

Minnesota Fire Danger Rating Guide
For use during **Spring Fire Season**

Forecast ISI (Canadian Initial Spread Index)

Forecast Minimum Relative Humidity (%)	Table 1	0-1.9	2.0-3.9	4.0-7.9	8.0-11.9	12.0 +
	61+	LOW	LOW	LOW	LOW	MODERATE
	45-60	LOW	LOW	LOW	MODERATE	See Table 2
	36-44	LOW	LOW	MODERATE	MODERATE	See Table 2
	29-35	LOW	MODERATE	HIGH	HIGH	See Table 2
	20-28	MODERATE	MODERATE	HIGH	HIGH	See Table 2
	<20	MODERATE	MODERATE	HIGH	VERY HIGH	Extreme

Fire Weather Index (FWI)

Forecast Minimum Relative Humidity (%)	Table 2	<15	15-24	25+
	45-60	MODERATE	HIGH	HIGH
	36-44	HIGH	HIGH	VERY HIGH
	29-35	HIGH	VERY HIGH	VERY HIGH
	20-28	VERY HIGH	VERY HIGH	EXTREME

Fire Behavior characteristics and fire suppression interpretations

FWI INTENSITY CLASS	Fireline Intensity (BTU/ft/sec)	Surface Head Fire Flame length (Feet)	Interpretation
1	<3	<1	Generally self-extinguishing or smoldering fire
2	3-100	1-4	100 BTU/ft/sec is the cutoff for direct attack with hand tools
3	100-500	4-8	Dozers, pumps, and aircraft can be effective in controlling fire.
4	500-1000	8-11	Spotting, torching and crowning are possible. Control of head fire with air resources will likely be ineffective
5	>1000	>11	Crowning is likely. Potential for major fire runs. Only flanking attack is possible.

LOW

CRITERIA

- Use spring criteria along with ISI/RH matrix from snowmelt until late May to early June
- Use summer criteria once vegetation has fully leafed out in late May or early June, until frost has effectively ended the growing season in late September or early October.
- Use fall criteria after frost has ended the growing season and fine fuels have cured.

Spring Criteria

- FFMFC 0-80
- FWI 0-3
- BI –Model L 0-14
- IC –Model L 0-6
- Intensity Class 1-2

Summer Criteria

- FFMFC 0-80
- BUI 0-20
- FWI 0-5
- ERC Model Q 0-18
- ERC Model G 0-22
- Intensity Class 1-2

Fall Criteria

- FWI 0-4
- BI –Model G 0-18
- BI –Model Q 0-27
- IC –Model Q or G, 0-5
- Intensity Class 1-2

Conditions

- < 10 % of resources committed to active fires
- Fires not likely to start. Few, if any fires expected
- Slow rate of spread
- Low intensity fires
- Control readily achieved

MIFC

- MIFC duty officer on call.

MN DNR Regions

- Normal staffing
- Regional Duty Officer scheduled but not necessarily on call.
- A Regional Duty Officer may be required if the statewide Planning Level has an “A” designator or Areas have forwarded 911 or other response calls to the Region office.
- Region prepares and submits an availability list to MIFC weekly by 1300 Thursday.

MN DNR Areas

- Weekly status reports are required. Submitted by Areas by 0900 each Monday.
- Minimal staffing needed for wildfire response.
- Office may be staffed on weekends if wildfires are probable.
- Generally no Initial Attack resources are on call.
- One Forest Officer should be available.

Initial Attack

- Personnel may be working on non-suppression duties.
- Helitack may be off duty or on one hour call back.

Extended Attack

- Handled within the local Area and/or Region.

Incident Management Teams

- In normal rotation cycle.

Aviation Program

- Aircraft crews may be on one-hour call back. Out of state assignments will be considered.
- Areas with aviation assets on duty need to communicate the status of these assets to the MIFC Air Desk so the Aircraft Status Report can be prepared by 0830.
- The MIFC Air Desk will communicate the status of all aircraft statewide on the MN DNR website by 0900 each day.

Detection

- Usually none is needed

Prevention (Burning permits, restrictions, variances)

- Normal procedures in place or per annual spring burning restrictions.

Prescribed burning

- Normal procedures in place as per Prescribed Burning policy.
- Division of Forestry resources, including emergency fire fighting personnel may be made available for assisting with prescribed burning to meet training goals.
- All MN DNR prescribed burns are to be reported to the appropriate Regional Forestry office at least one hour before ignition.

Safety

- Department standards enforced
- Safety briefings should include; proper lifting techniques, slips and falls, strains and sprains, etc.

MODERATE

CRITERIA

- Use spring criteria along with ISI/RH matrix from snowmelt until late May to early June
- Use summer criteria once vegetation has fully leafed out in late May or early June, until frost has effectively ended the growing season in late September or early October.
- Use fall criteria after frost has ended the growing season and fine fuels have cured.

Spring Criteria

- FPMC 80-88
- FWI 3-8
- BI –Model L 14-28
- IC –Model L 6-16
- Intensity Class 2-3

Summer Criteria

- FPMC 80-88
- BUI 20-34
- FWI 5-13
- ERC Model Q 18-23
- ERC Model G 22-30
- Intensity Class 2-3

Fall Criteria

- FWI 4-8
- BI –Model G 18-28
- BI –Model Q 27-47
- IC –Model Q or G 5-11
- Intensity Class 2-3

Conditions

- < 20 % of resources committed to active fires
- Fires can be contained with ground forces
- Spread moderate in forest, faster in open areas
- Low to moderate intensity fires
- Containment achievable in one burning period

MIFC

- MIFC Dispatch and Air Desk on duty with weekend staffing planned.
- MIFC duty officer on call 24/7.

MN DNR Regions

- Region dispatchers on duty or on call with weekend staffing planned.
- Region duty officers on call as per current Statewide Planning Level.
- Coordinate sharing of resources between Areas within the Region.

MN DNR Areas

- Daily staffing plans created and shared with adjacent Areas.
- Extended work schedules may be necessary.
- Minimal Area IA personnel on call.
- Area duty officer assigned and on call.
- Fire Team Leader and Area Supervisor should be aware of work/rest guidelines.
- One Forest Officer should be available.

Initial Attack

- Staffed as per Area Plans
- Personnel may be working on non-suppression duties but remain available electronically.
- Area helibases staffed and functional by 1000.

Extended Attack

- Statewide Response Resources listing is established. Personnel identified are on call as per current Statewide Planning Level.
- Areas may be asked to add resources to aid adjacent Areas.
- Consider ordering Logistical and Finance help through MIFC if an extended attack incident occurs.

Incident Management Teams

- Normal rotation.
- May be put on alert if the situation warrants.

Aviation Program

- State CL-215's available. Tanker bases appropriately staffed.
- Consider need for conventional retardant tankers if lakes are frozen.
- Contract helicopters available during their contract period.
- Areas with aviation assets on duty need to communicate the status of these assets to the MIFC Air Desk so the Aircraft Status Report can be prepared by 0830.
- The MIFC Air Desk will communicate the status of all aircraft statewide on the MN DNR website by 0900 each day.
- One ATGS available

Detection

- Minimal needs, primary aircraft coverage may be intermittent or shared between Areas. Coordination of detection flights between Areas and Regions is strongly encouraged to reduce numbers of aircraft and costs.

Prevention (Burning permits, restrictions, variances)

- Areas and Regions should consider shortening time periods of burning permits.
- Fire Management Section does weekly media releases.

Prescribed burning

- Normal procedures in place as per Prescribed Burning policy.
- Division of Forestry resources, including emergency fire fighting personnel may be made available for assisting with prescribed burning to meet training goals.
- All MN DNR prescribed burns are to be reported to the appropriate Regional Forestry office at least one hour before ignition.
- Regions are to provide MIFC Intelligence office with locations of prescribed burns prior to ignition.
- Consider requesting a spot weather forecast for the prescribed burn location.
- Patrolling prescribed burns until declared out is encouraged.

Safety

- Departmental standards enforced
- Annual refreshers completed
- Personal protective equipment inspected/worn
- Aviation safety procedures briefed periodically

HIGH

CRITERIA

- Use spring criteria along with ISI/RH matrix from snowmelt until late May to early June
- Use summer criteria once vegetation has fully leafed out in late May or early June, until frost has effectively ended the growing season in late September or early October.
- Use fall criteria after frost has ended the growing season and fine fuels have cured.

Spring Criteria

- FFMC 88-90
- FWI 8-20
- BI –Model L 28-42
- IC –Model L 16-30
- Intensity Class 3-4

Summer Criteria

- FFMC 88-90
- BUI 34-55
- FWI 13-22
- ERC Model Q 23-31
- ERC Model G 30-35
- Intensity Class 3-4

Fall Criteria

- FWI 8-16
- BI –Model G 28-38
- BI –Model Q 47-65
- IC –Model Q or G 11-19
- Intensity Class 3-4

Conditions

- < 50 % of resources committed to active fires
- Potential for spotting and torching
- Moderate to high rate of spread in all fuel types
- Moderate to high intensity fires
- Heavy fuels become involved, extensive mop-up may be necessary
- Containment achievable with additional support, lines may be challenged

MIFC

- MIFC Dispatch and Air Desk on duty with weekend staffing planned.
- MIFC duty officer on call 24/7.
- MIFC Intelligence section creates wildfire behavior predictions for each Region and communicates these to the Regions and Areas.
- Check with Regions for the need of CWN aircraft.
- Statewide Wildfire Investigation Team alerted.

MN DNR Regions

- Regional dispatchers on duty with weekend staffing planned.
- Regional duty officers are placed on call.
- Regional Extended Attack resources and personnel are identified and notified. This information is communicated with the Areas daily.
- Consolidate CWN Helicopter requests and coordinate with MIFC.
- Regions should make all DNR Divisions aware of the heightened wildfire danger as well as potential areas of special concern.

MN DNR Areas

- Daily staffing plans created and shared with adjacent Areas and Regional Dispatch.
- Extended work schedules highly likely. Overtime is available as necessary.
- Statewide Response Resources assigned on call per current Statewide Planning Level.
- Consider placing Area duty officers, initial attack, and equipment operators in an on call status.

- With Regional approval, Area Forest Supervisors may be placed in on-call status as the Area Duty Officer or for response needs.
- Areas will consider placing contract suppression equipment in a duty status (standby).
- Work/Rest Guidelines are to be followed and monitored.
- One or more Forest Officers available.

Initial Attack

- Staffed as per Area Plans.
- Personnel and equipment are staffed for immediate response.
- Consider preposition of resources for quicker response.
- Consider deployment of multiple engines and other resources to wildfires.
- Consider shifting engines and other resources between areas and regions as wildfires occur.

Extended Attack

- Personnel and equipment identified on the Statewide Response Resource list may be put on call as per current Statewide Planning Level.
- Extended attack resources are assigned and notified.

Incident Management Teams

- Team in rotation may be on alert depending on Statewide Planning Level.
- If multiple Regions have reached High fire danger MNICS should strongly consider putting the IMT in rotation on alert.
- Areas may, through their Region, request the IMT on rotation be placed in alert status.

Aviation Program

- State CL-215's available if ice free.
- Tanker bases appropriately staffed.
- Consider need for conventional retardant tankers or other aviation resources if lakes are frozen.
- Contract helicopters available during their contract period.
- Areas with aviation assets on duty need to communicate the status of these assets to the MIFC Air Desk so the Aircraft Status Report can be prepared by 0830.
- The MIFC Air Desk will communicate the status of all aircraft statewide on the MN DNR website by 0900 each day.
- Two ATGS on duty or on call as needed/determined by Wildfire Aviation Supervisor.
- MIFC will coordinate aviation needs with GLFFC partners daily.
- Consider alerting MN Army National Guard regarding use of their helicopters for wildfire response.

Detection

- Primary aircraft are being utilized for detection where necessary.
- Fire tower staffing is optional based on the Area plan.
- A secondary aircraft may be placed on standby.

Prevention (Burning permits, restrictions, variances)

- Burning permit restrictions in place
- Variances through forestry.
- Fire Management Section does media releases twice a week.

Prescribed burning

- If more than 50% of suppression resources are committed to wildfires restricting prescribed burning may be necessary. This decision will be made in conjunction with the MNICS organization and other DNR Divisions.
- If it has been necessary for the Region to relocate resources between Areas or Regions for wildfire response it may be necessary to restrict or curtail prescribed burning.
- Prescribed burns must be patrolled until out, with mop-up completed corresponding to fuel type.

Safety

- Departmental standards enforced
- Enhanced safety briefing with crews and wildfire personnel.
- Topics to include:
 - o Expected fire weather and trends
 - o Expected fire behavior and trends
 - o Lookouts, Communications, Escape Routes & Safety Zones (LCES)

VERY HIGH

Criteria

- Use spring criteria along with ISI/RH matrix from snowmelt until late May to early June
- Use summer criteria once vegetation has fully leafed out in late May or early June, until Frost has effectively ended the growing season in late September or early October.
- Use fall criteria after frost has ended the growing season and fine fuels have cured.

Spring Criteria

- FFMCI 90-93
- FWI 20-36
- BI –Model L 42-54
- IC –Model L 30-46
- Intensity Class 4-5

Summer Criteria

- FFMCI 90-93
- BUI 55-78
- FWI 22-34
- ERC Model Q 31-38
- ERC Model G 35-42
- Intensity Class 4-5

Fall Criteria

- FWI 16-26
- BI –Model G 38-50
- BI –Model Q 65-86
- IC –Model Q or G 19-31
- Intensity Class 4-5

Conditions

- < 50 % of resources committed to active fires
- Fires readily start with potential for spotting, torching, and crowning
- High to extreme rates of spread in all fuel types
- High to extreme fire intensities
- Control efforts at fire's head may fail

MIFC

- MIFC Dispatch and Air Desk on duty with weekend staffing planned.
- MIFC duty officer on call 24/7.
- MIFC Intelligence section creates wildfire behavior predictions for most Areas and communicates these to the Regions and Areas.
- Check with Regions for the need of CWN aircraft.
- Consider initiating daily MNICS conference calls.
- Consider pre-positioning of additional resources and possible out of state or contract resources.
- MIFC intelligence section creates spot wildfire behavior predictions for most Areas.
- MIFC will consider daily MNICS conference calls.
- Consider activation of the MN DNR Ready Reserve.
- Statewide Wildfire Investigation Team alerted.

MN DNR Regions

- Regional dispatchers on duty with weekend staffing planned.
- Regional duty officers on call.
- Extended attack resources are identified and list is communicated to the Areas daily.
- Consolidate CWN aircraft requests and coordinate with MIFC.
- Consider pre-positioning additional suppression resources.
- Regions must make all other DNR Divisions aware of heightened wildfire danger as well as potential requests for assistance.
- Consider requesting activation of the MN DNR Ready Reserve

MN DNR Areas

- Daily staffing plans created and shared with adjacent Areas and Regional dispatch.
- Extended work schedules are standard.
- Extended attack resources assigned on call and the Region dispatch is notified.
- Consider adding support personnel to Area dispatch.
- Area duty officers, initial attack, and equipment operators are placed in an on call status.
- With Regional approval, Area Forestry Supervisors may be placed in on-call status as the Area Duty officer or for response needs.
- Areas will consider placing contract suppression equipment in a duty status (standby).
- Work/Rest guidelines are to be followed and monitored.
- Leave requests of all types may be restricted.
- Out of State assignments may be restricted.
- Area should have one or more Forest Officers on duty per shift. Supplement with CO's if needed. Open burning violations should be enforced aggressively.

Initial Attack

- Dispatchers are in contact with region and adjacent areas to assess needs.
- Consider pre-positioning personnel and equipment in known high hazard areas.
- Consider immediate dispatch of air tankers if wildfire is in known hazard area.
- Consider automatic dispatch of helicopters to reported wildfires.
- Consider automatic dispatch of fire departments.
- All previous days wildfires should be checked.

Extended Attack

- Additional support personnel are assigned to dispatch
- Personnel and equipment identified on the Statewide Response Resource list may be put on call as per current Statewide Planning Level.
- Extended attack resources are assigned and notified.

Incident Management Teams

- Team in rotation may be propositioned or on alert. The next team in rotation will be notified of this status. MIFC Dispatch will contact the IC of the next IMT in rotation to begin preparations for a call-up.

Aviation Program

- State CL-215's available. Tanker bases appropriately staffed.
- Consider need for conventional retardant tankers or other aviation resources if lakes are frozen.
- Contract helicopters available during their contract period.
- Areas with aviation assets on duty need to communicate the status of these assets to the MIFC Air Desk so the Aircraft Status Report can be prepared by 0830.
- The MIFC Air Desk will communicate the status of all aircraft statewide on the MN DNR website by 0900 each day.
- Two ATGS on duty and/or on call.
- Consider alerting MN Army National Guard regarding use of their helicopters for wildfire response.

Detection

- Primary aircraft in may be utilized.
- Fire tower staffing is optional based on the Area plan.
- An additional aircraft may be placed on standby.

Prevention (Burning permits, restrictions, variances)

- Fire Management Section does daily releases.
- MIFC and Fire Management Section seeks involvement of Regional I&E personnel in daily news releases and PSAs highlighting current and predicted fire danger and behavior.

Prescribed burning

- Recommend no prescribed Burning for state agencies and federal partners
- If more than 50% of suppression resources are committed to active wildfire restricting prescribed burning is likely. This decision will be made in conjunction with the MNICS organization and other DNR Divisions.
- MN DNR Forestry Areas should strongly consider not issuing open burning permits for prescribed burns.
- Regions will notify MIFC of all prescribed burns at least 1 hour before ignition.

Safety

- Departmental standards enforced.
- Consider contacting partners and fire departments notifying them of expected fire weather and behavior factors.
- Briefings to include:
 - All topics from lower fire danger ratings plus
 - Entrapments
 - Wildland/Urban Interface procedures

EXTREME

Criteria

- Use spring criteria along with ISI/RH matrix from snowmelt until late May to early June
- Use summer criteria once vegetation has fully leafed out in late May or early June, until frost has effectively ended the growing season in late September or early October.
- Use fall criteria after frost has ended the growing season and fine fuels have cured.

Spring Criteria

- FFMC 93+
- FWI 36+
- BI –Model L 54+
- IC –Model L 46+
- Intensity Class 4-5

Summer Criteria

- FFMC 93+
- BUI 78+
- FWI 34+
- ERC Model Q 38+
- ERC Model G 42+
- Intensity Class 4-5

Fall Criteria

- FWI 26+
- BI –Model G 50+
- BI –Model Q 86+
- IC –Model Q or G 31+
- Intensity Class 4-5

Conditions

- > 50 % of resources committed to active fires
- Major fire runs possible
- Numerous or large active fires may be present
- High to extreme rates of spread in all fuel types
- High to extreme fire intensities
- Control efforts at fire's head may fail

MIFC

- MIFC Dispatch and Air Desk on duty with weekend staffing planned.
- MIFC duty officer on call 24/7.
- MIFC Intelligence section creates wildfire behavior predictions for most Areas and communicates these to the Regions and Areas.
- Check with Regions for the need of CWN aircraft.
- Consider initiating daily MNICS conference calls.
- Consider pre-positioning of additional resources and possible out of state or contract resources.
- MIFC intelligence section creates spot wildfire behavior predictions for most Areas.
- MIFC will consider daily MNICS daily conference calls.
- Formally request the MN DNR Ready Reserve be activated.
- Statewide Wildfire Investigation Team alerted.

MNDNR Regions

- Regional dispatchers on duty with weekend staffing planned.
- Regional duty officers on call.
- Extended attack resources are identified and list is communicated to the Areas daily.
- Consolidate CWN aircraft requests and coordinate with MIFC.
- Consider pre-positioning additional suppression resources.
- Regions must make all DNR Divisions aware of heightened wildfire danger as well as potential requests for assistance.

- Formally request that all qualified DNR personnel and equipment, regardless of Division, be made available for wildfire response statewide.
- MIFC intelligence section creates spot wildfire behavior predictions for all RAWS stations with extreme wildfire behavior components.
- Consider requesting daily MNICS conference calls if not already implemented.

MN DNR Areas

- Daily staffing plans created and shared with adjacent Areas and Regional dispatch.
- Extended work schedules are standard.
- Extended attack resources assigned on call and the Region dispatch is notified.
- Consider adding support personnel to Area dispatch.
- Area duty officers, initial attack, and equipment operators are placed in an on call status.
- With Regional approval, Area Forestry Supervisors may be placed in on-call status as the Area Duty officer or for response needs.
- Areas will consider placing contract suppression equipment in a duty status (standby).
- At this fire danger rating wildfire suppression will likely supercede all other work demands.
- Monitoring of the work rest guidelines becomes an important function of the Area Supervisor.
- Leave requests of all types are to be restricted.
- Out of State assignments are restricted.
- Area should have one or more Forest Officers on duty per shift. Supplement with CO's if needed. Open burning violations should be enforced aggressively.

Initial Attack

- Dispatchers are in contact with region and adjacent areas to assess needs.
- Consider pre-positioning personnel and equipment in known high hazard areas.
- Consider immediate dispatch of air tankers if wildfire is in known hazard area.
- Consider automatic dispatch of helicopters to reported wildfires.
- Consider automatic dispatch of fire departments.
- Consider immediate dispatch of helicopters and/or fire departments to all reported starts without detection or wildfire personnel on the scene.
- All previous days wildfires should be checked.
- Notify region of all starts.

Extended Attack

- Additional support personnel are assigned to dispatch
- Personnel and equipment identified on the Statewide Response Resource list may be put on call as per current Statewide Planning Level.
- Extended attack resources are assigned and notified.

Incident Management Teams

- Team in rotation is propositioned or on alert with the next team in rotation is in alert status.

Aviation Program

- State CL-215's available. Tanker bases appropriately staffed.
- Consider need for conventional retardant tankers or other aviation assets if lakes are frozen.
- Contract helicopters available during their contract period.
- Areas with aviation assets on duty need to communicate the status of these assets to the MIFC Air Desk so the Aircraft Status Report can be prepared by 0830.
- The MIFC Air Desk will communicate the status of all aircraft statewide on the MN DNR website by 0900 each day.
- Two ATGS pre-positioned with backups on call.
- Consider alerting MN National Guard regarding possible need of helicopters for wildfire deployment.
- Notify GLFFC partners of the situation and alert to possible need of partner aircraft.

Detection

- Primary and secondary aircraft (if contracted for) may be utilized and wildfire tower staffing is optional based on the Area plan.
- An additional aircraft may be placed on standby.

Prevention (Burning permits, restrictions, variances)

- Fire Management Section does daily releases.
- MIFC and Fire Management Section secures involvement of Regional I&E personnel with daily news releases and PSAs highlighting current and predicted fire danger and behavior.
- No open burning allowed.
- Consider recommending an outdoor burning ban if trend dictates.

Prescribed burning

- No permits will be issued for prescribed burning by MN DNR Forestry.
- Personnel and equipment dedicated to prescribed burning may be called upon to aid in the wildfire suppression effort if qualified.

Safety

- Weather updates, safety bulletins and red flag warnings are read over the air with confirmation from personnel.
- Daily Briefings for all personnel
 - All topics from lower fire danger ratings plus
 - Tailgate safety session
 - Briefings conducted prior to all fireline shifts
 - Consider ordering Federal Fire and Aviation Safety Team