

## Practical Bush Gear: The Modern Toboggan

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It would be very nice if you could condense a wall-tent wood-stove camping rig into something that would fit in a 30lb backpack, but you can't. It's just too bulky. That's too bad, because the practicality of this way of bush living is so obvious once you've tried it, that going back to an unheated pup tent in winter is repulsive. You want to bring it, and that means you've got to haul it. I've tried many methods of hauling, from the long skinny traditional toboggans, to plastic pulks, to rolls of polyethylene, but the simplest, cheapest and easiest-pulling rig I've come across is based on using

2 old-fashioned downhill skis.

Think about it. A set of skis has to support a 180lb person in soft and hard snow, it has to last for years, and it has to slide very easily on all types of snow. If it doesn't, it just won't sell. There's a kind of natural selection here. Slow skis don't cut it. Obviously no one is going to sacrifice their state-of-the-art \$600 Ski Magazine wonders to make a toboggan, but yard sales and pawn shops and goodwill stores are plentifully supplied with perfectly acceptable 70s and 80s vintage downhill skis for as little as \$5. You can probably find a set in your parent's garage for nothing. The concept after that is simple: 2 risers, a flat deck between them, and some way of lashing down or containing your load.

The materials are cheap. Besides the skis, construction-grade 3/8" spruce is fine for the deck, and 2x4s are fine for the risers. (Don't use thicker plywood. The deck must allow the runners to twist and flex, and thick plywood would prevent that.) Simple carriage bolts or threaded rod hold it all together (hot-dipped galvanized or even stainless steel if you want to avoid rust), and you can pull it with either a solid tongue or a rope to your harness. Use simple canvas for a "tank" (a containment), or just lash the load on.

The only problem is volume. Skis aren't very long. If you can find a set of 210cm skis you can make the unit long enough to contain a 1 week/2-person camp (if you're ruthless about what you leave behind – always a good thing), but if the skis are shorter or the gear more bulky, 2 sleds are required. This need not be a problem. Check out the photo. It's easy to hitch 2 smaller sleds together with a simple, bombproof hitch, so that the rear sled rides in the tracks of the first. This combination allows you more flexibility. Sometimes you may not want the great big double sled – then you just take one. Also on a route containing many steep uphill grades, it may be a blessing to be able to divide your load in 2. Two sleds will go over small hills and humpty-dumps more easily than will 1 rigid one. And you might want to use one small sled for day trips or gathering firewood or hauling home the huge quantities of fish you're going to catch (!).

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(By the way, there's a trick for climbing steep grades. Take along a 100ft 3/16 line, which is light and useful to have, and a sturdy pulley. Fasten the pulley to a tree, or to a line between 2 trees at the top of the hill, and thread the 100ft towline through it. Then hitch a person to the free end. As they come down the hill, they greatly ease the load of towing the unit up the hill! The long line is also useful in belaying the load going down steep hills.)

One risk I'd like to point out is that children will want to use this rig for a play-toboggan. It works well of course (too well), but it's lethal. If it hit a toddler going at speed – and it goes at a very high speed – it would surely cause an injury. Please don't allow it to happen. This is not a toy.

### Size

I won't go into inch-by-inch details here: the sled has to be tailored to suit your needs. Regarding size, keep in mind the width of your snowshoe trail. Too wide, and one ski will always bog down in unpacked snow. If your grub box was 13" from front to back, then the toboggan would end up being about 16". Keep it as skinny as you can and. (It sounds odd, but the traditional way to make a board toboggan stable was always to make it longer, not wider.) As for length, it depends on the skis, of course. If you're making 2, use one set of 190cm skis, and another about 135cm.

### Materials/Construction

Use fibreglass skis – they're lighter than steel. Make the riser above them out of a spruce 2x4. This is light and strong. Run it full length and round up the front so that the ski-tip is supported – otherwise it'll break off someday. You can lighten the 2x4 by routing out some of the wood to shape it into an "I" beam. (See photo.) I did this on a table saw using a dado blade. A router would work. It's not essential, but weight counts.



Don't use only screws to hold on the skis. It won't work. Use 5/16 hot-dipped galvanized carriage bolts. These will run up through the ski, the 2x4, the deck, the canvas, the gunwale, a washer and into a nut with a lock nut above that. (A drill press is handy here. If you do it by hand, line everything up very carefully.) Use 3 bolts per side. Countersink the heads, at least for the middle bolt, so that it doesn't protrude. Later, seal the heads by melting a ski-repair candle onto them (filling in the hole). If you want to add screws as well (good idea with fibreglass skis), countersink these as well and seal them up.

Again, use 3/8" 3-ply plywood for the decks – no thicker. It is strong enough and allows the unit to flex. Orient the grain of the 2 surface layers across the toboggan. Otherwise it'll splay out. This means a joint (since the ply comes only 4ft wide), but that doesn't matter – the 2x4s hold it all together. The ply is held in place by the bolts, and also by screws holding down the gunwale. Don't cut the ends of the deck off square. Cut them into a shallow point, so that you can hitch 2 sleds together and still turn

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a corner. Make a strong towing hitch by wrapping a piece of 14" x 1 1/2" x 1/8" aluminum strap around the point, having it stick out 1 1/2" or so (see photo). Bolt right through, put on the nut, hacksaw the excess bolt off almost flush, and peen the end over with a hammer so that it'll never work loose. Put a small clevis, or shackle, through a hole drilled 3/8" back from each end, to tie to. If joining 2 sleds, use a piece of cord between the shackles, tied in a loop. This will act like a shear-pin and will break before the rear sled lodges against something and gets damaged.

### Update: Suggested Modification

While using this sled on a trip last winter, I discovered a weakness. The sled had just run down a little slope and buried its nose in a snowdrift. This was no problem, but unknown to me one of the skis had wedged itself in the branches of a low bush, and when I gave a mighty heave to lift the sled clear I broke the front of the sled clean off. It fractured straight across at the point where the deck projects forward beyond the skis.

Don't forget that the grain of the plywood runs across the sled, and that it's 3-ply. That means there is only 1 ply running fore and aft, and that just doesn't supply enough strength. Also the metal strap happened to end just at that point.

I still recommend using the projecting front. To make it strong enough I advise doubling the plywood to a point about 6 inches aft of the front of the skis. Once this is glued and screwed into place flex will be reduced and there will be ample strength. There is no need to fit this extra piece into the riser or the outwale. Simply attaching a plywood plate under the deck, fitting between the risers, will suffice. Remember to allow for 2 thicknesses of plywood (3/4") plus the metal strap for the strap bolts (now 1 1/2" x 3/16 stove bolts).

Having made this repair I used 2 of these sleds on another snowshoe trip (10 days) in deep snow NW of Sudbury, and they stood up to the journey just fine.



A canvas surround, or tank, is a great idea. It adds weight initially, but it prevents snow from being crammed into every nook and cranny of your lashed-down load, and thus ends up saving weight. It also prevents things getting lost. Access to your load is made much easier too, since a simple out-and-back pattern of lines into hooks will hold the canvas in place. You can retrieve or stow items securely in a flash. (This is important. Losing a heavy mitten or a snowshoe or a rolled-up parka is no joke.) The fabric should be stiff. Use 10oz or so, and treat it with paint-on waterproofing. Make it quite tall, so that it overlaps a double-stacked load. Cutting a 60" wide bolt of cloth in half lengthways is about right. Arrange the cut edge to go under the gunwales, and the selvage edge uppermost. You'll have to sew the ends together, probably by hand. I used the seam type that mimics what you see when you hook your hands together, with 2 lines of stitches. To create that, I folded 5/8" of the fabric back, ironed it hard to get it to stay folded, hooked the other similar fold into it, pinned it, and sewed away with waxed linen thread. (see photo) Tedious to do, but strong.

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The gunwales can be spruce. I cut scuppers into them to save weight and allow a place to tie to. I did it on the table saw, but it can be done with a router, or saw-and-chisel. They should be held down with screws as well as the bolts, otherwise they may split under the pull of the tie-down lines. (Drill and countersink. I used #8x 2" deck screws about every 10".) This also holds the canvas down since it is trapped underneath. Round the edges of the scuppers so that the cord won't get cut. Remember to arrange the canvas under the gunwale so that it emerges to the inside, otherwise your tie-points would be covered up.



Use a hook-and-loop tie down system. (Don't use bungee-cord – it performs poorly at cold temperatures and just plain doesn't work as well.) This is fast and easy and secure – especially when your fingers are half-frozen. Make the double-ended hooks from 1/4" copper brake tubing: cut a 4" length and lay it on a flat metal surface. Flatten it gently with a hammer. Pass the ends down a file to remove any burrs. Bend them around to the required shape (see photo). I did this by clamping 1/4" bolts in a vise about 3/16" apart, sticking the piece of copper in between, and bending it around. If the bolts spread, spin a nut on one, and hold them together by drilling 2 holes in a small piece of scrap metal and slip it over the ends. You may have to cut part of the bolt-heads off to get them to lie close enough together.

On one side of the sled, tie a 3/16" cord to the end scupper, and then thread it through the scuppers so that there's a loop about every 14". Each loop should be clove-hitched to the scupper. (This is so when you pull on one loop, all the line doesn't get pulled through from the other loops.) Set a hook into every loop at its mid-point and crimp it so that it stays put. Arrange the hook so that its opening is upwards.

On the other side, tie a 3/16" cord to the end scupper and again loop it through the scuppers to match up with the hooks on the first side. This is what you cinch down on to secure the load. By starting at one end, hooking it in, and tightening as you go, it's easy to make all snug. You need a very long line – start with 50ft. Leave lots extra at the end to allow for large loads.

Before assembly, seal the wood with paint or varnish, thinned a bit to penetrate. This is to prevent the wood from soaking up moisture and getting heavier.

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### In Use

I tow with a belt harness. For all-day pulling it's the best I think. Make sure there's a strap over the back of your neck to stop it pulling down. It should have a buckle so that you can adjust it and remove it easily. Tow via a 4ft cord tied from the back of the harness to a carabiner. This allows you to clip in and out easily. The actual towline length depends on conditions.

You're going to get warm as you pull. Dress in layers. You may want the harness on over your shirt, with your windbreaker overtop. This way as tension goes on the towline, the back of your garment lifts up and ventilation increases.

Good Sledding!