

LOGGING SMALL TIMBER ON SMALL TRACTS WITH SMALL EQUIPMENT

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Colorado Tree Farmers, and land owners with “Forest Ag” plans or “EQIP” contracts to implement are often thinning, selectively cutting individual trees or small patches, which means removing many small trees and a few large ones. Removal of logs must be done with minimal damage to the residual stand, which requires a small maneuverable skidding machine. Yet, it should, ideally, be able to skid the largest logs with the leading end lifted off the ground to minimize soil disturbance and rutting.

The terrain the trees are to be removed from varies from flat to very steep and sometimes rocky. The skidding machine itself can operate on moderate slopes if the soil is stable. Removing trees from steep slopes or lesser slopes on easily erodible soils calls for the capability to winch logs up or down slopes while limiting the machine's movement to skid roads, ridge tops, etc. where soil disturbance is minimized and erosion controllable.

When the owner is doing the work himself, it is usually performed on weekends or intermittently, which suggests that the machine must be available at any time and on short notice. This effectively rules out renting or leasing. If the machine is owned and available on the property all the time, it should be capable of performing other chores to help earn its keep. This could include snow removal, minor road maintenance, landscaping and loading.

This suggests the following criteria:

- Maneuverable
- Four wheel drive
- Powerful enough to handle largest logs
- Able to lift leading end of logs off the ground with the 3-point hitch
- Able to lift the largest 8' log with forks on front bucket (15" x 8' green log = approx. 500 lb.)
- Adaptable to steep rocky terrain (winch with long reach)
- Affordable

Small to mid-sized four wheel drive farm tractors equipped with skidding winches meet this criteria. A skidding winch is a unit which mounts on standard 3-point hitches common to farm tractors. It houses a winch drum, usually vertically oriented, driven by the tractor's power-take-off (PTO) shaft on small tractors, or a hydraulic motor on larger units. The winch cable is usually fed off the drum upward then through a fairlead 5' or 6' high, which provides lift when winching in logs. The back side of the housing is the 'blade', which shields the tractor and tires from the logs. Midway up on the blade is a row of notches to receive the choker chains.

Disclaimer: *The following discussion is not intended to be an endorsement of the specific brands and models shown or discussed here. The photos used in this article were taken by the author of equipment used on projects he is involved with. This equipment is representative of small to mid-sized tractors with skidding winches that have proven themselves capable and efficient movers of small timber.*

Representative of the small end is this 20 h.p. Kioti brand tractor with the smallest Farmi brand winch, model JL290. This winch ships with 156' of 5/16" wire rope with a 6400 pound pulling capacity. It can carry 230' .



The log shown here is about the maximum weight that this equipment can skid while keeping the front end of the log off the ground. This is essential to minimize soil disturbance and rutting that can cause erosion.

This small tractor is capable of pulling this load uphill.





Representative of the mid-sized equipment is this 60 h.p. John Deere tractor with a mid-sized Uniforest brand winch, model 40E. This winch ships with 230' of 7/16" wire rope with a 8800 pound pulling capacity. This combination can handle large diameter logs in long lengths.



Skidding winches at the small end of the scale are usually driven by the tractor's PTO. Control ropes are used to engage the clutch and brake. The width of the 'blade' should be wide enough to extend from center line to center line of the back tires or more. This prevents logs from sliding up under the tractor and minimizes tire wear.

Common to both is the hardware on the winch cable. The terminal end is a grab hook. Behind that are 3 to 5 sliders. Choker chains attach to both the end hook and the sliders. A large washer is behind the sliders to prevent them from being jammed into the fairlead.





Choker chains are 4' to 6' in length, with a grab hook on one end and a pin on the other. The pin helps get the chain under the log. It works best if the pin has a slight curve so that it pushes up out of the dirt/duff on the other side of the log. The pin should be 8" to 12" long. The size of the chain must match the grab hook on the end of the winch cable and the notches on the back of the blade.

For maximum efficiency there should be 6 to 8 choker chains so that if 3 or 4 are in use skidding logs to the landing, the same number are in the woods where the choker setter can be placing them on the next turn of logs. When the tractor returns, the empty chokers are set off and the next turn of logs is ready to be attached to the cable via the sliders and winched in.

The pin on the end of the choker also helps thread the choker through the slider. It should be set within 1 foot of the log.





At left we have two chokers set, one on the end hook and one threaded through the slider. These two pieces are ready to be winched up to the blade.

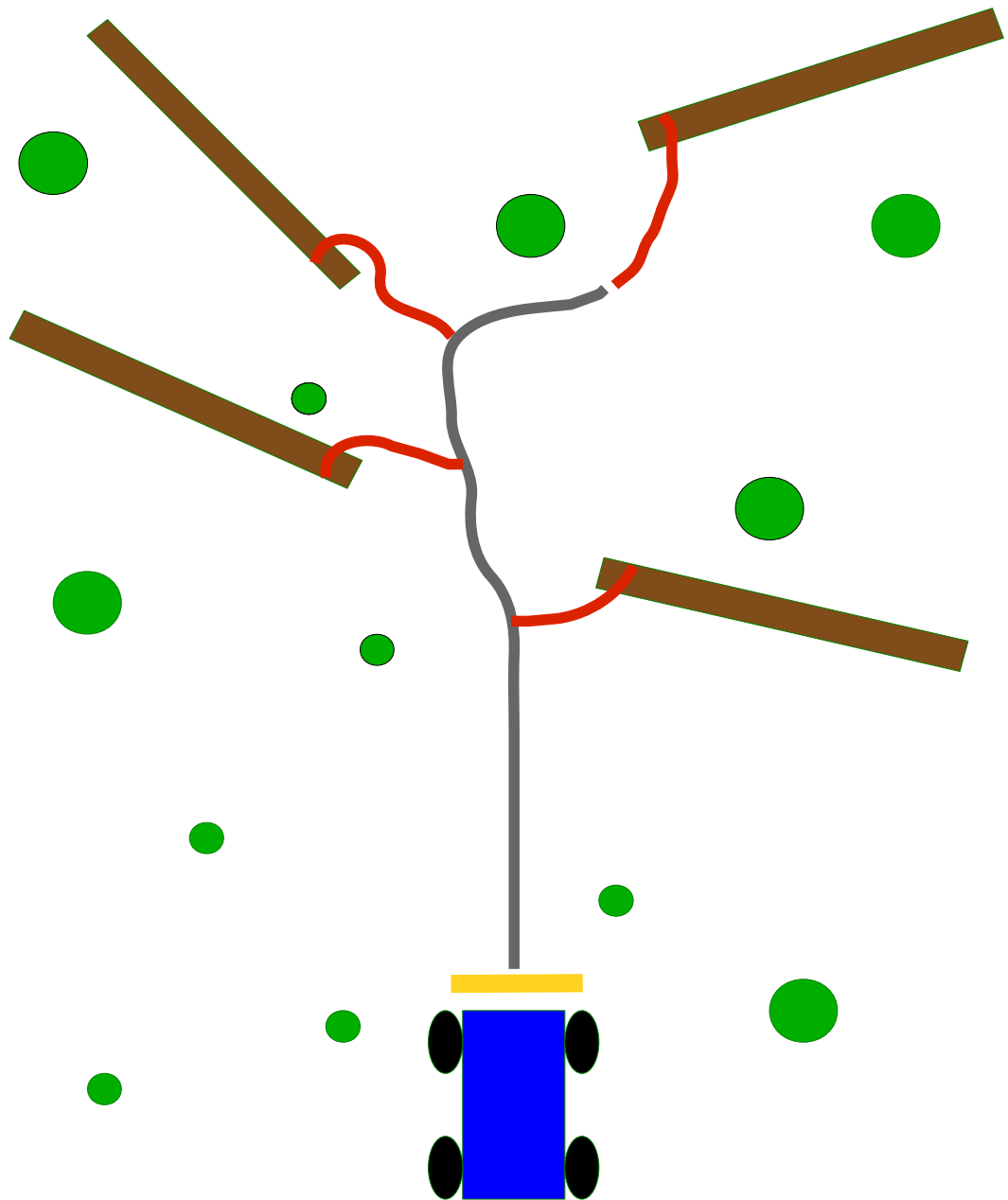
At that point the winch line is slacked, the chains removed from the sliders and hooked into the notches on the back of the blade. When the 3 point hitch is raised the ends of the logs are lifted off the ground. Pulling the logs with the chains attached to the notches in the back of the blade takes the stress off the winch and fairlead.

Choker Setting 101

Two people, tractor operator and choker setter, can maximize efficiency by keeping the tractor moving wood. Tractor idle time is minimized when the choker setter has chokers set on the next turn of logs when the tractor returns from the previous trip. The choker setter can guide the tractor into position then must wait for the operator to lower the Blade. Safety Reminder - If the choker setter approaches the winch to get the second set of chokers off the rack too soon, there is a substantial risk of getting a foot crushed as the blade comes down. After the blade is set, the free chokers are set off, the choker setter pulls the winch line out toward the next set of logs. The operator can assist by staying near the tractor and helping to pull cable off the drum. The end hook on the cable is pulled all the way out and hooked to the choker on the last log. Both men can then attach the remaining chokers to the sliders on the winch line. The choker setter then stands aside and signals the operator that he is in safe spot away from the cable and moving logs. The operator who stands along side the winch can then winch the logs up against the blade and drop them. The chokers are removed from the sliders and the chains placed in the notches on the blade. When the blade is raised by the 3 point hitch the front ends of the logs should be off the ground and they are ready to head for the landing. The choker setter then takes the second set of chokers and places them on the next set of logs.

Safety Reminder – Forestry operations can be hazardous. Care should be taken to never kink the cable or subject it to any abuse that might break individual strands in the wire rope. That could cause nasty puncture wounds, but more importantly, it can lead to failure of the winch cable under a load. When that happens the cable becomes a huge whip that can kill.

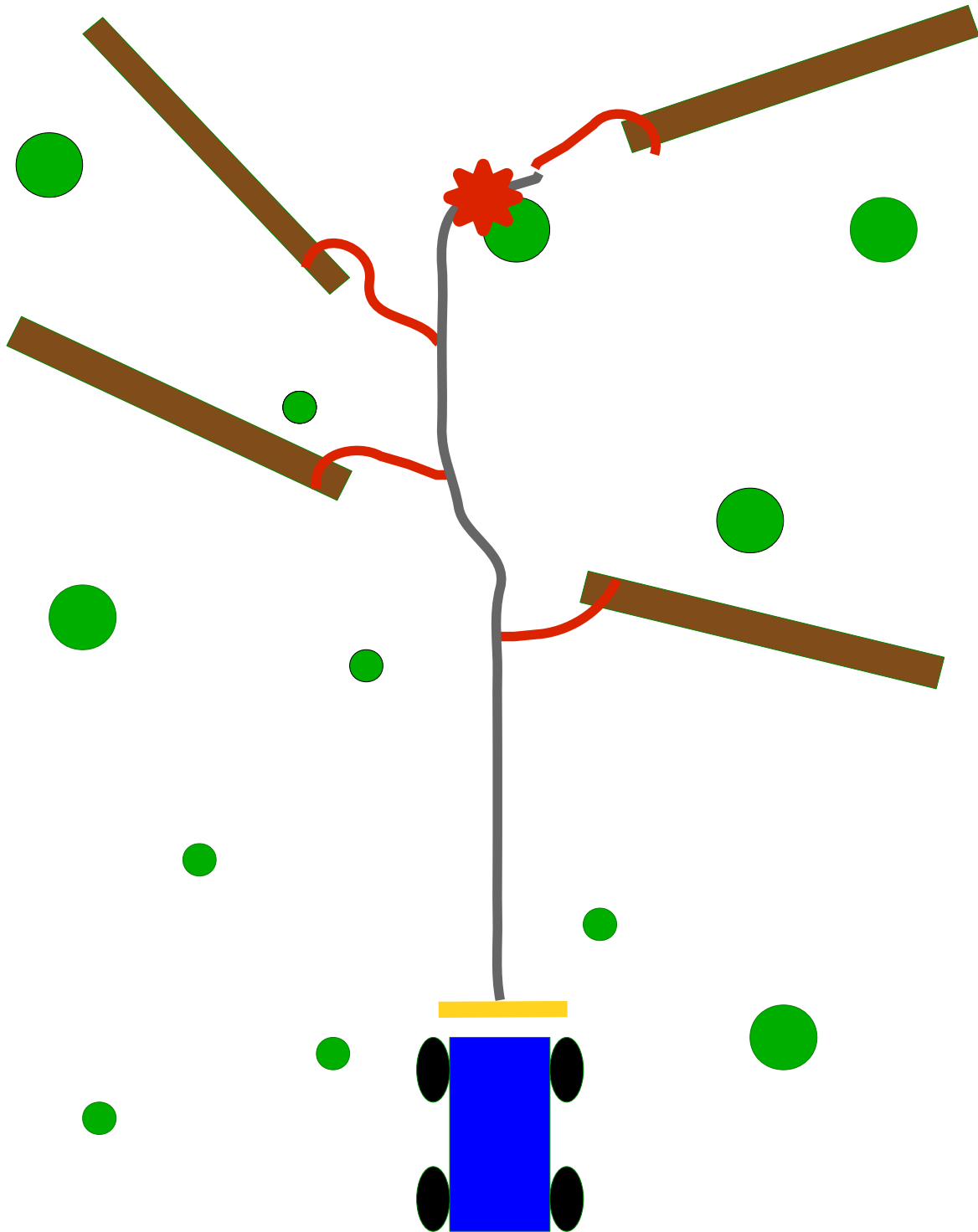
Some thought should go into selecting the spot for the tractor to set up and the selection of the next logs to move.



In this scenario, as the winch line (gray) is pulled in, the line will tend to straighten pulling the logs (brown) toward the center. As the end log comes in it will gather up the logs with chokers on sliders (red), which will straighten out and lay parallel to each other. This works best when the load on each side is balanced. Lighter logs that are not bound up in brush or coming uphill will move first.

Logs will usually slide past the standing leave trees (green) without disturbing the bark as long as it is a tangential pull and the log is clean. Branches should be cut flush with the bark surface so that they don't dig into the bark of the trees that remain after thinning.

In this scenario the last log will not come around the tree easily, if at all. If it does pivot around the tree it will probably rip off a big chunk of bark.



If a log gets hung up, it is usually best to stop pulling with the winch. It may just exacerbate the problem. The choker setter should communicate with the winch operator to stop and not try pulling again until the hang up is cleared. Hand signals or some form of communication is necessary to ensure that both workers are in safe spots before winching resumes.

Cost and Sources

Suitable tractors can be purchased new or used from many sources. Check out www.tractorhouse.com.

New tractors in the 30 hp class appear to be running about \$18,000 as of January 2009. In contrast the same \$18,000 would get you a well used cable skidder, at least 10 years old with over 10,000 engine hours on it. The dedicated skidder would be a more rugged, more powerful machine with greater skidding capacity. But, because it is designed for one thing, which it does well, it is not as versatile or as economical to run as a new farm tractor.

By going for a used tractor, one might be able to buy a little more machine for the same money.

To shop for winches visit www.hud-son.com or similar web sites. They carry the Uniforest and Farmi brands. Prices range from \$3,300 to \$4,000 plus freight and accessories. A local dealer in Colorado is Green Forests, Inc., in Broomfield, 303-450-9295.

Happy skid trails !