

The Owner Builder

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Off-grid mountain home

Special feature:
RECYCLE MANIA

Keep an eye on the costs

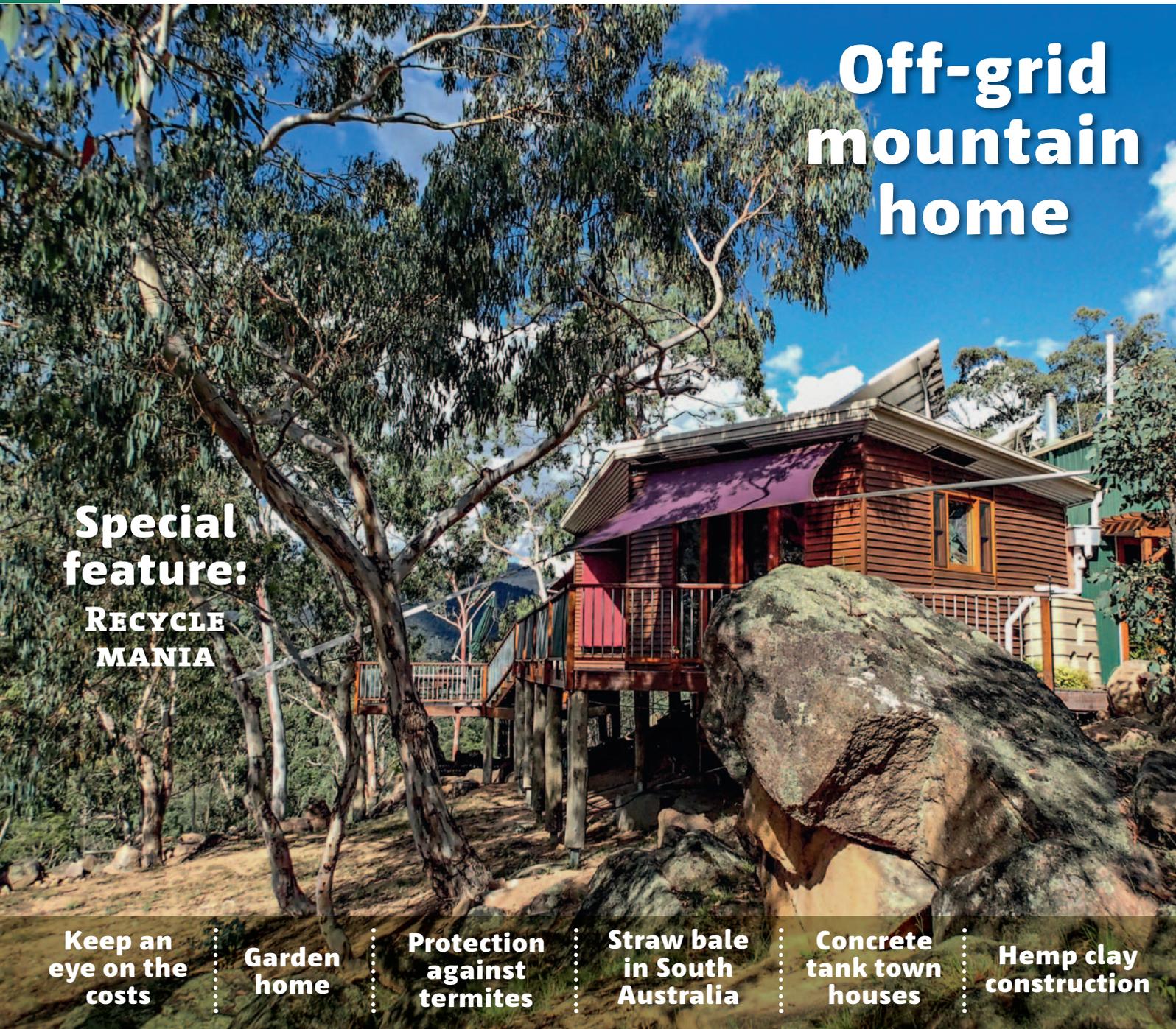
Garden home

Protection against termites

Straw bale in South Australia

Concrete tank town houses

Hemp clay construction





Where we made our stand...

Learning the pros and cons of owner building in Gippsland

We bought five hectares of steep, rocky bushland along a perennially flowing river in East Gippsland. I wanted a river to put a hydro power plant in and to paddle in, Carrie wanted trees and we both wanted mountains. Thirteen years of blood, sweat and tears later, we have what I like to call the 'best deck on earth.' We make a point of sipping our morning coffee out there, listening to the Bundara river flow and the kookaburras call, and marvelling at another glorious Aussie sunrise turning the bush to gold. But it was a close shave there for a while.

BY JEFFE ARONSON

Building from scratch

When we started you couldn't see the river except from on top of a tall granite boulder, reached after crawling through a wombat tunnel through the trees. No roads, no water pipes, no power, no structures, no sewerage, no phone, no local builders, no friends to help, nada.

Surrounded by the beautiful Alpine National Park, we built a shed to live in and work from and installed a micro-hydro power plant in the river.

At first we tried to appease all the various contractors, hardware store owners, delivery drivers, and backhoe operators, all of whom had their own ideas about how to build *our* home (usually involving their personal time frame, skill set, and dusty stuff they happened to have on their shelves for sale). We finally ended up doing it how we wanted.



We designed our passive solar home with 300mm of insulation in the floor and ceiling, 150mm in the walls, adjustable shading for the summer sun and double-glazed windows all around. We got a lot of 'You don't need that, mate' stuff from some of our neighbours. After we finished, during yet another 38 degree summer day when one neighbour literally lived in the river during the day since his cabin was hot as an oven, we invited him over for lunch. As he walked in, his eyes bugged out. 'Mate,' he said, 'did you install air con?'

Another of my neighbours, who built his own mud brick place from scratch, likes to say; 'You want it done right, do it yourself.' Which means you have to learn how to do it in the first place. All of it. You have to become a concrete guy, a carpenter, an engineer, a labourer, a power-plant manager, a brickie and a sparky.

Being a river guide by trade, I hadn't considered the kind of commitment required in building a homestead from scratch. The smarter fellows around these parts actually like doing all that stuff. Me, I'd rather be boating. But there was this hippie dream I had back there in the sixties. So I stuck it out. Thankfully.

Above left: Spacious deck with views to die for is a great area for entertaining friends after a swim on a hot day.

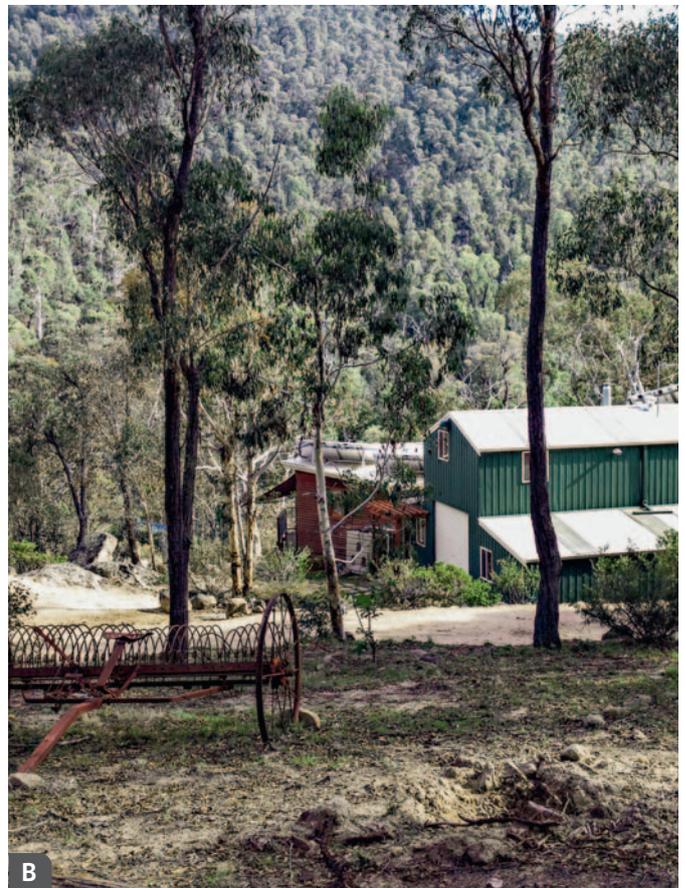
Above right: The first structure was the green 'American barn' with the house added later.

Below: View up to the house from the river. The hydro system weir is just visible.

Shed

We first bought a prefabricated metal shed called the 'American Barn,' with a workshop downstairs and a smaller space upstairs to live in. A bulldozer came in to make a road and flatten a pad for the shed. Then we got a bobcat in to dig trenches to lay the water pipe going up from the river, and then down from the holding tank we put on the road (the higher the better for water pressure). We buried them to protect them from fire, animals, and frost. Plus we didn't want to ruin the view.

We then went through the first of many lengthy processes with the Shire bureaucracy for 'weird stuff,' the grey water system (later it was the micro-hydro and composting toilet).

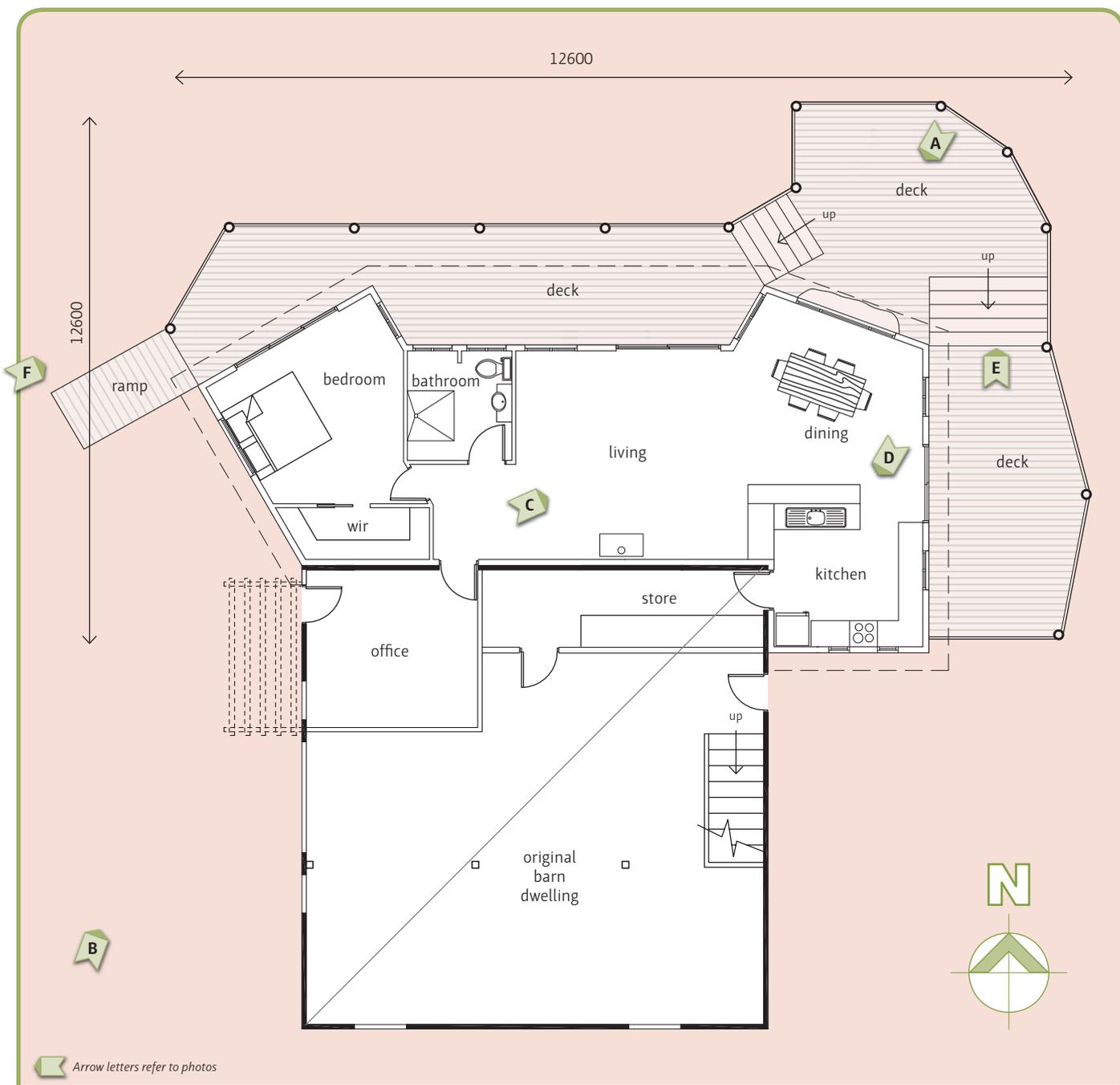


Standalone power

The grid ends about 20 kilometres down the road thus everyone here either has off-grid power or, like Abe Lincoln, reads by candlelight. Not being particularly fond of infernal combustion engines, we went with solar with a low-head micro-hydro backup on the creek.

The permits for the hydro involved the shire, water catchment authority, local Indigenous people, Parks Victoria and Dept. of Environment and Primary Industries. Since I designed it to be 'the most discreet waterworks I've ever seen' (a quote from the catchment authority bloke after a fisherman dopped us in for ruining 'his' fishing hole), in the end everyone was happy.





I moved tonnes of rocks by hand from the creek bed to create a stream side channel. I poured cement with chutes and buckets down a steep cliff to create the intake and weir to pond the water. I installed the original humungous steel hydro using six strong people, then removed it after a lot of issues. I then installed a great little low-head unit from Canada.

We retrofit more solar, bringing it to 1.8 kilowatts. This turns out to be enough to run the house, rain or shine, along with our 2,000 amp-hours of battery storage

(about three days worth). Easy, simple, just works.

After many failures from relying on others, I finally gave in and took two years of alternative energy classes, and have now rebuilt and rewired the entire system top to bottom. With time to potter, I rebuilt the hydro with better flood protection, and now that it's a backup rather than the main power source, we can finally love it.

When the sun shines and the river flows, we use the microwave, cappuccino maker, toaster, vacuum, laundry, power

tools, compressor, you name it. When the hydro is out for maintenance or during brief floods, everything necessary works fine; fridge and freezer, lights, stereo and computers, etc.

Carrie has taken on the task of heading down the hill every couple of days to clear the debris from the blades, I remove the hydro before the spring floods and replace the bearings every couple of years... so be prepared!

Our batteries are sealed gel-mat batteries, and have done well. But they're barely hanging on as we await



Clockwise from above: East deck; living area has a beautiful timber floor; kitchen leads through to store and barn.

the promised land of reliable, safe, and reasonably priced lithium technology batteries. Hopefully within the next couple of years? Flooded ones are the reliable, proven technology, but the sealed ones work just as well and take zero maintenance.

See *TOB 187 Feb/Mar 2015* for full details of our power setup.

Waste systems

We upgraded from a portable composting toilet to a rotating drum system. Excepting a few quirks and fragile plastic bits, it works great, even in our neck of the woods where the winters get down to minus 14 degrees.

But still, it's not for the faint-of-heart. When the wind is just right (pun intended), one can detect an odour in the bathroom in spite of the fan. And, of course, Carrie has to rotate the drum under the house every few days and empty the nice, not-smelly compost into the garden once in a while.

The grey water is simple: all household water (except urine in the loo) runs to a 1,500-litre grease trap, then to a dual set of long PVC pipes with lots of holes, buried in sand and gravel and surrounded by mesh. Always looks green down there, even in summer! Cleaning out the sludge doesn't need to be done in our lifetimes due to the large container and because



there's only two of us. It doesn't smell, as long as you add the enzymes weekly down the drain.

Hot water

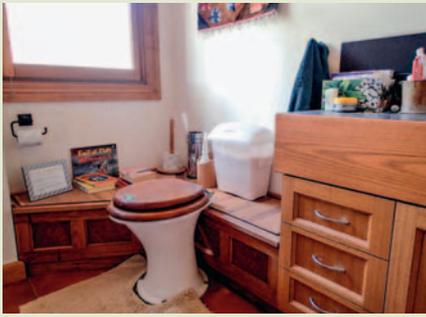
We have a solar hot water system that we can attach to a thermosyphoning water jacket in our wood stove for winter, and a gas-boost for when nothing else works. It's a separate system to the solar heating one, but uses the same storage tank. Magic.

However, we have to be very careful to never use the wood stove unless the house water is turned on (or it could explode!) but otherwise never pay it any mind. Basically, the holding tank on the roof has a tiny extra one attached to it that's

exposed to the air. That way, if the water starts to boil and steam from the wood stove, it never builds up too much pressure. It has taken some fiddling (as usual) to get it right, but now it works great.

Tip: a lot of plumbers don't know this setup. Ours attached the cold feed to it, but it's meant to 'see' if the hot water from the solar or wood stove is hot enough, and will turn the gas on only if not. If the cold feed is accidentally attached, it's *always* on!

The lesson here is that when you're dealing with 'weird stuff' i.e. alternative house gadgets, be sure you understand what you've gotten into, and make sure you pass the special information on to the tradesperson, even if they get their backs up because you dared to question their work. Especially then.



Termite and timber protection

With a house clad with 150mm thick insulation, fire retardant radial-sawn timber and built with wooden posts, rafters and studs, we have to be watchful. We put all the wood on metal stirrups well off the ground, and I check every potential spot annually. I built the house on a slope and left it open underneath, so it is easy to eyeball the whole thing pretty quickly for termite tunnels.

As for wood preserving, I understand a lot of folks like the 'rustic' look of weather-worn timber. I do as well, but unfortunately that also means the timber is rotting and cracking away. We used to use deck oil once a year, but now go with the water-based stuff. Five years later, while we still repair the odd split, it looks great and hopefully will last a lot longer than we will.

Another trick to watch for: we used all stainless steel screws with square-driven heads. They'll last forever but are brittle when installing, so be careful. But lasting forever also means that when you need to replace a board, you have to tear it out, as removing those screws is darn near impossible.

Above L-R: Composting loo works a treat, but requires regular maintenance; dining area and spacious lounge; bedroom has its own doors to the deck.

Windows

While we use a wood stove for winter heat, just as importantly we have lots of insulation in the floors, ceiling and walls and double-glazed windows. Lots of windows. They're also covered with honeycomb insulation blinds, which keeps the warmth in during winter, and the heat out during summer. The paper honeycombs tend to stretch over time, reducing the insulation overall, but are still better than thin drapes.

Well designed outside shading lets in the winter sunshine when the sun is lower, but shades the windows in summer. When it's 38 degrees or above outside (for a few nasty weeks), it never gets above 28 inside. That's a tad warm, but with a fan (run by that blazing sunshine!), no problemo.

Another tip is that there are several thicknesses of double glazed glass. We didn't know this at the time we ordered ours, and ended up with the thinnest. When you have a sea of glass, as we do,

that makes a big difference. The other thing is that our glass-makers used western red cedar frames from Canada(!). Apparently it is easy to work with and doesn't expand or shrink as much as local timber. But the Aussie parrots love to eat it, and have ruined many a home this way.

We've applied exterior oils all over the house, which not only preserves the wood but helps to keep the birds at bay. Regarding oil, I know some folks who've gone the cheap way with linseed oil, but watch out! If you don't add an anti-fungal, it turns black very quickly!

Temperature control

Ceiling fans are nice, but the object of a fan is twofold: in winter it does help by simply circulating the heat around the room; in summer, what keeps you cool is the direct air movement from the fan over your body. So I recommend floor fans placed in front of you wherever you happen to be hanging out.

We use *Ecofans* for moving warm air around the room in winter and love them. They sit on top of the stove and turn by an electrical motor that works simply from a heat differential (thermo-electric effect). No plugs, no load on your system.



If the wood is burning, the fan is turning!
Nice and way worth the cost.

The water jacket attachment in the wood stove for the solar hot water deserves a mention: it's simply a thermosyphoning set of pipes, which means that the cooler water slowly falls down one pipe to the stove, and the hot water slowly rises up the other to the solar holding tank on the roof.

Connectivity

We hadn't thought about it beforehand, but as it turns out phone reception is pretty critical (and potentially very expensive). Luckily, the phone cable goes right through our property.

Broadband is another matter; out here, it remains a bit of a challenge. We got lucky again; we get a bounce off the mountain at the end of our valley from the mobile towers in Ormeo, 30 mountainous kilometres away. After three years of fiddling on the roof with Yagi antennas and Telstra engineers and lots of hippie chrome (duct tape), we actually get pretty good reception, and only have to pay one wheelbarrow of gold a month to Telstra.

Bushfire

When the bushfires of 2003 went through our place, we were living in a metal shed. But what really saved our bacon was having pulled or burned all five hectares of brush beforehand. The parkland-like spaced trees broke the hurricane winds slightly and there was no ground cover to burn. While the mountains around us turned into blazing infernos, our block stayed manageable for all but about fifteen minutes (just like it says in the book), whilst we sheltered in the shed. It also helped to have our own personal fire truck (a water tank, pump, and hoses on a trailer).

Now that we have a wood clad home, besides keeping the ground cover cleared, the grass cut for at least 60 metres around the house, and trees and burnable items at a respectable distance, we've added sprinklers all around the decks and walls, and have a stack of corrugated metal handy to cover the expanse of glass (which, if heated and cracked, could be disastrous).

I've ruminated about whether or not to stay and defend next time. While I'm satisfied at having built our home



from scratch (with a lot of help from my friends), and appreciate having plenty of insurance, this is not just a home to my wife. It's Carrie's nest. She's not about to leave it behind, and I'm not about to leave her. So, decision made.

Final costs

We kept a spreadsheet tally of all our costs, which included: buying the land with three-quarters of a kilometre of river frontage, building three sheds (wood, garage and storage, and the American Barn with upstairs rental unit), a wonderful 120m² home and more deck space than the house itself, hydro, solar, water tanks, pipes and heating, grey water system, composting toilet, roads, etc. etc. The total came to over \$300,000 – about 50 percent more than I wanted to spend, of course..

Not including dozens of friends and neighbours helping out over the years, we contracted out the site clearing and grading (roads, trenches, shed pad, footer holes), hired concrete trucks and pumps for the hillside footings, and due to regulations, contracted out much of the electric wiring and plumbing.

Since I'm a good rough carpenter but can never get the finishing stuff right, and since I hate doing the plasterboard, we also hired that out, plus the tiling, the finished hardwood floor and the kitchen.

Other than those items, we did it all. For 13 mostly part-time years; I'd guess we put about five or six cumulative years into it. I gotta say, after all that hard yakka, it's taken me a couple of years of enjoying the

fruits of my labour to actually appreciate the place. And I also have to note that being so very remote has its challenges.

We do have quite a wonderful sanctuary now, with no mortgage and slight maintenance costs. When we retire, rates and food and petrol should be our biggest costs, plus the travelling we so love to do. ♦

Jeffe Aronson has rafted all over the world for 40 years. Now he's finished building his dream home, he's focussing on teaching swiftwater rescue here in Australia.

Subscribe to his newsletter 'I Can't Make This Shit Up' at www.river-god.com, or see www.shelter-in-place.net for his accounting of the '03 fires.

There is also a comfy holiday rental unit available on their property, should you like to take an alternative energy tour and try out.

Contact Jeffe for a chat on 03 5159 7252, jeffe0101@gmail.com



Links & resources

♦ Ecofans

Generate their own electricity from the surface heat of your wood stove and circulate warm air throughout the room.

www.caframo.com/hearth

In Australia: available from Pivot Stoves (www.pivotstove.com.au), ELS (www.environmentalliving.com.au).

♦ G.A. Hutchison & Associates

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