

Region 5 Regional Response Team Meeting Agenda

St. Paul, Minnesota - May 29-30, 2002

Wednesday, May 29, 2002: Minnesota History Center, 345 Kellogg Blvd, St. Paul, MN

- 1:00 pm Welcome – USCG & USEPA Region 5 Co-Chairs.
- 1:10 pm MSO Detroit's Rouge & Detroit River Spill Synopsis
Bob Allen, USCG
- 1:30 pm USCG Atlantic Strike Team Washington DC Anthrax Response
CDR Gail Kulisch, Commanding Officer, Atlantic Strike Team
- 2:15 pm Joint EPA/Coast Guard Marina Program – Dr. Barb Carr, US EPA R5
- 2:45 pm Break
- 3:00 pm Endangered Species Location & Recovery Plan Mapping
Ann Whelan, US EPA Region 5
- 3:45 pm CANUSLAK 2002 Isle Royale Spill Response Equipment Deployment
Exercise – CDR Bill Diehl, Commanding Officer, MSO Duluth.
- 4:30 pm Chronic Wasting Disease/Disposal Issues
David Woodbury, WI DNR
- 4:45 pm UMR Early Warning System - Jim O'Brien, IL EPA
- 5:00 pm Adjourn

Thursday, May 30, 2002: Department of Public Safety, Division of Emergency Management EOC, 444 Cedar Street, Suite 223, St. Paul, MN

- 9:00 am ✓ State of Minnesota Division of Emergency Management EOC Tour.
- 9:30 am ✓ Operations Manual - Ann Whelan, US EPA Region 5 (group) *- draft next meeting*
- 10:00 am ✓ Controlled Burning - Eric Jager, Eastern Area Coordination Center
- 10:45 am ✓ Break
- 11:00 am ✓ Federal and State Roundtable
- 1:00 pm Adjourn

next meeting -

MN

F+M Disease/Disposal
Debris Mgt (terror)

3-5,000 people involved
WEE plan - updated
Post disaster exercise

USCG - CANALSLAK = Detroit River
spell new boats

FEMA HAZOP exercise
cruelly violent happen
1.9 billion industry

WI

Chronic Wasting Disease
Disposal

361 sq miles
1 week every month → Spt

WMT Training - Madison

ICS video

Terrorism Exercise / Chemical Exercise

Security Systems

Int/state/wi/us/org/land/wildlife/water/energy/CWD/
wealth index/human

IL

Pipeline/leak - Wood River

Locks Issues FMD - above ground buried

Exercise - CSEPP - NO CST

CT Response Plan 3 State Hazard Teams



NO Indiana, Ohio, Michigan

DOI

- internet & email problems gone
best practices - bird care - / Mott done
sub of bird rehab

Tri-State Meeting

Fish Kill Protocol

2 Standouts - State Trustees / Form Fill out

Shoreline Clean-up Protocol

DOT

TRSDA - May 2 Notice of Proposed Rulemaking HMR

ATSDR

- ESF #8 March 13 meeting 19 people 17 HHS 1 RC 1 EPA

DOC


- Ken - out - Tom Callahan Callahan / person out in De

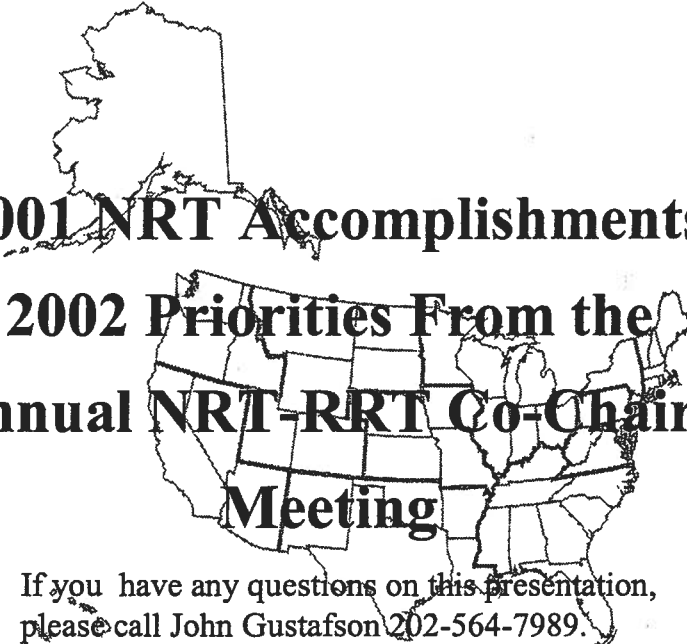
EPA testifying on CT resp.
more training, better
medical monitoring
core ER.

States FMD - Animal Disposal facilities

OSHA

WTC report on web - no fatalities
anthrax guidance on web
personnel random on web.





2001 NRT Accomplishments

2002 Priorities From the

Annual NRT-RRT Co-Chairs

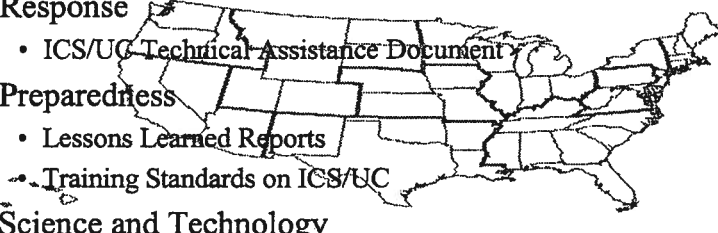
Meeting

If you have any questions on this presentation,
please call John Gustafson 202-564-7989.

Introduction

NRT Initiatives

NRT committee accomplishments

- Response
 - ICS/UC Technical Assistance Document
 - Preparedness
 - Lessons Learned Reports
 - Training Standards on ICS/UC
 - Science and Technology
 - Panama Canal Agreement
- 

NRT 2001 INITIATIVES AND ACCOMPLISHMENTS

Panama Canal MOA was signed on April 1, 2002 which will allow the U.S. to respond to oil and hazmat incidents in the Panama Canal.

NRS responded to 9-11 and Anthrax attacks. NRT Response Community developed the Technical Assistance Guidance on Anthrax Response. NRT provided assistance to U.S. Postal Service and formed the National Coordination Council. This process will be duplicated for other agencies.

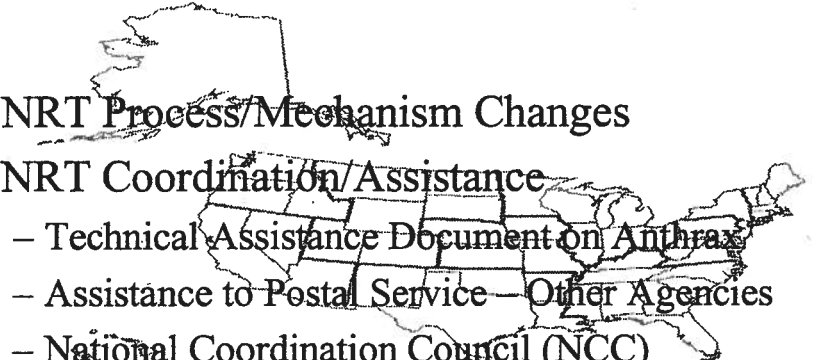
COMMITTEE ACCOMPLISHMENTS

The Response Committee has completed the ICS/UC Technical Assistance Document (TAD). It describes how to implement ICS/UC, decision-making authority, and OSC roles and responsibilities. It will be disseminated to all NRT members and RRTs late May 2002 for approval at the June 2002 NRT meeting.

The Preparedness Committee has completed the World Trade Center/Pentagon and Anthrax Lessons Learned Reports which was sent out to the RRTs for review and approval at the May NRT meeting.

The proposed NRT Training Subcommittee Counter-Terrorism (CT) and Hazardous Materials (Hazmat) Training Availability Web Site will allow all interested parties to access information regarding courses, programs, seminars, symposia, conferences, and workshops related to counter-terrorism and hazardous materials training. This website will be on the NRT Website in June.

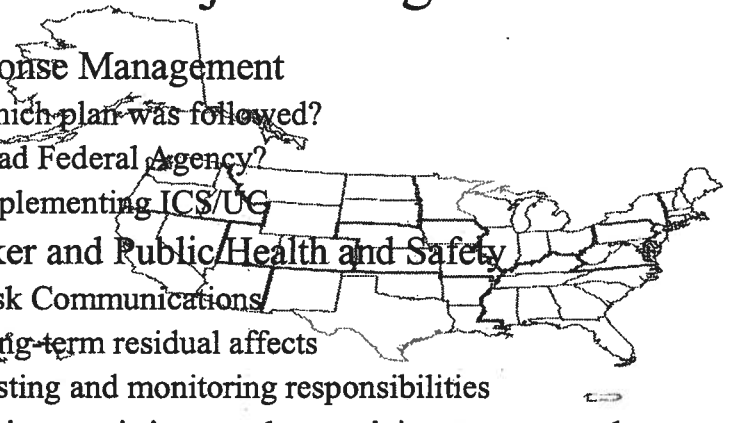
NRT/NRS Responds to 9-11 and Anthrax Attacks

- 
- NRT Process/Mechanism Changes
 - NRT Coordination/Assistance
 - Technical Assistance Document on Anthrax
 - Assistance to Postal Service – Other Agencies
 - National Coordination Council (NCC)
 - CDC, EPA, U.S. Coast Guard, OSHA, NIOSH

The NRT changed its management process after 9/11 to speed up interagency coordination and OSC support.

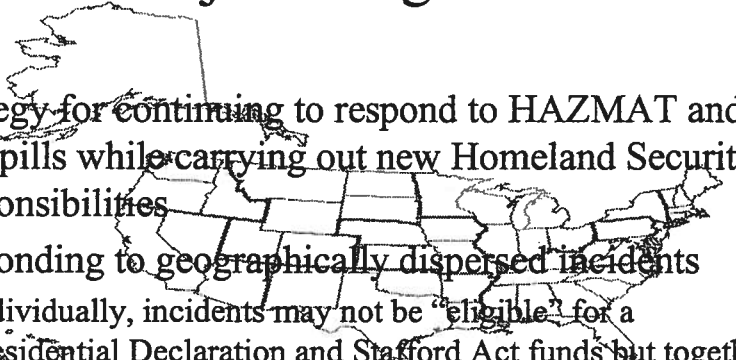
Special workgroups were set up to provide direct assistance to federal agencies.

NRT Lessons Learned Reports: Major Categories

- 
- Response Management
 - Which plan was followed?
 - Lead Federal Agency?
 - Implementing ICS/UG
 - Worker and Public Health and Safety
 - Risk Communications
 - Long-term residual affects
 - Testing and monitoring responsibilities
 - Planning, training, and exercising to respond to Biological Agents

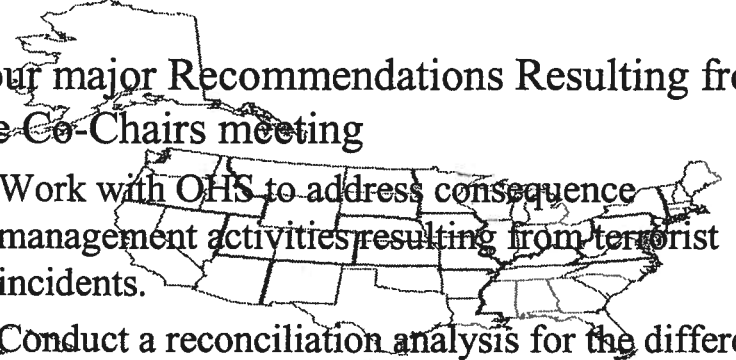
The NRT believes these Lessons Learned reports from the World Trade Center, Pentagon, and Anthrax incidents will help identify and develop the agenda for future NRT and RRT activities. The reports will be approved by the NRT this summer.

NRT Lessons Learned Reports: Major Categories

- 
- Strategy for continuing to respond to HAZMAT and Oil Spills while carrying out new Homeland Security Responsibilities
 - Responding to geographically dispersed incidents
 - Individually, incidents may not be “eligible” for a Presidential Declaration and Stafford Act funds but together the incidents may tax the response system beyond current capacity. How will this be paid for?

The Anthrax incidents were examples of geographically dispersed incidents where there was not a Presidential Declaration and no Stafford Act funding.

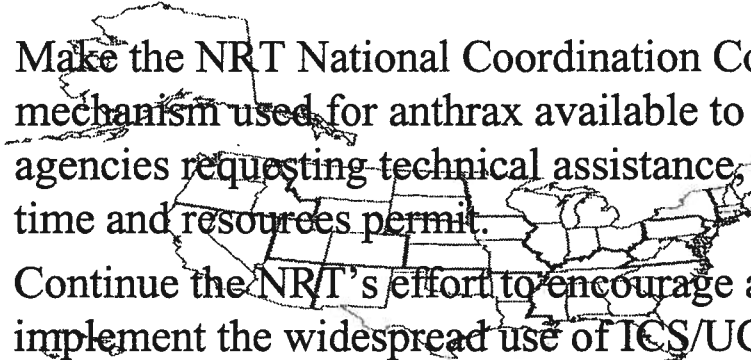
Priority Recommendations from the 2002 NRT-RRT Co-Chairs Meeting

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- Four major Recommendations Resulting from the Co-Chairs meeting
 1. Work with OHS to address consequence management activities resulting from terrorist incidents.
 2. Conduct a reconciliation analysis for the different plans involved in terrorism response (e.g. NCP, FRP, FRERP, DOJ/FBICONPLAN).

There were four major recommendations that were approved at the 2002 NRT- RRT Co-Chairs meeting, which was held in March in Orlando, FL.

1. The NRS recommends accepting the opportunity, as an interagency working group, to work with OHS to address consequence management as a result of terrorist incidents. The NRT Chair and Vice Chairs have briefed appropriate OHS Senior Directors. We have already determined an OHS point-of-contact for the NRS.
2. An action proposal has been developed by the Preparedness Committee and the Response Committee to form a workgroup to conduct this reconciliation analysis. This action proposal will be submitted to the NRT at the May 23, 2002 NRT meeting. This task would include three steps: (1) analysis of the plans to identify conflicts and gaps in coverage, (2) recommendations based on the analysis, and (3) a plan of action for implementing these recommendations.

Priority Recommendations from the 2002 NRT-RRT Co-Chairs Meeting

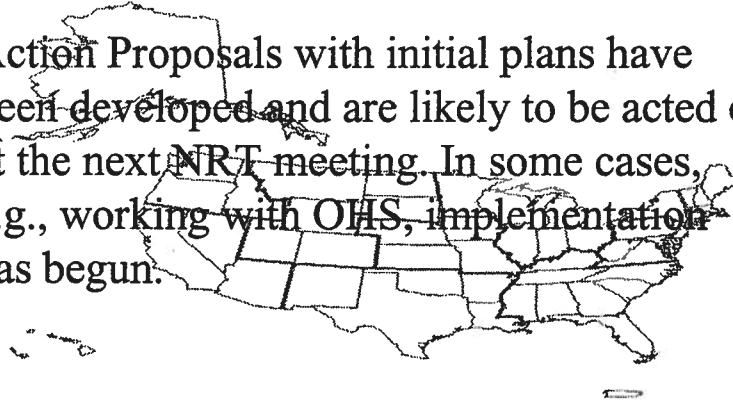
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3. Make the NRT National Coordination Council mechanism used for anthrax available to other agencies requesting technical assistance, as time and resources permit.
 4. Continue the NRT's effort to encourage and implement the widespread use of ICS/UC for Weapons of Mass Destruction response and other incidents.

Given the NRT's successful experience helping the U.S. Postal Service with the anthrax issue, the NRT/National Coordination Council mechanism will be made available to other federal agencies requesting assistance, as time and resources permit.

The NRT recommends continuing its efforts to encourage the widespread use of ICS/UC for WMD Response. During TOPOFF 2000, the NRT made the recommendation to the Justice Department that the federal government should adopt this system as the standard response management system at incident sites, including WMD incidents. Using ICS/UC will improve federal, state, and local response coordination. The NRT Response Committee and Training Subcommittee have successfully been addressing this issue. A new action proposal developed as a result of the 2002 Co-Chairs meeting will further the work of these committees. This action proposal will be submitted for NRT approval at the May 23, 2002 meeting. The recommendation of the NRT Executive Secretariat is that the NRT should task the Communications Ad Hoc Committee to develop a list of activities, (for example, interactive sessions with first responders, and outreach materials, such as, press releases, a federal register notice on the ICS/UC Technical Assistance Document,) that would build upon the work of the Response Committee and Training Subcommittee.

Next Steps – Implement Priority Recommendations

- Action Proposals with initial plans have been developed and are likely to be acted on at the next NRT meeting. In some cases, e.g., working with OHS, implementation has begun.



A representative from the Office of Homeland Security (OHS) met with the NRT at its April meeting to begin to identify areas where the NRT may be helpful to OHS, such as, response management, technical assistance, and policy development.

The NRT anticipates reaching out to the RRTs for technical assistance as projects develop.

STATE NATURAL RESOURCE TRUSTEE DESIGNATIONS**Federal Region 5**

August 2000

Illinois:**TRUSTEES:**

Brent Manning, Director
Department of Natural Resources
524 S. 2nd Street, Room 400
Springfield, Illinois 62701
ph: (217) 785-0075

Staff Contact: Steve Davis - Manger of NR Trustee Program
928 S. Spring Street
Springfield, Illinois 62704
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Thomas V. Skinner, Director
Environmental Protection Agency
1021 N. Grand Ave. E.
P.O. Box 19276
Springfield, Illinois 62794-9276
ph: (217) 782-3397

Staff Contacts: (Spills) Jim O'Brien, Mgr of Office of Chemical Safety
ph: (217) 785-0830

(Remediation /Super Fund Sites) Gary King, Manager
Division of Remediation Management
ph: (217) 782-0245

Indiana:**TRUSTEES:**

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400 W. Washington
Indianapolis, Indiana 46206
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Beth Admire, Chief of Staff
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100 North Senate IGCN-13
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Staff Contact: Marilyn Danks
ph: (651) 296-0777

Additional Contact: Lee Pfannmuller, Director
Division of Ecological Services
Department of Natural Resources
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Karen Studders, Commissioner
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ph: (651) 296-7302

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fax: (651) 296-8717
email: Kevin.Faus@pca.state.mn.us

Additional Contact: Roger Bjork, Northern Regional Director
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Ohio Environmental Protection Agency
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Columbus, Ohio 43215
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Wisconsin:

TRUSTEE:

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Department of Natural Resources
101 South Webster St.
Box 7921
Madison, Wisconsin 53707-7921
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fax: (608) 266-6983

Staff Contact: Brenda Hagman
ph: (608) 266-5883

Dichotomous Key for Fish Kill Investigations

After the initial visual inspection of the scene, an investigator can sometimes make preliminary assumptions about the cause of a fish kill. By using a process of elimination based on the evidence at hand, certain types of causes may be highly unlikely. A dichotomous key is provided below as an example of how the thought process might proceed. This key is offered as a tool—not as a definitive reference—for assessing fish kills. Opportunities to use the key to help reach a presumptive conclusion concerning the cause of a fish kill are provided in Chapter 13. Seven case histories are described to help potential investigators test their skill in evaluating the information that became available during the on-site investigation. Although the thought process would be the same for ponds, lakes, streams, and estuaries, most of the examples used in preparing the key were taken from data on fish kills in ponds. In streams, where evidence at the site may be transitory because of the flow, the investigator may have to check downstream to attempt to reconstruct the scene.

- | | |
|--|--|
| 1. Kill occurred in less than 24 hours..... 2 | 9. Kill occurred between 9:00 a.m. and 5:00 p.m. 10 |
| 1. Not known when kill occurred, or kill continued for longer than 24 hours 16 | 9. Kill occurred at other times as well 23 |
| 2. Kill occurred between midnight and sunrise..... 3 | 10. pH above 9.0 11 |
| 2. Kill occurred at times other than between midnight and sunrise 8 | 10. pH not above 9.0 14 |
| 3. Water dark in color, musty odor, or odor of sour cabbage..... 4 | 11. Dissolved oxygen high, often saturated, or near saturation..... 12 |
| 3. Water conditions normal in color and odor 6 | 11. Dissolved oxygen low or near normal for water temperature recorded 13 |
| 4. Some fish alive..... 5 | 12. Heavy bloom of one or more species of blue-green algae ... Toxic algal bloom |
| 4. All fish dead..... 16 | 12. Heavy bloom of dinoflagellate algae Toxic algal bloom |
| 5. Large fish dead, some small fish alive.... 6 | 13. Vegetation dead (appears burned) 14 |
| 5. Small fish dead, some large fish alive 18 | 13. Vegetation normal 15 |
| 6. Dissolved oxygen less than 2 ppm.... 7 | 14. Ammonia levels not high, near zero .. 15 |
| 6. Dissolved oxygen 2 ppm or more 9 | 14. Ammonia levels high Anhydrous ammonia spill |
| 7. Algal cells absent or dead if present 8 | 15. pH 6.0 to 7.0 Oxygen depletion |
| 7. Algal cells present and alive 10 | 15. pH below 6.0 Possible lethal low pH or heavy metal poisoning; possible mine drainage |
| 8. Dead algal cells abundant..... Oxygen depletion due to enrichment | 16. Some fish still alive..... 17 |
| 8. Algal cells absent..... Oxygen depletion due to algicidal substance | 16. All fish dead..... 23 |
| | 17. Kill size selective 18 |
| | 17. Kill not size selective 25 |
| | 18. Some small fish alive, large fish dead..... 6 |
| | 18. Small fish dead, some large fish alive..... 19 |
| | 19. Zooplankton and insects alive 7 |
| | 19. Zooplankton and insects dead 20 |
| | 20. Algal cells alive 21 |
| | 20. Algal cells dead or absent..... Toxic herbicidal substance |
| | 21. Fish showing convulsive or aberrant behavior 22 |
| | 21. Fish seemingly normal..... 24 |
| | 22. Fins in normal position..... 23 |
| | 22. Pectoral fins of fish thrust to extreme forward position..... Organophosphate pesticide |
| | 23. Kill occurred throughout day..... Pesticide poisoning |
| | 23. Kill occurred between 9:00 a.m. and 5:00 p.m. Toxic algal bloom (see also 11) |
| | 24. Recent temporary major change in water temperature..... Temperature kill (as from shutdown of thermal power generating plant or plant exceeding the allowed ΔT in discharge) |

24. Normal seasonal change in water temperature Temperature falls below or exceeds thermal tolerance—e.g., die-off of threadfin shad in cold weather; kill usually restricted to one species
- . Species selectivity evident 26
- . No species selectivity evident
..... Very high level of a toxic substance
26. Lesions evident on fish 27
26. No lesions on fish
..... Low toxicity or low concentration of toxic substance (see also 23)
- . Organisms in lesions visible to naked eye.. 28
- . No organisms visible 29
28. Organisms wormlike, attached to external surface of fish
..... Leeches (not a cause of death)
28. Organisms resemble copepods or have jointed body parts Parasitic copepods or isopods (known to kill fish)
29. Lesions not hemorrhagic 30
29. Lesions hemorrhagic
..... Possible bacterial or viral cause
30. Lesions as small discrete bodies or masses in tissues 31
30. Lesions appear as gray, yellow, or white areas on body
..... Bacterial or fungal cause
31. Lesion or mass filled with cellular material..
..... Cysts caused by sporozoans, protozoans (such as *Ichthyophthirius*), or helminths
31. Lesion or mass filled with gas 32
32. Bubbles of gas present in gills, fins, and behind eyes Gas bubble disease, due to supersaturation with a gas
32. Odorous gas in large bubbles in necrotic lesions Bacterial disease caused by *Edwardsiella tarda*



Chronic exposure to sublethal levels of contaminants may lead to tumors or other adverse effects in surviving fish. Public concern is heightened when melanomas, papillomas, and other anomalies, such as those on this black bullhead, are seen on fish.

RRT V Fish Kill Assistance Form

BACKGROUND

In the Fall 2000, the Region V Regional Response Team (RRT V) Co-Chairs formed a workgroup to develop guidance to assist federal on-scene coordinators (FOSC) in responding to chemical or oil spill incidents that involve fish kills. Coincidentally, a recent incident in our region highlighted the need for more clarity on what an OSC should expect when seeking state or federal agency support during a response that involves a fish kill. Therefore, it is imperative that a key component of the guidance document highlight your agency's contact information AND under what circumstances and authorities you will (or will not) respond to an FOSC's request for assistance. This questionnaire is intended to gather that information for inclusion in the guidance document.

WHAT WE NEED FROM YOU

Based on the two scenarios below we need you to answer the following questions in order to determine why, when and how your state and/or federal agency will respond to a fish kill and what assistance the FOSC may expect to receive from your agency.

- The FOSC receives notification concerning a suspected chemical release or oil discharge into navigable waters. A fish kill is observed that may be associated with the discharge.
- The FOSC is notified of a fish kill and proceeds with an investigation into the cause.

In both cases, the FOSC decides to direct or undertake preliminary actions contained in the RRT V Fish Kill Response Protocol and to solicit appropriate federal and/or state natural resource trustee representatives for technical assistance.

HOW THIS INFORMATION WILL BE USED

Our intent is to attach your responses to this form to the RRT V Fish Kill Protocol so that the information can be easily referenced by an FOSC. This will allow the FOSC to have a better understanding of who to contact, under what circumstances the agency will respond, and what assistance the agency can provide. The first two questions are to ascertain under what circumstances (authorities, laws, SOP's, etc.) your agency would respond to a fish kill. It is important for an FOSC to know when you will respond independent of any request from him/her. Questions 3-5 ask for specific information that an FOSC would need to know if he/she were to ask for help from your agency (assuming you were not already responding).

1. Are authorities and procedures in place in your state, region or tribal reservation/ceded territory to respond independent of an FOSC-led response to a fish kill? If so, please identify or attach to your response.

2. Under what circumstances will your agency or government respond to a fish kill independent of any request from a FOSC?

3. If assistance is needed by the FOSC in response to a fish kill who in your agency or government should be contacted?

- | | |
|---|----------|
| A) Name | E) FAX |
| B) Affiliation | F) Pager |
| C) Office telephone | G) EMAIL |
| D) 24-hour telephone | |
| H) Geographic area covered | |
| I) Trustee role of this person (if any) | |
| J) Other pertinent contact information | |

Additional notes pertaining to any of the above:

4. Having determined who is the primary responder/contact person, what conditions or situations (below) will trigger on-scene technical assistance from your agency or government within 24 hours of an FOSC request? Please check as many of the following as appropriate.

A) Procedures to recover your costs exist for:

- | | |
|---|---|
| <input type="checkbox"/> Regular duty work time | <input type="checkbox"/> Purchase or replacement of equipment |
| <input type="checkbox"/> Overtime | <input type="checkbox"/> Purchase or replacement of supplies |
| <input type="checkbox"/> Fish death/consumption lab analysis | |
| <input type="checkbox"/> Review, interpretation and reporting of lab analyses | |

B) ☐ The spilled product does not pose an unacceptable health risk to on-scene response

C) ☐ A criminal act may have caused the fish kill

D) ☐ A civil act may have caused the fish kill

E) ☐ The fish kill exceeds _____ (number) of fish
(if there a certain amount of dead fish that trigger certain actions, please explain below)

- F) ☐ The fish kill occurs in a certain type of waterbody
 ☐ waters classified as non-degradation ☐ Great lakes
 ☐ state or federal wild and scenic ☐ Major rivers
 ☐ Native or stocked trout stream ☐ Others (please identify)
- G) ☐ The fish kill affects use of a public park, reservation, natural area, wildlife area or recreation area
- H) ☐ The fish kill involves or threatens state-listed fish species or their habitat
- I) ☐ The fish kill involves federally listed (or proposed) fish species or designated "critical" habitat
- J) ☐ The fish kill affects fish species that fall under the trusteeship of the state or federally recognized tribe
- K) ☐ The fish kill affects fish species that are considered to be under joint federal and state trusteeship
- L) ☐ The fish kill poses a threat of secondary adverse effects to scavenging wildlife
 ☐ Resident species
 ☐ Migratory species
- M) ☐ The fish kill causes the trustee agency to consider posting a fishing closure or advisory
- N) ☐ The fish kill generates significant political, media or public interest

Additional notes pertaining to any of the above:

5. What technical assistance will your agency be willing to undertake as part of the FOSC-directed response? Please check as many of the following as appropriate:

- A) ☐ Qualitative and quantitative description of the fish kill, e.g., composition, age classes, numbers
- B) ☐ Sample collection, chain of custody labeling and preservation of affected fish and water for subsequent analysis
- C) ☐ Offsite transport and analysis of sampled fish for cause of death and determination of human health risk
- D) ☐ Review, interpretation and reporting of laboratory analysis results to the OSC

- E) ____ Communication of work activities and findings to the joint information center
- F) ____ Collection, removal and appropriate disposal of dead or injured fish
- G) ____ Public notification or posting of closing/re-opening of public fishing
- H) ____ Other actions (please list)

Additional notes pertaining to any of the above:

May 2002 RRT V Fish Kill Response Protocol

Introduction

RRT V U.S. Environmental Protection Agency and U.S. Coast Guard Onscene Coordinators (FOSCs) may observe dead or dying fish while patrolling navigable waters or responding to spills of oil and hazardous substances. At the request of the RRT V Co-chairs, this protocol was developed to assist the FOSCs in carrying out fish kill-related response operations pursuant to 40 CFR 300.135(c) of the September 15, 1994 National Oil and Hazardous Substances Pollution Contingency Plan.

Fish die as a result of a variety of natural and unnatural causes, among them old age, starvation, bodily injury, stress, suffocation, water pollution, diseases, parasites, predation, toxic algae, and severe weather. EPA's 1988 National Water Quality Report to Congress identified agricultural runoff as the largest or most frequent cause of fish kills, followed by spills, municipal facilities, industry, land disposal and urban runoff.

Fish kills are a common occurrence in the Midwest and in most other areas of the United States, and may involve large numbers of fish. In 1992, 43 states reported a total of 1,620 fish kill events from various causes. In 1996, in excess of 40 manure spills killed 670,000 fish in Minnesota, Iowa and Missouri. In 1998, a 100,000-gallon manure spill in Minnesota killed nearly 700,000 fish. In December 1999, an industrial chemical killed 4.6 million fish in Indiana. In July 2000, a discharge of mash (grain alcohol and molasses) killed at least 24,000 fish in Ohio. In January 2002, a fertilizer leak killed a near-record 1 million fish in Iowa.

The American Fisheries Society Special Publication 24 "Investigation and Valuation of Fish Kills" provides detailed procedures for investigating fish kills. The U.S. Fish and Wildlife Service (FWS) Resource Publication 177 "Field Manual for the Investigation of Fish Kills" also offers useful guidance and was used extensively in preparing this protocol. In addition, some states, e.g., Minnesota, Indiana and North Carolina, employ detailed protocols for investigating fish kills. Occasionally, workshops and training are offered to enhance basic knowledge and skills, e.g., "Proceedings from Minnesota Fish Kill Workshop" (March 1997) and "Investigating Fish Kills" [Course #FIS1135 (IVFK)] offered by the FWS National Conservation Training Center in Shepherdstown, West Virginia. These publications and manuals served as references for this protocol.

Purpose

The Fish Kill Response Protocol (protocol) identifies *preliminary investigative* actions that the FOSC may undertake during the first 24 hours of **his/her** response activity. In addition, attachments to the protocol identify federal, state and tribal natural resource trustee and Environment Canada representatives and *detailed investigative* actions that the representatives may undertake, coordinate or oversee in support of the FOSC preliminary investigation. The protocol specifies that the FOSC:

- 1) notify all potentially affected natural resource trustees that a fish kill has occurred;
- 2) complete the attached "**Recognize and Report Form**" R & R Form which records readily obtained observations and information about the fish kill and possible cause(s);
- 3) telefax copies of the completed R & R Form to notified trustee representatives; and,
- 4) inquire whether and on the basis of the R & R Report, the natural resource trustees and Environment Canada representative intend to visit the site and continue the fish kill investigation pursuant to their authorities and in accordance with their procedures, as prescribed in the attached "**Fish Kill Assistance Form**" (FKA Form).

Natural Resource Trusteeship

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Oil Pollution Act (OPA) authorize the United States, States and Indian Tribes to act on behalf of the public as trustees for natural resources under their respective trusteeship [CERCLA 107(f)(1) and OPA 1006(c)]. OPA also authorizes foreign governments, e.g., Canada, to act as trustees [OPA 1006(b)(5)]. Natural resources are defined in the NCP as land, *fish*, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States.

The FOSC shall ensure that potentially affected natural resource trustees are promptly notified of all discharges and releases [40 CFR 300.135(j)(1)], particularly when there is evidence of injury to fishes. Prompt incident notification is needed, not only to initiate response coordination and assistance, but to enable the trustees to quickly gather ephemeral data necessary for conducting a natural resource damage assessment (NRDA). For their part, the natural resource trustees are obligated to coordinate NRDA activities with the FOSC in order to preclude duplicative data gathering and to prevent interference with response operations. Where possible, the FOSC should share the use of federal response resources (e.g., aircraft, vessels and booms) with the trustees [40 CFR 300.615(3)(ii) and (iii)].

Natural resource trusteeship for fishes is often exclusive to one trustee [e.g., to tribes for all fishes within waters of a tribal reservation, to a state for resident fishes within state boundaries, to the Department of the Interior (DOI) or the Department of Commerce (DOC) for species listed as endangered or threatened under the Endangered Species Act (ESA)], but may be shared with other trustees [e.g., to DOI, NOAA and states for inter-jurisdictional fishes occurring in non-federally administered waters, to the Department of the Defense (DOD), NOAA and DOI for inter-jurisdictional fishes occurring within DOD-administered waters]. Trusteeship for fishes may be generally distinguished as follows:

The *Environment Canada* natural resource trustee has trusteeship for all fishes in Canadian waters, except those falling under the jurisdiction of the First Nations.

Governor-designated *state trustees* have sole trusteeship over all non-federally listed resident fishes, and share trusteeship with DOI and NOAA for inter-jurisdictional fishes and with the tribes for fishes occurring in ceded territories and waters. The RRT V *trustee agencies* are: Illinois Environmental Protection Agency; Indiana Department of Natural Resources and Indiana Department of Environmental Management (co-trustees); Michigan Department of Environmental Quality, Minnesota Pollution Control Agency and Minnesota Department of Natural Resources (co-trustees); Ohio Environmental Protection Agency; and, Wisconsin Department of Natural Resources.

Tribal Chairman or their designees of *federally recognized tribes* have trusteeship over all fish species occurring within tribal reservations, and share trusteeship with state and possibly federal trustees for fishes inhabiting ceded lands and water territories. There are currently 35 federally recognized tribes occupying reservations or ceded territories in Minnesota, Wisconsin and Michigan (none in Ohio, Indiana and Illinois). The tribes have ceded certain tribal lands and waters to the United States (Treaties of 1836, 1837, 1842 and 1854) in exchange for specific continued uses, including fishing rights. The ceded territories cover extensive areas of northeastern and east-central Minnesota, northern Wisconsin and northern Michigan, including all of Lake Superior, northern and eastern Lake Michigan and western Lake Huron.

Trustees for *DOI and NOAA* have trusteeship over fishes occupying waters under their direct management or administration, e.g., national parks, national wildlife refuges, national fish hatcheries and national marine sanctuaries. DOI and NOAA also have trusteeship over certain inter-jurisdictional fish populations.

Trustees for the *DOD, Department of Energy (DOE), and Department of Agriculture (USDA)* have trusteeship over fishes occupying waters that occur within their administered properties.

Trustee Response Assistance

State

Experience shows that discharges of oil or releases of hazardous substances in the Midwest primarily pose toxic risk to resident fishes under state trusteeship. If resident fishes are affected, the OSC may anticipate a state-prescribed level of spill response assistance, probably from regional biologists who manage fishery resources. Depending on the severity of the fish kill, such assistance may entail determining species composition and age classes, counting or estimating numbers of fish killed, determining the probable cause of death and reporting. Specific response assistance from individual state trustee agencies may be provided to the FOSC as prescribed in the FKA Form.

In addition, *other* state trustee personnel (as well as federal and tribal) may conduct a *separate*, broader investigation, i.e., the aforementioned NRDA, in order to assess injury to *all* trust natural resources (e.g., wildlife) and lost public uses. The state(s) may use the NRDA as a basis to file a

claim under OPA or CERCLA to restore natural resources to pre-incident conditions. Rules or regulations governing the conduct of NRDA are published by NOAA (oil) and DOI (hazardous substances). Generally, NRDA activities are conducted separately from response, but the information may, at the discretion of the trustee agency, be shared with the FOSC for use in response activities.

Federal

DOI or NOAA may undertake or assist the OSC with fish kill response, if the fish kill has occurred on their federally-administered lands and waters or has occurred within non-federally administered waters inhabited by certain depressed (rare, declining), inter-jurisdictional fish populations.

In general, *inter-jurisdictional fish populations* are found in the major Midwest rivers and the Great Lakes. Examples of inter-jurisdictional fish populations of interest to DOI and possibly NOAA include:

“lean” and/or “deep water” populations of lake trout in the Great Lakes;

yellow perch in Lake Huron and Lake Michigan;

walleye in Lake Huron, Lake Superior and Red Lake, Minnesota;

lake herring in the Great Lakes;

shovelnose sturgeon in the Mississippi River;

blue sucker in the Mississippi River;

lake sturgeon in the Mississippi River;

paddlefish in the St. Louis, Wolf, Mississippi and Wisconsin Rivers and Saginaw Bay;

sturgeon chub in the Mississippi River;

sicklefin chub in the Mississippi and Lower Missouri Rivers;

“coaster” brook trout in Lake Superior;

Western silvery minnow in the Lower Missouri and Upper Mississippi Rivers;

flathead chub in the Lower Missouri and Upper Mississippi Rivers;

Arkansas darter in the Arkansas River;

skipjack herring in the Mississippi River; and,

Plains minnow in the Lower Missouri and Upper Mississippi Rivers.

In addition, fish kills involving species that are listed, or proposed for designation, as federally ***threatened or endangered species*** under the Endangered Species Act are of primary interest to DOI (through the U.S. Fish and Wildlife Service) or NOAA (through the National Marine Fisheries Service) and could trigger their response assistance. Currently, the following species of fish are federally listed in the Midwest:

pallid sturgeon in the Mississippi River (Alexander and St. Clair Counties, Illinois);

Scotio madtom in streams of moderate flow over sandy gravel bottom (Franklin, Madison, Pickaway and Union Counties, Ohio); and,

Topeka shiner in prairie rivers and streams (Jackson, Lincoln and Rock Counties, Minnesota).

DOD, DOE and USDA may solicit help or assist the FOSC with fish kill response activities within their administered properties. They may also contact the states, DOI and NOAA for fish kill response assistance, as necessary.

The type and amount of response assistance that the federal trustees could provide to the OSC is identified in the attached FKA Form. ***As may be evident, federal and tribal fish kill response is less commonplace than that of the states, since the federal trustees have correspondingly less trusteeship and jurisdictional responsibility.***

Like the states, tribal, federal and Canadian trustees may undertake a NRDA for a fish kill involving species, lands and waters under their trusteeship. DOI and NOAA may also offer assistance to the states in their conduct of NRDA for resident species. Again, information obtained by the federal trustees via a NRDA may be provided to the FOSC for use in spill response.

Tribal

Federally-recognized tribes may seek or provide response assistance to the FOSC, or undertake fish kill response activities themselves, for incidents affecting reservations or ceded territorial lands and waters. Under Executive Order 13084, dated May 14, 1998, all federal agencies are required to consult with the tribes, particularly as related to regulatory practices and associated compliance costs. The tribes may seek both incident specific assistance and general help in the form of FOSC training for tribal personnel and/or "incident-specific" representation on the RRT and any Unified Command. Tribal assistance to the FOSC may take many forms, but is expected to be mutually beneficial. Tribal authorities may assist the FOSC in identifying cultural sensitivities and recommending response procedures in conducting source control and cleanup. They may

also advise or participate in actual removal and disposal of dead fish, provided tribal health and safety considerations are met. Expected assistance from individual tribes can be ascertained in the attached FKA Form.

The tribes may also undertake NRDA actions independently of other trustees or in conjunction with them. These actions are likely to have lost use components that reflect injury to natural resources and their uses, including tribal culture.

Fish Kill Advisory Network

The Izaak Walton League of America maintains a Fish Kill Advisory Network. The network, coordinated by staff in St. Paul, MN (telephone 651-649-1446), features a central database for the Upper Mississippi River Basin states of MN, WI, IL, IA and MO. The network is designed to increase the reporting and investigation of fish kills and to encourage the improvement of our nation's water quality. The database may be queried for various types of useful information, including time, location, fishes and numbers affected, causes, observed behavior, etc. FOSCs are encouraged to provide information on fish kills to the network by completing a four-page on-line fish kill report form. The web address is: <http://www.iwla.org/fishkill/fkform.htm>.

Health Precautions

The first consideration in responding to a fish kill is to appropriately safeguard the responders and the public. Dead fish and contaminated water may pose a health hazard and should be avoided wherever possible or encountered with proper safeguards. Prior to conducting a fish kill investigation, a proper site characterization must be performed to ensure that investigators are adequately protected. Responders should rely on guidance for site characterizations from their parent agency. FOSCs should provide the following precautions or admonitions to responders (except those actually engaged in fish kill investigation), potentially affected residents, appropriate local officials and local media outlets:

Do not collect or consume dead or abnormally behaving fish.

Do not swim or wade in waters impacted by or downstream from the fish kill.

If work involving water contact cannot be avoided, minimize water agitation to prevent inhalation of vapors and use protective clothing (e.g., elbow length and puncture resistant gloves, eye protection, apron and boots impermeable to water) to prevent skin and eye exposure.

Handle items immersed in waters of a fish kill with protective gloves and wash with soap and water.

Remove any clothing that has been immersed in water where fish were killed and wash the exposed area(s) with soap and clean water or a solution of 1 part household bleach to 10 parts water.

Do not allow pets to drink from or wade into waters impacted by or downstream of a fish kill.

Seek medical assistance if you experience illness that may be related to exposures at a fish kill.

Initial Gathering of Information

The first few hours of the fish kill investigation may be critical, not only for determining the cause, but minimizing the kill's extent. To this end, the FOSC should collect pertinent information as quickly and as safely as possible. Fish kills caused by toxic substances are usually abrupt. The mortality may begin at any hour and continue until all fish are dead or until the toxic substance has been degraded, neutralized or diluted. Small fish usually die first and affected fish often have convulsions, lose equilibrium, or show other signs of toxicosis. The FOSC's fish behavioral observations, as provided in the R & R Form, can provide important clues for determining the cause of the fish kill and rectifying the problem.

If not already undertaken by a trustee agency, the FOSC should quickly make observations and record preliminary information on the fish kill and possible causes to help facilitate more detailed investigation by appropriate trustee representatives. *As soon as possible upon arrival, the FOSC should implement appropriate health and safety precautions, survey the scene of the fish kill, and complete the R & R Form.* The R & R Form prompts the FOSC to record easily obtained information about the fish kill and possible cause based on his/her observations and minor sampling. Any additional observations may be recorded as notes on the reverse side of the R & R Form. The FOSC should promptly provide the completed R & R Form to the affected tribal, state or federal agency or foreign government trustee contact (as provided in the appropriately completed FKA Form) that has jurisdiction over the injured or dead fish so that they may consider initiating detailed investigations.

Determining the exact cause of a fish kill, as well as providing advice concerning removal of dead fish, is best left up to the appropriate trustee experts. The trustee representatives may collect samples and conduct detailed chemical analyses. In some cases, state, federal and tribal trustee agencies may use their own or contract laboratories to conduct the analyses. In other cases, the agencies may request that EPA laboratories do so. The fish samples may also be subjected to histological (tissue) examination. Again, the laboratory will depend on the preferences of the affected trustees. Any reports generated by the trustees should be made available to the FOSC for use in possible legal proceedings against potentially responsible parties.

Any FOSC preliminary public announcements about the causes of the fish kill should be offered with utmost caution, pending further investigation, testing, analysis and legal considerations. The trustee(s) providing fish kill response assistance should maintain close coordination with the FOSC, keeping them fully informed of their fish kill investigation and findings. Public announcements about the source and cause of the fish kill should be fully coordinated between the FOSC and the trustees.

FISH KILL RECOGNIZE AND REPORT FORM		1. Incident/Location:		2. Date/time prepared:		3. Person reporting: Name: Phone: Address: Affiliation:	
4. # of fish killed: _____ Incident Size: <input type="checkbox"/> Minor < 100 <input type="checkbox"/> Moderate 100-1000 <input type="checkbox"/> Major > 1000		5. Dimensions of fish kill: _____ Ft _____ Ft _____ Yds _____ Yds _____ Miles _____ Miles Acres: _____		6. Number of different types (species): _____ (List known types)		7. Fish types (species) not affected:	
8. Fish size differences: Relatively the same <input type="checkbox"/> Different <input type="checkbox"/> Range: _____ to _____		9. Weather Temperature (F) _____ Cloud Cover (%) _____ Precipitation (inches) _____ Wind speed (mph) _____ Wind direction (compass) _____		Today		Yesterday	
11. Nearby vegetation: <input type="checkbox"/> Discolored <input type="checkbox"/> Burned, brown <input type="checkbox"/> Dying <input type="checkbox"/> Dead		12. Water condition: Colored: <input type="checkbox"/> Heavy sediment load <input type="checkbox"/> Temperature (F): _____ Odor: _____ pH: _____ Dissolved Oxygen: _____ H2O Conductivity: _____		13. Fish condition: (General) Dying <input type="checkbox"/> Gills flared <input type="checkbox"/> Mouth agape <input type="checkbox"/> Spine Curved <input type="checkbox"/> Excessive Mucus <input type="checkbox"/> Lesions <input type="checkbox"/>		14. Insecticide impacts: (organochlorides) Increased ventilation <input type="checkbox"/> Jerky fin movement <input type="checkbox"/> Jerky body movement <input type="checkbox"/> Spasms, convulsions <input type="checkbox"/> Racing <input type="checkbox"/> Erratic Swimming <input type="checkbox"/> High excitability <input type="checkbox"/>	
				Discoloration: Odd fin position <input type="checkbox"/> Swimming at surface <input type="checkbox"/> Equilibrium loss <input type="checkbox"/> Attempting to get out of water <input type="checkbox"/>		(organophosphates) Lethargy <input type="checkbox"/> Dark reddishness <input type="checkbox"/> Hemorrhaging fin <input type="checkbox"/> Hypersensitivity <input type="checkbox"/> Convulsions <input type="checkbox"/> Coughing/Tremors <input type="checkbox"/> Spinal abnormality <input type="checkbox"/>	
15. Symptoms/Conditions		Possible Cause		Possible Source		Source Present?	
• Large fish coming to surface gulping for air		Oxygen depletion		Sewage Treatment Plant		Yes <input type="checkbox"/> No <input type="checkbox"/>	
• Small fish alive and normal				Livestock Feedlot		Yes <input type="checkbox"/> No <input type="checkbox"/>	
• Low dissolved oxygen				Irrigation/De-icing Runoff		Yes <input type="checkbox"/> No <input type="checkbox"/>	
				Decaying Plant Matter		Yes <input type="checkbox"/> No <input type="checkbox"/>	
				Dying Algal Bloom		Yes <input type="checkbox"/> No <input type="checkbox"/>	
• Large fish coming to surface gulping for air		Early oxygen depletion with slow reoxygenation		Ammonia Chemicals		Yes <input type="checkbox"/> No <input type="checkbox"/>	
• Adequate dissolved oxygen				Livestock feedlot		Yes <input type="checkbox"/> No <input type="checkbox"/>	
• Fish swimming erratically		Chemical pollution		Heavy Metal Plant		Yes <input type="checkbox"/> No <input type="checkbox"/>	
• Fish moving upstream to avoid something in water				Chemical Waste Facility		Yes <input type="checkbox"/> No <input type="checkbox"/>	
				Sewage Treatment Plan		Yes <input type="checkbox"/> No <input type="checkbox"/>	
• Fish dying or dead after heavy rain		Pesticide, herbicide washed out		Farms, Crop Fields		Yes <input type="checkbox"/> No <input type="checkbox"/>	
				Aerial Crop Sprayer		Yes <input type="checkbox"/> No <input type="checkbox"/>	
				Man/Mechanical Sprayer		Yes <input type="checkbox"/> No <input type="checkbox"/>	
• Stream banks/bottom covered with orange color		Brine water		Drilling operation		Yes <input type="checkbox"/> No <input type="checkbox"/>	
• Water has high conductivity		Acid		Coal/Strip Mining		Yes <input type="checkbox"/> No <input type="checkbox"/>	
• Low pH <input type="checkbox"/> Good clarity <input type="checkbox"/> Orange Discoloration <input type="checkbox"/>							
16. Documentation and samples: Photos taken # _____ Water samples # _____ Fish samples # _____		17. Trustees contacted: Name(s): _____ Phone: _____ Date/time notified: _____		18. Prepared by:			



Theodore Roosevelt National Park
Prescribed Burn Plan

Project Name: **Little Mo**

Project Number: 0201

Prepared by: _____
Eric Allen, WICA Fire Use Module

Date: _____

Prepared by: _____
Beth Card, Fire Management Officer

Date: _____

Technical Reviewer: _____

Date: _____

Recommended by: _____
Russ Runge, Chief, Resource Management

Date: _____

Recommended by: _____
Gary Kiramidjian, Chief, Visitor Protection

Date: _____

Approved by: _____
Noel Poe, Park Superintendent

Date: _____

Recommended by: /s/ Bobby Bloodworth
Midwest Regional Office

Date: 4-29-02

5/30/02

Review Comments for Little Mo RX:

Fire Management Officer:

Chief, Resource Management:

Chief, Visitor Protection:

Superintendent:

Technical Reviewer:

Regional Office:

Other:

5/30/02

PRESCRIBED FIRE PLAN - TECHNICAL REVIEW

Park: Theodore Roosevelt NP

Project Name: Little Mo RX Burn

Prescribed Fire Plan Elements	Status	Date	Initial
a. Signature Page			
b. Executive Summary			
c. Description of Prescribed Fire Area			
d. Goals and Objectives			
e. Risk Management			
f. Project Complexity			
g. Organization			
h. Cost			
i. Scheduling			
j. Preburn Considerations			
k. Prescription			
l. Ignition & Holding Actions			
m. Wildland Fire Transition Plan			
n. Protection of Sensitive Features			
o. Public and Firefighter Safety			
p. Smoke Management			
q. Interagency Coordination and Public Information			
r. Monitoring			
s. Post Fire Rehabilitation			
t. Post Fire Reports			
u. Appendices			

Status Coding:

- + Adequate – Meets NPS Standards
- 0 Adequate with modification. See comments.
- Deficient. See comments.
- NC Unable to evaluate.

Comments (Please add additional pages as necessary):

Signature: _____

Date: _____

5/30/02

B. Executive Summary

This project is designed to reduce fuel buildups and reintroduce fire to the ecosystem in the grasslands and riparian areas within the Juniper Campground and Little Missouri River corridor in the North Unit of Theodore Roosevelt National Park.

Direction to utilize prescribed fire to achieve goals and objectives further stated in this burn plan come from the park's Resource Management Plan and Fire Management Plan. The Federal Wildland Policy of 2001 also mandated federal land management agencies within fire dependent communities to reintroduce and maintain fire as a part of the ecosystem. The policy of using fire as a tool will help decrease risks to life, property and resources and help perpetuate the natural resource values for which this National Park was established.

C. Description of Prescribed Fire Area

General Description: This burn unit is located in the North Unit of Theodore Roosevelt National Park. It is approximately three miles within the park boundary along the main park road. The burn unit boundaries are the Little Missouri River and Juniper Campground and Picnic Area to the south and west. The northern boundary consists of a mowed line from the Long X Trail pullout to the east where it is tied into the natural bluffs and the main park road. The eastern boundary is a mowed line from the main park road to the Little Missouri River near mile marker XXXX.

Location: T148N R99W Sections 30, 31, 32, 33
47 36' 30" 103 20' 00"

Size: 800 acres

Elevation Range: 1950 to 2100 feet MSL

Description of boundaries:

North: Park road along most of the burn. In Squaw Creek drainage, natural barriers will be used as much as possible. A combination of hand and mowed line will be used to tie the natural barriers together. A line will be mowed from the Long X Trail pullout east to the bluffs.

West: Little Missouri River.

South: Little Missouri River and the park boundary fence on the extreme east end.

East: Mowed line along the approximate boundary of the 1999 Little Mo burn from the park road to the boundary fence.

Appendix 1 shows the Vicinity Map and Appendix 2 shows the Project Map.

Slope: 0%

Aspect: Mostly flat.

Vegetation Types and Fuel Models: Predominately fire behavior fuel model 2 (prairie/sage) with fuels along the woodland/prairie interface more closely resembling the more sheltered and shaded fire behavior fuel model 9.

Fuel Loading (tons per acre)

Size Class	Prairie/Sage (Fuel Model 2)	Green Ash/Box Elder Woodland (Fuel Model 9)
<3" (1,10,100-hr)	Average 2.6 (range 1.2-3.6)	Average 2.2 (range 0.8-3.5)
>3" (1000-hr)	0	Average 6.9 (range 1.3-15.2)
Litter	0	Average 0.8 (range 0.8-0.9)
Duff	0	Average 0.1 (range 0.0-0.3)
Total	Average 2.6	Average 9.1 (range 4.5-19.8)

Note: The average estimated tons per acre for both fuel models was determined from Aids to Determining Fuel Models For Estimating Fire Behavior, Anderson.

D. Goals and Objectives

Goals:

1. Increase native grass and forb cover.
2. Eradicate Canada thistle and Buckbrush.
3. Reduce the encroachment of wooded areas into the prairie.
4. Reduce fuels in the deciduous understory.
5. Restore the natural role of fire in the ecosystem.
6. Provide for training opportunities for local firefighters.

Decreasing decadent thatch will create openings for young, more nutritious vegetation growth that should improve native perennial/forb vigor and wildlife foraging habitat in the area. The burn will also create small openings in the hardwood canopy and fertile beds of nutrient-rich ash to promote new deciduous regeneration. A mosaic of burned and unburned patches will decrease fuel continuity. Reduced hazard fuels will help slow future wildland fire spread around and through Juniper Campground and picnic area. Fire behavior and effects will be closely monitored using established NPS fire monitoring protocols.

Specific Objectives:

1. Reduce 1-hr dead & down fuels in prairie field by at least 60% immediate postburn.
2. Reduce total brush density 30-50% one year post burn.
3. Mortality of cottonwoods will be less than 20% two years postburn.
4. Mortality of junipers will be less than 50% two years postburn.
5. Reduce non-native cover by 20-25%, increase native cover by 20-25% two years postburn.
6. Reduce silver sage (*Artemisia cana*) by 40-60% one year postburn.

E. Risk Management

This burn project has **XXXX** risk value as calculated by the hazard risk analysis process. Assessing reasonable risks and the mitigation to lower these risks generates this **XXXX** rating. This is documented on the Hazard Risk Assessment Worksheet (See Appendix 3).

F. Project Complexity

The Prescribed Fire Complexity Rating Worksheet generated **XXXX** low and **XXXX** moderate values. This rates the burn project as able to be implemented by a Burn Boss Type 2. See attached Wildland and Prescribed Fire Complexity Rating Guide (Appendix 4).

G. Organization

The number and type of resources needed to facilitate holding of expected fire behavior has been calculated using the Adequate Holding Resources Worksheet (Appendix 5). The burn organization is listed in the Organization Chart (Appendix 6).

H. Cost

Projected total cost, including base time is \$22,920. This includes overtime, per diem, supplies and preparation. Projected cost per acres is \$20.00.

	Planning			Preparation			Execution			Evaluation		
	Reg	Prem	Cost	Reg	Prem	Cost	Reg	Prem	Cost	Reg	Prem	Cost
Personnel	160	0	2,400	80	0	1,200	580	288	15,324	40	0	600
Equipment			0			50			1000			0
Aircraft			0			0			0			0
Misc. and per diem			450			4,000			3,000			0
Totals			2,850			5,250			19,324			600

I. Scheduling.

Proposed ignition date: Between March 1, 2002 and May 31, 2002. The burn needs to take place before the growing season starts.

Projected burn duration: Ignition – 3 days. Mop up – 3 days.

Any dates when the burn may be run during the proposed window: None.

J. Preburn Considerations.

A. Special Precautions/Regulations:

1. Archeological recommendation will be received from the State Historic Preservation Officer, Fern Swensen, or her designee. A verbal recommendation to implement this burn then complete a ground survey has been received by the Chief of Resource Management.
2. No threatened and endangered wildlife or vegetation species are know to utilize this area. This has been documented in the Resource Management Plan.

3. An air quality burn permit will be obtained and burn clearance will be coordinated with the ND Division of Air Quality. A copy of that permit will be kept in the burn folder, which will be on site during the burn.

A. Off Site:

1. Purchase needed equipment, supplies and materials.
2. Notify local fire departments of the scheduled burn and their role.
3. Prepare and distribute informational flier to residences and businesses in the area. Adjacent Property owners list is Appendix 7.
4. THRO staff will issue a press release at least two weeks prior to the burn. The press release will be sent to the usual park media contacts and will be posted at the Watford City Post Office, North Unit Visitors Center and at the North Unit entrance station.
5. Notify McKenzie Co. Rural Electric Cooperative of intent to burn beneath the powerlines along the Little Missouri River.
6. Ensure that all items on the Operations Go/No-Go Checklist are completed (See Appendix 8).
7. Ensure that the Agency Administrator's Go/No-Go Pre-Ignition Approval Form has been signed off and is still current (Appendix 9).

B. On Site:

1. Complete line preparation on east boundary by mowing a 15 foot wide fuel break from the park road to the boundary fence. The Burn Boss will designate the approximate line location.
2. Complete line preparation on the northwest boundary by mowing a 15 foot wide fuel break from the park road at the Long X Trail pullout to the bluffs to the northeast. The Burn Boss will designate the approximate line location.
3. Complete line preparation along the Cannonball Concretions trail within the burn boundary. Line preparation will consist of hand and mowed line across the various drainages. Natural boundaries will be utilized as much as possible. The Burn Boss will designate the approximate line location.
4. Complete hand and mowed line preparation at the base of the buttes between the park road and the buttes on the northwest end of the campground, near the pump house.
5. Remove burnable vegetation and ground fuels from around all telephone poles, trail signs, benches and fence posts throughout the burn unit, using a mower or weed eater. These areas include, but are not limited to, along the Buckhorn Trail through the entire burn, throughout the campground, along the Cannonball Concretions and Long X Trailheads and all signs along the road.

6. Prepare around all improvements within the burn boundary, using a mower or weed eater. This includes, but is not limited to, the Camptender's house and propane tank, electrical boxes behind all campground and picnic area bathrooms, barbecues in the campground and picnic area, picnic shelter, lift station in the campground, electrical/phoneline conduit under bridges in and around the campground, and pump house, water tank and spigot near Long X Trailhead.
7. Move all picnic tables within the campground onto paved camping pads.
8. Install 10-hr. fuel sticks at the burn site at least two weeks prior to the ignition date.
9. Set up hoses, bladder bags, drafting sites and/or fold-a-tanks as needed around unit. Place pump with supply line in river in campground.
10. Prepare drip torch mix.
11. Post notices announcing the proposed burn and the campground closures at Watford City Post Office, North Unit, South Unit and Painted Canyon Visitor Centers and at the North and South Unit entrance stations at least one week prior to burn.
12. Post trail and road closures one day before the burn – Buckhorn, Cannonball Concretions and Long X trailheads, utility road to sewage ponds.
13. Set up two ATVs, outfitted with water tank and pump, and transport to burn site. ATVs do not need to be on site prior to the first day of the burn.

Day of Burn:

1. Set up prescribed fire signs along the main park road, Juniper Campground, and Cannonball Concretions and Long X Trailheads.
2. Make final notifications. Use Day of Burn Notification List (Appendix 10).
3. Program handheld radios for frequencies identified in the Communications Plan of IAP.
4. Conduct pre-burn safety briefing with entire burn staff.
5. Treat accessible mowed lines with wetting agent immediately prior to ignition of that section of line.

K. Prescription

This prescription was developed using the fire behavior prediction program BEHAVE, version 4.4. The results of the BEHAVE runs are listed in Appendix 13.

Northern Great Plains Prescription for Management Ignited Prescribed Fire		
Backing or Strip Head Fire		
Fuel Model & Vegetation	Fuel Model 2 Green Ash/Box Elder Woodland	Fuel Model 9 Woodland/Prairie Interface
Relative Humidity	20-60	
Mid-flame Wind	2-10	
1-hr Fuel Moisture	4-11	
10-hr Fuel Moisture	7-15	
100-hr Fuel Moisture	10-16	
Live Fuel Moisture	50-150	
Rate of Spread (m/min.)	1.0-224.5	
Heat/unit area (BTU/sq.ft.)	373-532	
Fireline Intensity (BTU/ft/sec)	7-2,154	
Flame Length (ft)	1.1-15.4	

L. Ignition and Holding Actions

1. Test Fire

The test burn will be ignited near the main point of origin of the burn. The exact location will be determined at that time based on current and expected fire behavior. Fuels and topography will be representative of most of the project. Depending of fire behavior, the Burn Boss will decide to continue with the burn or postpone it until more favorable conditions exist.

2. Firing and Ignition

The prevailing winds for this area have a northern component, usually a west, northwest or north wind. The ignition pattern described below is for that wind pattern. If the winds are from a different direction, the firing will be rotated so that firing begins on the leeward side of the wind with a backing, flanking and strip head firing pattern used as determined by the Ignition Specialist, Holding Specialist and Burn Boss.

Initial ignition will occur at the southeastern corner of the burn. Starting at the test burn site, a firing team will strip along the east boundary from the Little Missouri River north to the main park road. Strips will also be laid from the southeast corner west along the north side of the boundary fence. Once this area is sufficiently burned to hold interior firing, successively wider strips will be ignited perpendicular to the

wind. Strip width will be continually evaluated to best meet management objectives and holding requirements. More than one ignition team may be utilized during any part of this operation.

Once firing within Block B is complete, Block C will be ignited using similar ignition patterns beginning from the Little Missouri River and the established burn in Block B. Ignition will slow through Juniper Campground and picnic area. Sensitive features, such as the CCC Shelter and other developments, will be secured with small backing strips before larger strips of fire are used. More than one ignition team may be utilized.

Ignition of Block D will begin near the Cannonball Concretions pullout. Firing will move north along the east side of the drainage, following natural barriers and the hand line. Firing will progress west along the park road after the east boundary of the drainage is secure. More than one ignition team may be used.

3. Holding Actions

The majority of the burn unit boundary will use natural fuel breaks as well as the main park road for holding lines. Where natural barriers are not available, hand or mowed line will be used. All holding lines will be patrolled by firefighters with hand tools as determined by the Holding Specialist. Engines and ATVs will be mobile and used accordingly to provide adequate patrol behind the ignition teams. The Burn Boss will be notified immediately of any spot fires. Initial attack actions will occur on all spot fires. Resources will be assigned to monitor smoke hazards along the main park road, assist with detecting spot fires across the main park road and provide for visitor safety.

Block B

A mowed line will be in place on the east boundary and this will be reinforced with sufficient wet line on the day of the burn.

Block C

Ignition patterns will be changed to minimize the amount of heat placed on or near any structures or improvements within this block. Small strips will be used near improvements with wider strips used as the burn moves away. Water and hand tool use will be used to keep fire from all structures. The engine assigned to Juniper Campground and picnic area will remain in this location throughout the ignition operation of this block for structure protection. This engine will also remain in the campground for structure protection until the firing of Block D has moved northwest of the campground and the threat of spotting or re-ignition has passed.

Block D

The eastern holding line will be a combination of natural barriers and hand line. This line will be of adequate size to stop fire spread from expected fire behavior in all necessary locations. The northern line of Block D will have a mowed line in place sufficient to hold the expected fire behavior. An engine will be available to patrol the main park road. An ATV or firefighters on foot will be available to patrol all sensitive lines as needed.

4. Critical Holding Areas

There are no critical holding areas outside the park boundary. The only critical holding areas are inside the burn unit. These consist of historic CCC shelters, a propane tank, the Campender's House, and other

improvements in Juniper Campground and picnic area, as well as the sewage ponds just east of the campground. All critical holding areas will be protected with engines and ignition patterns.

5. Divisions and Subunits

This burn is divided into three blocks – B, C, and D. Block A was burned three years ago and will not be burned now. The incident map will have reference points and a map grid.

6. Mop Up Operations

The burn will be mopped up at least 100 feet in as soon as possible. This will be done before all resources are released from the incident. Total mop up will be needed but can occur over the course of a few days. The main concerns for mop up will be the numerous animal (bison, longhorn cattle, horse) patties and the hardwood draws. The fire will have at least one engine assigned to it until no smokes are seen for two days.

M. Wildland Fire Transition Plan

If spot fires occur, the Holding Specialist will supervise initial attack.

If spot fires/slopovers cannot be controlled within one burning period with on site resources, the Burn Boss will convert the fire to wildland status. A Wildland Fire Situation Analysis (WFSA) will be completed. Any suppression actions will be in accordance with the Theodore Roosevelt NP Fire Management Plan.

Should the burn become a wildland fire, the Burn Boss will make a declaration of escape and assume the role of Incident Commander (IC). The IC will immediately notify Watford City Rural Fire Department, Chief XXXX, 701-842-XXXX, of the change in status to a wildfire and will order the appropriate resources for a control suppression strategy. The IC will also notify the Park Superintendent or their designee. If additional resources are needed, orders will be placed through the North Dakota Dispatch Center (NDC), 701-768-2552.

All section leaders (Holding, Ignition, Monitors) will provide for the safety of all personnel assigned to them during the escape. All personnel will be assigned holding or suppression duties.

Water sources (fold-a-tanks, pumps, RFD water tender) will be identified on the project map (Appendix 2). A drafting site will be set up adjacent to the Little Missouri River in the campground using a Mark III portable pump and hose. The location will be marked on the map.

Permanent water sources include three hydrants. One is located in front of the gas pumps in the Maintenance yard. The second is located approximately half way down the street in the residential area and the third is located at the end of the street in the residential area.

N. Protection of Sensitive Features

Part of this burn has been surveyed for archeological features. The State Historic Preservation Officer, Fern Swensen, has given a verbal recommendation to burn the unsurveyed areas. No cultural sites were identified within the burn boundary. A site survey will be completed post burn. If a site is revealed during the burn, mitigation will be taken to avoid damage to the area. The Chief of Resource Management, Russ Runge, will be notified as soon as possible of any sites or features that are revealed by the burn.

No T&E species are known to be utilizing the proposed burn unit area and no other special wildlife management considerations will be necessary.

O. Public and Firefighter Safety

- A. "Prescribed Burn – Do Not Report" and/or "Smoke Ahead" signs will be posted along the main park road and Highway 85, south of the park entrance.**
- B. If smoke conditions warrant it, traffic control will be conducted by assigned burn personnel and/or park rangers along the main park road. If smoke conditions warrant it, traffic control assistance will be requested from the McKenzie County Sheriff's Office for Highway 85.**
- C. A Job Hazard Analysis has been completed to evaluate and mitigate as many job related hazards as possible (Appendix 14).**
- D. A safety briefing will be given at the pre-burn briefing and at the start of each operational period. An Incident Action Plan describing burn operations, objectives, personnel/division assignments, spot weather forecast, incident map, medical contact information and radio frequencies will be distributed to all personnel. A Briefing Guide has been attached to use as an outline (Appendix 11).**
- E. All personnel will be advised of Lookouts, Communications, Escape Routes and Safety Zones. Any potential safety hazards, i.e. powerlines, will be pointed out.**
- F. All burn personnel will wear standard wildland fire personal protective equipment (PPE). This includes but is not limited to 8" wildfire leather boots, Nomex pants and shirt or jumpsuit, leather gloves and a hard hat. All burn personnel will carry a fire shelter and a fire tool at all times.**
- G. All burn personnel will be qualified according to NWCG standards for the position they will be performing. All personnel will have completed their pack test, or other required physical fitness standard, for the year and will be redcard certified.**
- H. All standard wildland firefighter safety rules will be strictly enforced (ref: Fireline Handbook).**
- I. The safety of the Fire Effects Monitors (FEMOs) will be maintained through effective communication with the ignition and holding teams and the Burn Boss.**
- J. The public will be kept at a safe distance from firelines. Authorized personnel must accompany all visitors and the press. The Burn Boss will be notified of all arrival and departure of visitors and the press.**

K. The Burn Boss will be notified of all accidents or injuries. If medical evacuation is needed, the Burn Boss, or their designee, will initiate evacuation procedures based on the Incident Medical Plan.

P. Smoke Management

Moderate smoke volume and/or decreased visibility may occur along the main park road, Juniper Campground road and Highway 85. Park personnel will assist with traffic control along the main park road if visibility poses a safety problem for road traffic. Assistance from ND Highway Patrol will be requested for traffic control along Highway 85 if visibility poses a safety problem for road traffic. Highway warning signs will be posted along the main park road and Highway 85.

No critical receptor points are within five miles of the burn, with winds out of the western/northern quadrants.

The main park road is part of the project's north boundary. The amount of smoke drifting across the road will be minimized as much as possible. If the smoke impacts traffic safety, the Burn Boss will determine if further burning operations should be suspended.

Proper clearance from the North Dakota Department of Health has been requested for this burn. Once received, the approval letter will be located in the Smoke Information portion of the burn folder. The state air quality department will be notified the day before ignition that the burn will take place.

The Burn Boss and FEMO will monitor compliance with the "Burn Day" regulations. If "No Burn Day" is declared, no new ignitions will be conducted.

Smoke emissions and behavior will be continually monitored and documented by the designated FEMO. Any significant change in smoke emissions and/or column behavior will be reported to the Burn Boss.

The burn will be ignited in unstable conditions and the Ventilation Index is "Good" or better, as indicated in the Spot Weather Forecast from the National Weather Service. This will result in the smoke being carried up and away from the burn unit and will minimize inversions. Dry fuel conditions with a low relative humidity will be preferred to produce the lowest possible emissions. Aggressive mop up techniques will be used to further reduce smoke. Diurnal nighttime weather patterns may necessitate mop up of the 1,000 and 10,000 fuels if the smoke is having an impact on the main park road and Highway 85.

Q. Interagency Coordination and Public Information

1. Media Releases and Public Notice Posting

The Burn Boss will ensure that a news release for the burn is prepared and posted at the Watford City Post Office and the North Unit, South Unit and Painted Canyon Visitor Centers, and distributed to the usual park media contacts.

A Public Information Officer may be ordered for the burn if deemed necessary by the Fire Management Officer.

The Park Superintendent, or their designee, and the Public Information Officer will be notified at least one week prior to the proposed ignition date.

At least one week before the burn, informational fliers will be distributed to nearby property owners to inform them of the planned burn. The flyer will suggest keeping windows closed and not having clothes on clotheslines. It will also include a park telephone number to provide residents with a source of information. Residents with health or respiratory problems will be asked to call the Fire Management Officer for more information. See List of Adjacent Property Owners (Appendix 7).

2. Notifications

One to three days before they burn date, they Burn Boss will ensure that the following have been contacted:

McKenzie County Sheriff	Dispatch	701-444-3654
Watford Rural Fire Department	XXXX	701-842-XXXX
ND Forest Service	Mike Santucci	701-328-9946
ND Game & Fish	Bruce Renhowe	701-328-6300
ND Fire Marshall	Bob Allen	701-328-5470
Montana-Dakota Utility		701-XXX-XXXX
McKenzie County Farmer		701-842-2351

R. Monitoring and Evaluation Procedures

- A. Monitoring protocols have been established by the Northern Great Plains Fire Effects Crew.
- B. During the burn, on-site monitoring will be conducted by the lead FEMO and other assigned FEMOs. They are responsible for the collection and documentation of weather, smoke and fire behavior observations. They will maintain communication with the burn boss, Ignition Specialist and Holding Specialist to ensure safe operations when working in the interior of the burn. Post burn data for grassland and shrub plots are usually collected the day following the burn. Forest plots will have post burn assessments approximately two to four years after the burn.
- C. After the burn, a fire critique will be conducted by the Fire Management Officer, Burn Boss, selected members of the burn team and the park staff to evaluate the level at which the burn objectives were accomplished.

S. Post Fire Rehabilitation

The fire staff will evaluate all temporary fire lines once the burn boss has declared the burn out. If it is determined that rehabilitation work is necessary, it will be completed with project funds within six months of burn completion. If any firelines are made barren of natural vegetation, leave, needles, grass or other native organic material will be replaced to encourage regrowth of vegetation.

T. Post Fire Reports

- A. The burn boss and DEMO will maintain an ICS-214 Unit Log throughout each operational period.
- B. The lead FEMO will prepare and submit an individual report that includes hourly weather, fire behavior and smoke observation data.
- C. The burn boss will prepare an Individual Fire Report (DI-1202) within five days of declaring the burn out.
- D. The burn boss will prepare a post burn report and submit a copy to the FMO, along with a copy of the Fire Monitoring report.
- E. The FMO will prepare a project accomplishment report in SACS.
- F. Fire Management will maintain a project file that includes the burn unit plan, spot weather forecasts, all required reports and any other paperwork that pertains to this burn.

U. Appendices

- 1. Vicinity Map
- 2. Project Map
- 3. Hazard Risk Assessment
- 4. Complexity Assessment
- 5. Adequate Holding Resources Worksheet
- 6. Organization and Resource Needs
- 7. Property Owners Contact List
- 8. Prescribed Fire Operations Go/No-Go Checklist
- 9. Agency Administrator Go/No-Go Pre-Ignition Approval
- 10. Day of Burn Notification
- 11. Briefing Guide
- 12. BEHAVE Outputs
- 13. Job Hazard Analysis

Appendix 3a – Hazard Rating Guide

Hazard Element	Hazard Probability			Potential Consequence		
	L	M	H	L	M	H
1. Environmental Data						
a. Seasonal Severity	BI low 0-6. Fire danger low.	BI moderate 7-20. Fire danger moderate to high.	BI high 21+. Fire danger very high to extreme.	Little difficulty with holding actions.	Holding more difficult and some heavy mop-up.	Holding actions difficult with extensive mop-up.
b. Fire Behavior	Flame lengths confined to surface fuels, spread rates low.	Rate of spread moderate, with greater flame length due to shrub component.	Rate of spread moderate to fast, with frequent high flame lengths due to dense fuels.	Low probability of difficulty in holding fire or for adverse fire effects.	Moderate probability for adverse effects, requiring additional holding resources.	High probability for adverse fire effects, fire may cause postponement of burn.
c. Fuels	Light surface fuel loading with minimal shrub component.	Moderate surface fuel loading and moderate shrub component.	High surface fuel loading with dense shrub component.	Fuels present no significant implementation problems.	Fuels will have some effect on implementation activities and holding force requirements.	Fuels will dramatically affect management organization and qualifications for implementation.
d. Weather	Weather stable, winds light and predictable, no frontal activity.	Weather slightly variable, winds present but light, occasional gusts, no frontal activity.	Weather highly variable, winds near prescriptive limits, gusts prevalent, frontal activity possible.	Little impact on implementation.	Weather variation will require mitigation actions involving additional resources.	Weather will serve as a major influence on organization, personnel qualifications, and specific implementation actions.
e. Topography	Low variability in slope with every aspect represented in the burn unit.	Low variability in slope with every aspect represented in the burn unit and fire line on ridge top.	High variability in slope and aspect, major implications on fire behavior and must be considered in prescription development and implementation.	Little influence on burn implementation.	Consideration of topography and line placement during the planning process is necessary.	Topography will necessitate mitigation actions to be developed and firing patterns and ignition methods to be modified to reduce impacts.

Hazard Element	Hazard Probability			Potential Consequence		
	L	M	H	L	M	H
2. Agency Values						
a. Ecological and Environmental Considerations	Fire poses little threat to cause adverse effects or long-term disturbances to natural resource values. No T&E species or critical habitat.	Fire poses moderate threat of adverse effects on natural resources and may cause short to mid-term alterations or inconveniences such as air quality. Small amounts of T&E species present.	Fire poses high potential for adverse effects to natural resource values or to cause long-term degradations in air quality. Some T&E present and/or critical habitat.	Low probability for adverse impacts and little need for mitigation actions.	Mitigation actions may need to be developed to ensure desirable outcomes. Some short-term effects may have to be accepted.	Prescribed Fire Plan must address mitigation actions to prevent undesirable outcomes.
b. Social and Cultural Values	Minimal social or cultural values in or adjacent to the project area.	Features of social or cultural value have been identified in and adjacent to the project area. Mitigation measures can be accomplished.	High social or cultural values have been identified in or adjacent to the project area. Mitigation actions are difficult to accomplish.	Severe fire behavior or fire outside the unit would not damage the identified values.	Severe fire behavior or fire outside the unit poses potential for moderate damage to special values. Concerned parties are aware and supportive of the project.	Excessive fire severity or fire outside the unit will have adverse effects (substantial damage to or potential destruction of the special sites). Acceptance by concerned parties is low.
c. Project Duration and Logistics	Fire planned to be of short duration, logistical needs easily accommodated.	Fire planned to be of short to moderate duration, logistical needs pose some difficulty.	Fire planned to be of moderate to long duration, logistical needs create much difficulty in accomplishing.	Minimal consequences because of duration or logistics.	Duration may impact firefighters and public and logistical needs must be specifically addressed.	Long duration fire necessitates greater information dissemination, mitigation to remove impacts to firefighters and the public, and logistical needs must be met or project postponed.
d. Smoke and Air Quality Management	Few smoke sensitive areas near project area. No potential scheduling conflicts with cooperators.	Multiple smoke sensitive areas, mitigation actions minimize impacts, low potential for scheduling conflicts.	Multiple smoke sensitive areas near burn area, mitigation actions unable to remove all impacts, duration increases impacts, high potential for scheduling conflicts.	No adverse smoke consequences.	Mitigation actions must address smoke impacts, and coordination is required to confirm scheduling.	Mitigation actions must be developed, regulatory agencies must concur, and scheduling conflicts may restrict implementation.

Hazard Element	Hazard Probability			Potential Consequence		
	L	M	H	L	M	H
3. Public Values						
a. Land Use Values	Some measures are taken to protect natural resources with some recreational impacts.	Extra measures are taken to protect natural resources, with additional recreational impacts.	Will significantly impact rare species, with potential extirpation.	Minimal impacts from land use values.	Mitigation measures to minimize impacts to natural resources or recreational areas.	Postpone burn or suspension of burn program in units with rare species.
b. Dwellings	No permanent or part-time residences present in area.	Some part-time residences or outbuildings near burn area.	Planned burn is located in wildland-urban interface zone, permanent residences in close proximity.	Little or no impacts from dwellings.	Plan must address actions to ensure adequate protection of residences.	Commitment of structural firefighting resources to burn area, and mitigation actions must adequately address potential fire escapes.
c. Non-dwellings	Few or no non-dwellings present.	Some outbuildings and non-residences near burn area.	Commercial structures in close proximity to burn area.	No impacts.	Planning must consider these non-dwellings.	Planning and implementation must adequately address all measures to prevent any adverse impacts.

Hazard Element	Hazard Probability			Potential Consequence		
	L	M	H	L	M	H
4. Human Factors						
a. Firefighter	Minimal firefighter exposure.	Some firefighter exposure due to fire duration and smoke.	Potential for high firefighter exposure to smoke during burn and to fire during holding actions.	No specific problems, implement standard safety measures.	Mitigation measures to eliminate smoke exposure.	Mitigation measures must address smoke exposure, use of mechanized equipment to eliminate exposure to fire.
b. Public	Minimal residential and roads exposure.	Some public exposure, mitigated through specific burning tactics.	Residential areas and roads are exposed to high smoke concentrations, especially during nighttime hours.	No adverse consequences anticipated.	Mitigation actions necessary to provide for maximum public safety.	Mitigation actions must be developed, coordinated with other emergency organizations and fully understood prior to ignition.
c. Fire Management	No problems with commitment and acceptance by park staff members.	No problems with commitment but some unwillingness to support and prioritize the prescribed fire over other activities.	Park staff not committed to using prescribed fire as a tool and not willing to support and prioritize prescribed fire over other activities.	No adverse consequences.	Park staff must be briefed on need and importance of prescribed fire.	The prescribed fire cannot be accomplished with in-park personnel, use of external resources needed.

Appendix 3b – Prescribed Fire Risk Analysis Worksheet

Hazard Element	Hazard Probability			Potential Consequences			*Risk (exhibit 4)
	L	M	H	L	M	H	
1. Environmental Data							
a. Seasonal Severity		X		X			Moderate
b. Fire Behavior		X		X			Moderate
c. Fuels		X		X			Moderate
d. Weather		X			X		Moderate
e. Topography	X				X		Moderate
2. Agency Values							
a. Ecological and Environmental Considerations	X			X			Low
b. Social and Cultural Values		X			X		Moderate
c. Project Duration and Logistics	X			X			Low
d. Smoke and Air Quality Management	X			X			Low
3. Public Values							
a. Land Use Values	X				X		Moderate
b. Dwellings	X			X			Low
c. Non-Dwellings		X			X		Moderate
4. Human Factors							
a. Firefighter		X		X			Moderate
b. Public		X		X			Moderate
c. Fire Management	X			X			Low

NOTE: Risk is determined using the Hazard Rating Guide following the risk assessment tables. Professional assessments were made choosing the best fit for each category from the available guide.

Appendix 3c – Prescribed Fire Risk Mitigation Table

Hazard Element	Risk	Mitigations / Controls	Residual Risk	Reference:
		Briefly explain what actions will be taken relative to each hazard element that will reduce the risk.		In Prescribed Fire Plan
1. Environmental Data				
a. Seasonal Severity	M	Firing methods will be adjusted to reflect the time of year, day, fuel, and weather conditions.	L	L. Ignition and Holding Actions
b. Fire Behavior	M	Firing patterns and directions will change depending on wind direction and fire behavior.	L	L. Ignition and Holding Actions- Firing and Ignition
c. Fuels	M	Heavy fuel accumulations adjacent to control lines will be thinned and/or treated with water prior to ignition. Natural barriers will be used whenever possible.	L	J. Pre-burn Considerations – Line Preparation
d. Weather	M	Firing patterns and ignition times will be dependent upon the weather falling into the weather prescriptions. If the weather exceeds prescription parameters, the burn will be postponed. In the event of weather exceeding prescription once ignition has begun, ignition will cease following completion of the sub-unit and resources will shift to holding and monitoring. The burn may continue if weather conditions return to acceptable prescription limits.	L	K. Prescription L. Ignition and Holding Actions – Test Fire Firing and Ignition
e. Topography	M	Firing patterns and ignition techniques will take advantage of the topography to maintain safety and achieve burn objectives.	L	L. Ignition and Holding Actions – Firing and Ignition
2. Agency Values				
a. Ecological and Environmental Considerations	L		L	_____
b. Social and Cultural Values	M	Suppression resources will be committed to areas with social value to limit the impact on these areas. Campground and picnic areas will be impacted only to the extent necessary to complete resource management objectives.	L	N. Protection of Sensitive Features
c. Project Duration and Logistics	L	_____	L	_____

Hazard Element	Risk	Mitigations / Controls	Residual Risk	Reference:
		Briefly explain what actions will be taken relative to each hazard element that will reduce the risk.		In Prescribed Fire Plan
d. Smoke and Air Quality Management	L	-----	L	
3. Public Values				
a. Land Use Values	M	Mitigation will consist of clearing around all of the developed features in the campground as well as along the roads. Dead and down buildups will be dispersed from the base of the cottonwood trees as much as possible to minimized mortality.	L	J. Pre-burn Considerations
b. Dwellings	L	-----	L	
c. Non-Dwellings	M	A staffed engine will be committed to protecting the few structures that could be impacted by this project. Other fire resources will be in the immediate area while active fire is near the structures.	L	J. Pre-burn Considerations L. Ignition and Holding Actions
4. Human Factors				
a. Firefighter	M	A safety briefing will be conducted at the start of each operational period. All personnel will be advised of Lookouts, Communications, Escape Routes, and Safety Zones. All other potential safety hazards will be pointed out and mitigated as soon as possible upon identification of the hazard. All burn personnel will wear standard firefighting personal protective equipment and will carry a fire shelter and fire tool at all times. All standard wildland firefighter safety rules will be strictly enforced.	L	L. Ignition and Holding Actions O. Public and Personnel Safety Appendix 14 - Job Hazard Analysis
b. Public	M	Traffic signs and will be posted along Highway 85 and the main park road and smoke emissions will be monitored throughout the burn. Any negative impacts on highway visibility will result in ceasing ignition until favorable conditions return. Only authorized burn personnel will be allowed within the burn unit.	L	O. Public and Personnel Safety P. Smoke Management and Air Quality
c. Fire Management	L	-----	L	-----

Appendix 4: Prescribed Fire Complexity Rating Worksheet – Little Mo RX

Complexity Element		Complexity Value		
		L	M	H
Primary Factors	1. Life and Safety	X		
	2. Threats to Boundaries		X	
	3. Management Organization		X	
	4. Political Concerns		X	
	<i>SUBTOTAL OF PRIMARY FACTORS</i>	1	3	0
Secondary Factors	5. Objectives		X	
	6. Fuels and Fire Behavior	X		
	7. Air Quality Values	X		
	8. Improvements		X	
	9. Logistics	X		
	10. Natural, Cultural, and Social Values		X	
	11. Tactical Operations	X		
	12. Interagency Coordination		X	
<i>SUBTOTAL OF SECONDARY FACTORS</i>		4	4	0
TOTAL COUNT OF COMPLEXITY VALUES		5	7	0

QUALIFICATIONS DETERMINATION TABLE:

	Prescribed Fire Burn Boss Type 2 (RXB2)	Prescribed Fire Burn Boss Type 1 (RXB1)
Primary Factors rated "H"	Less than 2	2 or more
	AND	OR
Total Count rated "H"	Less than 4	4 or more
		OR
	Minimum required on all prescribed fires.	When deemed appropriate by the agency administrator of unit Fire Management Officer.
Prescribed Fire Burn Boss Level Indicated (check one):		RXB1 RXB2 XXX

PREPARED BY: Eric Allen
Fire Management Officer

DATE: 09/21/01

APPROVAL BY: _____
Agency Administrator

DATE: _____

REVIEWED BY: _____
(Burn Boss immediately prior to burning)

DATE: _____

NOTE: Complexity worksheet completed using the following Complexity Value Guide.

Appendix 4 – Complexity Value Guide

COMPLEXITY ELEMENT	GUIDE TO COMPLEXITY VALUE		
	L	M	H
Life and Safety	Safety issues are easily identifiable and mitigated	<ul style="list-style-type: none"> • Number of significant issues have been identified • All safety hazards have been identified on the LCES worksheet and mitigated 	<ul style="list-style-type: none"> • SOF1 or SOF2 required • Complex safety issues exist
Threats to Boundaries	<ul style="list-style-type: none"> • Low threat to boundaries • POI<50% • Boundaries naturally defensible 	<ul style="list-style-type: none"> • Moderate threat to boundaries • 50<POI<70% • Moderate risk of slopover or spot fires • Boundaries need mitigation actions for support to strengthen fuel breaks, firelines, etc. 	<ul style="list-style-type: none"> • High threat to boundaries • POI>70% • High risk of slopover or spot fires • Mitigation actions necessary to compensate for continuous fuels
Management Organization	<ul style="list-style-type: none"> • Span of control held to 3 • Single resource incident or project 	<ul style="list-style-type: none"> • Span of control held to 4 • Multiple resource incident or project • Short-term commitment of specialized resources 	<ul style="list-style-type: none"> • Span of control greater than 4 • Multiple branch, divisions or groups • Specialized resources needed to accomplish objectives • Organized management team (FUMT, IMT)
Political Concerns	<ul style="list-style-type: none"> • No impact on neighbors or visitors • No controversy • No media interest 	<ul style="list-style-type: none"> • Some impact on neighbors or visitors • Some controversy, but mitigated • Press release issued, but no media activity during operations 	<ul style="list-style-type: none"> • High impact on neighbors or visitors • High internal or external interest and concern • Media present during operations
Objectives	<ul style="list-style-type: none"> • Maintenance objectives • Prescriptions broad • Easily achieved objectives 	<ul style="list-style-type: none"> • Restoration objectives • Reduction of both live and dead fuels • Moderate to substantial changes in two or more strata of vegetation • Objectives judged to be moderately hard to achieve • Objectives may require moderately intense fire behavior 	<ul style="list-style-type: none"> • Restoration objectives in altered fuel situations • Precise treatment of fuels and multiple ecological objectives • Major change in the structure of 2 or more vegetative strata • Conflicts between objectives and constraints • Requires a high intensity fire or a combination of fire intensities that is difficult to achieve

COMPLEXITY ELEMENT	GUIDE TO COMPLEXITY VALUE		
	L	M	H
Fuels/Fire Behavior	<ul style="list-style-type: none"> • Low variability in slope & aspect • Weather uniform and predictable • Surface fuels (grass, needles) only • Grass/shrub, or early seral forest communities • Short duration fire • No drought indicated 	<ul style="list-style-type: none"> • Moderate variability in slope & aspect • Weather variable but predictable • Ladder fuels and torching • Fuel types/loads variable • Dense, tall shrub or mid-seral forest communities • Moderate duration fire • Drought index indicates normal conditions to moderate drought; expected to worsen 	<ul style="list-style-type: none"> • High variability in slope & aspect • Weather variable and difficult to predict • Extreme fire behavior • Fuel types/loads highly variable • Late seral forest communities or long-return interval fire regimes • Altered fire regime, hazardous fuel /stand density conditions • Potentially long duration fire • Drought index indicates severe drought; expected to continue
Air Quality Values to be Protected	<ul style="list-style-type: none"> • Few smoke sensitive areas near fire • Smoke produced for less than 1 burning period • Air quality agencies generally require only initial notification and/or permitting • No potential for scheduling conflicts with cooperators 	<ul style="list-style-type: none"> • Multiple smoke sensitive areas, but smoke impact mitigated in plan • Smoke produced for 2-4 burning periods • Daily burning bans are sometimes enacted during the burn season • Infrequent consultation with air quality agencies is needed • Low potential for scheduling conflicts with cooperators 	<ul style="list-style-type: none"> • Multiple smoke sensitive areas with complex mitigation actions required • Health or visibility complaints likely • Smoke produced for greater than 4 burning periods • Multi-day burning bans are often enacted during the burn season • Smoke sensitive class 1 airsheds • Violation of state and federal health standards possible • Frequent consultation with air quality agencies is needed • High potential for scheduling conflicts with cooperators
Improvements to be Protected	<ul style="list-style-type: none"> • No risk to people or property within or adjacent to fire 	<ul style="list-style-type: none"> • Several values to be protected • Mitigation through planning and/or preparations is adequate • May require some commitment of specialized resources 	<ul style="list-style-type: none"> • Numerous values and/or high values to be protected • Severe damage likely without significant commitment of specialized resources with appropriate skill levels
Logistics	<ul style="list-style-type: none"> • Easy access • Duration of fire support is less than 4 days 	<ul style="list-style-type: none"> • Difficult access • Duration of fire support between 4 and 10 days • Logistical position assigned • Anticipated difficulty in obtaining resources 	<ul style="list-style-type: none"> • No vehicle access • Duration of support is greater than 10 days • Multiple logistical positions assigned • Remote camps and support necessary

COMPLEXITY ELEMENT	GUIDE TO COMPLEXITY VALUE		
	L	M	H
Natural, Cultural, and Social Values to be Protected	<ul style="list-style-type: none"> No risk to natural, cultural, and/or social resources within or adjacent to fire 	<ul style="list-style-type: none"> Several values to be protected Mitigation through planning and/or preparations is adequate May require some commitment of specialized resources 	<ul style="list-style-type: none"> Numerous values and/or high values to be protected Severe damage likely without significant commitment of specialized resources with appropriate skill levels
Tactical Operations	<ul style="list-style-type: none"> No ignition or simple ignition patterns Single ignition method used Holding requirements minimal 	<ul style="list-style-type: none"> Multiple firing methods and/or sequences Use of specialized ignition methods (i.e. terra-torch, Premo Mark III) Resources required for up to one week Holding actions to check, direct, or delay fire spread 	<ul style="list-style-type: none"> Complex firing patterns highly dependent upon local conditions Simultaneous use of multiple firing methods and/or sequences Simultaneous ground and aerial ignition Use of heli-torch Resources required for over one week Multiple mitigation actions at variable temporal and spatial points identified. Success of actions critical to accomplishment of objectives Aerial support for mitigation actions desirable/necessary
Interagency Coordination	<ul style="list-style-type: none"> Cooperators not involved in operations No concerns 	<ul style="list-style-type: none"> Simple joint-jurisdiction fires Some competition for resources Some concerns 	<ul style="list-style-type: none"> Complex multi-jurisdictional fires High competition for resources High concerns

Appendix 5: Prescribed Fire Modeling Outputs – Little Mo

Direct Inputs:

Fuel Model: 1
Percent Cover: 100
1 hr Fuel Moisture: 6%
Mid Flame Wind Speed: 10 mph
Terrain Slope: 10%
Direction of Wind Vector: 0 degrees
Calc for Max Spread Rate: Yes
Direction of Max Spread: 0 degrees

Direct Outputs:

Rate of Spread: 270 ch/hr
Heat per Unit Area: 91 Btu's/ft²
Fireline Intensity: 449 Btu's/ft²/s
Flame Length: 7.5 feet
Reaction Intensity: 826 Btu's/ft²/m
Effective Wind Speed: 8.4 mph

Size Inputs:

Elapsed Time: 0.1 hour

Size Outputs:

Area: 19 acres
Perimeter: 61 ch
Length-to-width Ratio: 3.1
Forward Spread Distance: 27.0 ch/hr
Backing Spread Distance: 0.7 ch/hr
Maximum Width of Fire: 8.9 ch

Contain Inputs:

Run Inputs: 1 – Line building
Mode of Attack: 1 – Head fire
Burned Area Target: 100.0 acres

Contain Outputs:

Total Line Building Rate: 540 ch/hr
Total Length of Line: 191 chains
Containment Time: 0.4 hours

Scorch Inputs:

Ambient Air Temp: 50 deg F

Scorch Outputs:

Crown Scorch Height: 29.4 feet

Mortality Inputs:

Tree Height: 75 feet
Crown Ratio: 0.2
Bark Thickness: 1 inch

Mortality Outputs:

Mortality Level: 10%

Ignite Inputs:

Dry Bulb Temp: 70 F
Fuel Shading: 0 ch/hr

Ignite Outputs:

Probability of Ignition: 60%

Ignite Inputs:

Dry Bulb Temp: 50 F
Fuel Shading: 0 ch/hr

Ignite Outputs:

Probability of Ignition: 50%

Appendix 5: Prescribed Fire Modeling Outputs – Little Mo

Direct Inputs:

Fuel Model: 2
Percent Cover: 100
1 hr Fuel Moisture: 6%
10 hr Fuel Moisture: 9%
100 hr Fuel Moisture: 15%
Live Herbaceous Moisture: 150%
Mid Flame Wind Speed: 10 mph
Terrain Slope: 10%
Direction of Wind Vector: 0 degrees
Calc for Max Spread Rate: Yes
Direction of Max Spread: 0 degrees

Direct Outputs:

Rate of Spread: 103 ch/hr
Heat per Unit Area: 463 Btu's/ft²
Fireline Intensity: 874 Btu's/ft²/s
Flame Length: 10.1 feet
Reaction Intensity: 3357 Btu's/ft²/m
Effective Wind Speed: 10.0 mph

Size Inputs:

Elapsed Time: 0.1 hour

Size Outputs:

Area: 2.5 acres
Perimeter: 23 ch
Length-to-width Ratio: 3.5
Forward Spread Distance: 10.3 ch/hr
Backing Spread Distance: 0.2 ch/hr
Maximum Width of Fire: 3.0 ch

Contain Inputs:

Run Inputs: 1 – Line building
Mode of Attack: 1 – Head fire
Burned Area Target: 100.0 acres

Contain Outputs:

Total Line Building Rate: 206 ch/hr
Total Length of Line: 201 chains
Containment Time: 1.0 hours

Scorch Inputs:

Ambient Air Temp: 50 deg F

Scorch Outputs:

Crown Scorch Height: 44.0 feet

Mortality Inputs:

Tree Height: 75 feet
Crown Ratio: 0.2
Bark Thickness: 1 inch

Mortality Outputs:

Mortality Level: 10%

Ignite Inputs:

Dry Bulb Temp: 70 F
Fuel Shading: 0 ch/hr

Ignite Outputs:

Probability of Ignition: 60%

Appendix 6: Adequate Holding Resources Worksheet for Prescribed Fire

Project Name: Little Mo RX
 Prepared By: Beth Card

Fuel Models Inside Project Area: 1, 2
 Fuel Models Outside Project Areas: 1, 2

Characteristics	Output Type	Modeling Predictions Inside Project Area		Modeling Predictions Outside Project Area		Unit of Measure
FUEL MODEL		1	2	1	2	
CRITICAL FIRE INPUTS	1-Hr Fuel Moisture	6	6	6	6	%
	Wind Speed	10	10	10	10	MPH (mid-flame)
	Slope	10	10	10	10	%
KEY FIRE BEHAVIOR OUTPUTS	Rate of Spread (ROS)	270	103	270	103	Ch/Hr
	Fireline Intensity	449	874	449	874	BTU/ft/sec
	Flame Length	7.5	10.1	7.5	10.1	Feet
	Probability of Ignition	60	60	60	60	%
	Spotting Distance	0.4	0.5	0.4	0.5	Miles
	Scorch Height	35	56	35	56	Feet
FIRE SIZE	Projection Time	0.1	0.1	0.1	0.1	Hours
	Forward Spread	27.0	10.3	27.0	10.3	Chains
	Backward Spread	0.7	3.0	0.7	3.0	Chains
FIRE CONTAINMENT	Method of Attack	Head	Head	Head	Head	Head/Rear
	Max Escape Target	100	100	100	100	Acres
	Max Containment Time	0.4	1.0	0.4	1.0	Hours
	Total Line Building Rate	540	206	540	206	Ch/Hr
Choose greater total line building rate from inside and outside the project area				540		Ch/Hr
Estimate potential number spot fires or slopovers at one time:				1		
TOTAL LINE BUILDING RATE NEEDED (Multiply line 1 times line 2)				540		

Production Rates: _____ Ease of Access: _____
 (refer to fireline handbook, other sources, and local knowledge)

POOR-FAIR-GOOD-EXCELLENT

On-Site Organization	Total # Planned on Burn	Total # Dedicated to Prescribed Fire	Total # Available for Spot Fire or Slopover Control		Line Building Production Rates		Spot Fire or Slopover Line Building Capacity
Overhead	5	2	3	X	0	ch/hr	0
Firing Crew	4	2	2	X	4	ch/hr	8
Holding				X		Ch/hr	
Fire Monitors	2	0	2	X	4	ch/hr	8
Engine (crew of 3)	12	1	11	X	24	ch/hr	264
ATV w/water	2	0	2	X	6	ch/hr	12
Other Personnel				X		ch/hr	
Other				X		ch/hr	
4. TOTAL CAPACITY						ch/hr	292
3. TOTAL LINE BUILDING RATE NEEDED (from table above)						ch/hr	540
5. DETERMINATION OF ADEQUATE HOLDING RESOURCES (line 4 minus line 3)						ch/hr	-248

* See the justification for holding resources on the next page for details

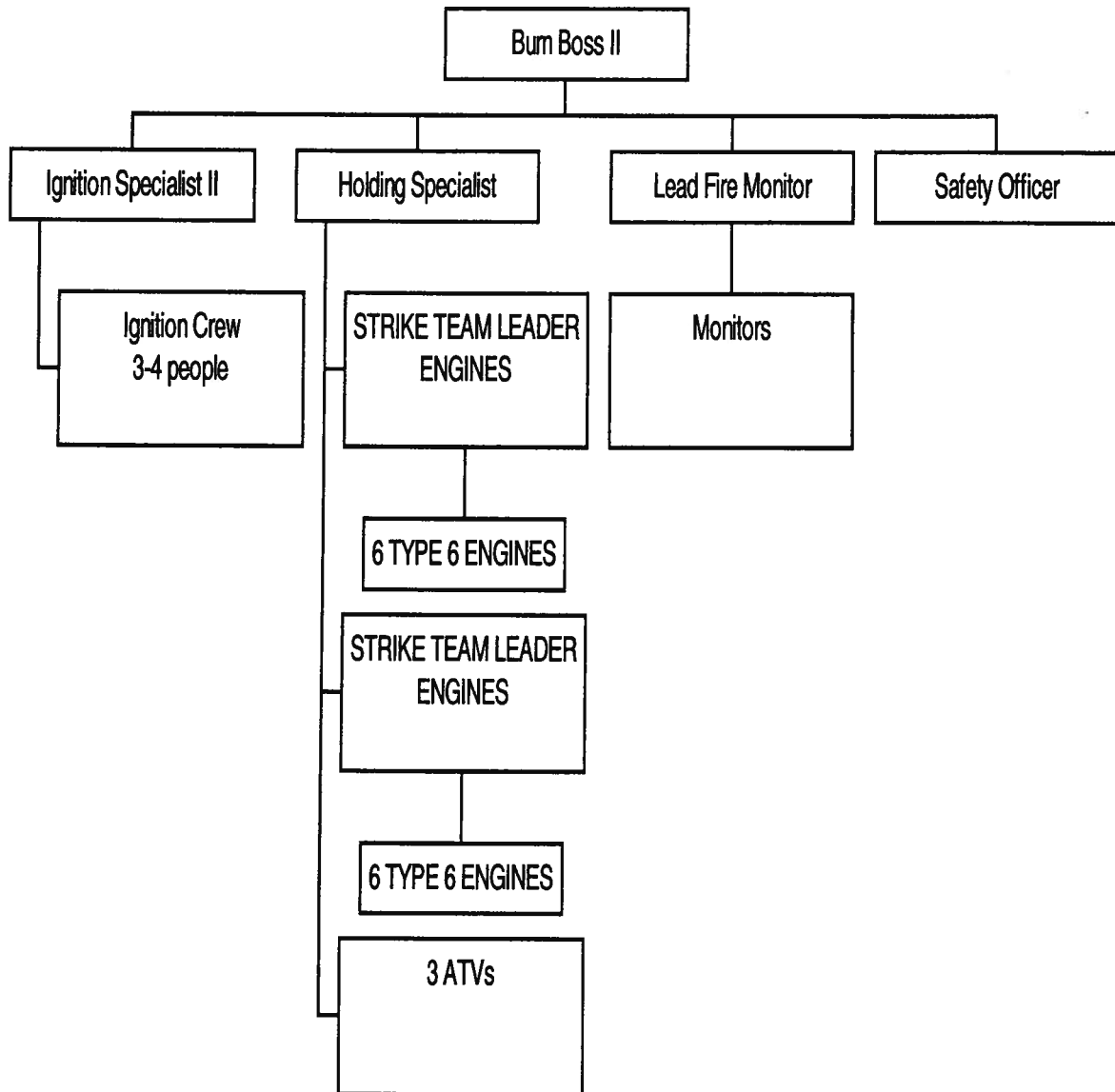
Justification for Holding Resources Worksheet

This worksheet was calculated using inputs that are at the hottest end of the prescription. This burn will not be ignited if most or all of the inputs are at the upper end. These inputs were used to allow some flexibility and to allow one or two of the inputs to reach the upper end without severely limiting our opportunities to complete the burn.

We plan to burn this unit before green up. We will have high soil moistures and fuel moistures will be on the rise. This will cause the fire to be much more controllable than if we were to burn in the fall, when soil and fuel moistures will be at a minimum.

The resources listed on this worksheet are adequate for this burn. The east boundary is a mowed line of approximately 400 feet from the road to the fence line. It is approximately 100 feet from the fence to the river. The southern boundary is the Little Missouri River. The river is wide enough to prevent spotting except under the worst-case weather conditions. The northern boundary for over half of the burn is the main park road. This is a two lane paved road. This will prevent the fire from creeping across the line. Spots could occur but they are unlikely due to the weather we will most likely be burning under. The rest of the north boundary is a mowed line along a trail. A good portion of this line makes use of natural barriers. Most of the engine crews will become a handcrew and will be utilized for protection of this line. The west boundary is the Little Missouri River and the base of some rock bluffs.

Appendix 7 – Organization Chart and Resource Needs



Appendix 8: Pre-Burn Checklist

Checklist of Pre-Burn Prescribed Fire Activities	
Line Preparation:	Check Complete
1. Construct 10' mower lines along the east of burn unit, approximately adjacent to the previous burn boundary.	
2. Construct line using a weed eater around the Squaw Creek section of burn unit, utilizing natural barriers wherever possible.	
3. Remove fuels from around electric utility boxes and poles, culverts, campground propane tank, park informational signs, and other park improvements to include but not limited to the main park road, sewage lagoons, picnic area, campground, Cannonball Concretions and the Long X Trailhead. These areas may be treated with water/foam prior to ignition on the day of the burn.	
4. Install hoselay, water tank, and portable pump in site 42 of the campground.	
On-Site: (may be done on the day of the burn)	
1. Pre-position ignition equipment and supplies, stage bladder bags along control lines and critical holding areas.	
2. Place "Prescribed Burn Ahead" and "Smoke on Road" signs along main park road and Highway 85.	
3. Collect on-site weather observations for the Spot Weather Request Form.	
4. Calculate fine dead fuel moistures and probability of ignition immediately prior to burn to ensure burn will be in prescription.	
Off-site:	
1. Update the IAP and make copies for burn personnel. Include a project map with location grid.	
2. Complete resource orders and submit to the North Dakota Dispatch Center.	
3. Obtain vegetation and wildlife clearance for T&E species.	
4. Distribute informational flyers (if needed).	
5. Mix pump and drip torch fuel – minimum 25 gallons.	
6. Ensure that equipment and engines are in working condition.	
7. Monitor weather and smoke forecasts.	
8. Fax Spot Weather Request to National Weather Service.	
9. Make necessary pre-burn contacts (Appendix 12).	
Post-Burn:	
1. Patrol fire area and report updates to burn boss or FMO.	
2. Map actual burn perimeter with GPS.	
3. Declare the burn out.	
4. Prescribed fire accomplishment report completed and submitted to FMO.	
5. Accumulate all observation forms and complete monitoring report.	
6. Complete DI-1202.	
7. Post notice of burn in the NPS Morning Report.	

Appendix 9:**Prescribed Fire Operations Go/No-Go Checklist**

Criteria:	YES	NO
Is the burn plan complete and approved?		
Are all fire prescription specifications met?		
Is the current and projected fire weather forecast favorable?		
Have all air quality considerations and smoke requirements been met?		
Are all personnel required in the prescribed burn plan on-site?		
Have all personnel been briefed on the prescribed burn plan requirements?		
Have all personnel been briefed on safety hazards, escape routes and safety zones?		
Is all of the required equipment in place and in working order?		
Are available (including backup) resources adequate for containment of escapes under worst-case conditions?		
Is there an adequate contingency plan developed?		
In your opinion, can the burn be carried out according to plan and will it meet the planning objectives?		
Are answers to all of the above questions "yes"?		

IF ALL CRITERIA ANSWERED "YES" YOU MAY PROCEED WITH TEST BURN.

Test Fire Documentation and Results

Location of the test fire:			
Time of test fire:			
Results of test fire: (note flame length and rate of spread)			
Go/No-Go Criteria:	YES	NO	
Are the fuels and weather conditions representative of the burn unit?			
Narrative/Comments:			
Is the observed fire behavior within prescription?			
Narrative/Comments:			
Was the test fire successful?			
Narrative/Comments:			
Are all prescription parameters in the prescribed fire plan favorable for implementing the project?			
Narrative/Comments:			
If the last three boxes are all "YES", you may proceed with the prescribed fire.			

RX BURN BOSS: _____

DATE: _____

IGNITION SPECIALIST: _____

DATE: _____

HOLDING OPERATIONS: _____

DATE: _____

Appendix 10:**Agency Administrator Prescribed Fire Pre-Ignition Approval**

Prior to ignition, review and sign this form with the Agency Administrator (Superintendent or highest level administrator). The Fire Management Officer or Burn Boss may conduct the review with the Agency Administrator; however, if it is the Burn Boss, there should be prior discussion between the Fire Management Officer and Agency Administrator.

If the burn is not initiated prior to the valid date, a new Agency Administrator checklist must be completed. If the prescribed fire is commenced within the valid date with no pause between ignition days, only one Agency Administrator checklist need be completed.

KEY ELEMENTS OF DISCUSSION:	YES	NO
1. Is the prescribed fire plan up to date? (changes, amendments, seasonality) Administrator comments:		
2. Have all compliance requirements been completed? (cultural, threatened and endangered species, smoke management) Administrator comments:		
3. Is Risk Management in place and the residual risk acceptable? (Refer to the Prescribed Fire Mitigation Table and Prescribed Fire Complexity Rating Guide) Administrator comments:		
4. Will all elements of the prescribed fire plan be met? (preparation work, mitigation, weather, organization, prescription) Administrator comments:		
5. Have all internal and external notifications been made? (cooperating agencies, local landowners, media) Administrator comments:		
6. Are key park staff fully briefed, and understand the implementation of the prescribed fire? Administrator comments:		
Other:		

Recommended by: _____
FMO/Burn Boss

Date: _____

Approved by: _____
Superintendent

Date: _____

Approval expires: _____
Date

This checklist must be reevaluated if not implemented
within _____ days of the approval date.

Appendix 12: Briefing Guide

ISSUE HANDOUTS – (IAP, Maps of Burn Unit, Organizational Chart, etc.)

WELCOME AND PROJECT DESCRIPTION – Burn Boss

1. Project Map
2. Vegetation and fuels
3. Terrain, slope
4. Roads / Access
5. Values at Risk
6. Water sources
7. Natural / man-made barriers
8. Unit goals and objectives
9. Project duration / operational periods

ORGANIZATION – Burn Boss

1. Organizational chart
2. Resource locations – division breaks
3. Equipment and locations
4. Contingency plan

IGNITION – Ignition Specialist

1. Test Fire location
 2. Blacklining
 3. Ignition personnel
 4. Fuel needs
 5. Ignition patterns, spacing, concerns
 6. Coordination with holding
- * Do all personnel know their assignments?

HOLDING – Holding Specialist

1. Organization of holding personnel
 2. IA of escaped fires; how will spot fires be handled?
 3. Engines, hoselays, pumps, water sources, etc
 4. Extended staffing into night ops and next day
 5. Contingency resources
- * Do all personnel know their assignments?

WEATHER AND FIRE BEHAVIOR – Fire Monitor

1. Spot weather forecast
2. Fuels and fire behavior
3. Predicted changes
4. Monitoring activities during the burn
5. Broadcasting on-site weather observations

COMMUNICATIONS – Burn Boss

1. Radio channels and frequencies
2. Clear text – names / positions
3. Monitor broadcasted weather observations and other relevant information

SAFETY – Burn Boss

1. LCES
2. 10 STANDARD FIRE ORDERS AND 18 WATCH OUT SITUATIONS
3. Weather and fire behavior
4. PPE
5. Fatigue and dehydration
6. Smoke inhalation
7. Visitor traffic and vehicle safety
8. Wildlife hazards

COMMENTS AND QUESTIONS – Burn Boss

Appendix 13: Job Hazard Analysis

United States Department of Interior NATIONAL PARK SERVICE	1. WORK PROJECT/ACTIVITY Prescribed Fire	2. LOCATION Theodore Roosevelt NP	3. UNIT Little Mo
JOB HAZARD ANALYSIS (JHA)	4. NAME OF ANALYST Beth Card	5. JOB TITLE FMO	6. DATE PREPARED 04/08/02
7. TASKS/PROCEDURES	8. HAZARDS	9. ABATEMENT ACTIONS ENGINEERING CONTROLS – SUBSTITUTION – ADMINISTRATIVE CONTROLS – PPE	
1. Driving to Work Site	A. General operations and public traffic B. Unsecured loads C. Hauling flammable substances D. Transporting sharp tools E. Loading vehicles	A. Defensive driving techniques B. Check loads for security before departing -- use tie downs. C. Use appropriate containers for transportation of drip torch fuels and gasoline. D. Use guards, cages, boxes or tool mounts. E. Use of proper lifting techniques.	
2. Hand Ignition	A. Proximity to intense heat and erratic fire behavior B. Smoke, sparks, cinders C. Noise of fire obscures verbal warnings D. Burning fuel dripping from torch – operator burned E. Ignitions in wrong locations F. Poor footing, heavy fuel accumulations	A. Use Personal Protective Equipment (PPE), maintain close supervision, use handheld radios, and lookouts. Thorough briefing on expected fire behavior. Adjust ignition patterns as needed to reduce exposure and fire behavior. B. Avoid very dense smoke, wear PPE, rotate personnel out of worst areas. C. Handheld radios for all ignition personnel. D. Igniters stay alert to location of torch flame. Close air vent when not igniting. Wear proper PPE. E. Thorough briefing of ignition plan. Know location of other igniters and personnel. Radios for all igniters. Close supervision. F. Constant awareness, identify hazard areas, slow down.	
10. SUPERVISOR'S SIGNATURE		11. TITLE	12. DATE

5/30/02

United States Department of Interior NATIONAL PARK SERVICE	1. WORK PROJECT/ACTIVITY Prescribed Fire	2. LOCATION Theodore Roosevelt NP	3. UNIT Little Mo
JOB HAZARD ANALYSIS (JHA) (Continued)	4. NAME OF ANALYST Beth Card	5. JOB TITLE FMO	6. DATE PREPARED 04/08/02
7. TASKS/PROCEDURES	8. HAZARDS	9. ABATEMENT ACTIONS ENGINEERING CONTROLS – SUBSTITUTION – ADMINISTRATIVE CONTROLS - PPE	
3. Traffic Hazards	A. Public vehicle traffic in close proximity to burn unit and fire personnel.	A. Warning signs will be posted along roadways to alert traffic of the burn in progress and smoke hazards. Burn personnel will avoid roadways whenever possible and take extra precaution when in traffic areas.	
	B. Smoke decreasing visibility along roadways.	B. Fire vehicles will operate with headlights at all times before, during, and after the burn. Engines and vehicles with light bars will use overhead lights when in heavy smoke and at all times when working along the roadway.	
4. Holding Actions/Mop Up	A. Smoke inhalation	A. Personnel will be rotated out of the smoke as often as possible while maintaining safe holding resources for the burn.	
	B. Use of hand tools	B. Hand tools will be used with standard safe techniques – proper personnel spacing, ensure tool heads are sharp and secure, proper PPE.	
	C. Pump/engine use	C. Trained personnel will operate pumps and engines. Ear protection will be worn at all times while working around the pumps.	
10. SUPERVISOR'S SIGNATURE		11. TITLE	12. DATE

5/30/02

JHA – Emergency Evacuation Instructions

Work supervisor and crew members are responsible for developing and discussing field emergency evacuation procedures (i.e. medical plan) and alternatives in the event a person(s) become ill or injured at the worksite and needs to be expediently transported from the scene.

Be prepared to provide the following information:

Nature of the accident or injury (avoid using victim's name).
Type of assistance needed, if any (ground or air evacuation).
Location of accident or injury, best access route into the worksite (road name/number).
Radio frequencies.
Contact person.
Local hazards to ground vehicles or aviation.
Weather conditions (wind speed and direction, visibility, temp).
Topography.
Number of person(s) to be transported.
Estimated weight of passengers for air evacuation.

These items listed above serve only as guidelines for the development of emergency evacuation procedures.

JHA and Emergency Evacuation Procedures Acknowledgement

As supervisor, I hereby acknowledge that the following employees have participated in the development of this JHA and accompanying emergency evacuation procedures, and have also been briefed on the provisions thereof, on _____ They will brief their subordinates on this JHA prior to implementation of the burn.

Supervisor's Signature

Supervisor's Name

