



***NP*Safe**

Safe Acts & Attitudes Foster Excellence

Tree Hazard Safety: Getting to the Root of the Problem

Participant Guide

Prepared by
NPS Risk Management Division

Hazard Tree Safety

Question or Comment?

“Excuse me [instructor’s name],
this is [name] at [location],
I have a question (comment).”

Wait for the instructor to
acknowledge you, then ask your
question or make your comment.

Get To Know Your Classmates...

- Your name?
- Your position?
- How long have you been with the park service?
- What do you hope to gain from the workshop today?

Objectives

- Identify direct causal factors for selected hazard tree accidents.
- Identify corrective actions to prevent similar accidents.
- Describe a hazard tree mitigation procedure.



Hazard Tree Safety

Objectives

- Explain key components that should be part of park level chain saw operator's training program.
- Identify training resources and reference materials that are available.



October 6, 1996

- C&O Canal
- Maintenance crew cleaning up after flooding

What Happened?

- Employee cutting down mulberry tree that was hanging over tow path
- Upper section of tree cut leaving twin-trunk stub with one side 4 feet high and other 8 feet high
- Made initial cut on 4 foot high section and began making similar cut on 8 foot high section
- 8 foot section broke free striking and fatally injury employee

Hazard Tree Safety

What Causes Were Identified?

- Inadequate knowledge and skills
 - No chainsaw operator training
- Lack of PPE
- Inadequate equipment
- Fatigue
- No SOPs

July 19, 2003

- Inyo National Forest
- Trail crew employee

What Happened?

- Camp set up in proximity to hazard tree
- During the evening tree fell and killed a member of the crew

Hazard Tree Safety

What Causes Were Identified?

- Trail crew did not accurately identify tree hazards
- Camp setup under a hazard tree

October 2, 2004

- Sequoia and Kings Canyon National Parks
- Initiating a test burn phase for prescribed burn
- 40+ personnel at site

What Happened?

- Top of dead tree (snag) caught fire
- Felling team came in to assess tree
- Decision to fell tree and falling zone designated
- Fire hose in path of planned fall
- Firefighters went to move hose
- Felling team went to assist
- Member of felling team fatally struck when top of burning snag fell

Hazard Tree Safety

What Causes Were Identified?

- Inadequate standards and policies for working near burning trees and snags
- No JHA for working near snag
- Hose lay became distraction
- Hose crew allowed in falling zone
- Felling crew members entered falling zone to help relocate hose

June 7, 2005

- Glacier National Park
- Dead eighty foot spruce in the middle of Boulder Pass Trail
- Decision made to fell the tree off the trail

What Happened?

- Employee decided to use trail as escape route
- Employee made initial cut in face
- Employee made cut on back side and placed wedge
- Employee continued cut and then began walking down trail with back to tree

Hazard Tree Safety

What Causes Were Identified?

- Inadequate knowledge and skills
 - No chainsaw operator training
- Poorly chosen escape route
- Improper assessment of tree

_____, 2006 or 2007

- _____ Park

“Those who do not learn from the past are doomed to repeat it.”

Tree Hazard

- A tree (or portion of a tree) with a potential for structural failure and/or uprooting AND one which has a potential for impacting a target (i.e. person, property, facility) in event of a failure

Hazard Tree Safety

Guide to Tree Hazard Mitigation Procedures

1. Determine the areas to be managed

Wilderness

Campground

Guide to Tree Hazard Mitigation Procedures

2. Adopt a rating system that mitigates the most critical hazards first

Tree (1-4) + Target (1-3) = Rating (2-7)

Guide to Tree Hazard Mitigation Procedures

3. Survey managed areas to identify tree hazards

Look for the "big picture."
Look for things out of place.

Hazard Tree Safety

Dead Trees



Leaning Trees



Broken or Hanging Limbs

Hazard Tree Safety

Guide to Tree Hazard Mitigation Procedures

4. Conduct an examination of individual tree hazards identified by survey
(Approach from safe side)

Conduct Examination

- Check the top
 - Dead or weak tops
 - Multiple tops
 - Broken or hanging limbs

Conduct Examination

- Check the bole
 - Broken or hanging limbs
 - Angles
 - Loose bark
 - Fire scar
 - Conks

Hazard Tree Safety

Conduct Examination

- Check the butt
 - Rot or decay
 - Cat face
 - Twin trunks (co-dominant stems)
 - Fungi growth
 - Exposed root systems

Conduct Examination

- Check other environmental factors



Poison
Oak
Or
Ivy

Bees

Guide to Tree Hazard Mitigation Procedures

5. Control immediate hazards
 - Recognize immediate hazards
 - Communicate hazards to all on site
 - Control the area until hazard can be mitigated

Hazard Tree Safety

Guide to Tree Hazard Mitigation Procedures

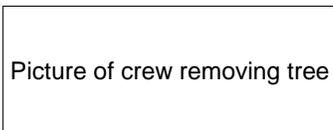
6. Plan your mitigation strategy

Plan Your Mitigation Strategy

1. What is the target that makes this a hazard and how can it be protected?
2. What is the most efficient and safe way to remove the hazard
3. What do I need to do the job safely?
4. What is my safety and emergency evacuation plan?
5. What is our policy and are there compliance issues?

Guide to Tree Hazard Mitigation Procedures

7. Mitigate the hazard



Hazard Tree Safety

Chain Saw Operator Program Park Level Policy

- Purpose and scope
- Chainsaw coordinator
- Roles and responsibilities
 - Supervisor
 - Employees
- Training requirements

Chain Saw Operator Program Training Requirements

- Classroom instruction
- Field demonstrations
- Hands on instruction
- Field evaluation
- JHA review
- Refresher/recertification
- First Aid/CPR

Other Training Requirements

- Hazard tree awareness
 - Annual training for all employees working in a forested environment

Hazard Tree Safety

Chain Saw Operator Program Park Level Policy (cont.)

- PPE requirements
- Working alone policy (Don't do it!)
- Capability/qualification system
- Annual review and revision of policy

JHA

NWCG S-212 Wildland Fire Chain Saws

- Required training for wildland firefighters who will be operating chain saws
- Trains participants to apply OSHA and NWCG safety standards
- Applicable to other park operations besides wildland firefighting



Hazard Tree Safety

NFES 1847 "If a Tree Falls" VHS Video

- Introduction to preventing accidents from snags in wildland firefighting
- Used with S-212 course or as stand alone training
- Good for refresher training



To Order NWCG Materials

- National Wildfire Coordinating Group catalog available at:
<http://www.nwcg.gov/pms/pubs/pubs.htm>
- Click on "Order Form" link for instructions on how to order materials



Wildland Fire Qualifications

- Performance based system
- Requires demonstrated proficiency
- Task Books aid in identifying and documenting proficiency

Hazard Tree Safety

Faller Task Books (Required for Wildland Firefighters)

- Class A
 - Up to 8 inch DBH
- Class B
 - Up to 24 inch DBH
- Class C
 - Greater than 24 inch DBH
- Available from BLM at:
<http://www.fire.blm.gov/training/blmtrng/faller.html>

“Red Book”

- Provides additional information on the qualification process for wildland fire chainsaw operators
- Chapter 14, pages 6-7
- Available at:
<http://www.fire.blm.gov/Standards/redbook.htm>

NFES 1077 Incident Response Pocket Guide

- Pocket sized field reference
- Includes:
 - “How to Properly Refuse Risk”
 - Hazard tree safety
 - Procedural chain saw operations
- May be downloaded from:
<http://www.nwcg.gov/pms/pubs/pubs.htm>

Hazard Tree Safety

“How To Properly Refuse Risk”

- Reference for employees and supervisors
- Adopted as interagency standard for wildland fire
- Applicable to other park operations

“How To Properly Refuse Risk”

- Every employee has the right to a safe assignment
- If an individual feels that an assignment is unsafe, they have an obligation to identify a safe alternative
- Turning down an assignment is one possible outcome

Hazard Tree JHA Template

- Developed by an interagency task group
- Endorsed by the Federal Fire and Aviation Safety Team
- Template designed to be modified
- Available at:
http://www.nifc.gov/safety_study/ffast.html

Hazard Tree Safety

U.S. Forest Service Region 1

- Snag and Hazard Tree Brochure
- Hazard Trees – An Interactive Study
- Sim Limb / Top Drop
- Available at:
<http://www.fs.fed.us/r1/projects/reference.shtml>

NPS Risk Management Division

- Go to InsideNPS.gov
- Click on NPSafe logo
- Click on Tools for Tree Felling

Tree Hazard and Tree Felling Resources

National Wildfire Coordinating Group (NWCG) Training Materials

These materials may be ordered from the NWCG National Fire Equipment System Catalog, PART 2: Publications 2006. The catalog (NFES 3362) and order form is available at:

<http://www.nwcg.gov/pms/pubs/pubs.htm>

S-212 WILDLAND FIRE CHAIN SAWS (2004)

CLASSROOM (24-36 hours + pre-course work)

NFES 1999 S-212 Instructor Guide \$9.05

NFES 2196 S-212 CD-ROM Course Materials \$1.35

NFES 2645* S-212 DVD \$2.73

NFES 2198* S-212 video, VHS (57:00) \$3.70

NFES 2000 S-212 Student Workbook \$1.13

NFES 2644 S-212 Pre-course Work \$.42

The CD-ROM contains all course materials, except the video/DVD. *The DVD and the video contain the same program. Upon successful completion of the course, the student will: list, define and apply chain saw safety standards as required by OSHA and NWCG agency manuals, handbooks, and directives; incorporate the approved use, maintenance and function of personal protective equipment in wildland fire chain saw applications; identify basic chain saw parts nomenclature, maintenance, tuning, troubleshooting and safety features; demonstrate field maintenance tasks required for chain saw operation; demonstrate the tactical application of chain saws in brushing, limbing, bucking, and falling for fireline construction and mop-up operation.

IF A TREE FALLS (1995)

NFES 1847 \$2.23 video, VHS (16:00)

An introduction to preventing accidents from snags in wildland firefighting. The video may be used as the stimulus for individual and team awareness of snag safety, leading to specific discussions and appropriate training at the local level to reduce injuries and deaths from snags.

Revised INCIDENT RESPONSE POCKET GUIDE (2006)

NFES 1077 \$1.45

Small pocket-sized guide with checklists and commonly used information that is helpful to initial attack or extended attack incident operations. The 2006 version changes: placed a Heliclock graphic on the cover to assist ground personnel communication with helicopter pilots; revised the safety reference for Power Line Safety at Wildland Fires; revised the reference for After Action Reviews; added a reference for Effective Use of SEATs; added a guide for Spot Weather Requests; added a reference for the Keetch-Byrum Index; added a reference on Human Factors and Decision-making; updated the Helicopter Passenger Briefing to match the IHOG; updated various first aid protocols; updated references for Hazard Trees and Falling Operations. Available at www.nwcg.gov/pms/pubs/pubs.htm

Tree Hazard and Tree Felling Resources (cont.)

Wildland Fire Qualifications

- Task based system
- Requires demonstrated proficiency
- Task Books aid in identifying and documenting proficiency

Faller Task Books

- Class A
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 - Up to 24 inch DBH
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- Available from BLM at: <http://www.fire.blm.gov/training/blmtrng/faller.html>

Additional information on the wildland fire qualification process for chain saw operators and fallers can be found on in Chapter 14, pages 6-7 of the Interagency Standards for Fire and Fire Aviation Operations, January 2006 (<http://www.fire.blm.gov/Standards/redbook.htm>)

Hazard Tree JHA Template

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U.S. Forest Service Region 1 (Northern Rockies area)

1. Snag and Hazard Tree Brochure: Available on the web at http://www.fs.fed.us/r1/projects/hazard_trees/snag_brochure_grimes_2003.pdf
2. Hazard Trees – An Interactive Study: Available on the web at http://www.fs.fed.us/r1/projects/hazard_trees/optimized_interactive_study.pdf.
A PowerPoint presentation that illustrates indicators of hazard trees and identifies assessment tools. Excellent product for a safety training session.
3. Sim Limb / Top Drop: Available on the web at http://www.fs.fed.us/r1/projects/hazard_trees/Soft-Limb-Synopsis-1-30-06.pdf.
An exercise that simulates a limb dropping out of the top of a snag while it is being felled. It clearly illustrates the reaction time needed to avoid being struck.