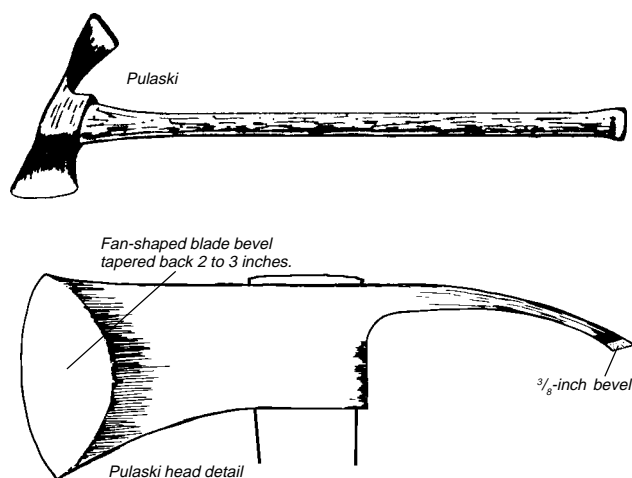


Tools for Grubbing

Pulaskis

The Pulaski combines an ax and a grub hoe into one multipurpose firefighting tool. Pulaskis adapt easily to trail work, especially for crews limited to a few tools, or crews with only a general idea of the job to be done. Combination tools are less effective than single purpose tools. An ax balances better and chops more safely and grub hoes are more efficient than Pulaskis. Pulaskis weigh about $5\frac{1}{2}$ pounds. Most have a 36-inch handle.



When using the hoe, stand bent at the waist with your back straight and parallel to the ground, knees flexed, and one foot slightly forward. Hold the handle with both hands so the head is at an angle to your body, and use short, smooth, shallow swings. Let the hoe hit the ground on its corner. Use the ax end to chop large roots after the dirt has been cleared by the hoe. Always wear safety goggles while grubbing to guard against flying chips of rock and dirt.



Use short strokes and let the hoe hit the ground on its corner.

Carry the Pulaski at your side. Grip the handle firmly near the head and point the ax end away from your body and down. Sharpen the cutting edge like an ax. When sharpening the hoe, maintain the existing inside edge bevel. Never sharpen the top of the hoe.

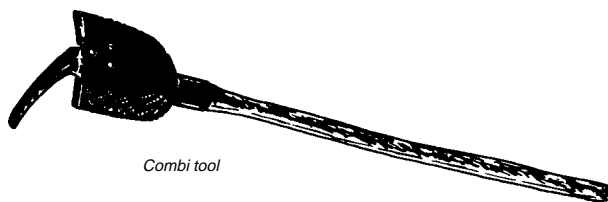
Combi Tools

The combination or combi tool is basically a military entrenching tool on a long handle. It functions as a hoe, pick, or shovel. These tools have recently been developed to aid Forest Service firefighting crews. Because of their wide blade and longer handle, most users have found them less fatiguing to use than traditional tools.

Use, carry, and maintain the tool as you would a Pulaski or McLeod.



Combination (or Combi) tool developed for firefighting, is popular for trail work.



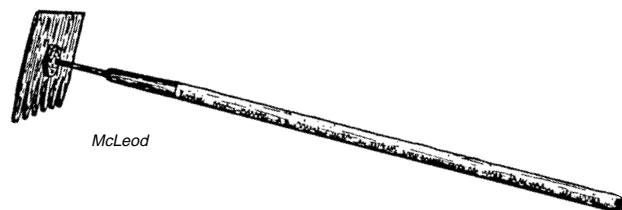


The combi tool serves as a hoe, pick, or shovel.

McLeods

The McLeod combines a heavy-duty rake with a large, sturdy hoe. McLeods work well for constructing trails through light soils and vegetation or for reestablishing tread along sloughed side cuts. They are inefficient in rocky or unusually brushy areas. The hoe edge is about $9\frac{3}{4}$ inches wide, the six rake teeth are $3\frac{1}{2}$ inches long, and the handle is 48 inches long. Weight is about 5 pounds.

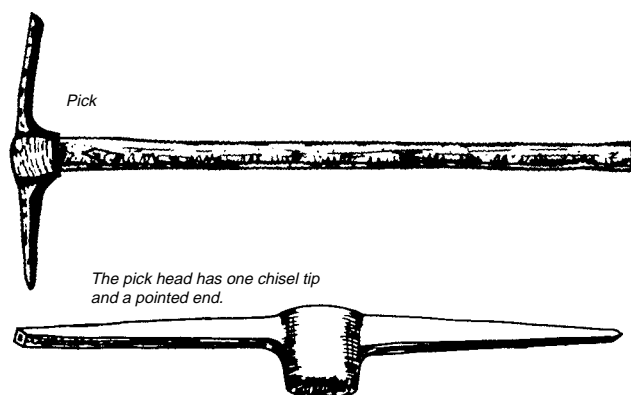
Carry McLeods like shovels with the head forward and the handle behind. Grip the handle firmly near the head and hold it away from your body while you walk. Sharpen the hoe with a mill bastard file. Maintain a 45° outside edge bevel. Honing the edge with a whetstone is unnecessary. Rake tines sometimes bend and should be straightened, but they are not sharpened.



McLeod

Picks

Pick heads have a pointed tip for breaking hard rock by forcing a natural seam. They also have a chisel tip for breaking softer materials. Picks commonly weigh 5 to 10 pounds and most have 36-inch handles.

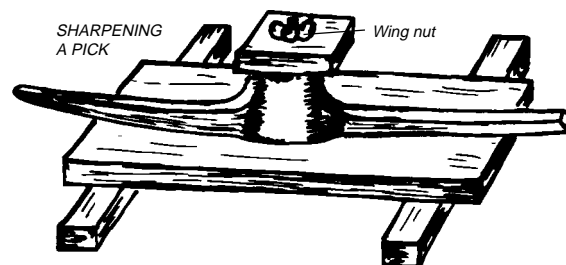


Pick

The pick head has one chisel tip and a pointed end.

When using a pick, stand comfortably with your feet about shoulder-width apart and one foot slightly forward. Grasp the handle with your forward hand near the head; place the other hand near the handle end. Bending over at the waist and keeping your back straight and parallel to the ground, work the pick like a Pulaski hoe with short, deliberate, downward strokes. Avoid raising the pick overhead while swinging; this wastes energy and creates a safety hazard because the heavy, narrow tool head cannot be easily controlled or directed. *Always* wear safety goggles while picking to guard against flying chips of rock.

An oval-tapered eye and handle end cause pick heads to tighten when swung, but allow a worker to remove handles for carrying and sharpening. Sometimes a small screw is screwed into the handle just below the head to prevent slipping. Before sharpening, secure the tool head to free both hands. Use a grinder or mill bastard file to sharpen pointed tips to $\frac{1}{8}$ -inch square. When sharpening chisel tips, maintain the factory bevel.



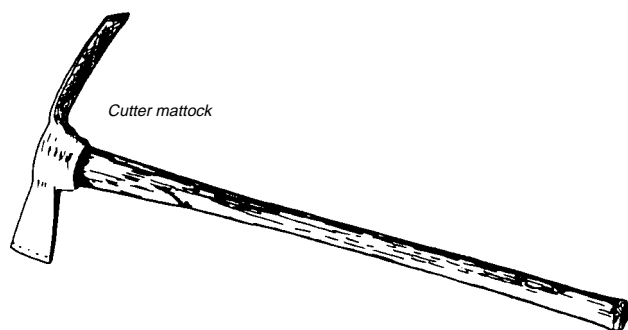
SHARPENING A PICK

Wing nut

Secure the head to the frame by placing a bolt through the eye of the head and fastening it with a wing nut. This allows for easy removal and keeps both hands free for sharpening.

Mattocks

The *cutter mattock* uses the same grubbing blade as pick mattocks, but includes an opposing 2-inch cutter blade instead of a pointed tip. Crews working in deep, rooty soil often prefer these tools; roots are severed with the cutter blade and then pried out with the grubbing end. Follow the use instructions outlined for Pulaskis.



The *pick mattock* is often recommended as the standard tool for trail work. It is used like a pick. It has a pointed tip for breaking rocks and a grubbing blade for working softer materials. The grubbing blade may also be used to cut roots or remove small stumps. Moreover, with the edge of the tool, you can tamp dirt and loose rocks or smooth a new tread, and the handle helps measure the trail's width.

Mattock handles are similar to pick handles. They are usually 16 to 17 inches long and they can be removed when transporting and sharpening the heads. Mattocks weigh about $2\frac{1}{2}$ pounds.

Maintain good cutting edges on mattocks. Keep grubbing blades sharpened to maintain a 35° edge bevel on the underside. Sharpen pick ends like a pick, and maintain factory bevels on cutter blades.



Types of mattocks.

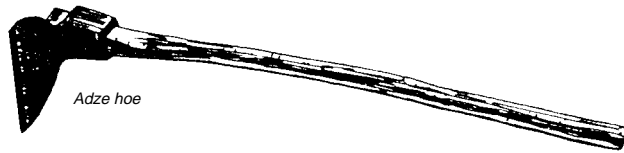
Adze, Grub, and Hazel Hoes

Use adze hoes, grub hoes, or hazel hoes to break sod clumps when constructing new trail or leveling an existing trail tread. These hoes are also useful in heavy duff. Operate hoes like Pulaskis, mattocks, and picks. Work the tool at an angle across the front of your body so the handle is not between your legs. Bend at the waist, keeping your back straight, knees flexed, and feet shoulder-width apart with one foot slightly forward. Control the swing by grasping the handle near the end with one hand and near the middle with the other. "Choking" the handle and swinging straight down may cause the handle to hit your shins or knees. Use short, shallow chops to save energy. Strike so the tool hits at an angle on its corner.

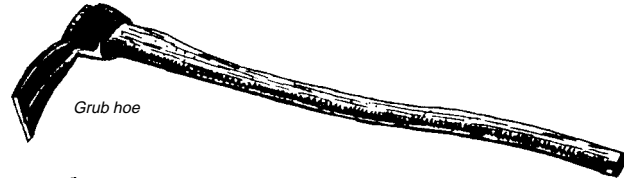


Adze hoes are useful tools for constructing trails.

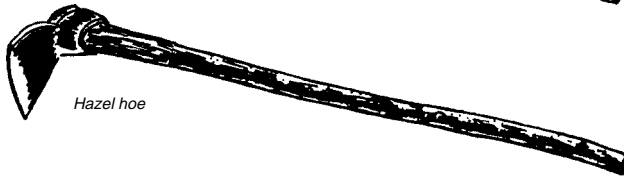
The tapered eyes and handle ends of these hoes force heads to tighten during use, but make them easily removable for carrying and sharpening. Like picks and mattocks, you can also use a screw to hold the head from slipping on the handle. To sharpen, remove the handle, secure the head so both hands are free, and use a file or grinder to bring the cutting edge to an inside bevel of 45° . Carry these hoes like Pulaskis, picks, or mattocks.



Adze hoe

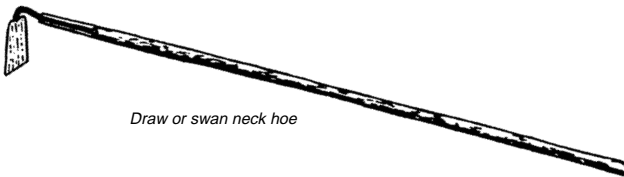


Grub hoe



Hazel hoe

Draw or swan neck hoes are useful for leveling or weeding. These hoes are light duty tools, however, and may often prove impractical for trail use. Carry draw hoes like shovels, with the sharpened edge away from the body and down. Sharpen the edge to an outside bevel of 45°. Finishing with a whetstone is unnecessary for all hoes.



Draw or swan neck hoe



Grub hoe being used for trail work.