

Wild Rice

Native American Tradition... Unusual Plant for the Garden Pond

by Denny Williams



A touch of history, both family and American, of a unique water garden plant.

bend them over the canoe. With the right hand (stick), they would flail the upper portion of the stalk (containing the rice kernels) downward into the canoe. This process

minor changes for centuries.

Today the method of picking lake rice varies from that traditional method. The only legal method on public lakes is now to use air boats or canoes fitted with a thrashing contraption. Paddy rice producers use combines because the water can be drained. After harvesting, the rice still must be dried. Most places use a machine somewhat similar to a

When my grandfather, Forrest L Bundy, was a teenager, a fur company named Gordon-Ferguson hired him to “live trap” mink and muskrat and release the animals in a small lake where they had built a dam and flooded some low land. The company had fenced this lake with the theory that they would raise these animals and get the quality of wild fur, but in a controlled environment. I think the economics of the times made that venture fail. While depositing some animals in the lake, my grandfather shot some ducks. As he cleaned the ducks, he opened the crops (a place where some birds store their food before digestion) as most good woodsman will do to find out what their quarry had been eating. They had been eating wild rice. He washed the ducks in the lake, and in so doing planted the first wild rice in the lake.

Wild rice was a dietary staple for the North American Indians of the Great Lakes region. They used birch bark canoes and sticks to harvest the rice. One person stood in the canoe and pushed with a pole while another person sat in the canoe and used two sticks to collect the wild rice. With a stick in the left hand, they would reach out, gather the rice stalks, and then

was repeated, changing the duties of the hands, for the right side of the boat. If done properly, only the ripest kernels would separate from the stalk and leave the rest of the kernels for later harvest. While this technique is not the most efficient method of harvesting wild rice, it assured the natural replanting of the species and the sharing of the food supply with other animals.

This sharing with nature lured an ample supply of ducks and geese, which were then harvested as well. Those native Americans had a crop which was tasty and nutritious, never needed cultivation, fertilization, or replanting... and the primary crop pests were the main course for dinner!

After harvest, the rice had to be dried. They made use of the sun or controlled heating over a fire. (From my experience, fire-dried rice is harder and stores easier and longer without spoilage.) During the drying process, the kernel shrinks and the husk becomes loose. At that point, the rice was tossed in the air from a basket so that the wind could blow away the chaff and leave the heavier kernel to fall back into the basket. They then had a food that could be boiled, roasted, popped, or stored for future meals. This method continued with only



(top) This is a picture of our private lake. The light brown vegetation surrounding the open water is wild rice.

(above) Dennis Williams and Parker Williams test the rice in late August to see if it is ready for harvest. The sticks in Parker's hands are used to gather the rice over the canoe and then knock the ripe rice off the stalk and into the canoe.

cement mixer but open on both ends. This machine rotates on a horizontal axis over a heat source, usually propane gas, until the rice reaches a degree of hardness. Knowing when the rice is ready is somewhat of an art form involving smell, taste, and feel. It is then ready to be dehusked. The rice is put into another cylindrical affair, but as it rotates one way, rubber paddles on the inside rotate in the opposite direction to separate the husk from the grain. Falling through an area of forced air, the chaff is blown outside to leave the rice clean. The next part seems to be optional. My processor polishes the



One of his most memorable quotes, speaking about his pro baseball period in 1920, he observed, "I never thought that I was any better than the next guy, but I knew that I was just as good." I learned more about life in the final 10 years of his life than I had in the previous 30 years of my life.

My wife, Mim, has taken over the duties of picker and, after a rocky start, literally, has become a "clean picker." Her stories are more contemporary and she does not repeat them, yet. In another 10 years, our kids will be old enough to help. Now they ride with us for one trip around the lake before boredom

sets in or they decide they cannot tolerate the worms and moths that inhabit the rice beds. We leave them at the boat landing with the cats and dog, just where my sister and I played waiting for our parents to take a break 40-odd years ago.

rice using a barrel equipped with rotating paddles that roll the rice and rub off the residue of the roasting process. The final step is sizing and bagging. The polished rice is brown in color and, when cooked in the exact proportions to unpolished rice, puffs up and yields larger servings. Unpolished rice is black in color.

From the 1950's through the 1970's, wild rice harvesting in our part of America was done by nearly every household with able-bodied men, women, boys, and girls. The population of my community was 314 people. I am sure there were at least 50 boats involved in the harvest with plenty of rice to go around. It was a major economic event which gave the ricers extra money to buy school clothes and other necessities for the upcoming winter months. Wild rice buyers were paying between \$1.25 to \$2.00 per pound (green), and you could pick 100-300 lbs. each day for about 2 weeks. Not bad money for 2 weeks of hard

work! (When wild rice is processed, it shrinks, making about 3 pounds of green rice required to make one pound ready-to-cook rice.)

Harvesting rice was also a social event.

Most people worked in paired teams in small wooden boats which were flat bottomed and pointed on each end. For some reason unknown to me then or now, they were all painted green. Everyone would paint their boats each fall in preparation for the season. These boats were very unstable on open water, but they slid through the rice and over logs very well. If you and your partner were not coordinated, it would mean an unscheduled swim and the loss of most of your rice. As I grew up, my grandfather became my ricing partner, as well as my mentor. I poled and he picked. He talked and I listened. The stories were the same from year to year but never any less interesting.

My father David Williams, his friend Rick Ecklund, and Parker Williams use a small pontoon boat in early July to check on the rice beginning to stand in shallow water.



(top) Denny tore off the tin from the original house and used its frame to reconstruct their home with solar panels, seen in the foreground. Since this picture they have added more panels and a small wind generator.

(inset) Denny Williams measures a load of 11 cords of peeled jackpine on his old Mack truck.

The Decline

With the expansion of civilization came the decline of the wild rice crop. As lakes became populated with cabins, the plants conflicted with swimmers and boaters. Instead of a valued food crop, wild rice became a 'weed' to be eradicated from our recreational waters.

Today most "wild rice" is not so wild. In the 1970's, wild rice was shipped to California where it was planted in paddies. Paddy-grown wild rice is usually fertilized and may have pesticides and herbicides applied. In addition, it must be planted every year because it is harvested with combines. That elimination of Mother Nature from the equation, in my opinion, has led to a smaller grain and a less tasty product. However, the American consumer now finds "cultivated" wild rice more affordable and plentiful. (The

state of Minnesota requires that paddy rice be labeled "cultivated" to help the consumer differentiate between paddy and real handpicked wild rice).

The population of Backus, Minnesota, is still around 300 people, but only one or two canoes bear seekers of the increasingly smaller and smaller beds of wild rice. The green boats are gone. I believe that true wild rice will become nonexistent in the public waters of Minnesota sometime in my life... or for sure in my children's lives.

Grow your own wild rice... in your own pond

For us, wild rice is an income-producing food crop. However, it is also an attractive grass-like plant that can be grown either in the larger farm pond setting or in a small garden pond as an alternative accent instead of cattails, bulrushes, or other tall water plants. A word of caution here for those water gardeners in moderately



Gary Eastvold picks debris out of the rice. The clean area is where the picker sits and the poler stands behind the picker at the rear of the canoe. Standing allows the poler to find the ripest rice and to maintain a pattern that assures we pick the majority of the rice. There are about 200lbs. of unfinished rice in this canoe.

warm to very hot areas: while long grain, white rice can be found in very temperate areas, wild rice is typically found as a native plant in regions with extremely harsh winters and mild, humid summers. Wild rice seeds need a period of very cold dormancy to do well. As you may have guessed from my grandfather's inadvertent seeding of our lake, the green kernels of rice can be scattered freely along a natural soil bottom or on the surface of a pot



Dennis Williams and Parker Williams keep a close watch on the ripening rice.

of soil. After the spring thaw when the water temperatures warm up (usually mid-May in extreme northern areas), the wild rice germinates. In mid-June the stalks are floating on the water. The stalks continue to float as they grow from 12 to 16 inches long. Mid-July finds them no longer floating but standing upright. At this point they look like any young grain crop, although technically they are a vivid lime green grass plant. In early August the plants are about 3-4 feet above the water level and begin to flower. The flowers are small and not very showy ranging in color from purple/ violet to white/yellow. Middle August finds the top 7-8 inches of the plant filling in with rice. By late August, the blossoms have receded to produce clusters of rice kernels ripe enough to harvest. The rice ripens in varying degrees that makes it possible to harvest one area of the lake one day and come back to it in a couple of days to pick again.

Since the growing habits of this plant are of an annual nature, harvested green kernels must be replanted for the next crop. Water gardeners may find that simply allowing the kernels to fall back down into the plant containers will produce the next year's growth. You could also collect and store the seed in a cool, moist location such as in a bucket of moist sand in a garage or shed during the cold months. Bring the

stored seeds out in early spring to reseed your pond pots.

In its natural habitat, wild rice is usually found in waters with some gentle and consistent movement. The recirculating filtration systems of most ponds should be more than sufficient. The plant grows wild in a variety of soil types, ranging from sand to mud. It does not do well in rocky bottoms. It grows naturally in water from 6 inches deep to almost 6 feet deep, and it is almost as tall growing in 6 inches of water as in 6 inches of water. I would suggest placing the planted container so that the surface of the soil is between 6 and 12 inches below the water line. In its natural setting, no fertilization is required. However, depending upon the conditions in each pond, you may want to fertilize lightly on the same schedule as your other aquatic grasses. Since wild rice does not have the same nutritional demands as a freely blooming water lily, moderation is recommended for the best looking plant. 🐦

Denny and Mim own Southfork Rice Company, Her 78 Box 142, Pine River, Minnesota 56474. Visit their we site at <http://www.uslink.net/~flyaird/rice.html> or e-mail Denny at flyaird@uslink.net. Call them at 1-800-920-2473.

Denny is also a pilot and can be reached at 218-947-3100 Visit <http://www.uslink.net/flyaird>

Travel Destination:

Nashville, Tennessee

by Todd Smith

One of the most unique under-glass gardens in the U.S. is within the Opryland Hotel in the heart of Nashville, Tennessee. The largest of the hotel's three indoor gardens, the Delta, is also the newest.

The Delta, all 4.5 acres of it, opened in 1996 as the visual highlight of a \$175 million hotel expansion. The Delta gives the feeling of a sub-tropical setting, perhaps the lower Mississippi River delta, with paths that wind through sabal palms, magnolias, camellias and other plants quite unexpected in temperate Nashville.

Across the top of the Delta is a sparkling glass roof weighing 650 tons

that in one place is 150 feet high. In the center of the garden is a cluster of shops and restaurants reminiscent of New Orleans, Savannah or Mobile.

Surrounding that cluster of indoor buildings is the Delta River which winds for a quarter of a mile through the garden. It is big enough that flatboats carrying up to 25 passengers each make leisurely trips past the Delta's sights!

Food is a big part of the Delta experience. The Delta Food Court offers six separate restaurants, while nearby is the Beignet Cafe from which wafts the sweet aroma of fresh pastries. The Delta's major restaurant is Beauregard's, housed in a two-story antebellum mansion.

The Delta is complemented by two other glass-topped gardens, the Cascades and the Conservatory. Each is about half the size of the Delta. Together, the three gardens feature thousands of tropical and sub-tropical plants, quiet places to talk or read,

(top) In visiting the Delta, you find the temperature and humidity always pleasant. (left) Although in the temperate climate of Tennessee, your senses say you are much further south, deep in the sub-tropical world of the Mississippi River delta.

paths to walk and great opportunities for people-watching.

Just as travelers think they've seen it all, they step into the breathtaking world of the Cascades, a water-oriented interior space at the Opryland Hotel.

Located between the hotel's Cascades Lobby and the European-inspired Conservatory, the Cascades combines elements of a tropical paradise, a mountain expedition, and a touch of the 21st Century—all rolled into one.

The Cascades, completed in mid-1988, is one of the highlights of the hotel's Phase III expansion. Like the neighboring Conservatory, it is crowned with a one-acre skylight—one of the largest glass roofs in the world—that connects two six-story wings of guest rooms. Both the Cascades, where the emphasis is on water, and the Conservatory, where the emphasis is on plants, are approximately two acres at ground level.

"I like to think of the Conservatory as formal, perhaps comparable to the living room of a very nice home. The Cascades, however, compares to the family room — full of activity, vitality and personality," said Earl Swensson,

Visitors to Music City have an unexpected treat in store at the famous Opryland Hotel — nine acres of indoor gardens.

OPRYLAND HOTEL

chairman of Earl Swensson Associates, Inc. (ESA), the architectural design firm that developed the two spaces.

A prominent feature of the Cascades is the Promenade, an elevated walkway that takes guests on a winding adventure under towering palms, over cascading waterfalls and through a 40-foot-tall mountain. Stairways lead down to a lake, a laser-accented fountain, a restaurant, and a revolving lounge.

"Our goal was to create a showplace to rival the existing Conservatory, an indoor area of tropical gardens, dining and entertainment facilities and walkways," Swensson explains. "Our dreams have been more than realized. As in the Conservatory, all of the human senses are affected. The Cascades is a place to view, listen to and enjoy the environment that surrounds you."

Opryland Hotel horticulturist Hollis Malone and his landscaping staff faced a similar challenge — creating a tropical plantscape that accented the Cascades' special features, while complementing the Conservatory. He visited 18 Florida nurseries before selecting more than 8,200 tropical ornamental plants representing 449 species. "We went a step further than the Conservatory by selecting a larger vari-



ety of flowering bushes and trees, as well as a number of rare plants," Malone said. "Many of the plants will flower year-round, offering an exquisite array of colors."

Plant varieties range from an Alexandria palm tree towering more than 40 feet high to six-foot-tall ginger bushes and jasmine vines. A more unusual item is the *Zamia pseudoparasitica*, a rare, prehistoric plant that attaches itself to palm trees, much like mistletoe attaches itself to oak trees.

Like the Conservatory, the Cascades has an elaborate climate control system that maintains a temperature of about 71 degrees. Humidity ranges from 60 to 65 percent, and sunlight levels are higher than in the Conservatory, providing a suitable environment for more plant varieties.

The black olive trees and West Indian mahogany trees resemble oaks, but unlike oaks, they do not shed their leaves. Using them, Malone says, helps create the appearance of the outdoors. And, yes, that really is Spanish moss trailing from

the branches. The largest of the 70 black olive trees is a 40-foot-tall specimen planted near the Delta's wedding gazebo.

The predominant palm tree in

Manmade sculpted cliffs and tumbling water are enjoyed from the river boats in the Delta.



Lush plantings and charming old-fashioned pathside lighting invite visitors into the amazing gardens at the Opryland Hotel. All photos by Donnie Beauchamp and courtesy of Gaylord Enterprises.





Sunlight sparkles in the waters below the expansive glass roof over the three gardens of Opryland Hotel in Nashville.

carries fertilizer to the plants. Some portions of that system are radio controlled.

Design of the Delta's gardens began two years before the Delta's opening in June 1996. With most of the plants originating in Florida, 32 tractor-trailer loads were required to transport them to their new home in the protected environment of the Delta. Hollis Malone has stories to tell about finding the trees that adorn the Opryland Hotel's Delta gardens. In certain circumstances, he says, it's not unusual to knock on someone's door and offer to buy a tree right out of the homeowner's yard!

"If the tree is pretty; if it's the right shape; if it's the right size, I'll ask," he smiles. Several of the Delta's mahogany trees were bought that way. Some weigh up to 16,000 pounds and have trunks 14 inches in diameter.

"It's tricky moving a tree that size, but it obviously can be done. It takes

special equipment and a BIG truck," Hollis adds. Malone notes that the sabal palms in the Delta came from near Homestead, Florida, and most of the black olive trees were rescued from land ready for residential development near Lake Worth, Florida.

At one end of the huge space, the Cascades' mountain dominates. Three waterfalls, ranging from 23 to 35 feet tall, rumble from the top of the mountain and cascade over rugged limestone rocks into a 12,500-square-foot lake.

The Promenade cuts a cave through the mountain, and two openings in the rock provide spectacular views of the waterfalls and the valley below. (The 'limestone' mountains and other formations actually are manmade, using concrete and a special surface treatment designed by the architects.)

On the opposite end of the Cascades' lake are several islands that are the setting for the Cascades Restaurant, an open-air facility that features a show kitchen, pavilion, waiting bar, colorful paintings, and a tropical landscape of plants, grottoes, waterfalls, and cliffs.

At the lake's center is the Cascades Terrace, a revolving lounge offering a complete view of

Aquatic plants are enjoyed close up from the leisurely traveling river boats.

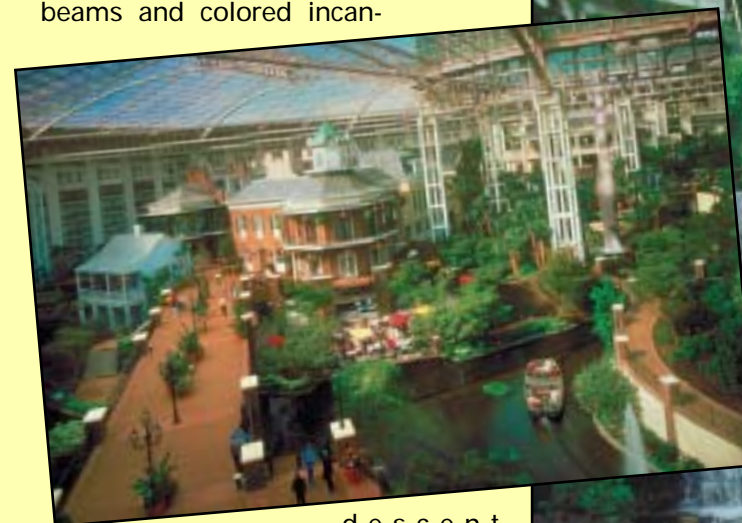


the Cascades. The centerpiece of the facility is a Victorian-style gazebo with Greek columns, archways, and beveled glass panels. A bougainvillea vine entwines among the gazebo rafters across the top of the structure. An arched bridge leads from the lounge to the Cascades lobby, the hotel's primary entrance.

The restaurant and lounge are separated by the "Dancing Waters," an intricate fountain accented by laser beams and colored incan-

the Gaylord Entertainment Company which includes the Grand Ole Opry, Opryland Hotel Convention Center, Opryland Themepark, Ryman Auditorium, Wildhorse Saloon, Opryland USA River Taxis, Music City Queen, Springhouse Golf Club, Nashville On Stage, Grand Ole Opry Tours, and Opryland KOA Kampground.

(left) Nine acres of indoor gardens, 30 shops, 15 lounges, and 10 restaurants combine with 2,883 guest rooms and 600,000 square feet of meeting space to make Opryland Hotel the largest combined hotel and convention center in the country. (below) Elegant Southern entertaining is the order of the day.



lights. Elaborate computers control the "Dancing Waters" shows, some of which are synchronized to music. ("Dancing Waters" is a trademark of Dancing Waters, Inc. of New York.)

The Cascades Courtyard, a string of retail shops, connects the Cascades and the Conservatory. A spiral staircase leads to the Promenade, an elevated walkway that winds through the Cascades and the Conservatory. The Cascades is surrounded by 824 guest rooms. "One notable aspect of the Cascades is that there are no support columns," Swensson notes. "Combine that with its special features, and there's no place like it anywhere in the world." Whatever the season, the amazing gardens — under glass — at the Opryland Hotel are not to be missed.

Todd Smith is the Publicity Director for the Opryland Hotel in Nashville, Tennessee. For information on hotel packages, call 615-871-6169. The Opryland Hotel is part of



Water Gardening for Handicapped or Disabled Gardeners

by Kathy Thirtyacre

Limited physical ability need not limit your garden enjoyment!

Building a pond is a physically demanding task. We all feel our age when it is done. Can you imagine building a pond when you are physically disabled?

Joanne took all winter to dig a 3' by 5' by 2' pond. She dug a little several times each day, resting in between each bout of digging. Except for some help with the heavier rocks she did it all herself — dug the hole, laid liner over carpet, placed rocks, planted the plants, put in the filter and introduced the fish and critters. Joanne, a retired lawyer, has had five back operations, a tendon transplant and operations on her knee and shoulder. Despite having been 'sliced and diced,' she is grate-

ful to be on her feet. Ponding was simply a challenge that she took a step at a time. Joanne's pond is home to six koi, two lilies and lots of water hyacinth. She uses an in pond filter and a 20 gph pump.

When I started looking for physically handicapped ponders, I had no idea who I would meet. It was thrilling to meet and communicate with ponders such as Hal and Bruce, fellows who are quadriplegics confined to wheelchairs, and hear about their ponds.

I learned that keeping a pond is not just a physical task. A pponder plans for the nurturing, maintenance and care of plants, fish, and critters with an eye to finding and keeping

the right balance for their environment. Their care means taking into consideration the changing seasons, the particular climate the pond is located in, and the unpredictability of nature. (Not to mention nature's other critters who show up and decide to move in.) All of these tasks require thought, compassion and a commitment that transcends physical limitations.

A pond can be as small as a pottery bowl with plants, a snail and a feeder goldfish, or a pond can be as big as the largest liner you can afford to purchase. Ponders tell you bigger is better and to plan on building more ponds once you are finished with the first. But beyond that, pon-

ders also tell you to plan, plan, and then refine that plan.

A pponder with physical limitations needs to start smart and not catch up the way the rest of us did. Proper research and planning saves a lot of backaches, headaches, and money.

First make some basic choices. Decide if the pond will be constructed from a premolded pond form or sunk in the ground with a liner. A premolded pond has the option of being an in ground pond or above ground with props from cinder blocks or bricks. The size of the pond is limited to the size of the pond forms available.

A lined pond can be constructed above or below ground. An above ground pond is constructed with a wood frame or out of builder blocks. It is an excellent choice for its accessibility, and no digging is required! A wide ledge on an above ground pond makes a handy place to sit and tend plants and fish.

An in ground pond needs edging to secure the liner and protect it from the sun's rays. Natural rock, landscape paving stones, and turf are commonly used, but they are also heavy choices. Signature Ponds manufactures Sequoyah stone™, a lightweight replica of fieldstone with a hollow center to make edging a lighter task. Also available is a right angle stone called a pond-edge or coping stone. This stone sits on the edge of the liner and wraps around the edge of the pond, securing the liner and hiding it at the same time.

Access to the pond is an important factor for a disabled pponder to consider. A raised pond gives the best options for access and ease of working in the pond. Wide ledges allow for seating and a place to set down supplies and keep them close at hand. Plan for construction of a hard surface around the pond, such as concrete for wheelchairs or closely mowed and flat turf for sure footing. A pond built into or on top of a deck or patio enables easy access from the house.

Consider constructing a small pond in half a whiskey/wine barrel or

in a large plastic container sold specifically for pond use. Visit Jeff Cook's web page for a detailed reference on building a small pond in a container. Read *Water Gardening in Containers*, published by Sterling Publishing Company. Rubbermaid™ has been surprised to learn how popular their stock tanks are for turning into ponds. Lori, a pponder with surgery defying Carpal Tunnel Syndrome, suggests a pond built into a table top and parking a wheelchair right under it. With enough knowledge, planning and money, just about anything is possible!

Several of my correspondents chose professional help from a landscape architect in designing and constructing their ponds and suggest seeking out a landscape architect with experience in ponding.

Maureen Phillips runs Everyone Can Garden™ and is an independent design consultant for the elderly, the disabled, and children. A registered horticultural therapist at the masters level, she works with the gardener to maximize the potential of gardening options from construction of the garden and access to it to modifying tools to work in the garden.

Check out the Master Gardeners program in your area to find a master gardener with experience in water gardening or gardening with physical

limitations. The Oregon Master Gardener program has made helping gardeners with disabilities a specialty of their program. As a resident of a different state, I was able to receive many information sheets through the OSU extension service.

Seek out koi, pond or water gardening clubs to find a collection of authorities of ponding in your area. Ponders can be found in cyberspace where information is generously exchanged and friendships formed.

Once your pond is constructed, it is time to move in the residents. Plants go in first to start the cycle of life and help balance the pond. Lugging a pot full of mud and plant out of the pond will kill just about anyone. Consider the following tips a smart idea for everybody.

- Plants can be placed in plastic pails with handles to grasp and haul out of the water. Drill some holes around the pail for water to move around the root system and drain out when the pail is lifted.

- Try the pots designed for hanging from the ceiling. The handle sticks right up over the plant and will be hidden by subsequent plant growth.

- Wide ledges for marginal plants prevent the pot from slipping off the shelf and down to the bottom of the pond. Over-turned baskets are light and easy to set in the pond to raise a



The inground pond is more accessible if its surrounds are solid and flat. Photo by H. Nash



Above-ground liner ponds are now available in handy kits. Photo by H. Nash

bog plant to the proper depth.

- The kinds of plants chosen and the way they are planted greatly eases the physical labor.

- The easiest plants to grow are the floaters, such as water hyacinth, water lettuce, frogbit, duckweed, and the tropical floating sensitive plant. Simply put them in the pond and set them adrift. Parrot's feather can be floated or tucked into shallow stream and waterfall course ways.

- Hardy lilies winter over in the pond. You have the option of growing dwarf types, particularly slow-growing varieties that do not need repotting every year. The pygmy *N. 'Helvola'* is an excellent choice for its upright-growing rhizome, slow growth, and smaller pot requirement. Potting the less vigorous varieties in larger pots extends the length of time between repottings, too. However, plan for assistance when removing the heavy potted plants for tending. Even a one-gallon nursery pot of

mud can be a strain on a sensitive back!

- Marginal plants under three feet tall are not likely to tip over in the wind.

- Use holeless pots to confine the plant growth.

- Consider the root structure and growth habit of plants you would select. Clump-growing plants such as bulrushes (*Scirpus*)

and *Cyperus* family (umbrella palms and papyrus) will not send scrambling rhizomes from the pot, while the taller cattails can poke holes in the sides of pots in their attempts to spread. Use wide-mouthed pots for surface running rhizomes such as sweet flag (*Acorus spp.*). Experiment with your plants and try growing them in less soil but in wider mouthed pots. Often, aquatic plants are shallow rooted plants that do not require a depth of soil as provided by standard nursery pots. Slower growing plants such as golden club (*Orontium*), arrow arum (*Peltandra virginica*) and forget-me-not (*Myosotis palustris*) may not require annual repotting and division. Avoid rampant growers such as floating heart (*Nymphoides spp.*) and water clover (*Marsilea spp.*) that can rapidly take over a small pond and necessitate frequent pruning and thinning.

- A handy method for planting marginals is to secure them in panty hose or landscape fabric, with sand or gravel and a fertilizer tab. Cover the bundle with a couple of rocks to anchor. Do not use natural burlap in this method as it degrades over a single season and removal from the pond can mean a split-open 'sack' with the dirt muddying up your water. The lack of a pot makes the



Too many fish in the pond means more maintenance!

Photo by H. Nash

plants easier to lift.

- Check in pond supply catalogs for long pole-like devices to trim lilies and insert fertilizer tabs or sticks. These hand tools enable work to be done from the side of the pond. You can also create your own long-handled tools by using the cure-all duct tape to affix broomsticks to shorter handled tools.

The inevitable question arises: do you need to filter your pond water? If you have a pump in your pond to recycle water through an ornament, fountain, or waterfall/stream, you will want to supply adequate mechanical filtration to keep the pump from becoming clogged with particulate matter. If your water display shows a reduction in flow, you know it is time to rinse off the pump! Although many pumps come equipped with a mechanical filter, supplying additional area of particulate accumulation lengthens the time span between cleaning. If you must clean your pump every week, you need more filtration media. Placing the submerged pump in a basket makes for easy retrieval. More extensive filtration is not necessary if you make sure your fish 'body and size' count is on the light side for your pond. Generally, consider an inch of fish per square foot of water surface as your maximum fish load. The closer you are to that magic number, the more likely you will need bio-filtration to maintain clean and healthy water for your fish.

Hal has 75 fish in his 3,000 gallon pond with waterfall and stream. He cares for one imported Koi, eight

Butterfly Koi, about 15 domestic Koi, shubunkins and a mixture of goldfish that started out as feeders. He uses a non-submersible pump with filtration from lava rocks and variegated sweet flag, irises, and arrowhead in the waterfall holding area. He also uses a 40 watt ultraviolet sterilizer. Two frogs share his pond with the fish. Hal and his four-year-old grandson feed the



Long-handled tools make it possible to work on the pond from its edge.

Photo by Karla Anderson

Hal uses a hand strap with a bent spoon and scoops the food out of a Cool Whip container.

There was a period of time when Rona was completely bedridden for many months without seeing her pond. Tragically, some of the fish suffocated because her husband did not know to clean the filter and didn't understand there was a problem until it was too late for some of her beloved fish. Retrospectively, Rona feels that a pond maintenance person should have been called in during this time. She takes her responsibility for keeping her pond inhabitants alive very seriously and feels that when getting into ponding a disabled person needs to consider whether they are able to commit to protecting the lives and well-being of the residents of their pond. If the answer is no, hire or find volunteer help.

Careful planning in the design and construction of the filter is important. Rona got rid of a cumbersome two box filter and replaced it with a lightweight single plastic box filter. She replaced the lava rock in the biofilter with a light weight charcoal, wrapped in fine mesh, which she dumps into a pool net and rinses. She replaced the thick sponges in the biofilter, which were too difficult for her to squeeze out during rinsing, with a thin batting material that captures the fish waste and is easy to lift and rinse out. Finally she replaced the screws in her

filter, too difficult to unscrew and screw back in, with velcro around the box.

Rona's pond is a 700 gallon rectangular raised pond made of painted metal with redwood lining the outside and top edges. On either side of the pond are matching bog areas filled with horsetail, pennywort and water iris. Because of raccoons, the pond is kept covered at night with heavy chicken wire framed in wood. With a fulcrum balance the cover is effortless to lift.

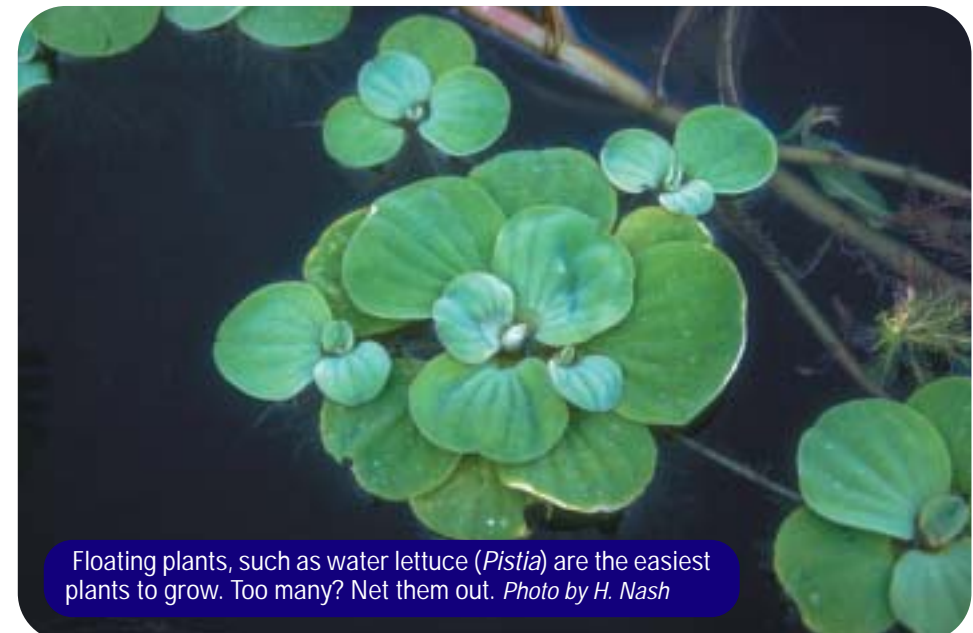
The right tools for any job makes a world of difference. The ponders I interviewed have made, modified, or purchased tools to help them work in and around their ponds. Total Living carries a number of garden tools and other products for independent living. In addition they have access to over 100 manufacturer's catalogs and other wholesale sources of products. The Oregon Master gardeners have informational sheets and several books that give detailed instruction

for making and adapting tools.

The yearly care and maintenance of a pond is where thoughtful advance planning comes in handy. Joanne wishes she had planned for some more room around the pond for ease in maintenance. Many of my correspondents rely on family or professional help to do some of the yearly chores around the pond. Jobs handicapped ponders need help with are repotting, skimming leaves, dropping marginal pots to the bottom or setting them in a earthen trench for the winter, and bringing in fish whose ponds will turn to ice cubes in harsh climates. Bruce over winters his tropical lilies in a small green house. Neighborhood teenagers are great help under direction from the water gardener. Just inform them the smell of 'ew du pond' is not lethal.

The work involved in the construction and maintenance of a pond can be considerable. Careful and realistic planning, along with the help of friends and family, assures ponding pleasures to all who wish the joy of water in their gardens. 🐸

Although Kathy Thirtyacres's first-love in writing is the mystery genre, we're grateful for her expedition into the realm of non-fiction. Kathy lives in Oregon with her husband and three children.



Floating plants, such as water lettuce (*Pistia*) are the easiest plants to grow. Too many? Net them out. Photo by H. Nash



Build a Japanese Bridge

by Joe Van Hook

Joe built this bridge for the 1998 Home & Garden Show in Tulsa, Oklahoma.

Here's an easy way to build a small, Japanese-looking bridge for spanning a small stream. It can be as wide as your surface planks will allow. It can be as long as you want, provided the length of materials is available and provided the arc doesn't cause too steep an incline at the far ends. The materials and plans shown here result in a bridge 4 feet long, 3 feet wide, with a 20 inch high handrail. At this size, it's very sturdy and fairly lightweight.

Materials needed:

- 1 each 4' x 8' sheet of 3/4 inch plywood (only 1/2 sheet is used)
 - 2 each 1" x 2" x 8' boards (finishing grade)
 - 3 each 2" x 2" x 8' boards
 - surface planks from 2 or more pallets
- Also: string and a pencil
- exterior wood glue
 - table saw or band saw
 - optional: sabre saw
 - mortise machine or mortise attachment for drill press/small drill & narrow chisel
 - 5/16" drill bit, 1/4" roundover bit
 - sandpaper
 - clamps or weights for gluing
 - galvanized deck screws
 - 1/4" hex-head stove bolts with

- large washers (no carriage bolts!)
- wood dough and paint thinner
- outdoor paint if desired

In a 4' x 8' sheet of 3/4" plywood, partially drive a small nail 2 feet from one end and centered. Tie a piece of string to it, and tie a pencil at the other end, just short of the center of the far end of the sheet. This will give you a radius of about 6 feet. Use this homemade compass to strike an arc across the top of the plywood. Cut along this line, preferably with a sabre saw, and keep the cutoff piece. Use it to draw another line 2" from the first cut. Cut along this line to make the first half of a handrail. Take this first piece and finish the cut sides so they're smooth

and even. Use this piece to measure and draw the cut lines for the rest of the curved pieces; the handrails and the floor joists. This will give all of them exactly the same curve. Each finished piece will consist of 2 laminated pieces of plywood, making them very strong. Measure the two outside floor joists to be wider than the inside joists by the thickness of the material you plan to use to cover the floor. Before laminating (with exterior wood glue), put these pieces aside for awhile.

Cut the two 8-foot lengths of 1" x 2" into 6 equal pieces each for the horizontal handrail supports. They should come out a little less than 16" each. Using a table saw or a band saw, cut off a 'shoulder' from each end, 1" deep, leaving a 1/2"-wide tenon.

Cut the two 8 foot lengths of 2" x 2" into 4 pieces each for the upright handrail supports. They should come out a little less than 2 feet each. Using the 1" x 2" pieces as spacers, line up the uprights flush with the 'shoulders,' and overlapping the tenons. Use one of the handrail pieces to line up the top

ends of the uprights. Mark the placement of the mortises by spacing the horizontal supports equally distant from the handrail. If you don't have a mortising machine or a mortising attachment for your drill press, just drill small holes at each corner of the mortise, and use a narrow chisel to hollow out the mortise. Make each mortise a little deeper than the tenon that goes into it. Drill a 5/16" hole two inches from the bottom of each upright, perpendicular to the mortises.

Dry-fit the handrail supports together. Don't glue them yet. With the handrail supports firmly fitted together, use them to mark the placement of the dado cuts in the handrail halves. The two opposing dado cuts will form a mortise when the halves are glued together. Now use the handrail piece to mark the shoulder cut of the tenon at the top of each upright piece. Leave enough at the top of each upright to extend just beyond the top of the handrail. Notice that the angle of the shoulder cuts are different on each tenon. Cut the top shoulders of the uprights to make a 1/2" tenon on each one.



Closeup showing floor connections



Railing pieces laid out



(above) Plywood marked for cutting



(left) Far view of bridge over stream entering natural pond



Floor panels laid out from pallets



Major assemblies - floor and 2 handrails

At this point, you might want to do any shaping and/or sanding needed on the handrails and supports. Routing the supports with a 1/4" roundover bit gives a nice touch.

Now you can do the glueup. The center joist should be two short pieces, and the outside joists should be one short and one long piece. Spread some weather-resistant glue evenly on the mating surfaces and clamp them together, or put weights on them on a flat surface. Glue the horizontal rail supports to the uprights. Glue the two halves of the handrail together and to the tops of the uprights, and clamp them together.

When the glue is dried, trim off the tips of the uprights protruding through the handrails. Using a hand saw or a table saw, trim the bottom tips of the floor joists so they have a flat, horizontal surface to sit on the ground. Using one of the handrail assemblies as a guide, mark the locations of the mounting holes on the outside floor joists. Drill 5/16" holes at these locations.

Prepare your materials for the floor. Old pallet planking is ideal for this purpose for two reasons. First,

it's usually made from very hard wood. Second, it's usually 'cupped' from being out in the weather. The cupping, if you're lucky, will match the curve of the floor joists. If not, you may want to deliberately soak and dry the wood several times to achieve this effect. Trim all the pieces to the same length. If they are irregular widths, don't worry; it gives some character to the floor. Sand the top surfaces if you want a smooth painted finish. Remove any nails or other hardware that may have been in the planks. Drill and countersink screw holes in the center and at the ends of each plank. Using galvanized deck screws, attach the planks to the floor joists, leaving about a 3/8" or 1/2" gap between them. The ends of the planks should fit inside the wider outside joists, giving a nice finished appearance. When lining



Joe's grandson enjoys Grandpa's creation.

up the center joist, be sure the screws go into one or the other of the 3/4" halves, or into the glue joint. You may want to stagger (zig-zag) the holes for this purpose.

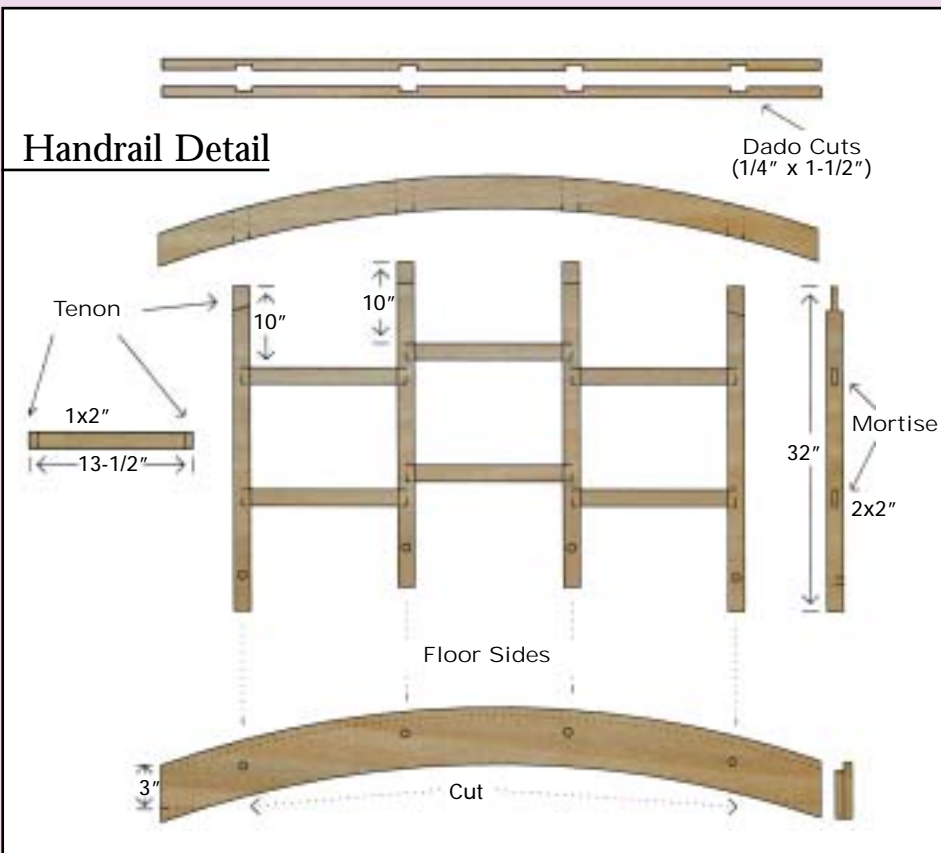
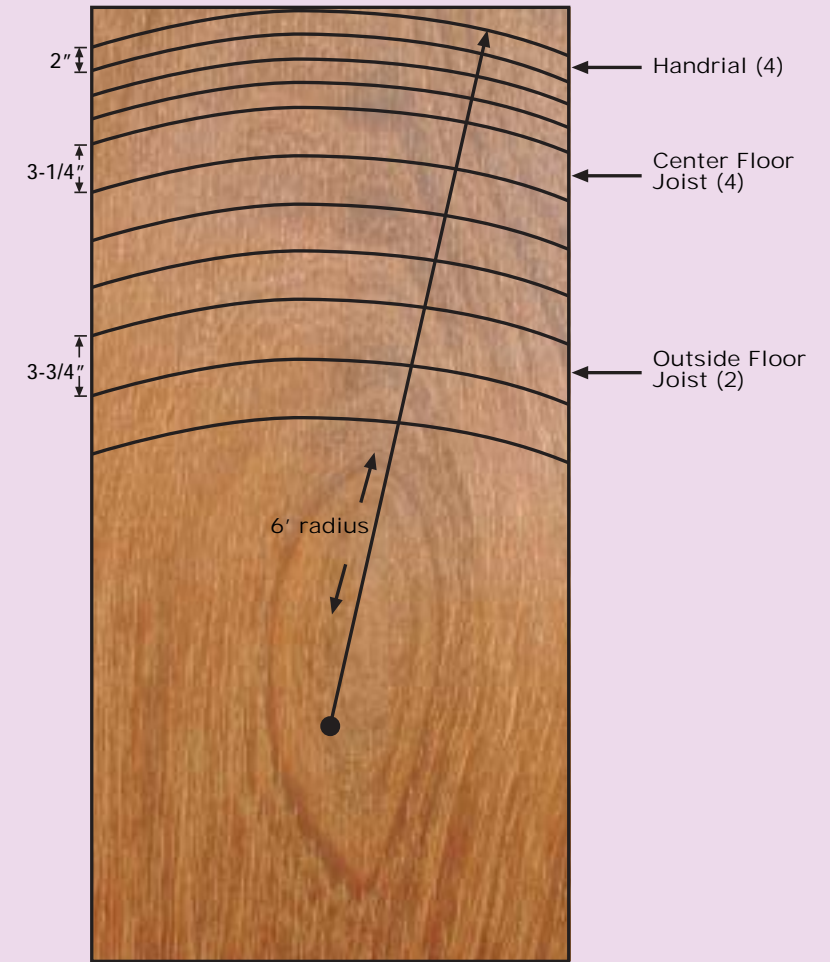
Prep for painting. If your plywood is less than perfect (voids, gouges, etc), use some wood dough to fill the larger imperfections. Then mix some paint thinner with some wood dough to make a thick slurry. Use your fingers to smear the slurry into smaller imperfections, leaving the surface higher than the surface of the wood. When it's dry, sand it even with the wood surface. Repeat this process if you find more voids.

I recommend painting the three major parts of the bridge before final assembly. Apply at least 3 coats of outdoor paint to all surfaces, even to the bottom of the floor. Attach the handrail assemblies to the floor with 1/4" hex-head stove bolts, using the largest washers you can find. Carriage bolts will eventually sink into the wood and the rails will become loose.

Variations: If your planks are longer than 32 inches, add another inside floor joist. If you want a longer span, you will have to use the 8-foot length of the sheet of plywood. This will require two sheets of plywood. When drawing the first arc, increase the radius by the same increase in the span. For example, an 8-foot span would need a radius of 10 feet. If you go to a full 8-foot span, you should anchor the ends of the bridge in concrete to prevent spreading. The strength of the bridge decreases with a greater span. Spreading can also be prevented by attaching guy-wires to the ends of the floor joists with a turnbuckle to tighten them.

Joe Van Hook is the President of the Green Country Water Garden Society in Tulsa, Oklahoma. Their annual pond tour is held in June. Call Joe at 918-341-9341 for more information.

Cutting Schedule, 4 x 8 sheet of 3/4" plywood



The completed bridge over narrow dry stream bed.