

The Bunyip Level

Nate Downey

Out here in the wild west the tools we use are changing, but basic survival issues remain the same. The pattern used to be: you, your partner, and your six-shooter heading for the nearest watering hole. These days I often find me, my partner, and my bunyip flagging out contour lines for future swales.

Be it a bunyip, an A-frame level, or a transit, the day is near when nearly every land steward will need a tool for measuring slope because (even with all the power of technology) overpopulation, lack of conservation, and almost unbridled pollution are making water supplies exceedingly scarce.

My tool of choice is the bunyip—also called a water level. It is more accurate than the A-frame and less cumbersome than the transit. The only problem is that bunyip use requires two people. The problem is of course, the solution here, since the point of using the level is to create a swale, which is a ditch dug on contour to soak runoff into the ground. And if you've done any swaling lately you'll know that two people can dig a swale in less than half the time it takes one person to dig it. (Dig it!) Levellers and Diggers unite!

You can easily make your own bunyip. You'll need two sticks numbered with equal units of measure, about 40 feet of clear flexible tube, and some wire or string. Any hardware store should have the necessary parts. The free yardsticks you can get are adequate for small leveling jobs, but usually break after a short while. Better would be sturdy wooden or metal sticks (you could craft your own). Attach the two sticks to the ends of the tube using the wire. A few scraps of copper electrical wire with

the insulation still on are just about perfect for this purpose. Make sure the zeros on both sticks are at the top or at the bottom or you will never find level! I like to put the zeros both at the top because then matching measurements to movements is more intuitive: the partner with the lower number needs to move up (to reach level), the partner with the higher reading needs to move downhill. But you can learn to do it in the reverse just as well. All you need now is water.

During my first permaculture course we were told that the best way to fill up a bunyip is to submerge it, because sticking one end of the tube under a hose gives you air bubbles and therefore inaccurate measurements. Since I wanted to start a permaculture landscaping business, this was a major drawback. What was I supposed to do? Slink through a client's home, run their bath, make a bunch of bubbly sounds and emerge five minutes later with a 40-foot hose dripping liquid?

I suggest using a funnel—which you can easily make out of an empty plastic soda bottle if you don't have a kitchen funnel hand. Whether you submerge, pour from a pitcher, fill with a hose, or use a funnel, you will probably have some air bubbles work out of the line. Hold the ends of the tube up and make sure any loops and kinks are out of the tubing. You may have to wiggle and flip the tube around a bit until it clears. You'll quickly learn in doing this that you must keep both ends of the tube covered with your thumbs, or you'll lose a lot of water. This lesson will help you as you start to lay out contours, because bunyip partners must coordinate their movements so as to minimize the loss of fluid.

So flip that funnel upside-down, fill her up and ease down on those groovy contours.

Nate Downey lays out swales with his partner Melissa McDonnell in Santa Fe, NM. He also teaches permaculture design.

Recipe for a Ram Pump

Mollie Curry

We all know that water flows downhill, so it's wonderful if your spring or reservoir is above your house, but what do you do if you've got water, but it's below where you need to use it? You can go to the water, which is what many early settlers did, building near springs and streams, and live with dampness, mold, and maybe tuberculosis; or you can carry the water, or these days more likely pump it up to where you need it (a constant energy cost if you use electricity or fossil fuel); or you can find a higher source of water.

In planning a home and market garden for himself and his wife Geni Stephenson in the mountains of North Carolina, my neighbor Leon Birstein faced just these choices, but being a clever fellow, he found a way to make water flow uphill with very little work: he designed and built a ram pump to move water from a potable spring below the homesite to a reservoir above it.

What is a ram pump and how can it do that? The beauty of a ram pump is that it uses the power of water flowing downhill to raise some of that water above the source. In fact, water can be raised up to ten times the height of the vertical fall between the source and the pump. It's basically a piece of plumbing that makes falling water "bounce" back up. But God, it has been said, is in the details, so read on.

Self-acting ram pumps have been around since 1797, when Joseph de Montgolfier of France invented them. In America, they were widely used from the 1840s until the early 20th



Home-made ram pump submerged in a plastic barrel.

century, when rural electrification provided greater pumping power cheaply. They are gaining popularity again as people grow more concerned about energy conservation and the pollution and harm to wildlife caused by the extraction, transport and use of fossil fuels.

Though a ram pump, like any other mechanical device, takes energy to create, and will wear out eventually, it is a truly appropriate tool because it will capture, over its lifetime, more

photo by Mollie Curry