

## OPERATOR COMMENTS

At the end of the evaluation, an informal debriefing was conducted with the evaluation team. The following statements are a compilation of their comments, including those written on their data sheets and those made during the debriefing. These comments are important, but they do not represent the conclusions of this evaluation.

### The Hand Ax

- Least safe.
- Too light.
- Single edge best for safety purposes.
- Not good on big trees with thick bark.
- A small ax will not work well late in the season when the bark is dry.
- It bounces back on spongy bark.
- Too small to cut off larger branches—branches larger than an inch in diameter.
- Takes too much time.

### The Leaf-Spring Tree Girdler (Figure 10)



Figure 10—Fabrication drawings of the leaf-spring tree girdler are available from MTDC.

- Should have a double edge—it is only a right-hand tool now.
- Cutting edge should extend to tip.
- The tool would balance better if thinner tubing were used for the handle.
- Need a “gripping” surface on handle—too slippery when hands are sweaty or when wearing gloves.
- Weight is about right.
- A “T” handle to fit the palm of the hand would be better when using the chisel point to peel bark.
- The guard as now designed is good.
- If the leaf-spring tree girdler is used on big trees with heavy bark, it is an excellent tool to pry off bark after a chain saw makes the initial top and bottom cuts.

### The Li'l Beaver (Figure 11)



Figure 11—The Li'l Beaver has a semi-conical cutting head.

- Works well, but is slow if you have to cut any branches over 2 to 3 inches in diameter.
- Do **not** give to inexperienced people.
- Make cutting head diameter larger.

- Do away with hook.
- Add swivel to shaft where it enters cutting head.
- Put better guard over plug wire.
- If you bend over too far, the engine kills.
- Some heat came through the backpack.
- Operators should wear face masks as the cutter creates a lot of fine sawdust (filing rakers shorter might alleviate this problem).
- Operators should always cut to the right. When cutting to the left, the unit **always** kicks back.
- Vibration was not a problem.

### The Chain Saw

- First choice with crew.
- Was not a “one use” tool—had other utility.
- Quickest with experienced operator.
- Easiest to use to clear brush in heavy undergrowth.
- Best to limb with.
- If girdling larger trees, a combination crew that included a chain saw and a Li'l Beaver working together would be fastest.
- More dangerous than the Li'l Beaver.
- Later in season, with dry bark, the Li'l Beaver would be faster at removing bark.
- Chain saw operators need a good tool to pry away bark on big trees after they have made the top and bottom kerf cuts—the chain-tightening tool does not work well for this.
- On bigger trees, the leaf-spring girdler was a good tool to pry away thick bark after top and bottom cuts were made with a chain saw.

## DISCUSSION POINTS

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If a tree is smaller than 4 inches d.b.h. (diameter breast height), it is most efficient to slash it with a chain saw.

In the 4- to 8-inch-d.b.h. size class, the Li'l Beaver averaged 18% faster girdling times than the chain saw, 47% faster times than the hand ax, and 55% faster times than the leaf-spring girdler.

In the 8- to 12-inch-d.b.h. size class, the Li'l Beaver averaged 16% faster girdling times than the chain saw, 56% faster times than the hand ax, and 69% faster times than the leaf-spring girdler.

In the 12- to 24-inch d.b.h. size class, the chain saw averaged 11% faster girdling times than the Li'l Beaver, 65% faster times than the hand ax, and 86% faster times than the leaf-spring girdler.

The data for the size class greater than 24 inches d.b.h. were incomplete. Although insufficient data were gathered in this size class, the most efficient tool would probably have been the chain saw.

For safety reasons, inexperienced crews should not be allowed to use powered equipment.

The Idaho City crew considered the leaf-spring girdler to be a much safer tool than the hand ax.

Chuck Frank of the Wasatch-Cache National Forest's Evanston Ranger District reports they are using the leaf-spring girdler exclusively on the Evanston and Mountain View Ranger Districts for girdling lodgepole pine in mistletoe control. They consider it an excellent tool for trees with thin bark.



## CONCLUSIONS

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Trees between 4 and 12 inches d.b.h. were most efficiently girdled with the Li'l Beaver. Trees larger than 12 inches d.b.h. were most efficiently girdled with the chain saw. Although the Li'l Beaver was considered safer to use than the chain saw, it was not as versatile, especially when limbing. If trees have many lower limbs, the chain saw will be faster.

For hand tools, the hand ax was more efficient than the leaf-spring girdler for trees up to 24-inch d.b.h. The data were inconclusive for the few larger trees that were girdled. Safety should be a consideration here. All test crew members considered the hand ax a more dangerous tool than the leaf-spring girdler.

For inexperienced crews, powered equipment is not recommended. The leaf-spring girdler appears to be the safest hand tool tested, although it was slower than the hand ax. In skilled hands the chain saw is hard to beat. In addition, the chain saw has many other uses.



## COMMERCIALLY AVAILABLE GIRDLING TOOLS

Prices were accurate during the winter of 1998-1999. The address information for the Ben Meadows Company; Forestry Suppliers, Inc.; Terra Tech, Inc.; Canadian Forestry Equipment, LTD.; and Bailey's is included only in the first reference to avoid duplication.

### Hand Axes

Hand axes are available from many sources. For girdling operations, a single-blade ax of the type referred to as a camper's or woodsman's ax with a 12- to 16-inch handle would work best (price \$8 to \$36).

#### Sources:

Your local hardware store

Bailey's  
PO Box 550  
Laytonville, CA 95454  
Phone: (707) 984-6133  
Fax: (707) 984-8115  
E-mail: baileys@bbaileys.com

Ben Meadows Company  
PO Box 80549  
Atlanta, GA 30366-9821  
Phone: (800) 241-6401  
Fax: (800) 628-2068  
E-mail: mail@benmeadows.com

Forestry Suppliers, Inc.  
PO Box 8397  
Jackson, MS 39284-8397  
Phone: (800) 647-5368  
Fax: (800) 543-4203

Terra Tech, Inc.  
PO Box 5547  
Eugene, OR 97405  
Phone: (800) 321-1037  
Fax: (800) 933-4569

### Li'l Beaver

The Li'l Beaver is a gasoline-powered girdler with a backpack power unit, flexible driveshaft, and semiconical cutting head that straps to the operator's wrist (price \$2,450 Canadian).

#### Source:

Brinkman & Associates  
Reforestation, Ltd.  
520 Sharpe Street  
New Westminster, BC V3M 4R2  
Phone: (604) 521-7771  
Fax: (604) 520-1968

### Chain Saw

A wide range of chain saws are available from many sources.

### Scorp (Figure 12)



Figure 12—A scorp that's big enough for girdling.

A hand tool primarily used in wood-carving to "hollow out" an area. These tools are configured with a short handle attached to a U-shaped tool steel blade. The cutting is done with a pulling motion. Most carving scorps sold in woodworking tool catalogs have a blade that is too small for girdling operations. The largest scorp you will usually find has a cutting blade diameter of just  $\frac{5}{16}$  inch. A larger scorp (3-cm cutting

surface) available from Canadian Forestry Equipment is suitable for girdling work (price \$54.30 Canadian).

#### Source:

Canadian Forestry Equipment, Ltd.  
1540 Trinity Drive, Unit 4  
Mississauga, ON L5T 1L6  
Phone: (905) 795-1610  
Fax: (905) 795-1632  
E-mail: cfe.msga@netcon.ca

### Kyuquot Girdler (Figure 13)

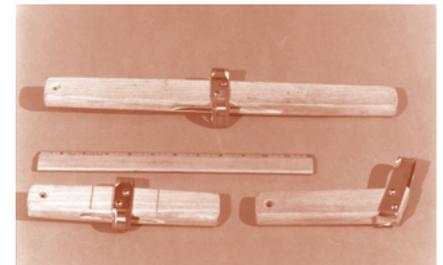


Figure 13—The Kyuquot Girdler is produced in three variations that are sold as a kit.

These tools use a blade similar to the scorp but with a cutting edge on both sides. The U-shaped steel blade is attached to the center of a long wooden handle, allowing the operator to use both hands. A smaller "vertical" cutting tool is also available from this manufacturer. It is configured like a scorp and intended for use with the Kyuquot Girdler. It can get into trunk depressions where the Kyuquot can not (price, set of three, including vertical cutting tool, \$70 Canadian).

#### Source:

Shelterwood Forest Management, Ltd.  
185 Pidcock Street  
Courteny, BC, Canada V9N1P5  
Phone: (250) 338-9717  
Fax: (250) 338-5604

## Ringer Tree Girdler

Another variation on the tree girdling-sized scorp, this tool is used with a single hand. It has a U-shaped steel blade that cuts a  $\frac{5}{8}$ -inch-wide groove through the bark and cambium layer. Replacement blades are available (price \$129.90 to \$156.90).

### Source:

Canadian Forestry Equipment, Ltd.  
1540 Trinity Drive, Unit 4  
Mississauga, ON L5T 1L6  
Phone: (905) 795-1610  
Fax: (905) 795-1632  
E-mail: cfe.msga@netcon.ca

Forestry Suppliers, Inc.

## Chain Girdlers (Figure 14)



Figure 14—This chain girdler uses two parallel lengths of cutting chain.

These tools are made of two parallel lengths of chain saw chain with handles on each end. The chain is brought around a tree trunk and then worked

back and forth by the operator to saw the bark. The operator will have to move around the tree at least once to complete the girdling. The best of these tools have more than one parallel length of chain with large comfortable handles. Many chain girdlers featured in outdoor catalogs are “pocket saws” for campers and are not suitable for a serious girdling operation (price \$54.30 Canadian).

### Source:

Canadian Forestry Equipment, Ltd.  
1540 Trinity Drive, Unit 4  
Mississauga, ON L5T 1L6  
Phone: (905) 795-1610  
Fax: (905) 795-1632  
E-mail: cfe.msga@netcon.ca



## GIRDLING TOOLS THAT ARE NOT COMMERCIALLY AVAILABLE

### Leaf-Spring Tree Girdler

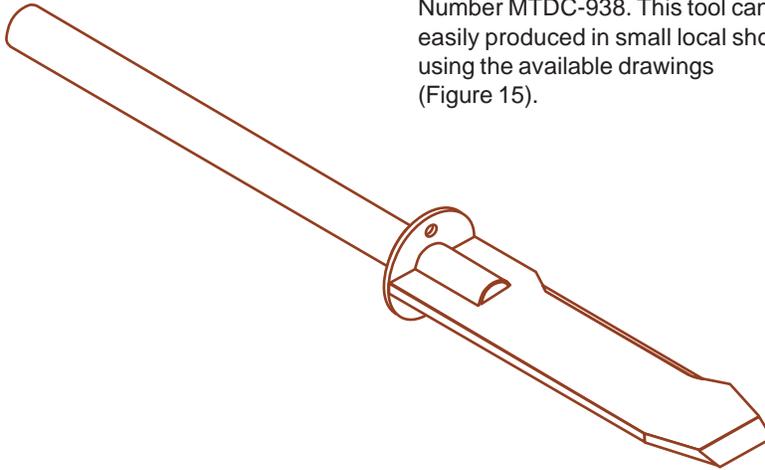


Figure 15—The leaf-spring tree girdler is not commercially available, but can be fabricated from available drawings. It is a safe tool for inexperienced seasonal girdling crews.



This tool was designed by Chuck Frank of the Wasatch-Cache National Forest's Evanston Ranger District. Drawings are available from MTDC. Ask for Drawing Number MTDC-938. This tool can be easily produced in small local shops using the available drawings (Figure 15).

### Plier Girdlers (Figure 16)



Figure 16—The Vredenburg girdlers are no longer available.

These are pliers-like tools with saw teeth on their gripping surfaces. They are designed to be clamped onto a tree trunk and then rotated around the trunk under hand pressure so that the teeth remove a complete ring of bark and cambium. The Vredenburg Girdler is an example of this type of girdler. The tool is not currently available.

## HAND TOOLS USED FOR GIRDLING

**V**arious hand tools carried by forestry equipment suppliers could be used as girdling tools, depending on the type of bark and tree size. Few tools are designed specifically for girdling operations.

### Tree Scribes

These are single-handed cutting tools with U-shaped blades designed to gouge through bark and leave a mark. They are similar to a scorp. Most cut a kerf only  $\frac{1}{4}$ -inch wide. They would primarily be useful on small-diameter, thin-barked trees (price \$41.50).

#### Source:

Ben Meadows Company  
Forestry Suppliers, Inc.

### Bark Knife-Draw Shave

These are two-handed tools like a drawknife with a slightly curved blade about 12-inches long (price \$37.75).

#### Source:

Bailey's  
Ben Meadows Company  
Forestry Suppliers, Inc.

### Wood Gouge-Bark Spud

A two-handed tool with a 2-inch-wide wedge blade and 18-inch handle. It is used to peel bark from logs (price \$31.95).

#### Source:

Ben Meadows Company  
Forestry Suppliers, Inc.

### Swedish Brush Ax-Clearing Ax

A chopping tool with a 20- to 30-inch-long handle and a replaceable blade (price \$25.75).

#### Source:

Ben Meadows Company  
Forestry Suppliers, Inc.  
Terra Tech, Inc.

### Machetes

This tool has many variations. The safest machetes for girdling would be those with shorter blades. Machetes are a very dangerous tool in the hands of inexperienced crews (price \$16 to \$23).

#### Sources:

Ben Meadows Company  
Forestry Suppliers, Inc.  
Terra Tech, Inc.  
Many others

### Ontario SP8 Survival Machete (Figure 17)



Figure 17—The Ontario SP8 Survival Machete is safer than a full-size machete.

This tool has a  $\frac{1}{4}$ -inch-thick, 10-inch-long blade with a flat end for prying. The top of the blade has saw teeth. The tool's overall length is 15 inches. It comes with a belt sheath.

This tool would be much safer to use than a full-size machete, but is too light to effectively girdle larger trees. It may be an excellent tool for chain saw operators to use when prying bark (price \$45.95).

#### Source:

Forestry Suppliers, Inc.



## About the Authors

**Bill Kilroy** has a bachelor's degree from Montana State University, Bozeman, MT, and has done graduate work at Golden Gate University, San Francisco, and at the University of Montana in Missoula, MT. He began his Forest Service career as an engineering draftsman at MTDC in 1980 and has worked on many of the Center's projects since then. Now he is the Forest Service's COMSEC custodian, coordinating the use of GPS receivers that have been encoded with military codes for increased accuracy.

**Keith Windell** is a Project Leader for reforestation, fire, and residues projects. He has a bachelor's of science degree in mechanical engineering from Montana State University, and has an extensive field background. He has worked for the California Department of Forestry, USDI Bureau of Land Management, and the USDA Forest Service.

## Library Card

Kilroy, Bill; Windell, Keith. 1999. Tree girdling tools. Tech. Rep. 9924-2809-MTDC. Missoula, MT: U.S. Department of Agriculture, Forest Service, Missoula Technology and Development Center. 15 electronic p.

Describes an evaluation of four tools that were used to girdle trees in steep terrain on the Boise National Forest's Idaho City Ranger District. Girdling severs a ring of bark and cambium around a tree's trunk, killing the tree. The girdlers that were evaluated included a hand ax, a prototype two-handed cutting tool fashioned from a leaf spring, a commercially available power girdler with a rotary cutting head (the Li'l Beaver), and a standard chain saw. Trees between 4 and 12 inches diameter breast height (d.b.h.) were most efficiently girdled with the Li'l Beaver. Trees larger than 12 inches d.b.h. were most efficiently girdled with the chain saw. For hand tools, the hand ax was more efficient than the leaf spring girdling tool. The report lists suppliers for girdling tools.

Keywords: chainsaws, chain saws, forestry practices, hand tools, ringing

### Additional single copies of this document may be ordered from:

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Missoula Technology and Development Center  
Building 1, Fort Missoula  
Missoula, MT 59804-7294  
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IBM: pubs/wo,mtdc  
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