

Pond Renovation AND A Woodland Stream

by Carolyn J. Weise

Jerry and Arlene Sanders recently moved into their new home in Brookville on the Long Island Gold Coast, made famous by Nelson DeMille's novel. As they surveyed their new wooded property, wanting to make it their personal haven, Jerry and Arlene called in a professional, Suburban Water Gardens.



Jerry and Arlene's new home already had a fenced swimming pool and shallow concrete pond. Their dream? A koi pond and a winding woodland stream!

The Koi Pond

The spacious yard is naturally predisposed to a pond and 35-foot stream, bogs, waterfalls, and koi. Bob BonGiorno appreciated the possibilities of expanding the naturalistic swimming pool and existing fish pond, tucked beneath a canopy of large evergreen trees and surrounded by decks and bridges leading to the cabana.



In the pond renovation, a winter drain is constructed in a shallower, separate part of the new pond near the waterfall entry from the new stream. This will allow water exchanges, if necessary, during the winter when the hibernating fish on the pond's bottom shouldn't be disturbed.

To convert the concrete, kidney-shaped goldfish pond into a koi pond, the 6 x 25-foot pond required greater depth than its original two feet. The first order of business would 'drop out the bottom' and dig down another three feet for a more koi-friendly depth of five feet. Salvaging the original sides, a ledge, part of the original bottom, was left intact as the center was removed, dug out, and re-cemented. Instead of holding 1500 gallons, the renovated pond could now hold 4,000 gallons. Two bottom drains, two skimmers and, a winter drain and return to keep from disturbing the warmer water on the bottom during cold weather completed the conversion.

The new concrete cured for 30 days. Because concrete is alkaline and its leaching of lime would create a water pH of 10, the slight-

est presence of ammonia or nitrite would be magnified to fish-toxic proportions. A rubber sealant applied after the concrete had sealed would allow a more desirable neutral pH of 7.2. Rubber "paint" is available from water garden dealers, home building suppliers and hardware stores. The other option, of course, would be to line the pond with EPDM flexible liner.

Knowing the pump must be able to move water from the pond to the filter and back into the pond by way of the stream, besides supporting three 750-vortex and cone filters, skimmers, and waterfalls, a Polaris II pump designed and manufactured by Suburban Water Gardens was selected.

The Woodland Stream

While the concrete cured and awaited its rubber sealant, construction of the woodland stream began. Dirt and foundation sand



Continuing the concrete pond construction into an adjacent bog, the concrete sides are faced with bricks. This bog area is higher than the main pond's edge to allow an additional, aerating waterfall return.



For stability, bricks are cemented into place around the edge of the shallow pond reservoir that contains the winter drain.

removed from the newly dug pond bottom were used to sculpt the stream's terrain, along with nine truckloads of additional topsoil. Rocks, an integral element in naturalized pond settings, were brought to the site: smooth Pocono cobbles and pebbles to line the stream bed, flat limestone to coordinate with the existing deck as the concrete pool's edge, and moss rock, some weighing 200-300 pounds each. The large but manageable moss rocks would be partially



(above) Bob decided that Pennsylvania stone best complemented the existing deck and cabana design. The flat stones allow a sheeting waterfall over the pond's spillway.

(inset) The pond's Pennsylvania stone edging continues under the deck for a finished and detailed appearance.

buried within the sculpted terrain to appear natural.

Bob designed the stream as a staggered and gently winding series of shallow pools, separated by rocky outcrops set into the graduating levels so that water flows from one into the next as miniature waterfalls. Crucial rock placements at the stream's edge and extending outward into the land-

scape integrate the design within the surrounding landscape. Within the newly sculpted ter-



rain, the stream, the bog pools, and the pond would become one with the garden. Hardy aquatic plants, interspersed with the rocks in the water feature, and selected landscaping plants will complete the integration.

To prevent water loss, a 40 x 10' 45-mil EPDM sheeting lined the stream's



At the top of the stream, water will be cycled from the pond and filter system into a header pond that is fully lined with rubber liner.

excavated channel. A layer of soil was raked smooth and all existing stone removed by hand to prevent puncturing or weakening the liner. Next came a layer of fine sand and then three yards of Pocono stone to cover the surface of the 35-foot-long, 4-foot wide stream. The gray-toned Pocono is heavy enough not to be washed downstream. The narrow space between the moss rocks was cemented discrete-

ly to assure the water's fall over the rocks. Assured of a leak-proof flow, the liner was securely tucked between and behind the stream-edging rocks above the water level, trimmed, and fully concealed with backfilled soil, more rocks, and plantings. Once

planted with aquatic plants, the stream will become part of the pond's filtration system. Next, the majestic trees had to be protected. With the terrain alteration, soil now rose several inches up many of the tree trunks. Left with soil around the trunks, the trees would be susceptible to fungal rotting and disease. Tree wells, boxed retaining walls around the trees, would hold the soil away from the trunks. By



Luis, one of Suburban Water Garden's crew, checks the level side-to-side across the 4-foot-wide stream excavation. This ensures the water will run evenly through the stream bed.

making the wells three times the size of a mature tree trunk and by using treated wood, the wells will protect the trees for many years. These tree wells will not be noticeable in the finished garden since the tops are flush with the ground and will be surrounded by landscaping plants.

The Bog Gardens

Then, we began constructing the bog gardens. An area was dug on each side of the stream next to the pond. A brick retaining wall



Luis smoothes the soil base in the streambed and makes certain no rocks might be present. He uses the back side of the rake to prevent puncturing the liner.

built alongside the pond was cemented between the walls and covered with the liner for a strong footing. The retaining wall of brick, which the homeowners already had, was also built at the outer edge of the second and bigger bog, beneath the cabana deck. With the retaining wall higher than the edge



Smooth Pocono stone is layered on top of the sand and soil. Its color blends well with the moss rock selected for the structural stonework.

of the pond, the water will flow from a return line buried and opening into the bog. The water will then flow over the bog's edge and into the pond. This will



A layer of damp sand covers the soil base in the streambed. improve the circulation to the pond and eliminate any dead areas where harmful bacteria can grow.

The first bog was dug 4'x10' and 2' deep. Around the entire area, the stones and liner hide the actual dimensions and aesthetically enlarge the pond itself, obscuring the edges of the manmade design. The other bog was dug deeper and wider, 6' x 10' and 40" deep with 6" standing water above the stone filling.



Working down the length of the stream, the soil base, sand covering, and Pocono stone is set into the bed.

Arduous describes the digging since the ground was mostly rock. Much of the rock was supported by wood beams that separated the bog into two separate areas, one on each side of

discarded foundation debris, left behind and buried by the home or swimming pool's builder. Electric lines in this area also ran straight through the second bog, as did a water line from the underground sprinkler system. The electric lines, already encased in PVC conduits, were



Looking toward the cabana and deck, the stream meanders from the woods. The liner will not be tucked away until we are satisfied with the stream design and its water retention.



Before the stream is finished, water is run through its system to check the flow for leaks and evenness.

the lines. This was not apparent when the bog was completed.



Plumbing, which will bring water from the pond's bottom drains, is coupled together with fence coupling. The plumbing is then buried to exit water into the filtration system (the vats in the background). Care is taken to prevent elbows in the plumbing line that might trap air and inhibit the function. Also, the plumbing will be buried at no higher an elevation than the pond's water level. (Use a surveyor's level, if necessary, to determine this.)



Suburban's vortex filtration system uses cone-shaped vats to effect both mechanical and biological filtration. Water enters the mechanical chamber where particulates are swirled by centrifugal action to the bottom for drainage and then flows through two chambers of bio-filter media.

Anxious Questions...

Nearly halfway through the construction, the anxious homeowners began asking questions about the care, the safety, and the responsibility of owning this much water. Although the



A concrete pad and a double layer of liner pieces protect the rubber liner from the weight of the concrete block supports set into the bog for the bridge.

pond, stream, and swimming pool area are already enclosed with a secure-locking iron fence, the Sanderses have grandchildren and others to protect. What about the koi? What kinds of plants are going to go into this? How will it look when it's finished? Do the plants need to be moved into the house for the winter? How much additional cost? *When will it be done?* It reminded me of the time spent waiting for my new kitchen to be installed, but, like my kitchen, it will be worth it.

Bob BonGiorno reassured the homeowners and suggested there is no cause for alarm since the children are already accustomed to the swimming

pool's presence, and the same precautions are taken around a pond as with the pool. The existing koi will be taken to Suburban Water Gardens to spend the winter in Suburban's



Santos built and stained the bridge sections back at Suburban's shop.



With the bridge installed, it seems a continuation of the existing deck.

temperature-controlled greenhouse. The fish will then return to a much improved home next spring.

Bob surveyed the work and had the workers remove the bog on the edge of the pond to replace it with a larger liner and a different rock edge. Laying out the landscape plan, Bob included many of his favorites: horizontal juniper, cotoneaster, leucothoe and penisetum, along with many leafy evergreens, as well as woodland perennials and hardy ferns. Hardy aquatics, such as cattails and water iris were planned for both sides of the walkway leading to the swimming pool. Taro, water hyacinth, and other tropical plants will provide a dynamic seasonal statement and then grace the home during winter. A spectacular display in the first bog is planned: three lotuses.

The Bridge

With the project nearly completed, the bridge could be installed. Made of a durable plastic wood at the shop, the bridge will last a lifetime. Each section measures 2 x 6 feet and was painted gray to match the deck and cabana. Within the bog, a foundation of a layer of concrete, two layers of pond liner, and then concrete blocks set in concrete was built to support the bridge and the people who will cross it. The bridge sections form a zigzag pattern across the large bog. Stepping stones placed beyond the bridge lead away to the filter, concealed behind the cabana.

Some delays were unavoidable with the work being outdoors and the late autumn weather typically capricious. By November 22, the bridge had been set in place and



To move and place a 400-500-pound rock, more than one person is needed!

anchored. Soon after, some of the plants had been added, and the protective wells were in place around the trees. Three muscled men and a wheelbarrow had set two 400-500

pound rocks in place. The pond had been refilled and no leaks were noted. *Acuba japonica*, five *Leucothoe* shrubs, and five hollies poised along the streambed, ready to face winter. The three lotuses, two horsetails, one water clover, water iris, and several water grasses were planted in the bog. The remaining bricks were stacked behind the shed,

and the blown leaves, spilled sand, dirt, and cement were cleaned out of the pond. With the debris cleared away, the picture became more distinct. An inch of new soil was



The finished stream empties water into the pond via a two-step waterfall. In the foreground, a second waterfall emerges from under the zigzag



A finishing detail after the bridge is installed: Pocono stone as an aesthetic and low-maintenance ground cover accented by a trio of boulders.

spread over the surrounding ground in preparation for restoring the carpet of grass.

Pond water replaced, the skimmers collecting floating leaves, and the filter was up and running. The liner won't be trimmed down until they are completely satisfied there are no leaks and the ground has had a chance to settle. December 2nd was the target date.

All in all, it went quickly. In the finished project, the water cascades among the rocks, splashes over the waterfall and out of the bogs, and the fish have a wonderful new home. The private haven is realized.☺



Free-form areas of Pocono pebbles integrate the stream and landscape design.



Looking to the deck, both of the pond's side bogs are visible, seeming to enlarge the pond itself.

A special thanks to Jerry and Arlene Sanders for allowing us to photograph the work in progress and to Bob BonGiorno and Suburban Water Gardens for sharing their creative talents.



Set among the pebble groundcover, stepping stones lead away to the filtration setup.



The completed stream offers a pleasing and natural design that will acquire character with mature landscaping in the coming spring.

JOIN THE RANKS OF Conifer Nuts AND Cone Heads

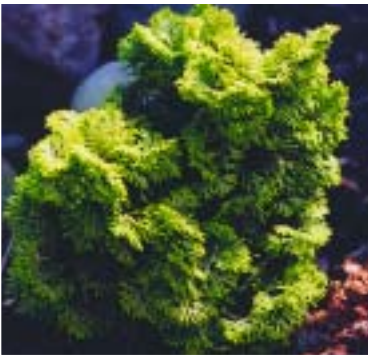
by Sandra McLean Cutler

Upon discovering the effortless rewards of dwarf conifers, you may become ‘susceptible’ and join the ranks of those bitten by the conifer bug. With no limit to the variety of dwarf and unusual conifers, you’ll want to own a sampling.

Before you know it, you’ll seek more and more and *many more* dwarf and unusual conifers, a sure sign of the affliction, earning the affectionate labels of ‘conifer nut’ and ‘cone head.’

Variety in Your Garden

Dwarf and unusual conifers come in a full range of colors from the bluest blue through all shades of green, yellow, gold, and even purple.



(above) *Juniperus squamata* ‘Blue Star’ provides a reliable blue accent anywhere in the garden. Place it near a water feature to meander through and drape over rocks. Readily available, it grows only 1-3 inches a year. I’ve controlled the growth of this plus-seven-year-old ‘Blue Star’ by keeping the soil lean. Rich soil promotes rapid growth.
(inset) Planting several Hinoki cypresses, *Chamaecyparis obtusa* ‘Nana Lutea,’ creates sparkling oases of gold with their rounded forms and cupped, fernlike leaves tipped in gold. Since the cultivar grows extremely slowly, it fills just the right space for many years.

They crawl, sprawl, creep, weep and grow upright as pillars, pyramids, fountains and globes in sizes from small to tall and with foliage from soft to sharp. Available in all sizes, some cultivars grow only a quarter-inch a year, while others grow up to a foot a year. Most do best in full sun, yet a few prefer partial shade. Besides adding beauty to your garden, a true gardener’s bonus is the minimal upkeep beyond proper planting and a bit of TLC the first year or two.

“Winter blues” takes on a whole new meaning with blue conifers in your garden. Because a lone blue conifer overwhelms the landscape, design repetition justifies



When this specimen blue spruce, *Picea pungens* ‘Montgomery,’ was planted six years ago, it was 2 1/2 feet tall and wide. Now about four feet tall and wide, it has grown about 4 inches a year instead of the anticipated 3 inches a year. When growing conditions are *too* favorable, dwarfs can grow faster than expected.



The small, golden Hinoki cypress ‘Nana Lutea’ on the left grows only an inch a year, allowing it to remain a streamside resident for many years. However, the golden mugo pine, *Pinus mugo* ‘Aurea,’ on the right has grown so large that it requires annual pruning to maintain its size. Growing in the garden trough in the center is the blue, fernlike *Chamaecyparis pisifera* ‘Boulevard’ that was only 3 inches tall five years ago. Now 16 inches tall, it anticipates a permanent home where it can fulfill its normal 6-12 inches per year to a mature height of six feet in ten years.



This blue sawara cypress, *Chamaecyparis pisifera* 'Squarrosa Intermedia,' grows loosely, almost in a "fluffy" or "lumpy" form without the usual reversions. Facing down this luscious plant is a very small golden yew,

Taxus baccata 'Watnong Gold.' Since it will stay small for many years, it can remain in this site, protected from the neighborhood's marauding deer. Tucked up front, the small golden Hinoki cypress, *Chamaecyparis obtusa* 'Nana Aurea,' provides further sparkling contrast. All of these plants were set out about six years ago. The one-gallon, root-bound sawara cypress (probably 3-5 years old) is now close to 3 feet tall. Both the now-eight-inch tall yew and the now-six-inch-tall Hinoki cypress were 1-2 years old and in two-inch pots.

This Rocky Mountain blue spruce, *Picea pungens* 'Glauca Prostrata,' is one of my favorite plants. Only a 6-inch sprig stuck in a 1 1/2-inch pot when purchased by mail seven years ago, several years passed with little growth. Transplanted to this well-drained spot beside our water feature, it has thrived.

inclusion of several cultivars. Many brilliant blue cedars, firs, junipers, spruce, and a few pines await your selection. Blue junipers also provide a bonus of plum coloration during winter. Spark your scheme by planting a gold or yellow cultivar near a blue; their sunshine makes the blue utterly brilliant. The blues shown here are just a few of the many available. Once bitten by the conifer bug, you'll enjoy the hunt for more. Remember, however, to arm yourself with the correct botanical name in your search for a particular cultivar.



Because Canada hemlock, *Tsuga canadensis* 'Curly,' grows about 1/4 inch a year and bears very brittle branches, protective rocks are necessary. The interesting foliage on the upper right is Japanese umbrella pine, *Sciadopitys verticillata*. Although its estimated growth rate is 6-12 inches a year, I've had this two-foot-tall pine more than five years. Barely larger from its original planting, it demonstrates that many factors influence growth.

Simple Maintenance

Though close to effortless once established, a bit of initial care protects your plants. Since it takes a few years for the roots to develop well before the top displays growth, the initial planting and the first year are critical.

Watering

With the exception of the pond cypress, conifers *require* good drainage. Covered in water, their roots die in only two or three days. The first year, however, frequent watering is necessary. Keep the soil moist but not wet to encourage good root growth. Do not allow the soil to dry out, yet remember that too much



The brilliant blue dwarf fir, *Abies lasiocarpa* var. *arizonica* 'Glauca,' stands out anywhere. Becoming more compact and growing about 1 1/2 inches a year, the plant has reached only 18 inches in five years.



Candle-flame form and powder blue color make this Rocky Mountain juniper, *Juniperus scopulorum* 'Moon Glow,' a favorite. Growing less than 2 inches a year, it won't need pruning for years, if ever.

water kills. Once established, most conifers can survive a three-week drought.

Mulch

Mulching at least an inch or two keeps your plants healthier as it

maintains moisture and moderates soil temperature, even as it inhibits weed growth. Pine bark mulch is an excellent choice for conifers.

Rocks

Placing rocks around the base of your plants as soon as they're planted discourages squirrels, chipmunks, raccoons, skunks, and opossums from grub-quests in the newly turned soil, uprooting your new plant in the process. Check under the rocks occasionally for vole and mice tunnels to their private dinner table – your plant's roots.

Besides lending aesthetic interest to the landscape, using rocks around your plants maintains moisture, moderates soil temperature, and gives support to small conifers. Place the rocks to support the limbs of smaller dwarf conifers and to prevent breakage from accidental tromping. A dog chasing a squirrel plays havoc with your treasures! Learning this the hard way, I immediately mended the broken



Rocks protect these valuable and vulnerable dwarf hemlocks, *Tsuga canadensis* 'Cole's Prostrate.' Truly dwarf conifers, they grow less than 1/2 inch a year. In twenty years they will still be less than a foot tall with spreads of 2-3 feet. Plant them as a stunning drape over a low wall near your water feature.

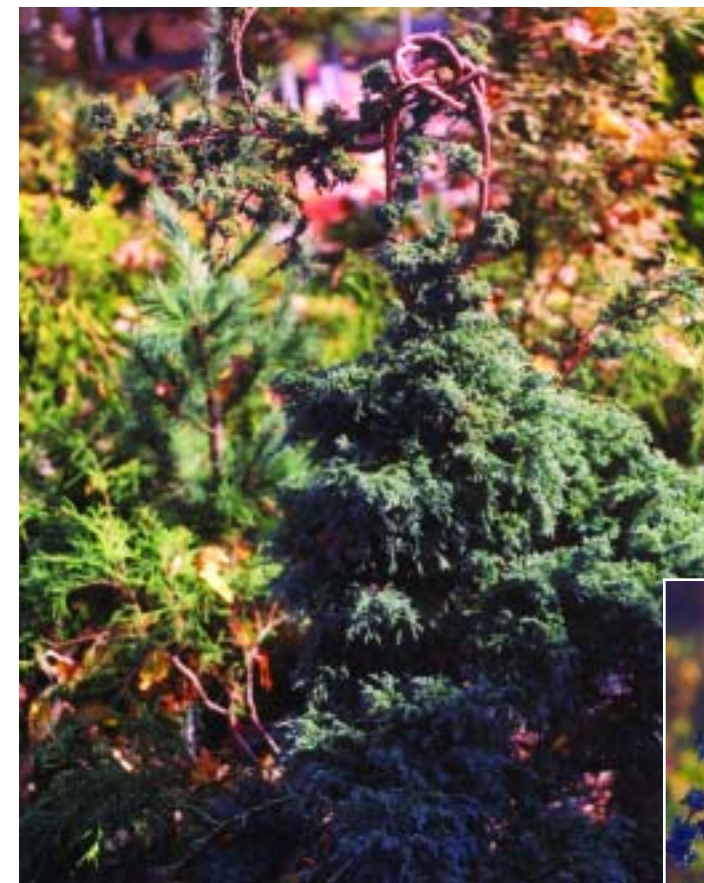
limb with masking tape and gave it a rock support. To my relief, it healed completely.

Pruning

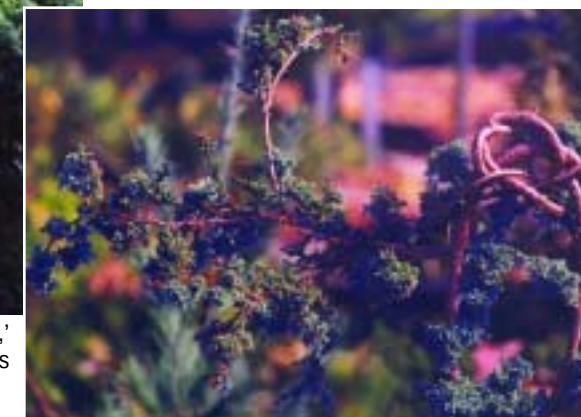
Although many conifer species tolerate it quite well, pruning is not usually necessary. Occasionally, however, the plant attempts to return to its origin, sending out a fast-growing or larger limb. Known as reversion, this rogue growth can overwhelm



Seven Alberta spruce make up this "dwarf forest": two *Picea glauca* 'Sanders Blue' in front, a small *Picea glauca* 'Rainbow's End' on either side, and five *Picea glauca* 'Conica' framing the back and sides. Depending upon how fast the 'Conica' and 'Sander's Blue' grow, the grouping may be attractive for only a few more years. I am counting on their harsh growing conditions and their close planting to slow the normal growth rate of 3-6 inches a year.



Sawara cypress, *Chamaecyparis pisifera* 'Squarrosa Intermedia,' notoriously sends out lengthy reversions. Taking advantage of this growth habit, I've braided and knotted the reversions.



the dwarf habit and result in the whole plant reverting to standard size. If you feel creative, experiment with training reversions into balls, knots, and braids for more unique specimens otherwise, prune them as they appear.✂

Sandra McLean Cutler is the author and publisher of *Dwarf & Unusual Conifers Coming of Age – A Guide to Mature Garden Conifers*. Visit her website at www.bartonbradley.com for more examples of these special conifers. See page 92 for information on ordering the book.