Two Tree Climbing Techniques for Wildlife Tasks

Martin S. Lowney,[1] *Mississippi Cooperative Fish and Wildlife Research Unit, P.O. Drawer BX, Mississippi State, MS 39762*

Edward P. Hill, *U.S. Fish and Wildlife Research Unit, Mississippi Cooperative Fish and Wildlife Research Unit, P.O. Drawer BX, Mississippi State, MS 39762*

David E. Steffen, *Mississippi Department of Wildlife Conservation, P.O. Box 451, Jackson, MS 39205–0451*

Abstract: We modified top-rope and lead-climbing techniques to develop safe, efficient methods for climbing trees. Two individuals, the climber and belayer, were required for each technique. An 11-mm belay rope, tree pruners saddle, tree climbing gaffs, adjustable lineman's pole strap, and 2.54-cm tubular webbing were required. Top-rope climbing was favored over lead-climbing, and was preceived as substantially safer. Bark characteristics of tree species affected climbing difficulty. Both climbing techniques have application in forestry, botany, and wildlife research.

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Tree climbing is necessary in many wildlife management and research tasks. Climber safety is an important consideration, and safe procedures for making repeated ascents are needed. Lead-climbing has been used to ascend tall trees (Eversole 1954) and top-rope climbing was described by Lyman and Riviere (1975) and Lowney (1987). Both techniques involve 2 individuals and use a rope attached to the climber's waist. In lead-climbing, the rope follows the climber and is attached to the tree by carabiners at intervals during the ascent to break possible falls. In top-rope climbing, the rope is secured above the climber and is retrieved as the ascent is made to prevent a fall. We evaluated top-rope and lead-climbing techniques to climb tall trees safely and efficiently while searching for wood duck (*Aix sponsa*) nests in mature bottomland hardwoods.

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[1]Present address: U.S. Department of Agriculture, APHIS, ADC, P.O. Drawer FW, Mississippi State, MS 39762.

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Methods

We used padded tree climbing gaffs (72 mm) buckled to the feet and lower legs for both climbing techniques. A tree pruner's saddle with an adjustable lineman's pole strap was buckled around the waist and buttocks (Fig. 1A). A bowline knot was tied in 1 end of the rope through a metal carabiner ring that was locked into the waist portion of the pruner's saddle.

In top-rope climbing, a 7.0–14.2 g (0.25–0.50 ounce) lead bell sinker attached to a size 7 brass barrel snap swivel was cast over a fork or sturdy branch above the cavity using a 2.6-m (8.5 ft) surf rod and spinning reel with 7.7k (17 lb) test line. The sinker was lowered to the ground, removed, and a light nylon cord attached to the swivel. The nylon cord was retrieved, pulling the climbing rope back through the fork to the ground (Fig. 1B), thus providing the climber with a rope above him that was secured and controlled from the ground.

Figure 1. Equipment used in top rope climbing technique for cavity inspection: a tree pruner's saddle with pole strap (A), a climbing rope extended above a fork or branch above the cavity (B), a friction point on the climbing rope at ground level (C), and the body belay (D).

In lead-climbing, the climbing rope was passed through carabiners snapped into loops of nylon webbing around the tree at about 3-m intervals during the ascent. The rope slides upward through the carabiners as the climber ascends.

The second member of the climbing team (the belayer) wrapped nylon tubular webbing around his waist and secured it with an overhand knot, secured a loop of webbing around the base of a sturdy tree, and connected each piece of webbing by a carabiner, thus anchoring the belayer. Another loop of webbing was secured to the base of a tree between the belayer and cavity tree, and connected to the belay rope by carabiner to provide friction on the climbing rope between the belayer and tree fork in top-rope climbing (Fig. 1C), and between the belayer and climber in lead-climbing. A body belay was achieved as the climbing rope was passed behind the back (Fig. 1D). As the climber ascended the tree, the belayer took up slack in top-rope climbing or played out rope in lead-climbing using belay technique (Lyman and Riviere 1975, Anonymous 1976). The reverse belay was used when climbers made their descent. It was critical for safety that the belayer kept both hands on the belay rope and was continuously prepared to prevent or break a fall should it occur.

With each climbing technique, the pole strap was passed around the tree and snapped into a saddle ring on the opposite side of the pruner's saddle. The climber walked up the side of the tree. After inserting the tree climbers' gaffs into the tree bark, the climber took several vertical steps and lifted the pole strap upward. The process was repeated until the cavity was reached.

When a branch had to be passed during the ascent, a lanyard with large safety snaps was passed over the branch, around the tree, and snapped onto each saddle ring. The pole strap under the branch was disconnected, moved above the branch and reconnected, then the lanyard was disconnected and the ascent continued.

When casts missed the desired location, the bell sinker was lowered to the ground to be disconnected. Otherwise, the sinker would occasionally tangle the monofilament line among tree branches during retrieval for the next cast. The line should not be pulled to free the bell sinker because the sinker could ricochet towards the person pulling the line and cause serious injury.

Results and Discussion

Six climbers used the lead-climb and top-rope techniques to ascend 5 and 134 live trees, respectively. The lead-climb technique caused anxiety among climbers because of the potential to fall twice the distance to the uppermost safety carabiner (3–10 m) before the fall was broken. In contrast, top-rope climbers were confident that the belay rope would hold them should they slip. Top-rope climbers also could rest in the pruning saddle on a tightened belay rope at any point during an ascent or descent, whereas lead climbers could rest only at intervals where safety carabiners were attached. Moreover, the attachment and removal of carabiners in lead-climbing was time consuming.

Belayers for lead-climbers were concerned about breaking a fall once its velocity had increased until the rope tightened, whereas belayers were confident they could prevent top-rope climbers from falling more than 0.5 m. Falls without injury occurred on several occasions with lead-climb and top-rope techniques to a distance of ≤2 and 0.5 m, respectively. Simulated falls near the ground verified the advantages top-rope belayers have over lead-climb belayers in preventing falls.

In addition to building climber confidence and being more comfortable, top-rope climbing provided a means of lowering a climber, which was complicated and difficult in lead-climbing. Under supervision of an experienced team member, inexperienced climbers could readily ascend trees using the top-rope technique. Its clear superiority over lead-climbing accounts for its disproportional use in our evaluation.

Climbing difficulty varied with tree species and number of branches over which the climber had to pass. The climber had to insert the gaffs forcefully into trees with hard smooth bark (e.g. sycamore [*Platanus occidentalis*], beech [*Fagus grandifolia*]). Some trees had very hard rather smooth bark (e.g. water oak [*Quercus nigra*], willow oak [*Quercus phellos*]). Caution was exercised on these trees because shallow penetration of the gaffs sometimes caused the climber to slip. Trees with loose shaggy bark (e.g. shagbark hickory [*Carya ovata*]) had to be climbed meticulously as the climbing gaffs often shredded bark segments and stripped loose bark during the ascent. Trees with medium to soft deeply textured bark (e.g. sweetgum [*Liquidambar styraciflua*], green ash [*Fraxinus pennsylvanica*] swamp chestnut oak [*Quercus michauxii*], black willow [*Salix nigra*], and baldcypress [*Taxodium disticum*]) were easiest to climb.

Climbing time varied according to the height to the cavity and the number of branches passed. In top-rope climbing, the entire operation, from casting the weight to moving to the next tree, averaged 1 hour per tree for heights about 12 m and involving 1 or 2 branches to pass. Some of the taller (>20 m to the cavity) multiple-branched trees took several hours to climb. Moving the climbing equipment from tree to tree in a 76 × 44 × 51-cm wooden box mounted on the rear carrying rack of an all-terrain vehicle increased the number of trees that could be climbed in a day.

These tree climbing techniques are applicable in research and management of raptors (Accipitridae), owls (Tytonidae and Strigidae), fishers (*Martes pennanti*), and tree squirrels (*Sciurus spp.*). Also, the techniques are suitable in forestry and botany research where researchers need access to fruits and flowers.

In 1985, the climbing equipment, including hard hats, cost approximately $300. Equipment can be purchased from suppliers of forestry and mountaineering products.

Literature Cited

Anonymous. 1976. Military mountaineering: training for combat. Training Circ. 90-6-1. U.S. Dep. Army, Washington, D.C. 135pp.

Eversole, K. R. 1954. Using the climbing rope and saddle in forestry. J. For. 52:285–286

Lowney, M. S. 1987. Availability and use of natural cavities for wood duck production in bottomland hardwood forests in the lower Mississippi flyway. M.S. Thesis, Miss. State Univ., Starkville. 52pp.

Lyman, T. and B. Riviere. 1975. Mountaineering and rock climbing. Winchester Press, New York. 213pp.