

Kansas Flint Hills Smoke Management Plan

Introduction:

History/Background

- 2003 burn season
- 2009 and 2010 seasons

Why prepare a smoke management plan for the Flint Hills

- Reduce air quality and economic impacts on downwind communities
 - Health effects
 - Air quality standards
 - Ozone formation and PM
 - Economic impacts of not meeting air quality standards in downwind communities
- Qualify for an exemption in the event of an exceedance of the air quality standards
 - Interim Air Quality Policy on Wildland and Prescribed Fires
 - Exceptional Event Rule
- Maintain the Flint Hills ecosystem and the related economy
 - Flint Hills Ecosystem
 - Fire is important tool in maintaining tallgrass prairie
 - Only 4% of original North American prairie remains; ~ 2/3 of that is in Flint Hills
 - Impact of human landscape changes on plant community and on need for increased burn frequency
 - Scientific consensus supports prescribed fire; one of greatest threats to tallgrass prairie is forestation due to fire suppression
 - Burning widely prescribed by range specialists and ecologists to maintain ecological integrity of tallgrass prairie
 - Tallgrass prairie requires fire every 1-5 years to prevent invasion of trees (e.g., eastern red cedar) and to maintain integrity of existing vegetation
 - In many cases, burning consecutive years may be necessary to prevent encroachment of woody species
 - Burning improves weight gains in stocker cattle; commonly 10-15% higher in spring-burned pastures
 - Use of fire in Flint Hills
 - On average, ~ 35% of total prairie acres in Flint Hills are burned annually; some intact areas of Flint Hills burned more frequently
 - Patch-burn grazing (PBG) is an option to traditional burning, but smoke reduction effectiveness has not been demonstrated
 - Some pastures in the Flint Hills may not be suited to PBG because of the difficulty of maintaining fire breaks
 - PBG may require additional resources (fire equipment and manpower) to implement
 - PBG is viewed by some as experimental, and may require additional research before it becomes a widely accepted practice

- Prescribed burning is necessary to maintain/preserve ecological integrity of tallgrass prairie
 - Plant and animal species depend on positive effects of burning
 - Failure to regularly burn will result in increasing losses of remaining last great landscape of tallgrass prairie
- Planning process and participants
 - Who participated
 - When and where
 - Process for adopting and implementing SMP
- KHDE Statutory and Regulatory Responsibilities
 - Brief description of Kansas laws and regulations regarding open burning

Reducing downwind impacts of Flint Hills burning:

- Best Management Practices (BMPs)
 - Modifications to existing BMPs prepared by KSU to incorporate provisions addressing air quality impacts prior to, during and after the burn
 - BMPs will be incorporated into burn plans
 - BMPs can be used independently for counties outside of area selected for burn plan pilot
 - Incorporate KSU zone concept currently in burn book to spread out burning over time where feasible
- Burn plans
 - Voluntary program in pilot county(ies) to determine whether burn plans can be an effective tool to bring air quality impacts into burn decision making process
 - Burn Plan contents would be based on USDA/NRCS Burn Plan model
 - Objective of Burn - Fill in checkboxes for grass/plant types and desired control
 - Burn Area
 - Describe current plant cover – woody and herbaceous plants
 - Detail existing and contingency firebreaks
 - Burn Preparation
 - Obtain burn permit if required and identify fireboss
 - Outline firebreak construction
 - Specify conditions for backfire, flankfire and headfire
 - Describe areas adjacent to burn area
 - Implementation
 - Write starting time of burn
 - Tally equipment and manpower
 - Checklists and Evaluations
 - Pre-Burn Checklist
 - Post-Burn Evaluation
 - Follow-up Evaluation (60-90 days after burn)
 - Air quality provisions
 - Pre-burn

- Determine ideal burn time for a given location based on KSU research and conditions of pasture
 - Review meteorological and air quality conditions
 - Utilize web based tool for predicting smoke plume rise and movement
 - Day of burn
 - Weather check
 - Test burn to evaluate plume rise and movement
 - Adjust start and stop time of burn based on weather conditions
 - Post burn
 - Extinguishing smoldering hot spots
 - Report acreage burned to emergency management official
- QUESTION: Should burn plans be submitted to any agency prior to burn??
- ISSUE: Are ranchers who prepare burn plans at some greater liability than those who do not?

Restrictions on non-essential burning during Flint Hills burning season:

- Discussion of rationale for restrictions
- Areas that are subject to the restrictions
- What types of burning are covered
 - Construction and demolition waste
 - Tree and brush waste
 - Crop residues
 - Parklands
 - _____
- Exemptions to the restrictions
 - Ice storm, tornado waste
 - Federal, state local officials burning prairie
 - Parks
 - _____
- QUESTION: What types of burns should be excluded from the burn restrictions?
- QUESTION: Should there be an approval process for the exempted burns or should they be listed in the regulation?
- QUESTION: If an approval process, who should grant the exemption?

Public Education and Awareness:

- Introduction/Overview
- Stakeholders will promote adoption and implementation of SMP
- Efforts to date
 - Public education/awareness began April 2003
 - KDHE took initial voluntary/educational approach to address issue
 - KDHE staff presented info in Fall 2003 to KSU conference
- Outreach Methods and Materials
 - Web site
 - E-mails

- Brochures
- Training sessions
- Press releases
- Outreach and education activities will raise awareness to achieve regulatory compliance and increase voluntary participation
- Activities coordinated for maximum effect
- Audience and Message Content
 - Health effects of smoke – establish methods for notification
 - Reasons for prescribed burning – educate that burning is critical to Flint Hills
 - Burn plans – electronic burn plan template to be developed
 - Best Management Practices – to reduce impacts of smoke
 - Smoke predictions using web based dispersion model
 - Burn bans – education about new April burn ban for non-essential activities
 - Federal air standards and smoke management - NAAQS education
 - Burned acreage data – KSU and KFS will be collecting data
- ISSUE: Who should host the web site?

Surveillance and Enforcement:

- Local emergency management officials and KDHE District offices will monitor compliance with the burn ban

Smoke Management Plan Evaluation:

- Introduction
- Avoid exceedance of NAAQS
- KDHE would seek EPA approval to exclude data if exceedance occurs
- Technical Information Gathered During Burn Season
- Air Monitoring
 - Ozone, PM_{2.5}, PM₁₀, NO_x
- Meteorology
 - Temperature, humidity, wind speed and direction, cloud cover, mixing height, temperature inversions
- Satellite imagery to locate and track smoke plumes and estimate acres burned
- Post Burn Season Report
 - Review monitoring data to determine whether NAAQS exceedances occurred
 - Evaluate whether Flint Hills burning contributed?
 - Speciation may be done for PM exceedance
 - Estimation of total acres burned
 - Report posted to KDHE web site
- Producer Survey to determine effectiveness of public outreach and burn ban effectiveness
 - Was producer aware of SMP, and if so, how did they find out about it?
 - Were burn practices modified?
 - Likelihood of following SMP next season?
 - _____
- Many uncontrollable variables when burning in Flint Hills

- Temperature, wind speed and direction, plume rise
- Effectiveness of plan should not be judged until multiple years of air quality data available
- Potential contingency measures for improvements in the SMP if there are future exceedances of the ozone or Particulate Matter standards
 - _____
 - _____
 - _____

Glossary and Acronyms

Appendices

- Full text of Flint Hills introduction document
- Map of air monitoring sites in Kansas
- Education/outreach table
- EPA's Interim Air Quality Policy On Wildland And Prescribed Fires
- 40 C.F.R. 50.14 (Treatment of air quality monitoring data influenced by exceptional events)
- Kansas Statutes Relating to Open Burning (K.S.A. 65-3005, 65-3010)
- Kansas Open Burning Regulations (K.A.R. 28-19-645 through K.A.R. 28-19-648)
- Proposed burning regulations (i.e., annual non-ag burn ban during April)
- Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide
- Format for federal agency burn plans
- The Nature Conservancy Burn Plan