Recreation Fire Tech Tips

United States Department of Agriculture
Forest Service
Technology & Development Program

December 2008

2300/5100 0823–2347P–MTDC

Improving the Pulaski Sheath

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The existing Pulaski sheath has two plastic covers, one for the ax and one for the hoe. The covers are pulled tight onto the toolheads with a plastic strap and slotted buckle (figure 1). Since the 1980s, the orange plastic Pulaski sheath has been used by trail maintenance and firefighting employees. In the late 1990s, rivets were added to the sheath for safety, tightening the covers on the ax and hoe heads.

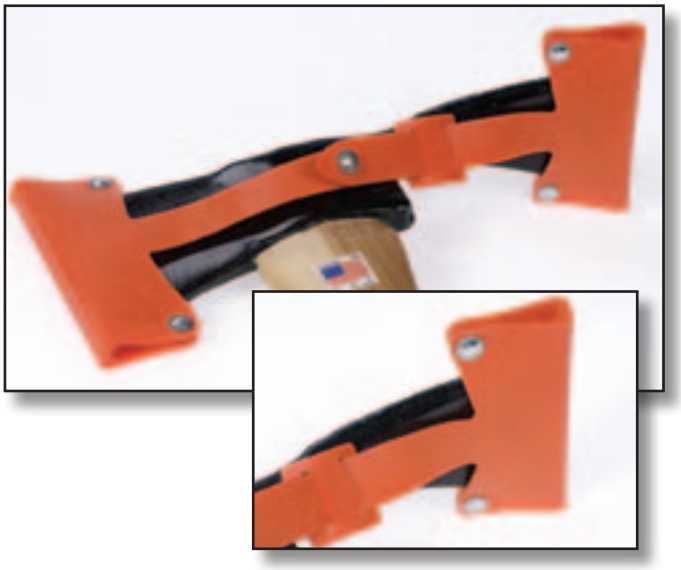

Figure 1—The existing Pulaski sheath has been used by trail maintenance and firefighting employees since the 1980s. The strap (inset) tends to slip through the buckle, allowing the toolhead covers to fall off.

Highlights...

- The orange plastic Pulaski sheath tends to loosen, allowing the covers to fall off the sharp ax and hoe toolheads.
- A section of the plastic strap can be replaced with 1-inch-wide nylon webbing with a double bar metal buckle that will keep the covers tight on the toolheads.

The Problem

The strap tends to slip through the buckle, allowing the covers to loosen or fall off the toolheads. The Missoula Technology and Development Center (MTDC) was asked to retrofit the strap to keep the plastic covers on the toolheads.

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The Solution

A section of the plastic strap and the old buckle can be cut off and replaced with 1-inch-wide nylon webbing with a metal buckle.

Cut the existing strap and buckle from the toolhead covers, leaving about 2 inches of plastic on each end.

Either:

A. Use a 1-inch slot punch to create a slot in each side of the toolhead covers. Thread the webbing through each slot and sew a double bar metal buckle to one end of the webbing (figure 2).

B. Sew 1-inch-wide webbing to the ends of the plastic strap using six to eight stitches per inch of heavy duty nylon thread (figure 3). Sew a metal buckle to one end of the webbing.

C. Rivet 1-inch-wide webbing to the remaining 2 inches of the plastic strap using 1/8-inch blind rivets (figure 4). Sew a metal buckle to one end of the webbing.

Table 1 lists parts and suppliers.

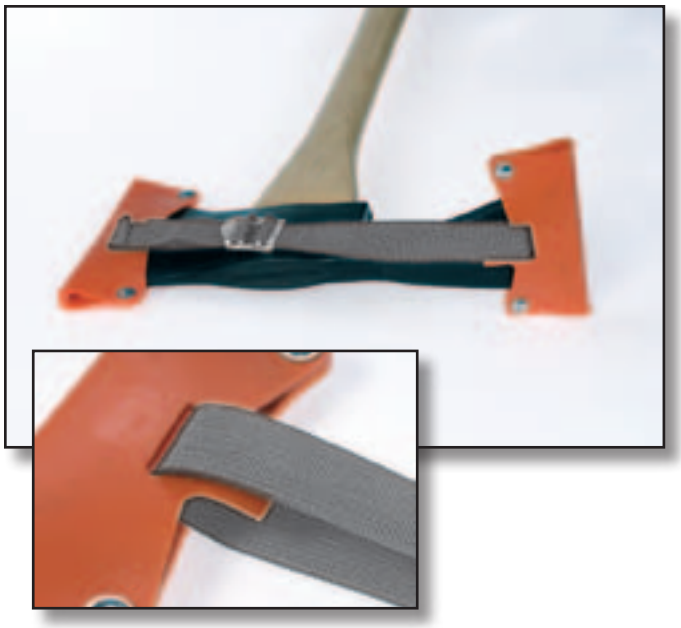

Figure 2—The plastic Pulaski sheath's strap can be improved by replacing the plastic strap and buckle with 1-inch-wide nylon webbing and a double bar metal buckle. This design shows the webbing looped through a slot (inset) made into one side of each toolhead cover.

Table 1—Parts and suppliers for the improved strap for the Pulaski sheath.

A, B, C	1-inch x 0.045-inch nylon webbing MIL-W-17337 or commercial equivalent	*http://www.LOWYUSA.com* Phone: 310–763–1111 Style No. WBN6/100 backpack webbing
A, B, C	1-inch double-bar metal buckle	*http://www.LOWYUSA.com* TBC 3739-Tabler buckle with lip under tongue
C	1/8-inch diameter blind rivet	McMaster-Carr Part No. 97447A020
C	1/8-inch round hole washer	McMaster-Carr Part No. 90183A212

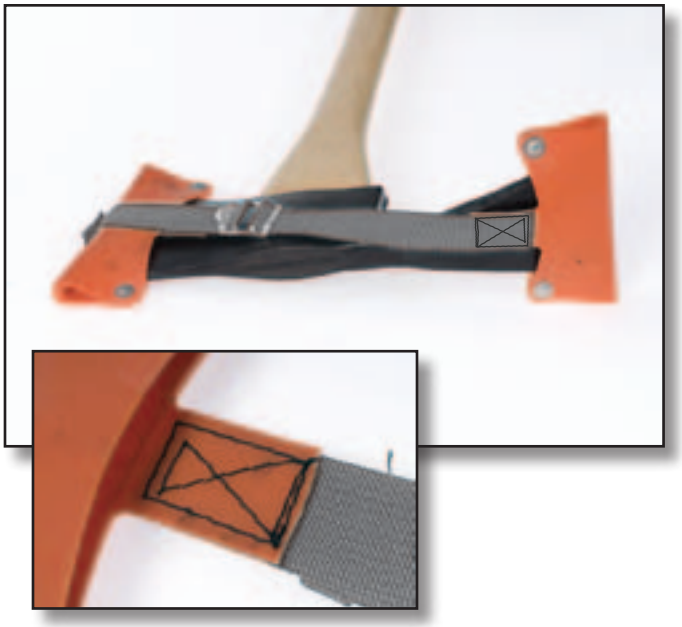

Figure 3—Sew 1-inch-wide webbing to the plastic strap, using six to eight stitches (inset) of heavy duty nylon thread per inch. The stitches in the larger photo were digitally enhanced so they could be seen clearly.

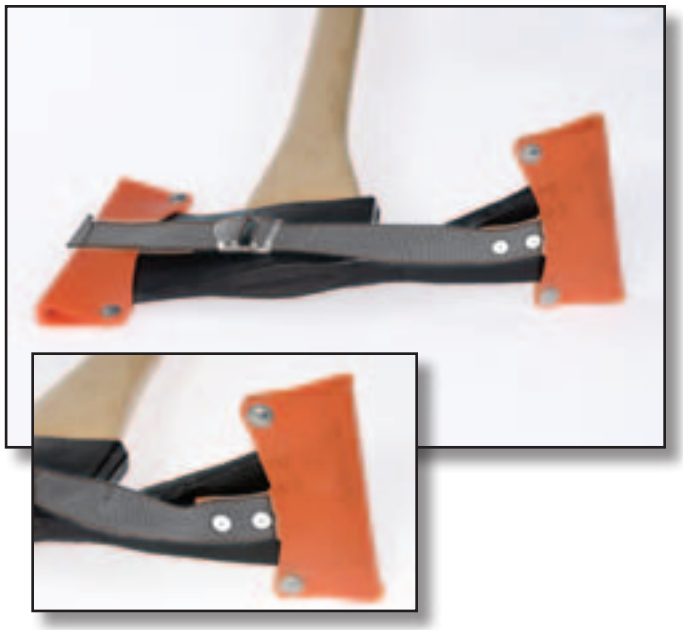

Figure 4—Rivet (inset) the 1-inch-wide webbing to the plastic strap.

Conclusions

Replacing the plastic strap and slotted buckle on the existing Pulaski sheath with 1-inch-wide webbing and a metal buckle keeps the covers tight on the sharp ax and hoe toolheads. The webbing strap keeps the toolhead covers together, preventing them from becoming separated or lost. This low-cost improvement allows existing covers to be used safely.

Acknowledgments

Thanks to Bill Goslin, Stevensville Ranger District of the Bitterroot National Forest, for submitting this project proposal. Goslin and his trail crew field tested various prototypes, providing comments and improvements until we found a simple, easy fix.

About the Authors

Mary Ann Davies is a project leader at the Forest Service's Missoula Technology and Development Center (MTDC). She received a bachelor's degree in mechanical engineering with a minor in industrial and management engineering from Montana State University. She worked in the Forest Service's Pacific Northwest Region with facilities, tramways, recreation, and fire. Before coming to MTDC in 1998, she worked 5 years with the Rocky Mountain Research Station's fire chemistry and the fire behavior groups in Missoula, MT. Davies works on projects in the nurseries, fire, and recreation programs and in the watershed, soil, and air program.

John Smith joined MTDC in 2005 as an equipment specialist. He graduated from the University of Montana with a bachelor's degree in education and taught elementary school in Ovando, MT. He began his Forest Service career in 1974 as a wildland firefighter working for the Superior District of the Lolo National Forest. A Missoula smokejumper for more than two decades, Smith's experience as assistant loadmaster foreman, master parachute rigger, and safety program manager is applied to fire equipment development.

Library Card

Davies, Mary Ann; Smith, John. 2008. Improving the Pulaski Sheath. Tech Tip 0823–2347P–MTDC. Missoula, MT: U.S. Department of Agriculture Forest Service, Missoula Technology and Development Center. 4 p.

Covers on the orange plastic Pulaski sheath protect users from the sharp ax and hoe toolheads. The strap on the sheath tends to slip through the buckle, allowing the covers to loosen or fall off the toolheads. A section of the plastic strap and the buckle can be cut from the sheath and replaced by 1-inch-wide nylon webbing and a metal buckle that will keep the covers tight on the toolheads.

Keywords: equipment development, fire fighting, firefighting, handtools, retrofits, safety at work, tools

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