The Wildfire Protection Business Management Manual, Section 11.7 – Safety Guidelines provides more information on PPE and other equipment. A detailed listing of MN DNR safety guidelines is contained in the MN DNR Safety and Health Manual.

With the exception of boots and cotton clothing, all the equipment is available from the Northeast Interagency Fire Cache in Grand Rapids. (See the ordering instructions section of this handbook.)

D. Operating and Working Around Equipment

Any MN DNR employee operating equipment must complete all required safety training prior to use. For example, any employee that must operate an all-terrain vehicle or off-highway utility vehicle must adhere to the policies contained in the MN DNR Fleet Policy Manual found within the MN DNR Safety and Health Manual intranet page. Specific MN DNR training that exists for ATV, UTV/SxS, Tracked Fire Equipment, Heavy Equipment and Truck and Trailer Operations must be completed. Refer to the MN DNR Safety and Health Manual, MN DNR Fleet Policy Manual, or your regional Management Resources representative for specifics. A list of training programs and descriptions can be found on the MN DNR intranet site under the Safety and Training page.

Because operation of wheeled and tracked ATV's or UTV/SxSs on prescribed burns can be dangerous, the following should be considered:

- Prior to using any vehicle equipment for burn operations, detailed instructions, including any required training on use, performance, capabilities, and limitations, will be provided to new operators.
- Hazards located on prescribed burn firebreaks will be clearly identified on prescribed burn unit maps, burn plans, and discussed during the pre-burn briefing. Prescribed burn bosses are responsible for the identification of these known and potential hazards.
- All waterway crossings that must be traversed during a prescribed burn must be identified in the burn plan, and the location of all water crossings must be identified on the burn plan map. Bridges and crossings must be inspected prior to the burn to make sure that the waterways can be crossed safely by the equipment. Traversing side slopes and soft areas should be avoided.
- Prescribed burn plan developers should strive to limit ditch crossings and the need for bridges. The burn plan design should also limit the use of equipment (i.e., ATV's, etc.) on steep terrain or in areas that pose a risk of vehicles becoming stuck.
- Notify all burn personnel about the equipment that will be used on a prescribed burn and the appropriate safety procedures to follow when working around the equipment.
- Equipment operators should use under-the-hardhat or helmet radio headsets for hands-free operation of equipment, and when there is high noise volume.
- When working near mechanized equipment, maintain eye contact with the operator. To ensure the safe operation of equipment, stay out of the operator's blind spots.

- Hauling additional drip torch fuel or gasoline on an ATV or UTV/SxS is often a necessary requirement during a prescribed burn. Refer to the policy guidelines for safety protocol in the appendix of the MN DNR Fleet Policy Manual.

E. Roadways and Work Zone Safety

The Minnesota Department of Transportation (MNDOT) and local road authorities are the best sources for addressing roadside work zone safety issues. They can provide guidance on signing, flagging, and other work zone procedures that can assist in achieving a safe environment for everyone. State and local law enforcement staff can provide planning and assistance during the burn day activities to help lessen the impact on drivers and traffic flow.

When burning in a MNDOT road right of way or other MNDOT property, prescribed burn planners should contact the Road Regulation Supervisor in the MNDOT District where the burn is planned. The Road Regulation Supervisor can help to determine what provisions may are required. The following website provides contact information for MNDOT District Offices.

Prescribed burns that occur along a road right of way or adjacent to roads should have signs posted to alert drivers of the potential smoke on the highway, or that their personnel are working along the roadway. While MN DNR employees have the responsibility to warn the public of hazardous traffic conditions, employees do not have the authority to enforce traffic laws (e.g, stopping or redirecting traffic). If prescribed burn operations (e.g., equipment or smoke) are predicted to impact roadways, include local law enforcement, MN DNR Conservation Officers, MNDOT personnel, or county highway department staff in your burn plan. These officials provide great assistance because of their training and authority related to traffic control or temporary road closures.

The MNDOT's Minnesota Manual on Uniform Traffic Control Devices governs work on or along roadways in Minnesota. Refer to the temporary traffic control section of the MN DOT manual for specific information.

Staff providing flagging and traffic direction should have flagger training as recommended in the MN DOT Flagging Handbook.

1. Clothing

All clothing worn on or near roadways must be in accordance with Minnesota OSHA Rules and MN DNR PPE or other policies. Specifically, all employees must wear FR ANSI (a flame resistant fabric) Class 2 or 3 high visibility vests under the following circumstances:

a. All employees are working on the ground on any wildfire or prescribed fire assignments **within road right-of-ways,** which would include: loading or unloading of fire equipment,

suppression, prescribed burning, mop-up or traffic control activities.

b. Employees working on the ground around any mobile earth moving equipment (bulldozers, road graders, backhoes, front-end loaders).

Vests must be worn during the above situations for daytime or night operations. For full 360-degree visibility of the wearer, the vest must be secured in front by a Velcro or other attachment and not left open. Vests should have a tear away feature in the event that the vest becomes entangled in hose reels, machinery, etc.

2. General Responsibilities for Traffic Control

    a. All traffic control devices (signs) must be kept clean and in proper position to insure optimum effectiveness.
    b. Remove traffic control equipment (signs) when it is no longer required or appropriate.
    c. Keep proper records of traffic control, including the starting and ending times, location, type of traffic control used, etc. The method of record-keeping may vary from a sentence in the Prescribed Burn Unit Plan to a complete Traffic Control Plan.

3. Traffic Control Signs

    When controlled burning on conventional highway right-of-way occurs, a sign indicating a prescribed burn is ahead should be installed prior to the burn area. In the event winds blow smoke over the roadway, a sign indicating smoke over the road should be installed past the prescribed burn sign. Signs can be purchased through the MN State Master Contract Release Number S-996(5)-Roll-Up Signs or other State contracts that supply the signs.

    All traffic control signs and devices should be constructed to yield upon impact, so they do not inflict any undue damage to a vehicle that strikes them. The approved ballast system for signs mounted on portable supports is sandbags.

    All signs must be retro-reflective (i.e., contain reflectors). Cones only need to be retro-reflective if used at night.

    All advance warning signs will be a minimum of 48” X 48” on all State (MNDOT) highways and all high-speed roadways (speed limit is 45 mph or greater). Advanced warning signs on low-speed roadways (speed limit is 40 mph or less) must be a minimum of 36” X 36”. **While these are MNDOT standards, consider using similar signage on all road jurisdictions when smoke and traffic are concerns.**

    Example text for traffic control signs includes, but is not limited to:

- Controlled Burn Ahead
- Prescribed Burn Ahead
- Smoke Over Road
- Caution Smoke Ahead

4. Identifying Advance Warning Areas

   The advanced warning area tells the driver what to expect ahead. It should allow drivers enough time to alter their driving patterns. The length of the advanced warning area is determined by the speed limit of the roadway. The table below should be used to determine the Advanced Warning Area.

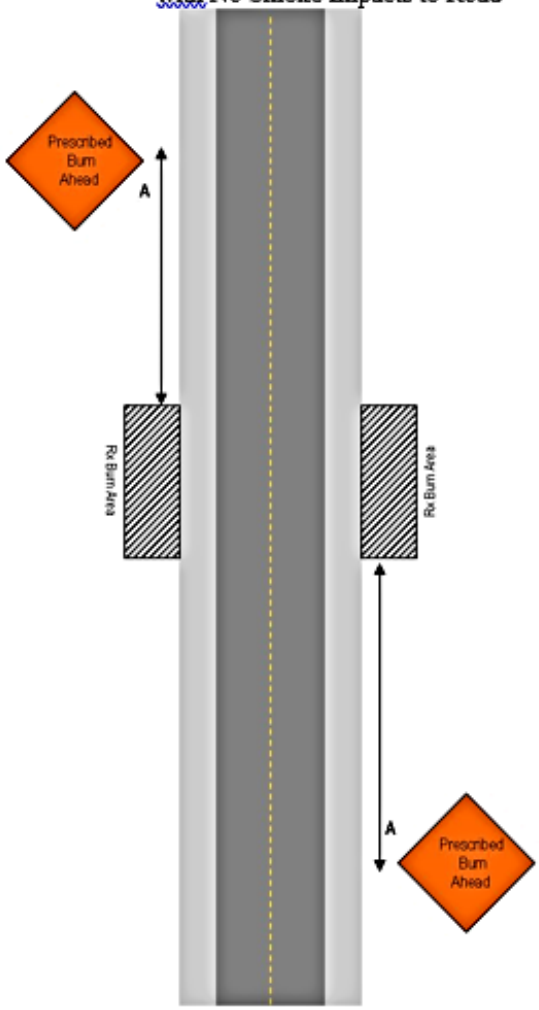
   Signs should be placed on the right-hand side of a two-way roadway and on both the right and left sides of a multi-lane roadway. If the location of the smoke or the work along the roadway changes, sign placement should be adjusted accordingly.

   For High Traffic road ways, signs may be augmented with the use of an electronic message board (which may be available through local transportation offices).

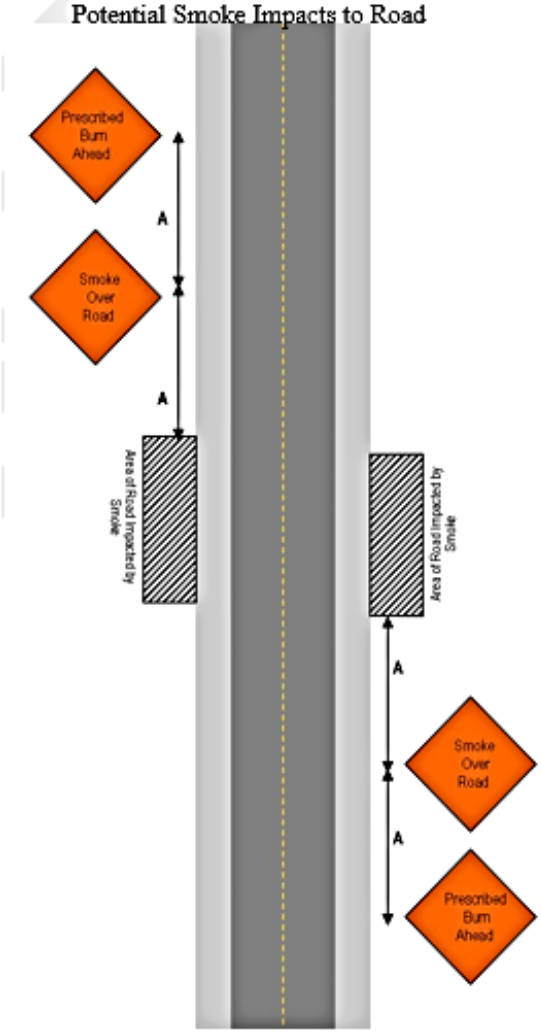
Advanced Warning Signing Distances For Prescribed Burns

Temporary Traffic Control Distance Chart	
Posted Speed Limit Prior to Burn Starting (mph)	Advance Warning Sign Spacing (A) feet
0 – 30	250
35 – 40	325
45 – 50	600
55	750
60 – 65	1000
70 – 75	1200

Advanced Warning Signing with No Smoke Impacts to Road



Advanced Warning Signing with Potential Smoke Impacts to Road



*Minnesota Manual on Uniform Traffic Control Devices - MN MUTCD

F. Safe Ignition Operations

The ignition plan, as detailed in the reviewed and approved burn plan, should include which ignition devices will be used, specific ignition techniques, and special safety considerations. All of these must be followed the day of the burn. The actions and roles noted below should be addressed in pre-burn planning and the burn crew briefing. The IRPG and appendix has a “Briefing Checklist,” which can aid in covering assignments, including ignitions operations.

Ignitions should take place only at the direction of a firing boss or burn boss, either of whom can be expected to understand fire behavior and recognize changing fire behavior that indicates potential dangers to fireline personnel.

Igniters must be in radio or direct communication with either the firing boss or burn boss at all times to receive direction regarding the timing and implementation of ignitions as well as emergency instructions.

Igniters must be familiar with the prescribed burn site, escape routes, and safety zones, which may change during the course of the burn.

Physical stamina of igniters should be monitored throughout the burn; accidents are more likely to occur when firefighters are fatigued.

Igniters should be briefed on their role when contingency plans will be implemented for spot fires or escaped fires.

G. Safety Communication

The First Report of Accident/Injury form was developed as a tool to report and communicate accidents, injuries, equipment failures, near misses, and other related incidents. An investigation and analysis may be performed depending on the extent of the injury, accident, or incident. A lessons learned document may be created and distributed as a result of the investigation and findings. More information on reporting accidents, injuries and near misses or safety communication, in general, can be located on the Safety, Health and Environmental Management MN DNR intranet page.

Prescribed Burn Reviews

A. After Action Review (AAR)

It is recommended that an informal After Action Review (AAR) or debriefing be conducted on each prescribed burn. An AAR is a professional discussion of an event, focusing on performance standards. The objective of the After Action Review is to identify successes and failures. This enables firefighters to discover for themselves what took place, why and how to maintain strengths, and improve upon weaknesses.

Questions to answer in conducting an AAR include:

a. What was planned?
    - Review the primary objectives and expected action plan.

b. What actually happened?
    - Review the day's actions:
        - Identify and discuss effective and non-effective performance.
        - Identify barriers that were encountered and how they were handled.
        - Discuss all actions that were not a standard operating procedure or presented safety problems.

c. Why did it happen?
    - Discuss the reasons for ineffective or unsafe performance. Concentrate on WHAT not WHO is right.

d. What can we do better next time?
    - Correct weaknesses/sustain strengths.

The AAR should be informal. The AAR guide in the Incident Response Pocket Guide (NFES 1077) may be used for field reference. Additional information on AAR facilitation can be found at NWCG After Action Reviews.

The AAR provides a reference aid to the burn boss that can be used to complete the Prescribed Burn Unit Log.

B. Elective Reviews

One of the responsibilities of the Regional Prescribed Burn Committee is to coordinate and advance the science of prescribed burning and monitoring. One way to accomplish this is to periodically review a burn that was conducted in the region. This option provides a more thorough review than an After Action Review. A particular burn can be selected for review based on the complexity, sensitivity, uniqueness, or creativity.

C. Review of a Prescribed Burn Escape or Incident within an Incident

Prescribed burn reviews may be initiated for a range of incidents, including defined prescribed burn escapes or another significant incident within an incident associated with the prescribed burn or escape. Prescribed fire reviews analyze a specific event and capture the lessons learned for the benefit of field staff throughout the state and provide recommendations for improving prescribed burn policy, protocol and operations.

The Department of Natural Resources recognizes the importance of a credible Prescribed Burn Program and the need to coordinate with other Department of Natural Resources reviews and investigations.

ALL EMPLOYEES ARE RESPONSIBLE FOR:
- Being observant for events that may contribute to an incident.

- Initiating appropriate action on observed events within the limitations of their training, equipment, and capability.
- Reporting and documenting all events associated with the escaped prescribed burn or other significant incidents.

1. Definition of a Prescribed Burn Escape and a significant Incident within an Incident

    a. A prescribed burn becomes a wildfire when the burn boss determines that an escape has or is likely to occur. It is considered an escape when one or more of the following conditions occur:
        - Fire is outside of the planned perimeter of the prescribed burn that requires suppression resources beyond those identified and under the command and control of the burn boss as contingency resources either on or off-site.
        - Fire is outside the planned perimeter of the prescribed burn that burns onto another ownership where the landowner has not given permission to burn.

    b. A significant incident (also known as an "incident within an incident") is defined when one or more of the following conditions associated with the prescribed burn occur may include but not limited to the following:
        - The prescribed burn escapes as described above.
        - There is structure or equipment damage or loss (due to prescribed fire operations) regardless of ownership, including those used in the project (e.g., farm equipment, buildings, etc.).
        - The potential for a tort claim against the state exists that may be due to damage from the fire or some related activity (e.g., a traffic accident, aircraft incident, etc.).
        - A crew member sustains an injury that requires significant medical assistance (e.g., hospitalization, emergency care, medivac or ambulance transport).

2. Reporting Responsibility

    a. The burn boss is responsible for completing the MN DNR Escaped Prescribed Burn/Incident within an Incident Report and to provide copies of the report to his or her supervisor and the relevant Regional Prescribed Burn Committee. The burn boss should also provide information to the pertinent Division of Forestry area office so that they can complete an Individual Fire Report (within 24 hours of escape).
    b. The burn boss or the burn boss's supervisor is responsible for notifying the Regional Prescribed Burn Committee Chair about the escape, or another significant incident as soon as it can

safely be accomplished. The supervisor is also responsible for reviewing the escaped burn/incident within an incident report and implementing any corrective actions.

3. Incident Review **(Under Revision)**

   The Regional Prescribed Burn Committee is responsible for requesting approval from the Reginal Management team (RMT) to conduct a review of an escape or another significant incident. This will be done using the delegation of authority found on the Prescribed Fire forms web page. The RMT will issue a delegation of authority to the Regional Prescribed Burn Committee for assembling the review team and conducting the review.

   The Regional Prescribed Burn Committee Chair, in consultation with the committee members and the RMT, is responsible for assembling the review team and appointing a review team chair. The review team is responsible for: ensuring proper documentation and analysis of the facts, identifying lessons learned, developing recommendations, and drafting a written report. The level and scope of the review will be determined by the injuries, damage, and cost associated with the escape or another significant incident.

   Review Team Composition

   The review team will include members of the Regional Prescribed Burn Committee and a member of the Statewide Prescribed Burn Committee.

   Other possible incident review team members may include:

   1. A regional or division land administrator representative for the land on which the incident occurred.
   2. Area Forester or Area Fire Team Leader of the MN DNR Forestry Area that issued the burning permit.
   3. Other subject matter experts (may be from other regions or partner agencies, MIFC).

   The burn boss of the prescribed fire, crew members on the prescribed burn, suppression staff, air operations staff, wildfire investigative team member(s), ignitions specialist, firing boss, the land manager or other witnesses may be invited to provide background, statement of facts, or other information as part of the review process.

   Conflict of Interest

   There may be instances that occur when a regional prescribed burn committee member or other possible review team member may have a potential conflict of interest in serving on the incident review team. Potential conflicts may include but are not limited to: operational

participation on the burn where the incident occurred; directly supervises the burn boss of the incident; is the program leader for the management of the land where the incident occurred; or is the program leader of the crew that executed the prescribed burn where the incident occurred.

In cases where there is a potential conflict of interest, the regional prescribed burn committee member or other possible review team member will document the circumstances of the potential conflict in writing to the regional committee chair. The regional committee chair will forward the documentation presented to them along with a short explanation to the RMT. It will be RMT responsibility to determine if a conflict exists. In cases where the regional committee chair may have a potential conflict, the regional committee chair will provide the documentation of the potential conflict to the regional committee vice chair. The vice chair will forward the documentation and explanation to RMT. The vice chair will assume lead of the incident review when the chair is determined to have a conflict.

If the RMT determines that a regional committee member or other possible review team member has a conflict of interest, that individual will be replaced. The RMT will contact the regional manager for the employee with the conflict and the regional manager will appoint a replacement. The replacement will be temporary and will serve on the incident review team until the review is completed.

In the event of an escape or another significant incident, the following actions should take place to properly document, analyze, and report the escape:

a. Documentation of Events

The burn boss will document all relevant information and events within 24 hours of control using the Escaped Prescribed Burn/Incident within an Incident Report form including:

1. Background (i.e., description of planned burn, the Prescribed Burn Unit Report, actions leading up to the burn).
2. Burn events (i.e., what happened during the burn and the escape, and a chronology of the events is suggested).
3. Cause of the escape or other incident and contributing factor(s) (i.e., equipment failure, communication issues, personnel action, fire behavior, weather change, drought conditions, etc.).

Other documentation should be completed as needed. For example, A MN DNR Employee/Equipment Injury/Accident Investigation form should be completed if an injury occurred or if

damage occurred to a vehicle. A MN DNR Incident Report should be completed if there is a possible tort claim or law violation.

The review team may request additional information from personnel who would have firsthand knowledge of the events of the escape.

All escaped prescribed burns must have an Individual Fire Report (NA-01985-05) completed by the Area Forestry Office in conjunction with the incident commander of the escaped fire.

b. Review Team Analysis

The review team should analyze all relevant information to identify the factor(s) causing the escape or other significant incident(s). This may include analysis of:

1. Direct causes (i.e., equipment failure, weather changes, personnel actions, etc.).
2. Prescribed Burn Unit Plan to determine if it was adequate for the project and if procedures in the plan were followed.
3. Experience and training levels of personnel involved.
4. Overall policy, guidance, and procedures relating to prescribed burning.

c. Review Team Report

All reviews will have a written report outlining the events of the escape or other significant incidents, recommendations, and lessons learned in order to provide information that will help avoid similar incidents in the future. See appendix for a guide on the suggested format and content of a review report.

The Review Team will submit a draft report to the Regional Management Team for approval. The RMT approved report will be submitted to the Regional Prescribed Burn Committee. The Regional Prescribed Burn Committee will immediately forward the approved report to the Chair of the Statewide Prescribed Burn Committee.

The Review Team will suggest actions that will help avoid future incidents to the corresponding Regional Management Team and Statewide Prescribed Fire Committee. Suggestions may include but are not limited to equipment improvements, additional training, additional task book assignments, division or statewide policy revisions, or qualification requirement changes.

d. Dissemination of Findings

The SPBC will be responsible for reviewing and approving the written report and developing a summary of findings and lessons learned document. The chair or designee of the Statewide Prescribed Burn Committee will coordinate with the MN DNR Data Practices Officer in developing the final version of the document. This summary will be reviewed, finalized, and may be distributed by the SPBC via e-mail to MN DNR program and regional managers. The summary of findings may also be posted on the SPBC Microsoft Teams Lessons Learned folder available to those with MS Teams accounts or possibly the MN DNR HYPERLINK "http://intranet.dnr.state.mn.us/forestry/fire/index.html"Wildland Fire Information intranet page. intranet page.

The SRBC will summarize findings from escaped burn reports or other significant incidents annually to identify common threads and lessons learned for other prescribed burn personnel in the state. The findings may be incorporated into the annual fireline safety refreshers.

Documentation

A. Burn Plan Review

New burn plans require a review by the Division of Forestry and should be submitted by February 28th each year if possible or target date set by the Regional Prescribed Burn Committee or other policy to allow the Division of Forestry staff time to review before the spring burn season. Plans submitted before February 28th of each year will be returned with an assigned burning permit or specific recommendations to ensure contingency planning is adequate for the project. Generally, there will be a three week review period unless otherwise agreed upon at the Area level, or as established in regional policy. Plans submitted after February 28th will be reviewed as time permits; however, a specific date for the return will be established at the time the Division of Forestry receives the plan. New plans that have been reviewed and approved may be entered into the Rx Reporting Module.

B. Prescribed Burn Reporting (i.e. Prescribed Burn Reporting Module)

Burn bosses (or designee) initiating a burn are responsible for entering data into the Fire Reporting Module for the land they manage. Future prescribed burn data can be entered. The land manager will enter the data for the contracted burns planned for state-managed lands. This applies to Private land that is burned in conjunction with state land burns. Prescribed burn acreage encompassing both federal and state lands will be reported separately. The federal partner (e.g., US Fish and Wildlife, US Forest Service) will report for the federal land acreage they manage in the Fire Reporting Module separately from the state land managers who will report for the state acreage.

Data is used to develop annual accomplishments, summaries, and other information as required by Operational Order 47. This information is also used to monitor and model particulate emissions from smoke, particularly in major urban areas of the state. In very rare circumstances, prescribed burning can be temporarily shut down per EPA limits if poor air quality conditions are present. The Prescribed Burn Reporting Module will also serve as a one-stop-shop for regional or statewide accomplishment requests for acreage, the number of burns, fuel types, etc. These entries may be used by regional staff to obtain previous accomplishment information for the MINCS weekly calls.

Final prescribed burn accomplishment information for each burn unit must be entered into the reporting application within 48 hours of completing the burn. This will provide all of the agencies using this data with timely information.

Directions for entering your prescribed burn data into the reporting module are available on the MN DNR Prescribed Fire Internet site.

When a request for permission to access this application is received, use the permission form available on the MN DNR intranet site. Fill out the electronic form completely, select the Prescribed Burn Reporting Module, check the Affirmation box, and click **submit request**. Access permission will be granted within a few days of submitting the application.

C. Burn Permits

The local Division of Forestry office will use the planned burns (previously reviews and approved) that have been entered in the Rx reporting module for the area (or region) as their list when issuing burn permits. To assure consistency when entering burn plans into the application, include the 1/1/20xx date formant and the Agency Subunit name (i.e., FAW R# area name or PAT R# park name). Follow the dates established in local agreements or Regional Policy when entering burn plans. Contact the appropriate Division of Forestry when all of the planned burns have been entered. The local Division of Forestry office can search for your agency subunit name when issuing permits.

D. Burn Permit Activation and Burn Notification

Burn plan notification will happen upon activating a permit or changing the burn date in the reporting module to the same date the permit is activated. If either the activation or burn date information is incomplete, the Division of Forestry office may contact the burn boss regarding inconsistencies with the permit activation or reporting module date. Set the date of the burn in the reporting module at least one day before the burn, but no later than 0830 the morning of the burn. **The same date/time of the activation AND reporting entry will constitute as burn notification.** The Division of Forestry can obtain the Prescribed Burn Module data from the reporting module for use during the MNICS daily activity reporting.

E. Prescribed Burn Unit Log

The Prescribed Burn Unit Log is described in detail in the burn planning section of this handbook. This report contains the burn day forecast and observed weather, fire behavior observations as well as post-burn observations and recommendations. Activity logs generated during the burn and mop-up phases can also be included in the report.

F. Annual Accomplishment Reporting

Each discipline is responsible for entering completed accomplishments in the Prescribed Burn Reporting Module. Accomplishments provide data for the **annual** summary generated in December. The summary includes the number of burns and the total acres burned by fuel model.

The Division of Forestry is responsible for compiling the **annual** department-wide summary of prescribed burn accomplishments for the calendar year. These figures are submitted to the MNICS Prescribed Fire Working Team for inclusion into their smoke management requirement report to the Minnesota Pollution Control Agency.

Prescribed Burn Restrictions

A. Purpose

Prescribed burning is a management action that brings with it a relative level of risk for adverse outcomes. As fire danger increases the level of risk generally increases as well. In addition to the increased risk of escape or hazardous conditions for the line crew, this increased level of risk may exacerbate factors not directly related to the fire environment. Such factors may include suppression resource shortages and social political perceptions of prescribed burning. Information and Status

Fire Danger Adjective Rating Level

In 1974, the Forest Service, Bureau of Land Management and State Forestry organizations established five standard Adjective Fire Danger Rating Level descriptions for public information and signing. Based on extensive analysis of historical fire weather patterns and fire occurrence. Minnesota uses a matrix of Initial Spread Index (ISI) and Relative Humidity (RH) during the spring, with an additional qualifier at an ISI above 12 of Fire Weather Index (FWI). A matrix of FWI and Fine Fuel Moisture Content (FFMC) is used to determine the fire danger adjective level during the summer. During fall either the spring or summer matrix is used dependent on the Drought Code (DC) being above or below 250. Above = spring matrix. Below = summer matrix.

Burning Restrictions

Burning restrictions are a means to indicate to the public and agency personnel the need for a burning permit prior to any open burning that requires a permit per MN Statute 88.17 and MN statue 84.97 . Categories of restrictions range from No Permit Required to Elevated Burning Restrictions. Restrictions are set by Forestry Fire Team Leaders under normal conditions and in coordination with DNR Fire Prevention Staff and other Fire Management Agencies at higher levels.

Current Fire Danger Adjective Rating Levels and permit restrictions can be found at the MN DNR Forestry wildfire information web page.

Preparedness Level

The Preparedness Level is a five-tier (1-5) fire danger rating decision tool that is based on NFDRS and CFFDRS output(s) and other indicators of fire business (such as projected levels of resource commitment). Preparedness Levels will assist fire managers with more long-term (seasonal) decisions with respect to fire danger. The basis for Preparedness level in the spring is a breakdown of the 5-day average of Burning Index in Fuel Model X. Summer and fall utilize a breakdown of Build Up Index and Energy Release Component in

Fuel Model Y. In order to establish a State-wide Preparedness level interagency preparedness planning calls are conducted twice weekly (Tuesdays and Fridays) while State-wide Preparedness Level is at a 3 or higher. At Preparedness Level 2 or below preparedness planning calls occur weekly (Tuesdays). Decisions to annually start and stop or adjust mid planning period are made as needed. Regional and local decisions on preparedness are done per local protocol and indices have been broken down for each of the FDRAs to aid in the support of these decisions.

Current Preparedness Levels for Forestry Regions can be found here.

Current Preparedness Levels for Forestry Areas can be found here.

Distribution of burn restriction status information will be accomplished as broadly as possible, including:

1. Send an e-mail to internal and external electronic distribution lists. The lists include MN DNR and MNICS partners and members of the public who have expressed interest in receiving the information.

2. Divisions will notify staff or entities within their Divisions that may be essential to contact immediately, such as a burn crew, state park or Wildlife area office with planned burns.

3. MIFC will contact the affected Division of Forestry regional offices by telephone if they were not on the conference call. MIFC intel reports and MN Fire Environment Forecasts are issued daily via email and posted on the MN DNR Forestry wildfire web page.

4. Social media will also be utilized to direct interested parties to monitor changes to the fire information website.

B. Activation of Burning Permits and Additional Approvals

Current Area, Regional and Statewide fire conditions must be considered prior to the permit activation:

Normal Activation

Activation Under Elevated Preparedness Level

The burn boss, land manger, or designee is responsible for ensuring the following enhanced approvals are received.

- At Area Preparedness Level 4 or higher the following roles apply:
  - Regional Forest Manager will have approval authority for burn permit activation.

    - Area Forestry reevaluates the contingency plan at least 48 hours prior to the anticipated burn date as provided in advance by the burn boss or land manager.
- At Regional Preparedness Level 4 or higher the following roles apply:
    - the Fire Section Manager (or designee) will have approval authority for burn permit activation.
    - Area Forestry reevaluates the contingency plan at least 48 hours prior to the anticipated burn date as provided in advance by the burn boss or land manager.

Additional Approval Under Elevated Fire Danger

- At Very High or Extreme fire danger adjective ratings and with an approved burning permit, the regional manager for the division planning the prescribed burn, with concurrence from their division leadership, will make the final decision to commence burning. All documents, including the Prescribed Burn Plan, Complexity Analysis, Contingency Plan, and the burn permit, will be provided to the Division regional manager by the assigned burn boss for review prior to the decision to commence burning. This divisional approval process is related to fire danger ratings and is independent of the above.

C. Decision Making Process

The Divisions of Forestry, Ecological and Water Resources, Parks and Trails, the Section of Wildlife, and MNICS Partners will participate in the MNICS conference calls during periods when fuel and weather conditions are favorable for wildland or prescribed fire. Current and forecasted weather and fire behavior information will be provided and discussed.

Division of Forestry Regions and Areas, utilizing information discussed during the MNICS and Regional conference calls along with protocols and processes included in several policy and guidance documents, will determine the need for burning restrictions and regulate the start date. Regions/Areas are responsible to coordinate open burning restrictions with other agencies and authorities within their Region including MN DNR Divisions, U.S. Forest Service, Bureau of Indian Affairs, Tribes, Sheriffs, etc., and with neighboring Regions/Areas. MIFC and Fire Prevention Staff will help to coordinate through MNICS and the MN DNR conference calls.

If disagreements arise regarding the implementation of open burning restrictions, those involved must consult with their section chief or division director regarding the proposed restrictions. The Wildfire Section Manager will also consult with the respective section chief or division director in order to reach an agreement and implement the decision. The Wildfire Section Manager retains the ability to establish restrictions if regions/areas are unable to reach a consensus on the restrictions.

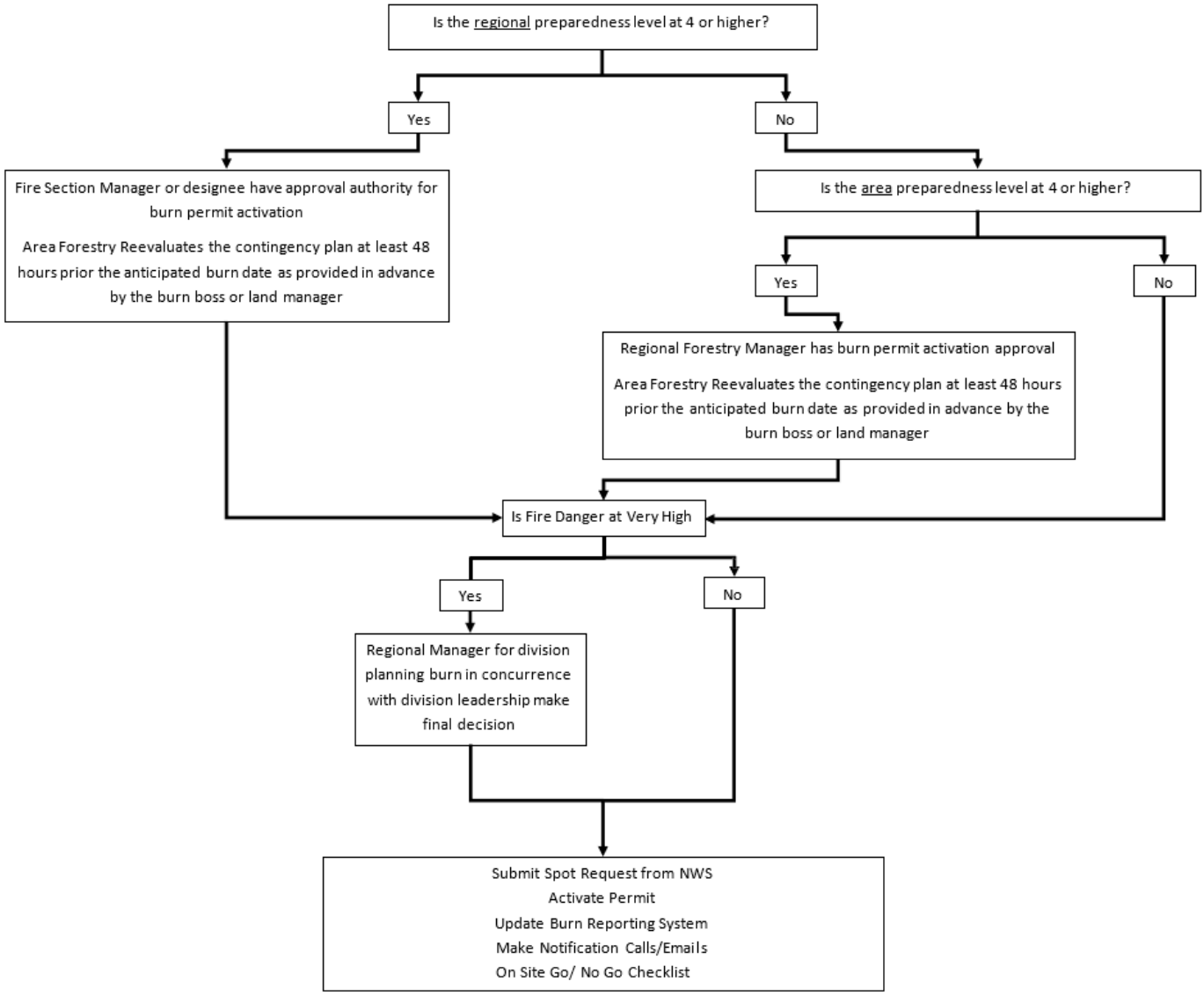
D. Removal or Change of Restrictions

The same decision-making process will be used for lifting the restrictions or making changes to the original restrictions.

E. Availability of Prescribed Burn Suppression Resources during Burning Restrictions

Most restrictions on prescribed burning are short term and implemented only during periods of very high to extreme fire danger. During periods of restrictions on prescribed burning and when the Division of Forestry staff and contract personnel resources are insufficient to manage wildfire activity, divisions may allow their qualified staff to assist in wildfire suppression through the Ready Reserve process or serve as local suppression support through coordination with the local Forestry office. Resources can be made available locally, regionally, or for statewide use. Regular work time and overtime spent on suppression by non-Forestry personnel is fully reimbursable. Detailed information is available in the Wildfire Protection Business Manual.

Flow Chart—Additional approvals required during elevated preparedness levels and fire danger ratings.



Appendix

Blank Forms (forms can be found at Forms)

- MN DNR Prescribed Unit Plan (other Burn Plan examples can be found here)
- Prescribed Burn Complexity Rating System Guide Worksheet (PMS 424)
- Briefing Checklist
- Incident Action Plan Risk Analysis Form (ICS 215A)
- Medical Plan (ICS 206)
- SafeCom
- Grant of Permission to Burn Lands Not Administered by the Department of Natural Resources
- Resource Order Form
- Wildfire Risk Assessment
- MNICS Daily Reporting form
- Escaped Burn/Incident Report
- Escape Burn or Incident Review Delegation of Authority

Examples

- Completed MN DNR Prescribed Burn Unit Plan with shaded table
- Completed Prescribed Fire Complexity Rating System Guide Worksheet
- Completed Resource Supply Order
- Completed Resource Equipment Order
- Prescribed Burn Briefing Outline
- Suggested Escape Review Report Outlines

Fuel Models – listing of the 13 original fuel models and the 40 newer fuel models

Minnesota Native Plant Community Classification

Standard Prescribed Fire Contract Provisions

BehavePlus Shaded Table Explanation

Helpful Internet Addresses

Prescribed Burn Briefing Outline – EXAMPLE

A. Burn Organization
    A. Organizational Chart/Personnel Assignments
    B. Equipment Assignments
    C. Other Resources
B. Burn Objectives
C. Description of Burn Area
    A. Review Map of Burn/Topographical Features/Acreage
    B. Values at Risk
    C. Problem Areas
    D. Fuel Type (Both Inside and Outside the Burn Unit)
    E. Roads/Access
    F. Water Sources
    G. Natural/Manmade Barriers
D. Expected Weather
    A. Wind Direction and Speed
    B. Relative Humidity
    C. Temperature
    D. Fuel Moisture
    E. Atmospheric Stability
    F. Predicted Changes
E. Communications
    A. Procedures
    B. Frequencies/Channels
        1. Burn Crew
        2. Dispatch
        3. Cooperators
        4. Others
F. Firing Sequence
    A. Test Burn
    B. Ignition Equipment (Type, Number, etc.)
    C. Pattern and Sequence of Firing (Map)
G. Contingency Plan
    A. Slop Over vs. Escape
    B. Assignments/Organizational Chart
    C. Strategy
    D. Tactics
H. Safety
    A. Inspect Personal Protective Equipment
    B. Lookouts, Escape Routes and Safety Zones
    C. Hazards (Footing, Natural, Man-made, Smoke [visibility], etc.)
    D. Potential Problems
    E. Other (Air Operations, Flammable Fuel Handling, etc.)
    F. Crew physical fitness – expectations

SUGGESTED ESCAPE REVIEW REPORT OUTLINES: COMPLEX AND BASIC

Complex Outline

1. Executive Summary
A one- to two-page summary of the accident with highlights of lessons learned.

2. Introduction
An overview of the accident, the setting, and background information on conditions.

3. The Accident Story
The factual story of the accident using the techniques of nonfiction storytelling.

4. Lessons Learned by Those Involved
A listing or creative display of the views expressed by those involved in the accident related to what they learned and what they believe the organization should learn from their experience.

5. Lessons Learned Analysis
An analysis of the relevant workplace conditions to explain the nature of the accident. The relevance (to the accident) of a given condition is a subjective determination made by the review team and, where feasible, originates from the lessons learned by the peers. Highlight conditions that were key to the accident and that may be setting the organization up for a subsequent accident.

6. Summary
A brief summary of the Lessons Learned Analysis. Performance-shaping factors or workplace conditions that pose an unnecessary risk to future operations should be discussed in this section and will serve as the basis for any recommendations.

7. Appendices
The appendices feature information such as a Human Performance Analysis/Human Factors report, fire shelter performance report, engineer's structural analysis, fire behavior analysis report, etc.

8. Recommendations (Optional)
A listing of reasonable courses of action that modify, enhance or remedy performance-shaping factors that create unnecessary risk to future operations. Recommendations are often the most contentious part of the report; if required, should be given to Delegating Authority separately.

Basic Outline

1. Summary
A one- or two-paragraph summary of the accident.

2. Narrative or Chronology
A brief summary of what happened. This can be told in the form of a timeline, a narrative, story or a first-hand account.

3. Lessons Learned by Those Involved
A listing or creative display of the views expressed by those involved in the accident related to what they learned and what they believe the organization should learn from their experience. Alternatively stated as: "What would I do differently next time, knowing what I know now?"

4. Summary (Recommendations Optional)
A brief summary of the review. If it is requested by the Agency Administrator, this summary may also contain team lessons learned. (Recommendations are generally not advisable.)

BRIEFING CHECKLIST

Situation

☐ Fire name, location, map orientation, other incidents in area

☐ Terrain influences

☐ Fuel type and conditions

☐ Fire weather (previous, current, and expected)

☐ Winds, RH, temperature, etc.

☐ Fire behavior (previous, current, and expected)
Time of day, alignment of slope and wind, etc.

Mission/Execution

☐ Command
Incident Commander/immediate supervisor

☐ Leader's intent
Overall objectives/strategy

☐ Specific tactical assignments

☐ Contingency plans

☐ Medevac plan
Personnel, equipment, transport options, contingency plans

Communications

☐ Communication plan
Tactical, command, air-to-ground frequencies
Cell phone numbers

Service/Support

☐ Other resources
Working adjacent and those available to order
Aviation operations

☐ Logistics
Transportation
Supplies and equipment

Risk Management

☐ Identify known hazards and risks

☐ Identify control measures to mitigate hazards/reduce risk

☐ Identify trigger points for reevaluating operations

Questions or Concerns?

Description of Fire Behavior Fuel Models

Grass and grass-dominated fuels

Fuel Model	Typical Fuel Complex	1 Hour Load tons/ac	10 Hour Load tons/ac	100 Hour Load tons/ac	Live Heat tons/ac	Fuel Bed Depth in Ft	Moisture of Extinction Dead Fuels
1	Short grass (1 foot)	0.74	0.00	0.00	0.00	1.0	12%
2	Timber (grass and understory)	2.00	1.00	0.50	0.50	1.0	15%
3	Tall grass (2.5 feet)	3.01	0.00	0.00	0.00	2.5	25%

Table from “Aids to Determining Fuel Models for Estimating Fire Behavior” by Hal E. Anderson. April 1992 National Wildfire Coordinating Group NFES 1574.

Chaparral and shrub fields

Fuel Model	Typical Fuel Complex	1 Hour Load tons/ac	10 Hour Load tons/ac	100 Hour Load tons/ac	Live Heat tons/ac	Fuel Bed Depth in Ft	Moisture of Extinction Dead Fuels
4	Chaparral (6 ft)	5.01	4.01	2.00	5.01	6.0	20%
5	Brush (2 ft)	1.00	0.50	0.00	2.00	2.0	20%
6	Dormant brush, hardwood slash	1.50	2.50	2.00	0.00	2.5	25%
7	Southern rough	1.13	1.87	1.5	0.37	0.2	25%

Table from “Aids to Determining Fuel Models for Estimating Fire Behavior” by Hal E. Anderson. April 1992 National Wildfire Coordinating Group NFES 1574.

Timber litter

Fuel Model	Typical Fuel Complex	1 Hour Load tons/ac	10 Hour Load tons/ac	100 Hour Load tons/ac	Live Heat tons/ac	Fuel Bed Depth in Ft	Moisture of Extinction Dead Fuels
8	Closed timber litter	1.50	1.00	2.50	0.00	0.2	30%
9	Hardwood litter	2.92	0.41	0.15	0.00	0.2	25%
10	Timber (litter and understory)	3.01	2.00	5.01	2.00	1.0	15%

Table from “Aids to Determining Fuel Models for Estimating Fire Behavior” by Hal E. Anderson. April 1992 National Wildfire Coordinating Group NFES 1574.

Slash

Fuel Model	Typical Fuel Complex	1 Hour Load tons/ac	10 Hour Load tons/ac	100 Hour Load tons/ac	Live Heat tons/ac	Fuel Bed Depth in Ft	Moisture of Extinction Dead Fuels
11	Light logging slash	1.50	4.51	5.51	0.00	1.0	15%
12	Medium logging slash	4.01	14.03	16.53	0.00	2.3	20%
13	Heavy logging slash	7.01	23.04	28.04	0.00	3.0	25%

Table from “Aids to Determining Fuel Models for Estimating Fire Behavior” by Hal E. Anderson. April 1992 National Wildfire Consulting Group NFES 1574.

Fuel Model Parameters – Excerpted from "Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel's Surface Fire Spread Model" USFS Gen Tech Report RMRS-GTR-153

FM Code	Fuel Model Name	1 hr Load t/ac	10 hr Load t/ac	100 hr Load t/ac	Live Herb Load	Live Woody Load	Bed Depth	Dead Fuel Extinction Moisture %
GR1	Short, sparse dry climate grass	0.10	0.00	0.00	0.30	0.00	0.4	15
GR2	Low load dry climate grass	0.10	0.00	0.00	1.00	0.00	1.0	15
GR3	Low load very coarse humid climate grass	0.10	0.40	0.00	1.50	0.00	2.0	30
GR4	Moderate load dry climate grass	0.30	0.00	0.00	1.90	0.00	2.0	15
GR5	Low load humid climate grass	0.40	0.00	0.00	2.5	0.00	1.5	40
GR6	Moderate load humid climate grass	0.10	0.00	0.00	3.4	0.00	1.5	40
GR7	High load dry climate grass	1.00	0.00	0.00	5.40	0.00	3.0	15
GR8	High load very coarse humid climate grass	0.50	1.00	0.00	7.30	0.00	4.0	30
GR9	Very high load humid climate grass-shrub	1.00	1.00	0.00	9.00	0.00	5.0	40
GS1	Low load dry climate grass-shrub	0.20	0.00	0.00	0.50	0.70	0.9	15
GS2	Moderate load dry climate grass-shrub	0.50	0.50	0.00	0.60	1.00	1.5	15
GS3	Moderate load humid climate grass-shrub	0.30	0.30	0.00	1.50	1.30	1.8	40
GS4	High load humid climate grass-shrub	1.90	0.30	0.10	3.40	7.10	2.1	40
SH1	Low load dry climate shrub	0.30	0.30	0.00	0.20	1.30	1.0	15
SH2	Mod. load dry climate shrub	1.40	2.40	0.80	0.00	3.90	1.0	15
SH3	Mod. load humid climate shrub	0.50	3.00	0.00	0.00	6.20	2.4	40
SH4	Low load humid climate timber-shrub	0.90	1.20	0.20	0.00	2.60	3.0	30
SH5	High load dry climate shrub	3.60	2.10	0.00	0.00	2.90	6.0	15
SH6	Low load humid climate shrub	2.90	1.50	0.00	0.00	1.40	2.0	30
SH7	Very high load dry climate shrub	3.50	5.30	2.20	0.00	3.40	6.0	15
SH8	High load, humid climate shrub	2.10	3.40	0.90	0.00	4.40	3.0	40
SH9	Very high load, humid climate shrub	4.50	2.50	0.00	1.60	7.00	4.4	40
TU1	Low load, dry climate timber-grass-shrub	0.20	0.90	1.50	0.20	0.90	0.6	20
TU2	Moderate load, humid climate timber-shrub	1.00	1.80	1.30	0.00	0.20	1.0	30
TU3	Moderate load, humid climate, timber-grass-shrub	1.10	0.20	0.30	0.70	1.10	1.3	30
TU4	Dwarf conifer with understory	4.50	0.00	0.00	0.00	2.00	0.5	12
TU5	Very high load, dry climate timber-shrub	4.00	4.00	3.00	0.00	3.00	1.0	25
TL1	Low load compact conifer litter	1.00	2.20	3.60	0.00	0.00	0.2	30
TL2	Low load broadleaf litter	1.40	2.30	2.20	0.00	0.00	0.2	25
TL3	Moderate load conifer litter	0.50	2.20	2.80	0.00	0.00	0.3	20
TL4	Small downed logs	0.50	1.50	4.20	0.00	0.00	0.4	25
TL5	High load conifer litter	1.20	2.50	4.40	0.00	0.00	0.6	25
TL6	Moderate load broadleaf litter	2.40	1.20	1.20	0.00	0.00	0.3	25
TL7	Large downed logs	0.30	1.40	8.10	0.00	0.00	0.4	25
TL8	Long needle litter	5.80	1.40	1.10	0.00	0.00	0.3	35
TL9	Very high load broadleaf litter	6.70	3.30	4.20	0.00	0.00	0.6	35
SB1	Low load activity	1.50	3.00	11.00	0.00	0.00	1.0	25
SB2	Moderate load activity fuel or low load blowdown	4.50	4.30	4.00	0.00	0.00	1.0	25
SB3	High load activity fuel or moderate load blowdown	5.50	2.80	3.00	0.00	0.00	1.2	25
SB4	High load blowdown	5.30	3.50	5.30	0.00	0.00	2.7	25

Minnesota's Native Plant Community Classification: System Groups, Systems and Classes as of June 18, 2003

A. Upland Forests and Woodlands

Fire-Dependent Forest/Woodland System

Forest Model Code	Description
FDn12	Northern Dry-Sand Pine Woodland
FDn22	Northern Dry-Bedrock Pine (Oak) Woodland
FDn32	Northern Poor Dry-Mesic Mixed Woodland
FDn33	Northern Dry-Mesic Mixed Woodland
FDn43	Northern Mesic Mixed Forest
FDc12	Central Poor Dry Pine Woodland
FDc23	Central Dry Pine Woodland
FDc24	Central Rich Dry Pine Woodland
FDc25	Central Dry Oak-Aspen (Pine) Woodland
FDc34	Central Dry-Mesic Pine-Hardwood Forest
FDs27	Southern Dry-Mesic Pine Oak Woodland
FDs36	Southern Dry-Mesic Oak-Aspen Forest
FDs37	Southern Dry-Mesic Oak (Maple) Forest
FDs38	Southern Dry-Mesic Oak Woodland
FDw24	Northwestern Dry-Mesic Oak Woodland
FDw34	Northwestern Mesic Aspen-Oak Woodland
FDw44	Northwestern Wet-Mesic Aspen Woodland

Mesic Hardwood Forest System

Forest Model Code	Description
MHn35	Northern Mesic Hardwood Forest
MHn44	Northern Wet-Mesic Boreal Hardwood Conifer Forest
MHn45	Northern Mesic Hardwood (Cedar) Forest
MHn46	Northern Wet-Mesic Hardwood Forest
MHn47	Northern Rich Mesic Hardwood Forest
MHc26	Central Dry Mesic Oak Aspen Forest
MHc36	Central Mesic Hardwood Forest (Eastern)
MHc37	Central Mesic Hardwood Forest (Western)
MHc38	Central Mesic Cold Slope Hardwood Conifer Forest
MHc47	Central Wet-Mesic Hardwood Forest
MHs37	Southern Dry Mesic Oak Forest
MHs38	Southern Mesic Oak Basswood Forest
MHs39	Southern Mesic Maple Basswood Forest
MHs49	Southern Wet Mesic Hardwood Forest
MHw36	Northwestern Wet Mesic Hardwood Forest

B. Wetland Forests

Floodplain Forest System

Forest Model Code	Description
FFn57	Northern Terrace Forest
FFn67	Northern Floodplain Forest
FFs58	Southern Floodplain Forest
FFs59	Southern Terrace Forest

Wet Forest System

Forest Model Code	Description
WFn53	Northern Wet Cedar Forest
WFn55	Northern Wet Ash Swamp
WFn64	Northern Very Wet Ash Swamp
WFs55	Southern Wet Aspen Forest
WFs57	Southern Wet Ash Swamp
WFw54	Northwestern Wet Aspen Forest

Forested Rich Peatland System

Forest Model Code	Description
FPn62	Northern Rich Spruce Swamp (Basin)
FPn63	Northern Cedar Swamp
FPn71	Northern Rich Spruce Swamp (Water Track)
FPn72	Northern Rich Tamarack Swamp (Eastern Basin)
FPn81	Northern Rich Tamarack Swamp (Water Track)
FPn82	Northern Rich Tamarack Swamp (Western Basin)
FPs63	Southern Rich Conifer Swamp
FPw63	Northwestern Rich Conifer Swamp

Acid Peatland System

Forest Model Code	Description
APn80	Northern Spruce Bog
APn81	Northern Poor Conifer Swamp

C. Upland Grasslands, Shrublands, and Sparse Vegetation

Cliff/Talus System

Forest Model Code	Description
CTn11	Northern Dry Cliff
CTn12	Northern Open Talus
CTn24	Northern Scrub Talus
CTn32	Northern Mesic Cliff
CTn42	Northern Wet Cliff
Ctu22	Lake Superior Cliff
CTs12	Southern Dry Cliff
CTs23	Southern Open Talus
CTs33	Southern Mesic Cliff
CTs43	Southern Maderate Cliff
CTs46	Southern Algific Talus
CTs53	Southern Wet Cliff

Rock Outcrop System

Forest Model Code	Description
ROn12	Northern Bedrock Outcrop
ROn23	Northern Bedrock Shrubland
ROs12	Southern Bedrock Outcrop

Lake Shore System

Forest Model Code	Description
LKi32	Inland Lake Sand/Gravel/Cobble Shore
LKi43	Inland Lake Rocky Shore
LKi54	Inland Lake Clay/Mud Shore
LKu32	Lake Superior Sand/Gravel/Cobble Shore
LKu43	Lake Superior Rocky Shore

River Shore System

Forest Model Code	Description
RVx32	Sand/Gravel/Cobble River Shore
RVx43	Rocky River Shore
RVx54	Clay/Mud River Shore

Upland Prairie System

Forest Model Code	Description
UPn12	Northern Dry Prairie
UPn13	Northern Dry Savanna
UPn23	Northern Mesic Prairie
UPn24	Northern Mesic Savanna
UPs13	Southern Dry Prairie
UPs14	Southern Dry Savanna
UPs23	Southern Mesic Prairie
UPs24	Southern Mesic Savanna

D. Wetland Grasslands, Shrublands and Marshes

Acid Peatland System

Forest Model Code	Description
APn90	Northern Open Bog
APn91	Northern Poor Fen

Open Rich Peatland System

Forest Model Code	Description
OPn81	Northern Shrub Shore Fen
OPn91	Northern Rich Fen (Water Track)
OPn92	Northern Rich Fen (Basin)
OPn93	Northern Extremely Rich Fen
OPp91	Prairie Rich Fen
OPp93	Prairie Extremely Rich Fen

Forested Rich Peatland System

Forest Model Code	Description
FPn73	Northern Alder Swamp

Wet Meadow/Carr System

Forest Model Code	Description
WMn82	Northern Wet Meadow/Carr
WMs83	Southern Seepage Meadow/Carr
WMp73	Prairie Wet Meadow/Carr

Marsh System

Forest Model Code	Description
MRn83	Northern Mixed Cattail Marsh
MRn93	Northern Bulrush-Spikerush Marsh
MRu94	Lake Superior Coastal Marsh
MRs83	Southern Mixed Cattail Marsh
MRs93	Southern Bulrush-Arrowhead Marsh

Lowland Prairie System

Forest Model Code	Description
WPu53	Northern Wet Prairie
WPs54	Southern Wet Prairie

Standard Prescribed Fire Contract Provisions - Minnesota

The following are suggested standard contract provisions pertaining to prescribed fire contractors; requirements for funding source of this project.

1. Minimum Personnel and Equipment Qualifications

   A. By signing this agreement or contract, the CONTRACTOR certifies that all employees hired by CONTRACTOR and employed in prescribed fire operations meet the minimum qualification requirements pursuant to the following categories and defined by MN DNR Prescribed Fire Handbook 2020

      Burn boss
      Burn boss, meets the level required by each individual Prescribed Fire Plan, will be present on all incidents.

      Ignition specialist/Firing boss
      Must be at least one Ignition Specialist or Firing Boss present on incidents if required in the Prescribed Fire Plan.

      Other Personnel
      Other contracted resources or positions must meet the minimum standards identified in MN DNR Prescribed Fire Handbook 2020.

   B. The CONTRACTOR must ensure all employees in prescribed fire operations utilize Personal Protective Equipment (PPE) meeting State fire policy standards.

   C. The STATE reserves the right to reject any contract crewmember that is not in full compliance with the qualification requirements for the position they occupy. Failure of any member of the crew to demonstrate an ability to perform tasks listed above for the position they occupy will be cause for immediate release from a contract.

   D. The CONTRACTOR can obtain a copy of Minnesota Department of Natural Resources Prescribed Fire Handbook 2020 by the MN DNR Prescribed Fire website.

2. Training

   A. Requirements

      1. In addition to the training requirements defined by MN DNR Prescribed Fire Handbook 2020 the CONTRACTOR must ensure that all returning company employees receive Annual Safety Refresher Training. This training will include, at a minimum, RT-130 Annual Fireline Safety Refresher including The New Generation Fire Shelter PMS-411 (Pamphlet and Video) refresher courses. CONTRACTOR must maintain records validating that the employee has received this additional training.

B. Record Keeping

1. The CONTRACTOR must maintain a complete set of training records for each employee. This will, at a minimum, include copies of all course certificates required as a prerequisite for the position employee is occupying and, documentation of required Annual Safety Refresher Training. Employees should be responsible for maintaining original course certificates.
2. The CONTRACTOR will maintain employee training and experience records, including records and certification cards for workers that are hired subsequent to receiving a contract, in such a manner that they can be easily obtained and available for inspection at any time during the Contract, Agreement period, or Incident.

3. Prescription and Planning Requirements

A. The CONTRACTOR agrees to follow plans outlined in the Prescribed Burn Plan for each burn included in this Contract.

1. The STATE will provide a State approved Prescribed Burn Plan for each individual burn.
2. The CONTRACTOR is responsible for obtaining any supplies and equipment required in each burn plan.
3. The STATE will be responsible for securing a burn permit(s) as required for each specific burn plan (MN DNR Forestry Division – contact information included in prescribed burn plan).
4. Prescriptions will be followed in a manner that meets burn objectives and provides for safety of employees, adjacent lands and properties, and private citizens.
5. The CONTRACTOR will evaluate the site on the day of the burn to ensure that all conditions outlined in the burn plan are met on the burn day, prior to ignition. The burn boss and ignition specialist/firing boss must inspect the entire perimeter of the burn on the day of the burn. Preferably, the entire crew should accompany the burn boss and ignition specialist/firing boss on this inspection.
6. The CONTRACTOR is responsible for all activities relating to the on-site execution of the burn.

4. Pre-burn Consultation and Post-burn Reporting

A. CONTRACTOR must schedule a meeting with the MN DNR representative prior to starting any contract work and will also schedule a meeting following completion of all contract work.

B. The CONTRACTOR will provide the STATE no later than (enter date here) a post burn field report with conditions and results of each prescribed burn to (contact name here).

1. Prescribed Burn Field Report is included with each burn prescription.

Table Shading for Acceptable Fire Conditions

A primary use of the BehavePlus option of table shading for acceptable fire conditions is for prescribed fire planning. Acceptable conditions (such as 2 to 8 foot flame length) can be specified; unacceptable conditions are then “shaded” on output tables. (They are actually crossed off or left blank.) In this way, conditions such as wind speed and dead fuel moisture that result in acceptable conditions can be identified.

The approach used in BehavePlus is different from that in the RXWINDOW program of the old BEHAVE system (Andrews and Bradshaw 1990). RXWINDOW reversed the calculations to determine environmental conditions that corresponded to specified fire conditions. That approach is not feasible given the additional fire models (such as crown fire) that are available in BehavePlus.

To add acceptable fire conditions to your worksheet, check the box next to table shading for acceptable fire conditions in the module selection window. Output variables available for table shading are given in a table in the BehavePlus variables paper (Andrews 2009).

The added section of the worksheet lists output variables that allow input fields for minimum and maximum acceptable values. Entered values only affect results if the associated box is checked. If acceptable conditions are specified for flame length, values outside of that range on the flame length output table are crossed off. Associated table entries are also crossed off on any other table that is produced (in this example, surface rate of spread and reaction intensity).

It is a good practice to first show the values that are crossed out (unacceptable values) so that you see what is happening. Once you create the table that you want, you can produce a nicely formatted table with blank cells using **Configure > Appearance preferences > Tables**, checking the box next to **Show only acceptable conditions** when table shading, and recalculating the run.

Helpful Internet Addresses

MN DNR Prescribed Burn Website – contains burn plan examples, MN DNR Prescribed Burn task books, blank forms
https://www.dnr.state.mn.us/rxfire/forms.html

MN DNR Forestry forms- contains blank Prescribed burn unit plans, fire investigation report, permission to burn on non-MN DNR land, and work capacity forms.
http://intranet.dnr.state.mn.us/forestry/forms/index.html

Standard Fire Behavior Fuel Models- pdf of standard 40 fuel models and descriptors
https://www.fs.fed.us/rm/pubs/rmrs_gtr153.pdf

Fire Danger Indexes – Canadian Model
https://www.dnr.state.mn.us/forestry/fire/maps/fdi_canadian.html

Canadian Fire Behavior Prediction system
http://cwfis.cfs.nrcan.gc.ca/background/summary/fbp

Minnesota Fire Behavior Reference Guide (Canadian Index)
http://www.fbfrg.org/cffdrs/fwi-fbp-calculations-worksheet

MN DNR Wildland Fire Information Center – contains fire danger predictions, links to fire weather, situational updates
http://www.dnr.state.mn.us/forestry/fire/index.html

NWCG Prescribed Fire Complexity Rating System Guide (PMS 424)
https://www.nwcg.gov/publications/424

BehavePlus Fire Modeling System- information about the system, download newest versions, trainings, and publications
https://www.frames.gov/behaveplus/home

NWCG Fire Behavior Field Reference Guide (PMS 437)
https://www.nwcg.gov/publications/pms437

MN Smoke Management Plan-
http://mnics.org/wpress/wp-content/uploads/2011/02/Smoke-Mangement-Plan.pdf

Minnesota Department of Transportation's District Offices
http://www.dot.state.mn.us/information/districts.html

National Wildfire Coordinating Group- Home Page
https://www.nwcg.gov/

National Wildfire Coordinating Group Publications
https://www.nwcg.gov/publications

Northeast Interagency Fire Cache located in Grand Rapids Minnesota
http://mnics.org/wpress/northeast-interagency-support-cache/

NWCG National Fire Equipment System Catalog (PMS 449-1)
https://www.nwcg.gov/publications/pms449-1

Resource Supply and Equipment Order Forms
https://www.nifc.gov/nicc/logistics/coord_forms.htm

MN DNR Safety & Health- manual, SAFECOM, training, work injuries, JSA, and more
http://intranet.dnr.state.mn.us/safety/index.html

MN DNR Fleet Policy Manual
http://intranet.dnr.state.mn.us/mr/fleet/policies/index.html

Minnesota Department of Transportation's Manual on Uniform Traffic Control Devices
http://www.dot.state.mn.us/trafficeng/publ/mutcd/index.html

Permission to access the Rx Reporting Application link
http://intranet.dnr.state.mn.us/forestry/forist/access/frs.html

Lake States Fire Science Consortium
http://lakestatesfiresci.net/

NWCG ICS Forms page
https://www.nwcg.gov/publications/ics-forms

FEMA Emergency Management Institute ICS forms
https://training.fema.gov/icsresource/icsforms.aspx