

DEVELOPMENT OF GUIDELINES FOR PRESCRIBED FIRE IN IOWA

Iowa is one of the few states without guidelines for conducting prescribed burns. Recent efforts to remedy this situation resulted in a set of draft guidelines for conducting prescribed burns in Iowa. This project is funded by the US Forest Service and facilitated by the Iowa DNR's Bureau of Forestry. There are many reasons to develop guidelines for conducting prescribed burns. These range from safety issues, to increasing the number of acres burned and improving the way land is managed with fire. However, it should not be a surprise that a major driving factor is liability: increased tendencies toward litigation put anyone who intentionally lights a landscape-scale fire at great risk for a lawsuit. This is an unfortunate but genuine problem, as is the fact that well documented, careful preparations are one way to reduce the potential negligence associated with prescribed burns.

Prescribed fire is a complex subject, and any potential guidelines or standards add to that complexity on a variety of levels. There are many different parameters to consider when preparing to do a burn, and different groups and individuals predictably vary widely in their approach. In particular, the degree of training considered appropriate for the "burn boss" (person in charge of the fire) varies from very little to literally years of effort. Opinions on safety equipment are not quite so divergent, but do vary significantly. Economic factors have a large influence on this situation; many agencies are severely restricted financially and funding for equipment and training courses is not available.

To address some of these issues, and to get some consensus for the guidelines, a steering committee was formed with representation from most agencies and organizations that do prescribed burning in Iowa. This committee agreed to recommend training courses overseen by the National Wildfire Coordinating Group (NWCG). It also agreed that the guidelines should be brief with numerous references for access to more detailed information, and that a thorough burn plan should be emphasized. The draft guidelines have gone through committee review and are now available for general comment and use.

GUIDELINE AND NWCG DETAILS

The guidelines, and two sample burn plans, are currently available at: http://prrcd.org/inl/prescribed_fire.htm The guidelines are assembled as a reference document, not a "how to burn" instruction manual. NWCG-based training recommendations are provided, along with recommended safety equipment, the headings (and possible subheadings) generally used in a burn plan, and numerous online links for more information. Some definitions, and sample burn plans from the US Fish &

Wildlife Service (USFWS) and The Nature Conservancy are also included. Eventually this document will be published and made more widely available.

The NWCG (www.nwcg.gov/) was designed to establish an operational group to coordinate programs of the participating wildfire management agencies. They have developed numerous courses and taskbooks for different positions in an "incident command system", a method of command coordination during a fire (wildfire or prescribed). The guidelines recommend firefighters and other prescribed fire crew members take certain NWCG courses developed for firefighters.

RESPONSE TO GUIDELINES

As might be predicted, the responses of people reviewing the guidelines range from "way too lenient" to "way too strict". This reflects the prescribed fire community in Iowa: some people have been doing burns for years with no training and do not see any need to change, others have become highly trained within the NWCG system and are convinced the safety and liability issues demand a high level of training and preparedness.

Nothing replaces experience, and there are many people with extensive experience, but no formal training, successfully conducting prescribed burns in Iowa. It is also true that the majority of those experienced individuals that have gone on to complete the NWCG coursework say that they now conduct safer and better burns. Certainly one undeniable underlying issue is that the lack of funding for training and equipment restricts the options for NWCG compliance in some situations. To that end, we are working to facilitate offering more training courses for those interested, and increasing the opportunities for equipment purchases.

Some people report that they feel that some of the initial NWCG coursework (especially for the S-130/S-190 introductory class) has too much focus on forest and western wildfire, rather than grassland fires. In some cases this course is now being offered with an extra focus on grassland burns, but with the NWCG certification intact. It is considered important to remain within the NWCG system, both to that a certified firefighter that moves to another state or agency does not have to repeat basic coursework, and because most agencies that adhere to NWCG standards require anyone participating on a burn to have completed at least the introductory firefighter course, S-130/S-190. Nevertheless, it has been suggested that some sort of Iowa-focus prescribed fire course be developed. This is unlikely, since the liability issues associated with creating and certifying a non-NWCG training are daunting, to say nothing of a case of re-inventing the wheel: the NWCG system was developed using years of firefighting experience.

Another concern is that the guidelines will "shut down" prescribed fire by requiring stringent training and preparation for any fire. This is not the case. In particular, low-risk rural fires are not the same as complex urban burns at the wildland-urban interface, and do not require the same level of risk reduction. Furthermore, private landowners carry their own liability insurance, so may choose whatever level of preparation and safety

with which they are comfortable. Other groups are equally responsible for their own burns, and any liability from negligence claims that may result. The guidelines are intended to promote safety and preparedness, provide access to information on those topics, and increase awareness of safety issues that might not otherwise be addressed. They are not a universal set of regulations for each and every prescribed fire conducted in Iowa.

Ironically, in another example of the divergent opinions on prescribed fire, there are also concerns that NOT requiring stringent training and preparation for prescribed burns will "shut down" prescribed fire – due to the consequences of an escaped fire that results in a significant negligence claim.

Burn Plan

The sample burn plans have also caused some individuals to worry that they will be forced to use such a document on their own burns. In particular the USFWS plan is quite long and detailed and could require considerable time to complete. Burn plans such as this one are indeed used routinely by USFWS and National Park Service employees doing burns on federal land. However, this level of detail is generally not required by other agencies in Iowa, even those that endorse NWCG standards.

The alternate sample burn plan is much less detailed, and underscores the reason so many subheadings are listed in the guidelines: there are many parameters to consider, but a burn plan should be personalized to fit the burn and the burn boss. A burn plan is a tool that is used to ensure thorough preparations are done, that nothing is forgotten, to use as evidence of preparedness in the event of an escape or negligence claim, and to document the condition of the landscape for future land management use.

It is, however, reasonable to consider the fact that the more highly trained and regulated prescribed fire managers do use detailed burn plans. One reason for this lies in the fact that careful and thorough pre-burn preparations, well documented via a burn plan, can be used to show that a fire escape was due to a change in environmental conditions after the fire was lit. Conversely, lack of good documentation indicating thorough preparations may lead to greater liability.

In addition, an excellent (and happily non-liability-related) reason to have a thorough burn plan (although not necessarily as complex as the USFWS sample) is that it is a useful tool for land management planning. It will include pre- and post-burn assessments and suggestions for future work. If accompanied with photographs, it can be invaluable a couple years after a burn when new management is being considered. Over a period of years, consecutive burn plans can evolve into a long term record of land management and condition. This is invaluable to anyone new to a particular parcel of land, and provides a basis for assessment of the success of various practices over time.

We hope that an additional positive outcome of having the guidelines in place will be increased availability of federal funds for training and equipment, leading to an increase in the number of trained burn managers and more burning overall. Furthermore,

uniform NWCG training will allow different agencies within the state to coordinate to do complex burns. Already Golden Hills RC&D and the DNR Forestry Bureau are working to establish a joint Cooperative Fire Specialist position, to be located at the Loess Hills State Forest. This person would help coordinate prescribed burn training, refresher courses, and activity reports for a variety of agencies. We also hope to someday have a well-equipped team of mobile prescribed fire specialists that can move around the state executing complex burns. We can only predict that better Iowa land management, on a far greater scale than exists today, will result.

Prescribed Fire Guidelines

(August 2004 draft)

These guidelines are divided into five sections: training recommendations, safety recommendations, burn plan components, sample burn plans, and resources for more information. This document has been created as a safety tool for Iowa land managers. It is for use to reduce the risks inherent with prescribed fire. Before any fire is started, all possible precautions should be taken to insure the safety of personnel and property. This includes training, equipment, and site preparation.

A. Training recommendations:

It is strongly recommended that NWCG (National Wildfire Coordinating Group) standards be followed for prescribed fires in Iowa. Their website is included in the reference section of this document. The NWCG defines a large variety of positions within an "incident command system" for firefighting situations. They compose task books and coursework to train individuals interested in being certified for the various positions.

It is always preferable to have highly trained firefighters working on a prescribed fire, for both safety and liability reasons. For non-complex, low risk prescribed fire it is recommended that the burn boss be ranked as a Burn Boss 3 (RxB3, a position created by the US Fish & Wildlife Service for low complexity burns) or at least have completed the required coursework. For more complex prescribed fires the burn boss should have completed both the coursework and the task book for Burn Boss accreditation (NWCG RxB1 or RxB2, or USFWS RxB3). Complex prescribed fires should also have squad bosses who have completed the NWCG Fire Fighter Type I training, or NWCG s130/s190 (Basic Wildland Firefighting/Introduction to Wildland Fire Behavior), 131 (Advanced Firefighter Training), and s290 (Intermediate Wildland Fire Behavior). Crew firefighters on both simple and complex prescribed fires should have completed NWCG s130/s190 or be paired with someone who has completed those courses.

It should be noted that most federal agencies require more stringent levels of accreditation for their fire crews. Partnering with these agencies to increase the amount of fire management done in Iowa may require RxB2 or RxB1 certification for burn bosses.

There are refresher courses for some NWCG levels. To maintain a "red card" individuals need to have completed the s130/s190 courses (once), pass at least a moderate level pack test (carry 25 lbs. two miles in 30 minutes), and attend a yearly one-day refresher course. Refresher courses for other NWCG positions vary. In some cases refresher courses are not offered; certification is maintained by performing in the credentialed capacity (or higher) on a fire assignment at least once per year.

B. Equipment recommendations:

Personal Protective Equipment: It is recommended that all fire personnel wear Nomex clothing (shirt and pants), high top leather boots, leather gloves, fire rated hardhat, eye/ear protection, and all underclothing be of natural fiber. The danger of wearing 2 polyester or other synthetic materials should be emphasized with anyone attending a burn. Roadside visibility materials are essential if the fire is near a roadway.

Personnel also should carry a fire shelter (for protection from flames and superheated gasses in the event of entrapment) and fussees (as a means to light a separate fire in order to burn out a safety zone ahead of the threatening fire front). A fussee should not be considered an alternative

to a fire shelter; in some conditions a fire shelter will be critically needed but a fussee will be useless.

Recommended Tools: The tools needed for a safe prescribed fire will vary with each fire and should be specified in the burn plan. A drip torch(es), pre-tested 2-way radios, cell phone, flappers, rakes, backpack pumps, weather kit, and a first aid kit will be needed for most fires. Additional commonly used items include a stop/go paddle if the fire is near a roadway, chain saws, mechanized water transport, leaf blower, and a fire weather portable radio.

C. Burn plan components:

Because of the large degree of variation in the complexity of prescribed burns, there are no standardized burn plans. A burn plan can be short or long, depending on the complexity of the proposed burn and the desires of the burn boss. This section covers the components that should be included in any burn plan, and the items potentially included in each component.

All burn plans should include the following sections:

1. Site information
2. Burn site specific information
3. Objectives & Goals
4. Site preparation
5. Organization: personnel & equipment
6. Prescription: weather, fire behavior, smoke management
7. Ignition & holding plan (with map)
8. Contingency plan (wildfire response plan)
9. Mop up
10. Post burn evaluation.

For each section there are numerous sub-headings that may or may not be included in a specific burn plan. Whether or not a sub-heading is included in a specific burn plan is determined by the site and the preferences of the burn boss. Each section and potential headings are discussed below:

I. Site information: this section contains contact information for the site to be burned.

Potential headings:

Owner:	Name	home phone	cell phone	
Property:	Name	Address		
Location:				
Section	township	range	911 address	GPS coordinates
Contact information:				
Local dispatch center				
Fire Department				
Public Safety Communication Center				
Medical Emergency:				
Other:				
Courtesy notifications:	neighbors, organizations			

2. Burn site-specific information: this section is for information specific to the burn being planned. Potential headings:

- Target date range:
- Permits needed (check all appropriate):
 - Air quality
 - City ordinance
 - Fire chief
 - None
- Estimated Size of Burn:
- Description of Burn Site (attach drawing or photo of site, indicate N and other pertinent landmarks):
 - Overstory (percent canopy, basal area, height):
 - Understory (percent, height):
 - Warm season grasses:
 - Cool season grasses:
 - Forbs:
 - Shrubs or Brush:
 - fuel type:
 - site topography (slope, aspect):
 - area of contiguous fuels:
 - firebreaks present (indicate on map also):
 - backup firebreaks present (indicate on map also):
 - closest water source (type and distance):
 - other water source(s):
- Previous burn management (dates, results, wildfire or prescribed, etc.):
- Description of adjacent area (if significantly different in fuels, topography, etc.):
- Special Considerations (flora, fauna, safety, public not in agreement, etc.)
- Smoke sensitive areas within 3 miles (people with asthma, buildings, roads):
- Hazards (power lines, gas lines, wells, etc.):

3. Objectives & Goals: This section contains information about the reason(s) the burn is being planned. Potential headings:

- Management objective:
 - WUI considerations (hazardous fuel reduction)
 - Hazard reduction
 - Ecological
 - Training
- Resource objective (be specific, for example "increase forb component by 20%"):
 - Stimulate warm season grass
 - Stimulate cool season grass
 - Reduce cool season grass
 - Stimulate forbs
 - Manipulate grazing
 - Control invasive plants
 - Improve habitat
 - Remove litter

4. Site preparation: This section details work that needs to be done prior to the planned burn. Potential headings:

- Firebreaks needed: type (dozer line, hand line, mowed, other) length, width

- Identification and location of natural firebreaks: roads; crop fields, waterways (note material composition and width)

5. Organization-personnel equipment: This section outlines the organizational and equipment needs of the planned burn. Potential headings:

- Firing crew:
- Holding crew:
- Traffic control crew:
- Equipment:
- Other:

6. Prescription: This section covers data to be collected immediately before ignition of the planned burn. Some items must fall within a previously determined range or the burn will be cancelled.

Weather: Acceptable Burning Parameters (indicate minimum/maximum or circle all appropriate):

- Type of firing method:
backing flank ring strip head head
- Allowable Rate of Spread (specify ft./min. or ch./hr.):
- Allowable Flame Length (feet):
- Allowable Mid-Flame Wind Speed (mph):
- Allowable Wind Direction: N, NE, E, SE, S, SW, W, NW
- Relative Humidity (percent):
- Temperature (Fahrenheit):
- Time of Year:
Spring summer dormant
- Fuel Moisture:
4-8 1-hr. TLF3 7-12 10-hr. TLFM (fuel sticks)
- Days Since Last Rain:

Fire behavior:

Smoke management:

7. Ignition & holding plan – map. This section contains the protocol to be followed immediately before ignition of the burn; some headings are to be filled in at that time. Potential headings:

Map of burn site (may be included w/site description)

Pre-Burn Contacts:	When	Who Will Do Contacting
Weather Service	Day before	
Fire Departments	Day before	
Conservation Officer	Day before	
County Sheriff	Day before	
County Health	Day before	
Local Residents	ASAP and day before	

Burn Day Contacts:

Weather Service	AM
All Cooperators	AM

Local Residents AM
Fire headquarters AM

Weather Data (circle source):

NOAA	NWS	Internet Media (specify)	Other (specify)
1. Sky:		6. Highest Temperature:	
2. Precipitation:		7. Lowest Relative Humidity:	
3. Cold Fronts:		8. Atmospheric Stability:	
4. LASI:		9. Wind Speed:	
5. Wind Direction:		10. Mixing Height:	

note: on-site weather data collection is needed before, and during, a burn

Firing technique: this is often not decided until the day of the burn

GO-NO-GO Check List:

1. Are all fire prescription specifications met?
2. Is the weather forecast favorable now and throughout burn?
3. Are all necessary lines constructed and checked?
4. Are all personnel required in the plan on-site?
5. Have all personnel been briefed on the prescribed burn plan?
6. Have all personnel been briefed on safety hazards, escape routes, and safety zones?
7. Do all personnel have the required PPE with them?
8. Is all required equipment in place and in working order?
9. Do you have needed direct communications established?
10. Do you have access to adequate water?
11. Do you have all keys and gate access?
12. Have you made all notifications?
13. In your opinion can the burn be carried out according to the plan and will it meet the planned resource management objectives?

**If all 13 Go-No Go questions were answered "yes", you may proceed with the test fire.

8. Contingency plan: wildfire response plan

9. Mop-up: This section contains details of the post-burn clean up needs

10. Post burn evaluation:

- Operational data
- Weather data after burn
- Vegetation status after burn (pre- and post- burn photographs are both ideal and simple to collect, and can be compared to photos taken months later)
- Rx fire summary
- Recommendations for future management

D. Sources for More Information:

PLANNING RESOURCES

Tall Timbers Fire Ecology Database - <http://www.ttrs.org/feco.html>
NFDRS - <http://www.seawfo.noaa.gov/fire/olm/nfdrs.htm>
ICS Forms - <http://www.nwcg.gov/pms/forms/icsforms.htm>
Florida Division of Forestry - <http://flame.doacs.state.fl.us/>
Riverside Fire Lab - <http://met.rfl.psw.fs.fed.us/index.html>
National Climate Data Center - <http://lwf.ncdc.noaa.gov/oa/ncdc.html>
NPS Fire monitoring handbook- <http://www.nps.gov/fire/wildland/science/effects.htm>
Fire Effects information System - <http://www.fs.fed.us/database/feis/>
Ventilation Climate Information System – www.fs.fed.us/pnw/fera/vent
Fire Behavior Prediction programs – www.fire.org

WEATHER

NWCG Weather Links and much more
<http://www.nwcg.gov/teams/wfewt/NWCGBib/fireweather.html>
Accuweather - <http://www.accuweather.com>
Boise Fire Weather - <http://www.boi.noaa.gov/firewx.htm>
Lightning - <http://www.lightningstorm.com>
Satellite Images - <http://www.osei.noaa.gov/Events/Fires/>
FS Wildfire Assessment System - <http://www.fs.fed.us/land/wfas/>
Drought Monitor - <http://drought.unl.edu/monitor/monitor.html>
Fire Weather Training Modules - <http://www.seawfo.noaa.gov/fire/olm/NWSFWX.htm>

OTHER SITES

Wildland Fire - <http://www.wildlandfire.com/>
Cerro Grande Report - <http://www.nps.gov/fire/fireinfo/cerrogrande/>
Geomac – Wildfire Information – http://geomac2.cr.usgs.gov/fms_conus
The Nature Conservancy Fire Management – www.tncfire.org
National Interagency Prescribed Fire Training Center – <http://fire.r9.fws.gov/pftc>
USFWS/Bureau Indian Affairs fire training - <http://fire.fws.gov/fm/training.htm>
USFWS Prescribed Fire Burn Boss 3 (RxB3) task book -
<http://www.bianifc.org/training/RXB3TASK.pdf>
National Wildfire Coordinating Group home page – www.nwcg.gov
National Interagency Fire Center – www.nifc.gov
Tall Timbers - <http://www.ttrs.org>

E. Sample Burn Plans:

TNC and USFWS
go to: <http://prrcd.org/inl/index.htm>



PRESCRIBED BURN PLAN

State:
Preserve/Site:
Burn Unit:

Fire Planner(s):

Name:
Title:

Signature

Date

Name:
Title:

Signature

Date

Fire Leader:

Name:
Title:

Signature

Date

Fire Manager:

Name:
Title:

Signature

Date

1. LOCATION:

Preserve/Site:
Burn Unit:
Map Location (e.g. T/R/Sec.):
Unit Area:
County/State:
Ownership:

2. SOURCES OF EMERGENCY ASSISTANCE (location & phone #):

Fire:
Law Enforcement:
Medical:
Attorney:
Nearest Phone to Unit:

3. PERMITS AND OFFICIAL NOTIFICATIONS:

Burn Permit/Notification Required? Yes / No
Source(s):

Air Quality Permit/Notification Required? Yes / No
Source(s):

Other Notifications Required? Yes / No
Source(s):

4. NEIGHBOR NOTIFICATIONS:

Name	Address	Phone

5. UNIT DESCRIPTION:

Vegetation Types	Fuel Models	% of Unit Area	% Slope	Aspect

Fire Unit Narrative Description (include description of surrounding fuels):

Maps Attached:

Preserve location map:	Yes / No
Preserve burn unit map:	Yes / No
Preserve fuels map:	Yes / No
Burn unit map with ignition pattern, hazards, etc:	Yes / No
Aerial photograph:	Yes / No
Smoke Screening Map	Yes / No
Map to Hospital	Yes / No
Other:	

6. PRESCRIBED BURN JUSTIFICATION:

Type of Burn (ecological management, hazard reduction, training, or research):

Burn Unit Management Goal(s):

Specific Burn Objectives:

7. FUEL AND WEATHER PRESCRIPTION (give acceptable ranges)

Required Parameters:	MAX	MIN	PREFERRED (if applicable)
Wind Direction(s)			
Effective Windspeed (mph)			
1-Hour Fuel Moisture (%)			
10-Hour Fuel Moisture (%)			
100-Hour Fuel Moisture (%)			
Live Fuel Moisture (%)			
Atmospheric Mixing Height (ft)			
Other (e.g. KBDI, Live/dead ratio):			

Guidance Parameters:	MAX	MIN	PREFERRED (if applicable)
Air Temperature (°F)			
Relative Humidity (%)			
Days Since Rain			
20 ft wind speed (mph)			

List any combinations of parameters that you will exclude from your burn window (e.g. high windspeeds with low 1-hour fuel moisture).

Other Comments:

8. PREDICTED FIRE BEHAVIOR (From BEHAVE or attach BEHAVE outputs: use inputs from #7; include predictions for fuels surrounding burn unit) Use this information as a guide to the potential range of behavior from a free-burning fire, and for contingency planning.

	Fuel Model		
	#	#	#
Max. Headfire Flame Length			
Min. Headfire Flame Length			
Max. HF Rate of Spread			
Min. HF Rate of Spread			
Max. Backfire Flame Length			
Min. Backfire Flame Length			
Max BF Rate of Spread			
Min. BF Rate of Spread			
Max. Scorch Height			

9. FIRE BEHAVIOR NARRATIVE (Describe *desired* fire behavior. How will you manipulate fire behavior to meet management and control objectives?):

10. SMOKE MANAGEMENT PLAN

Smoke screening procedures completed? Yes / No

List downwind/downdrainage smoke sensitive areas (give distance):

List other smoke sensitive areas:

Map of smoke sensitive areas attached? Yes / No

Describe desirable smoke behavior and smoke management actions:

11. CREW ORGANIZATION

Qualified fire leader(s):
Crew Number **to**
Organization chart attached? **Yes / No**
Fitness & experience requirements if different from TNC guidelines:

12. EQUIPMENT

Required items:	<u>Available</u>
Pumper on site	Yes / No
Three radios	Yes / No
Protective clothing	Yes / No
First aid kit	Yes / No
Weather kit	Yes / No
Fire shelters	Yes / No

Justification(s) for exemptions:

Equipment Item	Number	Source

13. BURN DURATION

Time (indicate minutes or hours) for:

Baseline Preparation:

Spreading Fire:

Mop-up:

Total Duration:

14. MANAGING THE BURN (Describe each of the following):

Firebreak preparations:

Firing techniques and ignition pattern:

Crew communication:

Fire behavior and weather monitoring:

Holding:

Fire sensitive areas:

Contingencies (include safety zones, escape routes, secondary control lines, escape response procedures):

Potential hazards to crew:

Mop-up:

Public relations:

Follow-up assignments:

15. DOCUMENTATION

Does the site have a Site Conservation Plan?	Yes / No
Review of Laws and Regulations complete?	Yes / No
Site Fire Management Plan complete?	Yes / No
Site Wildfire Response Plan complete?	Yes / No

Exemptions or modifications of TNC burn requirements and guidelines:

Justification(s) for exemptions or modifications:

16. LEGAL CONSIDERATIONS

Describe the ownership/management responsibility of this site:

Releases/waivers required?	Yes / No
Releases/waivers attached?	Yes / No

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