



# FIRE PROTECTION TRAINING

Procedures Handbook 4300

HANDTOOLS

**TOPIC:** Pulaski

**TIME FRAME:** :15

**LEVEL OF INSTRUCTION:** Level I

**BEHAVIORAL OBJECTIVE:**

*Condition:* Given a written quiz

*Behavior:* The student will identify, describe the basic use, care, maintenance, and safety precautions associated with the Pulaski.

*Standard:* With a minimum of 80% accuracy

**MATERIALS NEEDED:**

- A Pulaski with guard
- Student handouts
- Vise
- Wooden blocks
- Gloves
- File with handle and guard
- Appropriate visual aids
- Audio visual equipment

**REFERENCES:**

- Teie, Firefighter's Handbook on Wildland Firefighthing, 3<sup>rd</sup> Edition, Appendix: Use and Care of Hand Tools
- NFES 1571, NWCG Firefighters Guide, 1986
- IFSTA, Wildland Firefighthing for Structural Firefighters, 3<sup>rd</sup> Edition, Chapters 3 and 6

**PREPARATION:**

During wildland fires much of the control line is constructed using handtools. The Pulaski is one of the most versatile tools we have at our disposal. In order to effectively utilize the Pulaski, the firefighter must know its uses, how to properly maintain it and the tool's safety precautions to be followed.



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PULASKI

## I. PARTS AND NOMENCLATURE

### A. Handle

1. Wood or fiberglass
2. Shoulder
3. Butt

### B. Head

1. Cutting edge
2. Grubbing edge
3. Eye

### C. Wedges

1. Wood
2. Steel
3. Polystyrene

## II. BASIC USES

### A. Cutting brush

1. Obtain secure footing

### B. Grubbing

1. Grubbing edge

### C. Trenching and digging

## III. CARE AND MAINTENANCE

Information Sheet #1

Demonstrate



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- A. Inspect tools before and after each use:
  - 1. Handle
    - a. **Smooth**
      - (1) Sand as necessary
      - (2) Do not apply
        - (a) Linseed oil
        - (b) Wax
        - (c) Paint
    - b. **Straight**
      - (1) Place out of service if
        - (a) Warped
        - (b) Twisted
        - (c) Not properly aligned with head
    - c. **Sound**
      - (1) Free of cracks
      - (2) Free of burns
    - d. Clean and dry
  - 2. Head
    - a. Free of cracks
      - (1) If found place out of service
      - (2) Do not paint head
        - (a) Paint will hide cracks



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- b. Free of burrs or chips
  - (1) File as necessary
- c. **Secure**
  - (1) Head is tightly fastened to the handle
- d. **Sharp**
  - (1) Cutting and grubbing edges properly sharpened
    - (a) Use a 12" flat mill bastard file
    - (b) Apply even pressure across full width of the cutting edge. Taper back in an arc 2" at deepest point
    - (c) Cutting edge even across full width
    - (d) Grubbing edge sharpened to maintain a  $\frac{3}{8}$ " bevel at 45° angle
  - (2) Free of nicks or chips
  - (3) Permissible to treat with a rust inhibitor
  - (4) Tool guard in place whenever tool is not in use

Information Sheet #2

## IV. SAFETY PRECAUTIONS

Demonstrate



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- A. When using tool
  - 1. Maintain 10 foot interval
    - a. **“Maintain Your Dime”**
  - 2. Maintain firm footing
  - 3. Watch for obstructions
    - a. Overhead
    - b. Within arc of swing
  - 4. Wear gloves and appropriate PPE
    - a. Pay particular attention when gloves are wet
  - 5. Do not allow head of tool to get too near body
  - 6. Concentrate on impact area to:
    - a. Prevent ricochet or glancing blow
    - b. Avoid rocks and other hard objects
    - c. Avoid hazards
      - (1) Beehives
      - (2) Electrical wires
      - (3) Barbed wire
  - 7. Pace yourself
  - 8. Use proper tool for the job
- B. When carrying tool
  - 1. Grasp at balance point with head forward
  - 2. Carry on downhill side



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3. Carry horizontally (parallel) to the ground with grubbing edge up
  4. Sound off when passing another person with "**coming through**" and wait for that person to yield right of way
  5. Cutting edge pointing downward and grubbing edge upward
- C. When passing tool
1. Pass handle (butt) first
  2. At arms length from other person
    - a. Never toss
- D. When grounding tool
1. Place head of tool toward center of circle with handle outward. Cover with shovel lying flat if alone ("Wagon Wheel")
  2. Shield the head of the tool to the extent possible
    - a. Use tool guards whenever practicable
  3. Place all crew tools in the same area
- E. When sharpening tool
1. Secure tool in vise
    - a. Utilize wooden blocks or
    - b. Newman tool holder
  2. Use gloves
  3. Use file with handle and a file guard in place
  4. Rest the palm of one hand on the tip of the file



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- a. Do not wrap the fingers over the tip of the file
- 5. Sharpen in a motion away from the body
- 6. Remove tools from the vise if leaving the area
- 7. Make visual check for sharpness, don't run finger across blade
- F. When storing tool
  - 1. Store in a clean, cool, dry area
  - 2. Store in a secure area or in the proper compartment
  - 3. Separate in-service and out-of-service tools
  - 4. Always keep the tool guards in place
  - 5. Secure tools properly in tool racks

## V. REHANDLING

- A. Removing handle not secured with epoxy
  - 1. Secure head in vise
    - a. Use wood blocks to protect head
  - 2. Saw off handle next to head
  - 3. Drill holes through wood remaining in axe head (use 1/4" bit)
  - 4. Drive out remaining wood in direction it was inserted
- B. Installing handle without epoxy
  - 1. Inspect eye for cracks, breaks, or burrs

Demonstrate



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- a. Discard head if cracked
2. Check new handle for defects, warp, twists, etc.
3. File down neck of handle with coarse wood rasp to fit eye of Pulaski head
  - a. Shoulder not to exceed  $\frac{1}{2}$ "
4. If not already provided, saw slit for wooden wedge  $\frac{2}{3}$  the depth of the head
5. Fit handle into eye of head
  - a. Should have no gaps between handle and eye of head
  - b. Check for proper alignment of head ( $90^\circ$  to handle)
  - c. When fitting head, never pound directly on head with metal hammer
6. Drive soft wood wedge into slit as far as possible (avoid splitting handle)
7. Saw off excess wedge with hacksaw and file smooth
8. Drive two metal wedges (#4 or #5) at a  $45^\circ$  angle to the wooden wedge, being careful not to spread eye
9. Check for tightness by putting axe in vise (using head blocks) with handle horizontal and try to move handle up or down
10. Sight down handle for alignment
- C. Removing handle secured with epoxy
  1. Saw off handle next to head



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2. Boil head 20 to 30 minutes
  3. Drive out handle with punch while still hot
  4. Clean eye with wire brush and sandpaper
  5. Wipe head with solvent rag and air dry
- D. Installing handle with epoxy
1. Check head for cracks
  2. Shape handle to fit eye using coarse wood rasp, finish with fine rasp
  3. If not provided on new handle, saw slit for wedge  $\frac{2}{3}$  the depth of head
  4. Mix epoxy according to manufacturer's instructions and apply to surfaces to be bonded
  5. Drive handle into place
  6. Using polystyrene high impact wedge, coat with epoxy and drive into slit of handle (avoid splitting handle)
  7. Allow epoxy to completely harden
  8. Saw off excess handle and dress with a coarse file
  9. Remove excess epoxy with a wire wheel brush



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PULASKI

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## **SUMMARY:**

The Pulaski is one of the most versatile wildland fire suppression handtools. It can be used for cutting, trenching, digging, grubbing, and forcible entry. In order to effectively use a Pulaski, the firefighter must be familiar with its uses, how to maintain it, and the safety precautions to be taken.

## **EVALUATION:**

A written quiz.

## **ASSIGNMENT:**

To be determined by instructor(s).