

Green



Half-Acre

Off-Grid Country Living — In the City

Risa Buck

Photos by Pam Lott

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Fourteen years ago, I moved to Ashland, Oregon, hoping to settle in and create a more permanent place to call home. I was very fortunate to have bought a 1950s house and an old shed on a half-acre of land with two friends. When our circumstances changed, I remained the sole caretaker of this land. I wanted to move out of the original house and build a smaller, passive solar home. I knew that I wanted to create a place that was efficient and sustainable. Since I was several screws short of being a builder, it was obvious that I had a lot of homework and networking to do.

In the mid '80s through the early '90s, I lived in a five-person vegetarian cooperative in Davis, California. There, I was first exposed to permaculture concepts, which include nurturing the relationships that exist between the land, animals, and people. Wise use of resources and integrating different systems (composting, plant diversity, seed collecting) also play an important part. What began with the pleasures and necessity of eating fresh, local food, traveled full circle to include every aspect of my life—from what I consume and where it comes from, to how it was created and what the costs are (human, environmental, economic, political, and spiritual). I built my house the way I did because it expresses (in part) the way I want to be in the world.

Since that time, I've created a place to live that's become not just a home, but a way of relating with the world around me. The off-grid home designed for one person a decade ago has blossomed into a "sustainable urban homestead," which I now share with my partner Pam and dog Ahlyo. Other developments include a wind generator, straw bale studio, water catchment systems, and extensive gardens.

This off-grid, passive solar homestead uses wise design to achieve thermal comfort, energy efficiency, and sustain its occupants. On the roof, a solar thermal collector heats the home's water, and a solar-electric array provides electricity. A small wind generator supplements the solar electricity during winter months. Below the middle, front windows, a raised cinder-block bed provides a perfect place to grow greens in winter and heat-loving vegetables in the summer. Fourteen years ago, this homestead was a barren lot, with a dense peppering of star thistle and foxtail weeds.

Shelter

I worked with architect Ryan Langemeyer, who had been one of my housemates in the original house (now a rental home) on the property. Ryan is a great problem-solver, and there was no shortage of challenges and opportunities during this project.

With good southern exposure, the long, rectangular lot lent itself well to building a passive solar home. To maximize solar gain into the house, most of the windows face south. A south-facing roof allowed a place to mount solar hot water and solar-electric panels. A dense dirt mound (berm) along the north side of the house creates additional insulation and thermal mass, which helps keep the house cooler in the summer and warmer in the winter. The passive solar design was a natural choice that allows the flexibility to change with the seasons. In the summer, we use window shades and grape arbors to shade the house. During wintertime, the grapevines die back, and we open the shades to let in as much light and heat as possible.

Each year that passes, the thermal comfort of the house and surrounding area improves, especially in the summertime. As the grapes and trees mature, more shade is generated, cooling the entire area. It is tricky planting very large trees because we don't want to shade the rooftop PV panels or solar hot water panel.

On summer evenings, when outside temperatures become cooler, we open windows to lower the indoor temperature. In the morning, as temperatures rise, we close windows and shades to retain the coolness.

A south-facing, cinder-block raised bed allows winter gardening with freeze protection due to its close proximity to the house. In addition, the reflective heat from the windows, the overhang, and the masonry block create a heat sink. During the summer months, the bed really heats up and makes for happy tomatoes, eggplant, basil, and peppers. I can extend the growing season on both ends without a greenhouse.

Straw Bale Studio

When I first considered the design possibilities for my home, I was very interested in straw bale construction and energy independence. I chose to pursue off-grid living, although I regretted not building a straw bale home. Five years later, I got my chance to build with straw, when I needed to replace the shed that was deteriorating.



Above: Risa gets her gloves muddy applying the first layer, or scratch coat, of earthen plaster on the straw bale studio's exterior walls.

Middle: One hundred straw bales, purchased from a local farmer, were used to construct the studio.

Top: The completed studio.



Above: Large south-facing windows admit an abundance of sunlight, eliminating the need for artificial lighting during the day, and providing heat during the winter. In the summertime, drawing the shades prevents the rooms from overheating.

Top: Smart design in this passive solar house means maximizing small spaces and "stacking functions." Here, a loft above the kitchen serves as a storage area for the water heater tank, which is connected to a rooftop solar collector. This arrangement allows water from the tank to be delivered to the kitchen and bathroom below by gravity, instead of an electric pump.



at a glance

Location: Ashland, Oregon

Property Size: 0.5 acres

Main House: 800 sq. ft.

Studio: 289 sq. ft.

Energy Systems: Off-grid, wind and solar-electric; solar hot water system with propane, on-demand backup water heater. Average daily electricity production: 1.6 DC KWH

Water System: Rainwater harvesting and catchment for irrigation. Capacity: 3,000 gallons (ferro-cement tank); 10,000 gallons (pond)

Space Heating: Masonry stove; Annual wood use: 1 cord of a hardwood, like oak or madrone

Cooking & Refrigeration: Propane cookstove and refrigerator

Food Production: Extensive gardens that include raspberries, 'Concord' and 'Red Flame' grapes, fig, kiwi, apple, persimmon, almond, olive, Asian pear, plum, peach, cucumber, garlic, sugar snap peas, greens, squash, tomatoes, basil, eggplant, peppers, and okra; Winter food production: 5 percent; Summer: 66 percent

Transportation: By foot and by bicycle (85 percent); by biodiesel-fueled car (15 percent)

What We Love Best: "We get the best of both worlds. We're close enough to town to walk or bike, and we have the space to live with greenery, critters, and Ashland's surrounding beauty."

Special Challenges: "The ferocious unsustainable development happening in the valley. In the last several years, overinflated real estate prices have made it difficult or impossible for households with 'regular' incomes to live here.

"Also, when we need a technician to work on our various systems, it is still tough to find someone who can problem-solve the solution. We thank the heavens for Joe Schwartz, *HP* tech editor and CEO."

Building code dictated that the walls of the straw bale studio be non-load bearing, although that building code has now been revised. We poured the concrete floor and constructed the framework first. Once that was complete, I organized a three-day work party. A couple of experienced "strawpenters" guided the 30-person crew to stack bales, attach chicken wire, and apply stucco.

The straw bale design is very simple. The 17-by-17-foot building has an open floor plan, with a toilet and small sink enclosed in one corner. A couple of truth windows—small cut-aways in the walls—reveal the straw and chicken wire behind the plaster.

The coolness inside the straw bale studio in the summer is comparable to air conditioning. Similarly, in the winter, once the space is heated, it takes very little energy to keep the space warm. The insulating qualities (2-foot-thick; 61 cm walls) of the straw bale studio far surpass any other kind of building I have been in. It has a unique aliveness and character with its undulating walls.

Trash to Treasure

Whenever possible, we use salvaged materials. When the local co-op built a new store, I scored the bakery shelves and adapted them as a multi-use cabinet for food storage on one end and the stereo and music collection on the other. An old fire escape ladder, with wheels welded on the bottom for mobility, provides access to the loft above the kitchen. We extended one of the grape trellises by using an old metal bed and various other collected metals. We converted a newspaper recycling bin from the local Lion's Club into a garden shed. Besides being more cost effective and usually higher quality, an additional benefit from reusing materials is reducing waste (items slated for the landfill get a new lease on life). An incredible abundance of resources are available because one person's discard is another's asset. The satisfaction from obtaining these materials is priceless—it keeps life going as one gigantic treasure hunt.



Risa, Pam, and Ahlyo dine alfresco on the patio they constructed using concrete salvaged from two neighborhood construction jobs. Originally destined for the dump, the neighbors were happy to find a home for it (and avoid the disposal fee). The concrete was broken into smaller pieces, and transported across the yard, one or two pieces at a time—tough work, but a great payoff for the sweat equity.



Above (left): On the middle roof—a solar thermal collector preheats the household's water. An array of solar-electric panels on the upper roof meets the majority of the home's electrical needs. An Air 303 wind turbine also contributes to the home's energy production and keeps the batteries charged during winter months, when there is typically less sunshine and more wind.

Above (right): Living in town lets Risa and Pam walk and bike to many places. For longer trips, they use Risa's Volkswagen Golf TDI. They fuel her car with biodiesel, a plant-based, renewable fuel, making this car, which averages 48 mpg, an even cleaner, greener vehicle.

Below: The fuel-efficient masonry stove does double duty as a home heater and clothes dryer when the laundry is hung in front of it on a retractable clothesline. Combining passive and active strategies like these maximizes the house's energy efficiency.



Energy

My house still is the only city-sanctioned, off-grid home within the city limits. Initially, the City of Ashland was concerned about my energy independence. They were concerned that if I provided my own electricity, I might be at risk of "running out." I believe they feared a mini-revolution of wannabe, off-gridders following in my footsteps. But this fear was unfounded. The energy needs for an average household are considerably greater, and an off-grid system to meet those needs would be more costly than the very modest system that sustains us.

The 370-watt solar-electric (photovoltaic; PV) system works year-round. In the winter, when there is less sunshine, a wind generator supplements the charging of the system's batteries. With two of us using a system originally sized for one, we are mindful (some might accuse me of being hypervigilant) of our energy usage.

Our house takes advantage of several efficient 12-volt appliances. A 12-volt car stereo system offers the best sound for the lowest electrical use and cost. I chose a 12-volt television for the same reasons. My laptop computer runs on 12-volt DC and 120-volt AC. And, in summer, a 12-volt ceiling fan runs constantly to circulate air in the house.

We don't have the luxury of ignoring the bigger picture before making changes. If a grid-tied home adds a new appliance, the consequence shows up in the form of a bigger monthly electric bill. Our consequences would likely drain the six Trojan deep-cycle batteries, eventually rendering them worthless. Purchasing a new bank of batteries for my small system would run about US\$1,000. It is not a mistake I want to make even once.

In the winter, we use about one cord of hardwood in the masonry stove. The fire heats air chambers inside the stove, which absorbs the heat and radiates it to the surrounding space. This clean-burning, efficient heater only requires one fire a day for about 90 minutes. Once the vent and flue are shut, the stove radiates heat for the next 24 hours, maintaining indoor temperatures between 67°F and 70°F (19–21°C). Raising the window shades on sunny winter days also maximizes any solar gain and helps heat the home.

A rooftop solar collector heats household water. In the summer, the sun heats the water between 140°F and 160°F (60–71°C). In the winter, the sun only heats the water to about 80°F (27°C). I learned the first winter that you cannot comfortably wash dishes and bathe at that temperature. Now, a propane, on-demand heater supplements the solar water heater.

Food & Water

An important part of our homestead is creating a balanced landscape that helps support itself, and works with where and how we live. As a small household, we grow a fair amount of food, relying more heavily on the garden during spring, summer, and fall. We pay particular attention to building good soil, which helps with water conservation, and makes for happy earthworms and other critters. A diverse mix of fruit and shade trees, shrubs, perennials, herbs, and veggies are planted in multistoried layers, which help support one another by shading or by providing mulch. We also group plants with similar needs together and locate them according to the attention they require (plants that need more tending are closer to the house). One special consideration is solar access, and making sure to plant accordingly to avoid blocking solar gain to the house.

The grounds have changed dramatically over the years, and have been further enhanced by Pam's garden design expertise. Fourteen years ago, the backyard had an English walnut tree, pampas grass, and 'Red Flame' grapes, but the dominant species were star thistle and foxtail weeds. When it rained, water rushed toward the end of the property and eroded the hillside below. Today, the walnut and grape are in an expanding community with trees, bushes, vines, veggies, herbs, and flowers. The erosion has ceased.

Each area of our landscape has a specific function and purpose, whether it's growing veggies or providing shade for us to hang out. As the garden gets more established, it becomes more self-sustaining. Besides enjoying the seasonal and annual changes, there's nothing like stepping out the front door and picking a fresh salad or filling a cereal bowl full of raspberries.



Above: A luscious crop of peaches was only a small sampling of the delicious harvest from Risa and Pam's front yard garden. This year's bumper crop has been quarts and quarts of raspberries.

Top: In bloom—a wide assortment of perennials and annuals grace the gardens, providing wonderful color, sweet fragrances, and plenty of special nooks and crannies for wild creatures.

At right (upper): A ferro-cement cistern, built on site, contains up to 3,000 gallons of rainwater that washes from the rooftops of the main home and straw bale studio. The tank was constructed by workshop participants in 1996. With the addition of the pond, the tank now serves as standby storage for times when the pond dips below the 3-foot mark. Both are used for irrigation.

Right: A rainwater catchment pond acts as the homestead's primary reservoir, storing between 8,000 to 12,000 gallons of water. It also hosts a variety of wildlife. *Gambusia* (mosquito larvae-eating fish) share the pond with tadpoles, snails, *Anacharis* (a submerged aquatic plant that oxygenates the water), and water lilies. Since the pond was built, a great blue heron and two ducks have visited, as well as fox, deer, raccoon, gophers, ground squirrels, and skunks. Future plans include raising fish for food, so an aeration system was recently installed (powered by excess solar-electricity generated on site), to ensure adequate oxygen to the plants and animals living in it.



A work in progress—the half-acre
14 years ago, and today.



Home, Sustainable Home

I feel very grateful to be on this adventure of creating a sustainable urban homestead. The unfolding of what a half-acre of land can become is well underway. It has been my palette for integrating beauty (building stuff) with the natural surroundings. The support and participation of friends and family over the last decade have helped make it possible.

This article has provided some snippets of accomplishments and highlights since 1995, but I consider my evolving homestead a lifelong journey of creating and re-creating, figuring out what works and what might work better. I believe it is possible as an individual to make a positive difference with how we *impact* our environment. It is because of that belief that I feel encouraged and hopeful.

We can all do more with less. Although I strive to consider, as much as possible, the many-layered consequences from my choices, I am not, nor have I tried to be, a purist in any sense of the word. I am a consumer, and I want to be a conscientious consumer.

My chosen lifestyle connects me closely with my environment. It is a daily relationship that I cherish. From

the food we grow to eat and the food we purchase (local and organic), to the various scavenged materials, the energy generated by the sun and wind, and the used cooking oil collected from local restaurants for making biodiesel to fuel my diesel car—all of these things and more are decisions we make every day. The lifestyle we have chosen is not for everyone. It is a conscious choice to live here in this way. It feels so luxurious to be able to have an integrated connection with my surroundings and then be able to go up the street to the co-op, the movies, or the public swimming pool. That's a pretty good life.

And last but not least, I now get to officially thank CJ Banner and Tracy Wood—two dear friends who have participated in *so* many projects in the last thirteen years. Hardly an endeavor has occurred successfully without their consult, creativity, and hard work. When they aren't around and there's a challenging situation (a need to move something way too heavy), I imagine how they might approach it, and this helps me see it through. Thank you! Thank you!

Access

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Pam, Risa, and
Ahlyo.