Two-Tree Systems

There are several hoisting systems that suspend loads between two trees instead of from a single tree. Often suitable single trees are not easily found, and with two trees potentially more weight can be lifted.

The simplest two-tree method is to throw each end of a rope or cord over two limbs, tie off one end to the tree, attach a light load in the middle, and haul back on the other end of the rope until the load is suspended (Figure 10). Be sure to throw the rope over limbs as high as possible, since there will be considerable sag to the line and it may be difficult to lift the load high enough. Depending on the amount of weight being lifted, various types of rope can be used. Parachute cord may work for very light loads, but it is tough on hands because of its small diameter and tendency to stretch. Manila rope and mountain-climbing accessory cords are good choices.

All that is needed for this basic method is rope. Because there is no mechanical advantage and because of friction, load lifting is difficult. It is best suited for light loads, 20 to 50 pounds.

A variation on this technique increases load-lifting capacity. Throw one end of the rope over a limb and tie it off as previously described. Instead of throwing the other end over a limb in a different tree, drape a pulley block over the limb of the second tree as described for the single-tree method, with the main haul line threaded through it (Figure 11). Attach the load to the main haul line and pull the end of that line to lift the load. Tie off to the tree. The weak link in this system is the pulley draped over the limb. But, since the block is close to the tree trunk the branch is stronger there than 4 feet out as required for the single-tree method described earlier.

When mechanical advantage hardware is used with this technique, use strong, nonstretch rope and quality blocks and other equipment. Also, the two trees should be at least 10 inches in diameter to prevent them from pulling together.

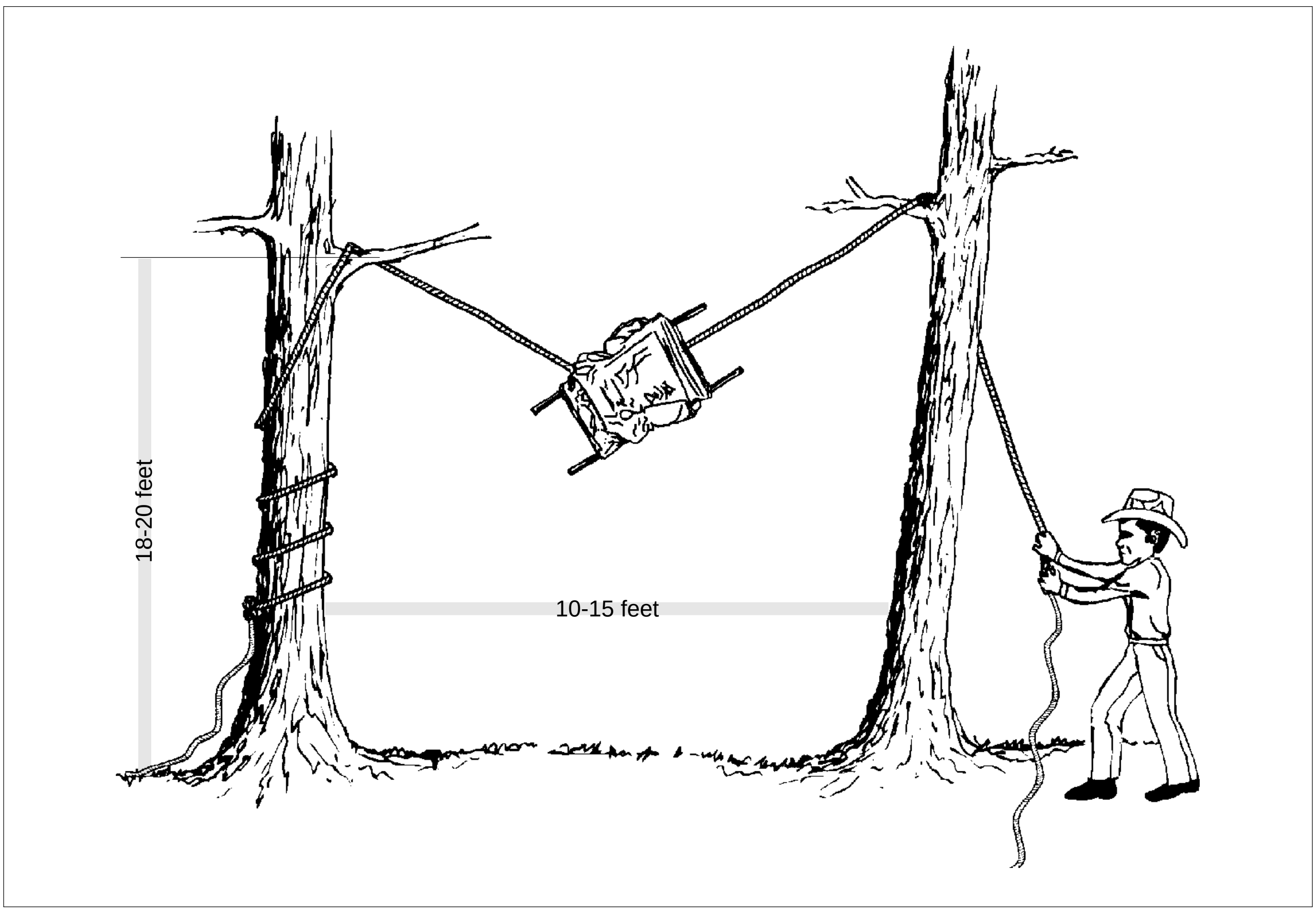

Figure 10.—Basic two-tree method.

Suspending a Support Pole or Cable Between Two Trees

The most popular and time-tested technique for heavier loads involves suspending them from a pole between two trees (Figure 12). Many of the permanently installed hoists utilize this technique, and heavy poles mounted with steel J-hooks and bolts can support an entire elk carcass. However, the low-impact techniques described in this report should not be used for such heavy loads because the support poles are not as securely mounted and the diameter of the poles is less than those typically used for the permanent installations.

Most popular is suspending a pole about 15 to 18 feet high between two trees. Getting the pole that high in the air without climbing the tree has left many people scratching their heads. One way is to place one end of a 15- to 20-foot pole, which should be at least 6 inches in diameter, in the crotch of one tree, then raising the other end using a rope and pulley draped over a limb in the other tree. Once the pole is raised to the desired height, securely tie off the lift rope around the tree. For added safety, throw some additional rope around the pole to help secure it to the tree. Lift the load by means of a second haul line thrown over the pole, or through preattached pulley systems. Winches, fence stretchers, or portable pullers can also be used to help raise the load.

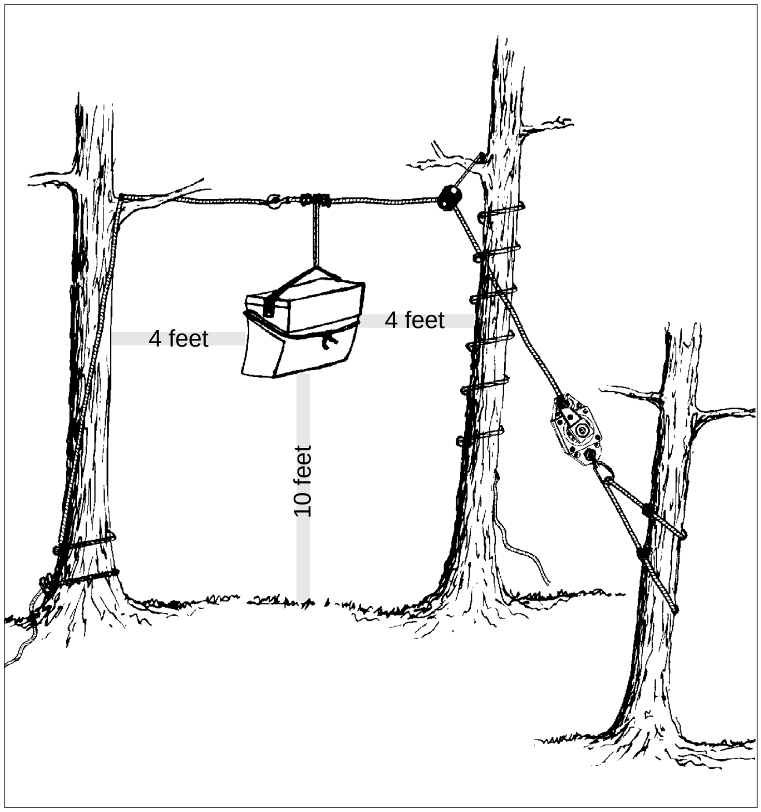

Figure 11.—Two-tree system with block.

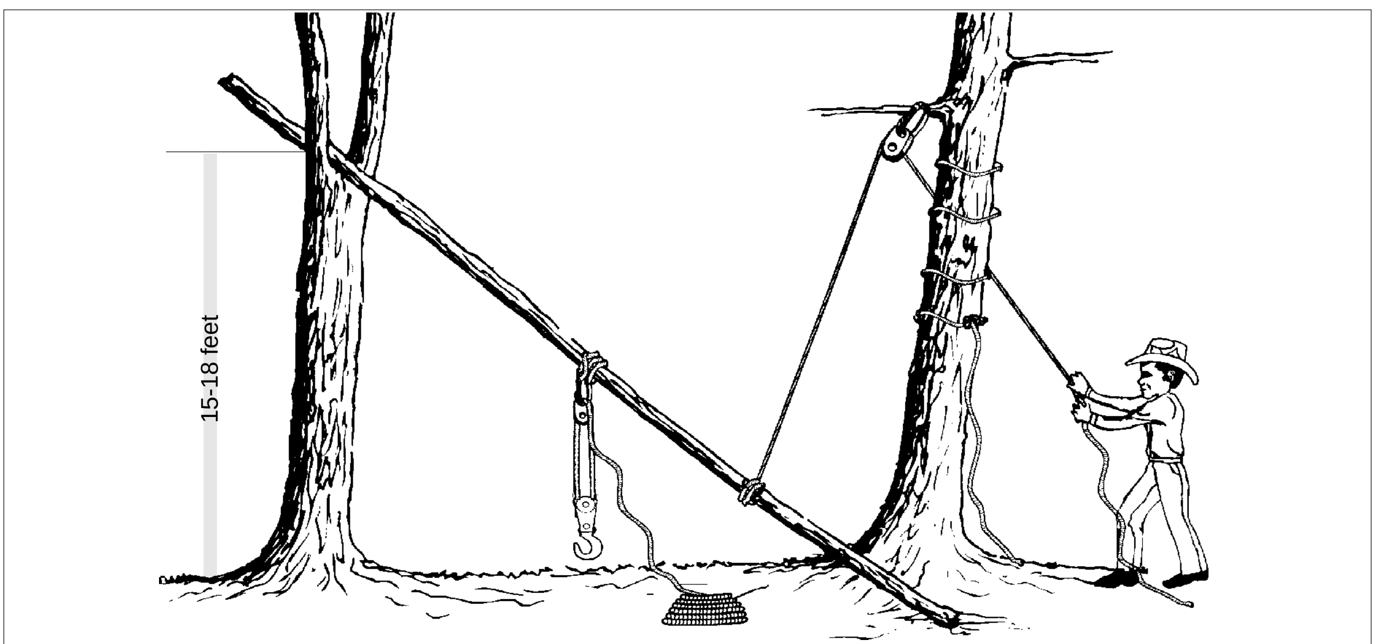

Figure 12.—Lifting a support pole.

A second, more secure way to raise the support pole is to first place one end in a crotch as just described. Then lash a second pole, 15 to 20 feet long, to the cross pole at a right angle (Figure 13). Carefully raise this structure against the second tree, like half of a football goal post, tying the vertical pole off securely to the second tree. Lifting all this weight may be difficult, so two or more people, or assistance from a block and tackle will help. Don't let the end of the pole in the tree crotch fall out. Erecting three poles, like an entire football goal post, is another possibility if the team is there to help lift it into place.

What should you do if there are no suitable poles handy or no crotched trees near your campsite? Here, stringing a rope or cable between two trees, with a second haul line attached, works very well (Figure 14). People who have used this technique have found that the support line stretches and sags, so attach the rope extra high, 18 to 25 feet. Also, the support cable with load attached tends to pull the two trees together, so the trees should be at least 10 inches in diameter. Heavy loads can be lifted with this method.

Some sag in the rope is beneficial. The greater the angle of deflection or "sag" in the line, the greater the load capacity. Let's use 5-mm accessory cord with a breaking strength of 5.0 kN (1,124 pounds) as an example. If the distance between trees is 15 feet and only 1/2-foot of sag, the line will only support 150 pounds. With 1 foot of sag, capacity increases to 300 pounds, and 2 feet of sag increases the breaking strength of the support rope to 600 pounds. Table 1 illustrates load capacities with other variables.

Rope used as a support line should have limited stretch. Five-mm climbing accessory cord and manila packstock lash rope are good choices. Another option is a 15-foot length of 3/16-inch flexible 3x19 strand core wire rope with looped ends and cable clamps to stop sliding. Tie ropes to each end of the cable and tie off around the trees.

To install, first throw the rope over limbs on each tree, 18 to 25 feet high. Pull the heavier support line, with separate block and tackle attach as desired, into the air. Tie off one end of the line and hand-tighten the other end before tying it off.

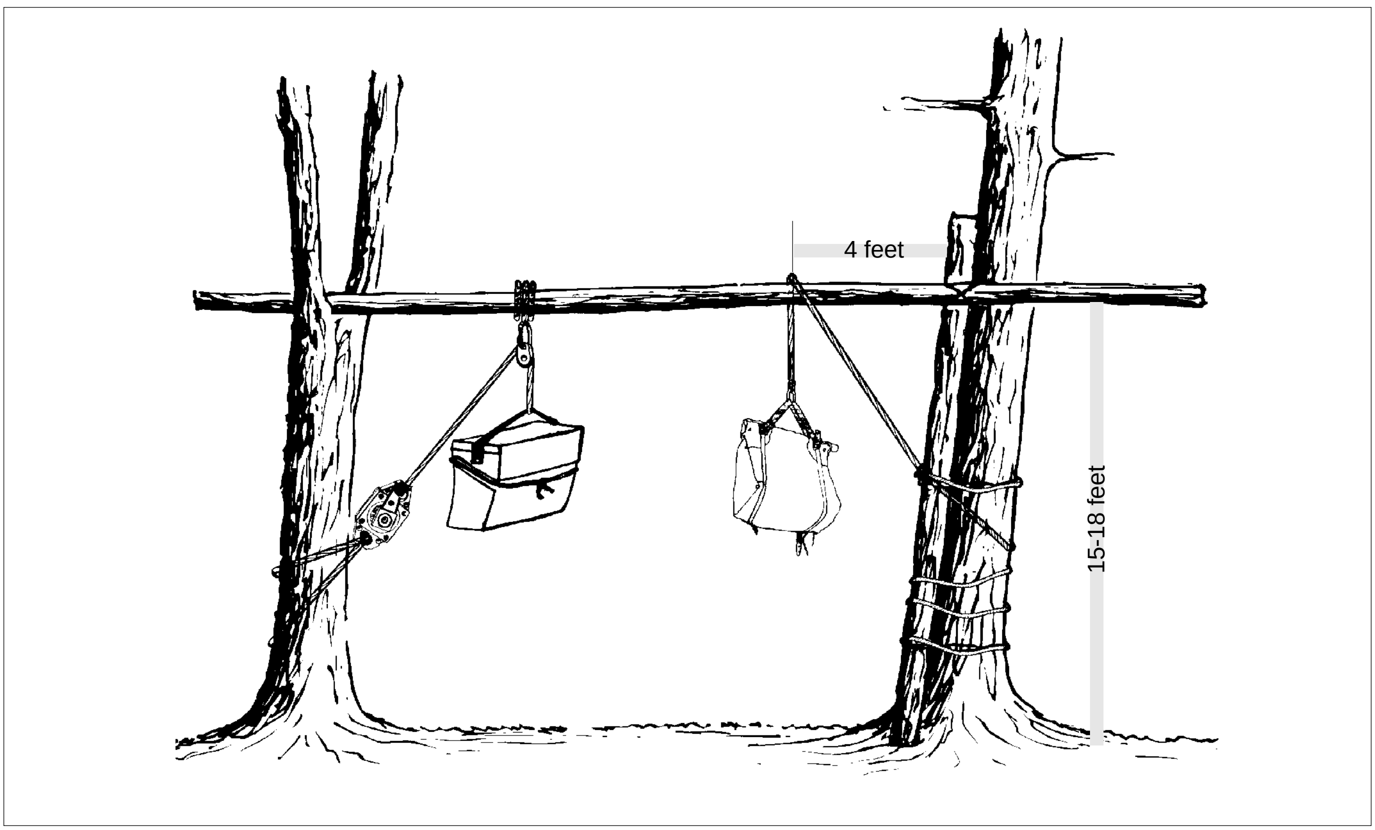

Figure 13.—Supported cross member.

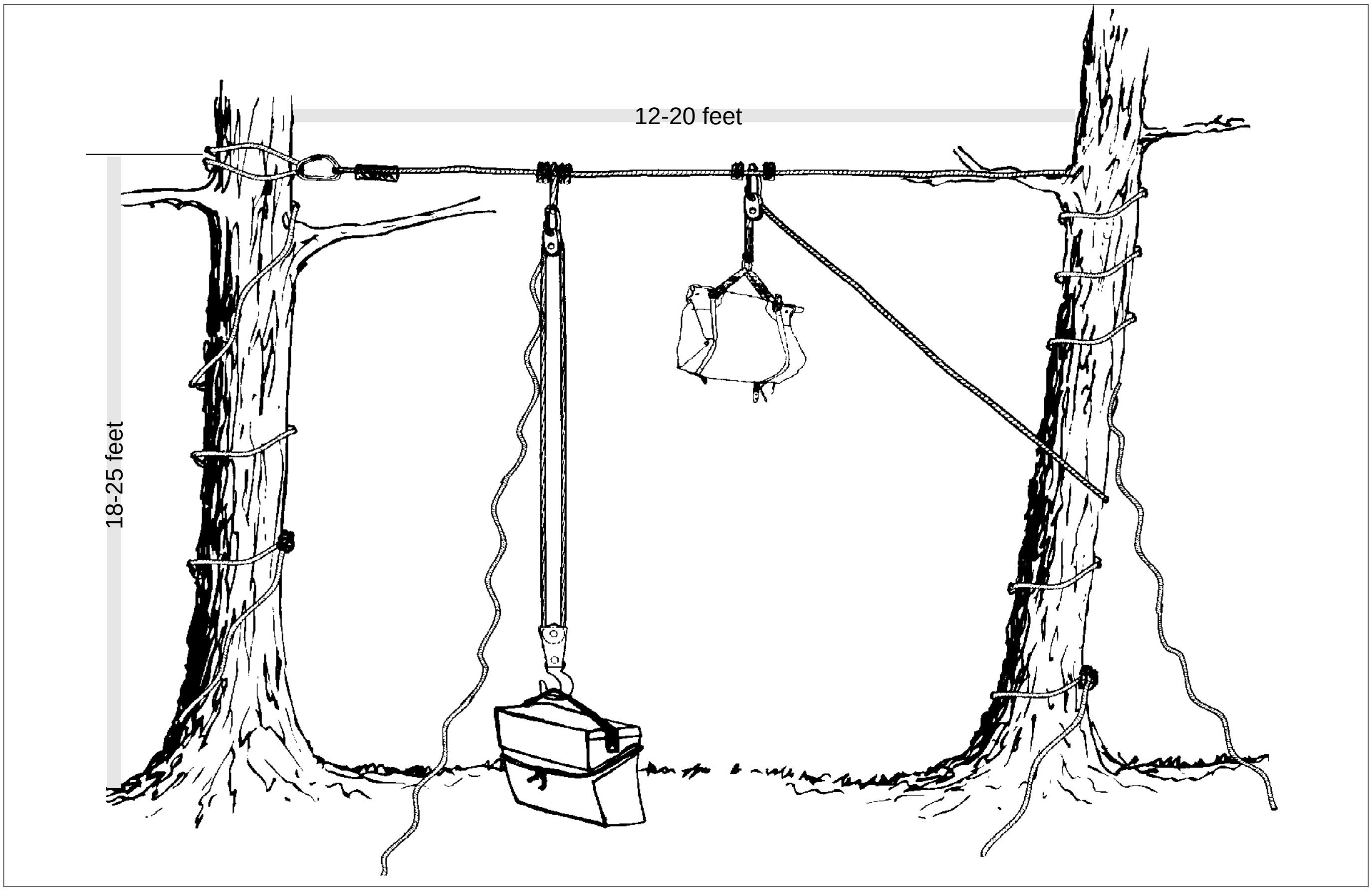

Figure 14.—Cable between two trees. This method also works well with accessory cord instead of cable.

Table 1.—Load capacity of 5-mm climbing accessory cord.

Deflection in Feet at Mid-Span	Distance Between Trees					
	5 Feet	10 Feet	15 Feet	20 Feet	25 Feet	30 Feet
0.5	450.3	224.9	149.9	112.4	89.9	74.9
1	905.2	450.3	300.0	224.9	179.9	149.9
1.5	1368.7	676.9	450.3	337.5	269.9	224.9
2	1844.8	905.2	601.2	450.3	360.1	300.0
2.5	2335.8	1135.6	752.8	563.5	450.3	375.1
3	2841.5	1368.7	905.2	676.9	540.8	450.3