

Environment

Local hazardous dams await reconstruction

by Toan Mach

Just a handful of dams across Centre County have been classified as high hazard and yet little seems to be happening with their reconstruction.

The 72-acre Lake Perez in Stone Valley owned by Penn State University has been drawn down for almost two years to nothing more than a muddy patch. Its dam is untouched.

Larry Fennessey, a Penn State engineer, said that the lake is drained, but no further work is being done on the project. The repairs are expected to take millions of dollars and not begin until 2014, if funding is secured, according to a July 2009 Centre Daily Times report.

Another local dam that has made headlines is Philipsburg's Cold Stream Dam, which has several major problems according to Tom Rathbun, a Department of Environmental Protection spokesman in Philipsburg. The top of the dam is irregu-

lar, he said. It is not smooth and aligned as a regular dam should be. The downstream slope, which is the wall of the dam, is excessively wet. The overtopping protection of the dam which prevents water from overflowing to the other side does not function efficiently, Rathbun said.

There's "nothing wrong with it [Cold Stream Dam]," said Harry Wood of the Philipsburg Borough Recreation Committee. He said the DEP just wants to repair the dam for flood protection.

Jan McDonald, the Borough Manager of Philipsburg, said that the borough still permits tourists and residents to be in the area for recreational activities. Engineers from DEP are working on design of the rehabilitation project, McDonald added.

An estimated 655 people, 10 businesses and three daycare centers could be harmed if Cold Stream Dam collapses, according to the Emergency Action Plan.

The Commonwealth Financing Authority granted Philipsburg nearly \$2.3



Photo by Toan Mach
Cold Stream Dam, in Philipsburg, was constructed in 1889.

million for the rehabilitation project for Cold Stream under the H2O PA Act. The authority provides single-year or multi-year grants to municipalities or municipal authorities to assist with the construction of drinking water, sanitary sewer and storm sewer projects, according to guidelines issued by the Pennsylvania Department of Community and Economic Development.

The funds cover three major improvements, explained Rathbun. The first project is the restoration of the overtopping protection by using a process called Roller Compacted Concrete (RCC). This will prevent water overflowing from the reservoir.

"The RCC overtopping protection will allow the dam to safely overtop during a large storm event," he said.

Second, the borough will use part of the

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Ecologist promotes Amazon village sustainability

by Jill Gómez

Haley van Oosten, founder and president of L'Oeil du Vert, a company that searches the world for fragrances to create unique scents, knew about the sublime fragrance given off by the resin of the copal tree. With a serendipitous click on the Center for Amazon Community Ecology (CACE) website, van Oosten initiated the possibility for a new product that might help sustain the native village of Brillo Nuevo and other small forest communities in the Peruvian Amazon. She read about the Center's research on copal and contacted Campbell Plowden, a State College ecologist and environmentalist who established CACE four years ago.

"How many places on the web can tell you a lot about copal resin?" laughed Plowden.

We don't hear as much in the news these days about the Amazon, but its forests are still being damaged and denuded at alarming rates to raise cattle and soybeans, cut

Plowden is optimistic that the new belt-making enterprise could prove to be one more—albeit small—step toward helping a village such as Brillo Nuevo find ways to improve the lives of its people and safeguard its surrounding forest.

timber, and extract oil and minerals. Thousands of colonists are entering the region on an ever-growing network of roads. The fertility of the region's ancient soils is low, so farmers often adopt short cycles of slash and burn agriculture, abandoning plots and moving on to new areas. Sometimes communities accept much-needed quick cash for removal of their largest trees regardless of the loss of fruit trees, water quality and social harmony.

Plowden is passionate about protecting the rain forests and worked with Greenpeace for over a decade against forest destruction in the Amazon. Those years taught him, however, that he couldn't do it well on a global scale. He entered a PhD

program in ecology at Penn State with the dream of working directly with native Amazon communities to try to find positive alternative solutions. He spent a couple of years with the Tembé Indians in the eastern Brazilian Amazon, studying the ecology, sustainable harvest and marketing of non-timber forest products (NTFPs). These items include plant fruits, fibers and resins (and sometimes animal parts) that forest people can collect for personal use or make into products like handicrafts they can sell.

While Plowden found this work enriching, he quickly discovered the challenges of harvesting plants without harming them and selling them for a price that made all of the time invested in finding and getting them to

market worthwhile.

Plowden founded the not-profit organization CACE in 2006 to "promote the understanding, conservation and sustainable development of human and other biological communities in the Amazon region."

"We believed that if we could look very selectively at plants that people in forest communities could process themselves and sell as value-added products, we could fulfill two very important goals in the conservation picture," said Plowden. "One [goal] is to simply enable people to generate more income to help them buy basic supplies, help them put their kids in school, buy medicines, etc. The other is to develop lucrative activities that can be genuine incentives to reduce their attraction to or dependence on destructive logging and cash crop agriculture—activities that can be profitable in the short term but are very harsh on the forests."

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Plowden and his Peruvian colleagues have begun their fifth year of trial and error discoveries about how to best harvest the copal resin and distill it into a precious golden essential oil that they hope, with practice and perfection, may sell for \$500 or more per liter—a respectable profit for an Amazon community.

Finding widely dispersed copal trees is the first challenge in this venture. Even teams of locals who intimately know the forest around their village may only find three or four trees with resin lumps in a full day. The lumps are formed on the trunks of trees by bark-boring weevils. Sustainably harvesting most plant parts means avoiding harm to the host plant. In this case, Plowden is trying to figure out how much and how often resin can be removed so enough weevil larvae growing inside the lumps can live to maturity and produce the next generation of weevils.

Last summer, Plowden took a copper alembic pot with him to Peru to use in the group's first attempt to distill copal resin to produce its essential oil.

"It was a comedy of errors. It's critical that you seal all of the joints between your pot, your column, your tubes, your condenser, etc.," said Plowden. "Old world oil distillers traditionally use a paste of rye flour to do this. We looked all around the city of Iquitos (the capital of Peru's largest Amazon state of Loreto), and not surprisingly, we couldn't find any rye flour."

"When we returned to the village, I presented this problem to the village *curaca*, Manuel, who suggested we try making a paste with mashed cassava. One of the things the Bora [people] eat daily is a very thick bread made from the root of this staple crop. So we thought, we'll make the paste, put it around the joints, and then as it heats up, it will basically solidify into bread that will seal the joints. But steam leaked out, so we kept adding more paste. Soon half of the pot was covered in a thick and



Photo by Natalya Stanko

Campbell Plowden, right, setting up an alembic distillation pot with Manuel, *curaca* of the village of Brillo Nuevo in the Amazon.

half-cooked coat of cassava dough."

Just in case, Plowden had brought down some plumbing sealant. They pulled off the crusty cassava, applied the sealant to the junctures—and it worked! They discovered they needed to pry it off right after a distillation run before it turned rock-hard.

Thanks to support from the Rufford Small Grant fund in the U.K., CACE has been able to contract a field savvy Peruvian agronomist and respected young Bora leader to further develop the copal pilot project in Brillo Nuevo.

"It was exciting to produce our first batch of copal oil last summer, but unfortunately

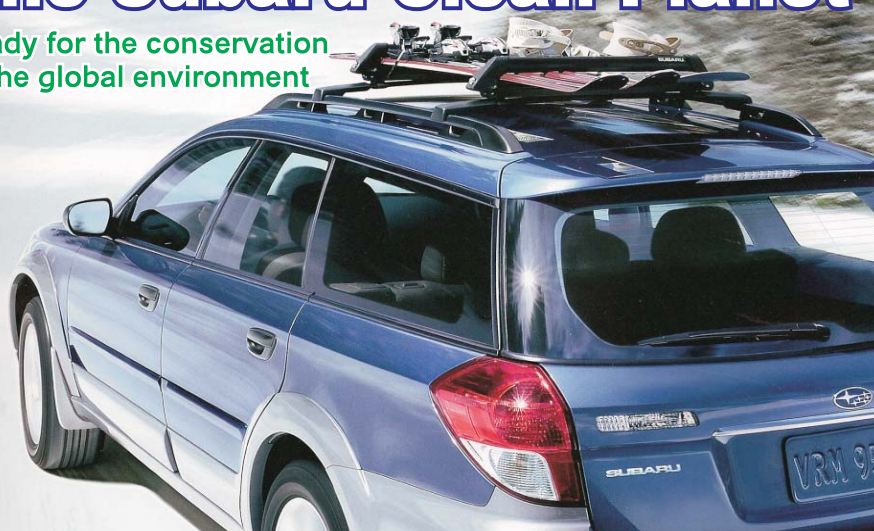
its strong lemon scent made it seem better for a cleaning fluid than perfume," said Plowden. "Our team is now searching for new species of copal resin to test, and we are going to let some resin lumps sit for awhile before we distill them because essential oils often improve with age like a fine wine. We're learning a lot as we go along."

While the copal project is mostly aimed at developing a way for men to generate some income from the forest (as a potential

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fund to construct a low-level drain. Rathbun explained that this will allow draining of the reservoir for an emergency or maintenance.

The remaining funds will be used to rebuild the pedestrian bridge over the spillway where water from the reservoir runs down. Builders will use a new pre-stressed concrete structure for the new bridge.

Rathbun said the total cost for the completed project cannot be determined because the engineers are still developing the details. The cost changes as the engineers adjust the details of the plan.

According to DEP, of more than 700 high hazard dams statewide, currently 130 are in some stage of repair. The agency is still under the process of studying, designing, and waiting for approval for reconstruction. Last year, 18 dam projects

received funding from Commonwealth Financing Authority under the H2O PA Act, Rathbun said.

Although H2O PA Act provides \$50 million for high hazard dam projects in Pennsylvania, the estimated cost for dams in Pennsylvania for the next five years is \$1.4 billion. Rathbun said other counties rely on other sources for extra allocations such as PENNVEST, capital budgets and the County Environmental Initiative Program. Only a few have received funding.

And residents living near dams that have received funding see little progress on site.

"Most of those projects are in the design phase and DEP is working closely with the engineers who are designing those projects," Rathbun said.

Coyler Lake and Poe Dams in Centre County have been classified as high hazard "unsafe" dams, can could affect 250 and 153 people, respectively, according to the DEP.

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alternative to logging), Plowden and CACE also try to support artisans in their partner communities who are mostly women. The Center buys a wide range of plant-based handicrafts including bags, baskets, jewelry and decorative items which it sells at presentations and craft fairs. Its Amazon Forest Store is due to go online this fall.

"A few communities already have unique products that tourists really like to buy. The women from Brillo Nuevo and other remote communities are skilled weavers, but few tourists go there and they don't get much for their long labor because they tend to make the same handicrafts as all the other communities: hammocks and bags.

"Why don't you try making some belts?" Plowden suggested to a group of women during his March 2009 visit there.

"I passed out buckles, showed them my belt as a model and invited them to create any design. One woman made alternating blocks of red, yellow, black and tan from the natural-dyed chambira palm fibers. Another exclaimed, 'Wow, that looks like a *naca naca* (coral snake),' and an exciting marketing idea was born."

Last summer Plowden met with the women again, listing the snakes they knew and drawing the basic patterns on a blackboard. The women produced prototypes of a dozen colorful Amazon snakes including *anaconda*, *cascabel* (tropical rattlesnake) and *loro machaco* (green tree pit viper).

Plowden is optimistic that the new belt-making enterprise could prove to be one more—albeit small—step toward helping a village such as Brillo Nuevo find ways to improve the lives of its people and safeguard its surrounding forest.

To learn more about the Center for Amazon Community Ecology, visit www.amazonecology.org.



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Strategies for going native with garden perennials

by Sally McMurry

By planting more native species in our flower gardens, we can promote biodiversity. Biodiversity is crucial, not only because it means more birds and butterflies for us to enjoy, but because ultimately humankind depends on biodiversity for critical ecosystem services such as clean water.

Planting natives is a noble goal, but sometimes it's hard to know where to start. In the next columns we'll discuss strategies for approaching native-plant gardening with perennials; this week we discuss how to get the most biodiversity "bang for the buck."

Beginning gardeners can "go native" right from the start, while veterans will probably look to incorporate more natives into existing, conventional schemes. Basic garden design principles can apply in either case: start with the "bones" (larger plants that supply a superstructure, often remaining above ground), then plant with specimens and clumps organized by height, texture, color, and blooming season. Other aesthetic sensibilities may need to change along the way, though. For example, chewed leaves, galls, boles, and holes mean that your native plants are attracting native predators. In turn, those species will attract their own predators – native songbirds, butterflies, and pollinating insects. So, welcome the holes and boles. Native gardens have beautiful proportions, textures, and colors, just as conventional gardens do; but they are not so excessively tidy or blemish-free as their conventional counterparts.

Recently, extensive native-plant lists have appeared on the Internet. The Lady Bird Johnson Wildflower Center, for example, sponsors an authoritative Native Plant Database (www.wildflower.org/plants/).

These resources are encouraging; they show that the native-plant gardener's choices are vast. They are also overwhelming, especially for someone new to the whole idea of native plant gardening. Rather than simply choose randomly, it helps to have a strategy. One good strategy is to seek a large biodiversity "bang for the buck." In other words, use native plant species that are known to attract many other native species. Among herbaceous perennials, two groups promote this goal especially well.

One is goldenrod (Genus *solidago*); the other, aster (Family *asteraceae*, genus *aster*). Fortuitously, the two not only attract lots of insects and birds; they also bloom in the same season and complement each other with yellow and purple hues.

Goldenrod tops Douglas Tallamy's list of "most valuable... perennial native plant genera in terms of supporting biodiversity in the mid-Atlantic region." Tallamy reports that goldenrods support 115 native species of Lepidoptera (moths and butterflies) alone. Of the many insect species found in association with Goldenrod, among the most specialized is Goldenrod Gall Fly (*Eurosta solidaginis*). The female adult deposits eggs in a goldenrod stem; the eggs hatch into larvae, which eat from the stem and create a swelling called a gall. They stay there all through the winter, surviving by secreting an antifreeze-like chemical. In turn, their predators may crack open the gall and enjoy the juicy larval morsels. One such predator is the Downy Woodpecker, a favorite backyard bird.

Several goldenrod species make excellent perennial-garden plants. The ones I'll mention are generally regarded as not aggressive; easy to manage; colorful; and undemanding with regard to sun, moisture, and soil. *Solidago speciosa*, Showy Goldenrod, reaches two to five feet in height. Its soft yellow flowers are borne in a pyramid shape. Showy Goldenrod attracts butterflies and pollinators, especially bees. Fragrant *Solidago odora*, Sweet Goldenrod or Licorice Goldenrod, is equally tall but flowers in a delicate spray. *Solidago nemoralis*, Gray Goldenrod, provides a shorter counterpoint, growing only to about a foot. Gray goldenrod has the merit of being well-behaved and blooming a long time.

Second on Tallamy's list is the aster; it attracts 112 native Lepidoptera species. Asters have multitudes of tiny daisy-like flowers (technically not flowers, but that's another story) in colors ranging from vivid purple to pale pink and even white. Bushy Aster, *aster dumosus*, has lovely tiny pale blue flowers with yellow centers. It grows to about three feet tall; it could be sandwiched between tall and short goldenrods. The American Goldfinch and the Monarch butterfly feed on the Bushy Aster, while the Painted Lady butterfly and American Toad



find shelter in its leafy confines. Native plant expert William Cullina rates *Aster laevis*, smooth aster, "one of the best for gardens." This 1-3 foot plant has nodding pale blue to lavender flowers. It's a larval host and nectar supplier for the several butterfly species, including the pearl crescent butterfly, *Phyciodes tharos*. Finally, New England aster, *aster novae-angliae*, grows 2-3 feet and tends toward purple- and rose-colored flowers. This popular aster is widely available commercially (though some plants marketed are cultivars; see sidebar). It complements goldenrod especially nicely.

Together, asters and goldenrods can form the core of a colorful late-season flowerbed. Their benefits don't stop when they quit blooming. If allowed to stand over the winter, they provide cover and food for the birds. This snowy winter, I often spied juncos and white-throated sparrows hopping about in the thicket of dead aster stalks in my perennial border.

By the time the seeds and galls begin to dwindle, the green shoots appear, harbingers of a new season in the perennial cycle.

What is a Native Plant, Anyway?

A plant must have two important qualities to be a 'native.'

I. A native plant makes its home in a particular area, evolving to the conditions and climate where it lives. A plant native to Maine is not a native of Central Pennsylvania and may not provide the nourishment or benefit of a true native. The official definition of a native plant is:

A plant species "that occurs naturally in a particular region, state, ecosystem, and habitat without direct or indirect human actions" (Federal Native Plant Conservation Committee, 1994).

II. A native plant must retain all of its qualities when propagated by humans as 'cultivars'. Some gardening experts trust that 'cultivars' of native plants are of equivalent value. Others believe 'cultivars' should not be considered natives.

Cultivar: A variety of plant that has been created or selected intentionally and maintained through cultivation (American Heritage Science Dictionary).

Native plants frequently have characteristics, including shapes and heights, that don't fit into common landscaping plans.

If a local native plant's bloom period, color, or frost hardiness is changed, it could have a drastic effect on the hummingbirds, bees and other wildlife that may utilize it.

To spot a 'cultivar' check the identification marker. The cultivar's name is written after the Latin name, as in *Zinnia elegans* 'Tom Thumb'. Native plants only have the plant species name.

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Ardent male woodcocks woo females in spring

by Alice L. Fuller

“Beezp...beezp...beezp.” Wisps of mist rise from the ground soggy from April showers, and we strain our eyes to catch a glimpse of the author of these strange sounds before darkness blots out our vision altogether.

Finally, following the sound of the harsh call that sounds more like a “Bronx cheer” to our ears than a love call, we spot a small feathered fellow strutting along one edge of the clearing.

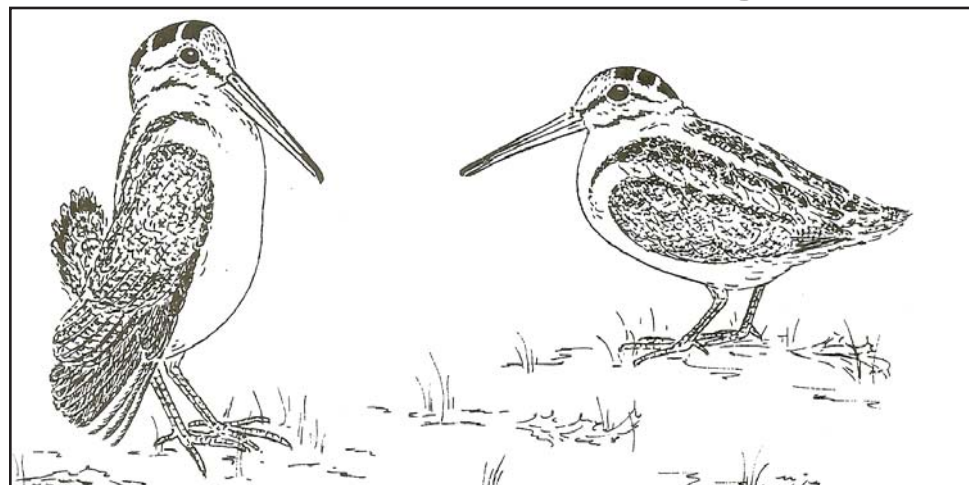
To our ears “Beezp” is not a romantic sound; undoubtedly, a lady woodcock finds it much more attractive. Even so, our pint-sized Romeo has other stunts in his drama bag. We hear a whistling sound and catch a glimpse of the bird flying from the ground, but quickly lose sight of him as the dark form blends into the background trees. The whistling sound tells us the tiny actor is spi-



raling higher into the sky.

As the whistling ceases we almost hold our breaths not to miss the peak of the dramatic performance, and we are rewarded when the jumble of warbling notes falls to our ears. In a moment we hear a startling “bzeep” almost at our feet. After his brief burst of ecstasy, our performer has tumbled back to earth to repeat the entire routine.

With a little time and patience anyone who chooses can witness this brief show on any pleasant spring day from the end of March until the early part of May. Shows are given twice daily, at dawn and dusk. On a moonlit night the performance may continue into the evening hours.



One must first search out woodcock country. This species is partial to alder thickets, boggy woods or damp places in deciduous woodlands. Mostly shy and retiring except during the courtship season, the male woodcock selects a clearing in his chosen territory to serve as the stage for his ebullient performance.

One spots such a location by listening for the nasal call of the male, usually referred to as “peenting.” By remaining quiet and unobtrusive, one may observe the male bird strutting like a miniature “turkey-gobbler,” such as the one sketched by Dorothy Bordner.

If one picks up the woodcock’s act while enough light remains to see his actions, it might be possible to observe the entire “sky-dance” of the ardent male.

After watching this odd little bird, one might be surprised to learn that it actually is a sandpiper. The woodcock belongs to the same bird family as the pectoral sandpipers. This species doesn’t have the globe-trotting tendencies of many of its relatives. The woodcock ranges in eastern United States and southern Canada and doesn’t travel any farther south than need be to find food supplies.

The woodcock seems to be an aberrant shorebird which has taken to the woodlands, and it tends to be a loner while many sandpipers congregate in great flocks. In A. C. Bent’s “Life Histories,” the woodcock is succinctly described as “this mysterious hermit of the alders, this recluse of boggy thickets, this wood nymph of crepuscular habits.”

The woodcock’s diet, too, contributes to its uniqueness, for most of the bird’s food

consists of earthworms. Naturalists have observed that a woodcock can consume twice its own weight in earthworms in a 24-hour period.

This sandpiper has unusually large eyes, set far back and near the top of the head. Such large eyes, like those of the owls, presumably result from the bird’s preference for being active in the evening or early dawn hours. The location of the bird’s eyes probably makes it easier for it to spot danger during the hours it spends probing with long bill into soft ground in search of earthworms.

Another adaptation of the woodcock is the dark, mottled pattern on the back which harmonizes with the dry leaves of its surroundings. Mother woodcock can incubate her eggs in a hollow on the ground and blend so perfectly with her background that she is not likely to be seen or disturbed except by accident.

It is quite likely that female woodcocks are already busy with domestic duties while their ardent mates continue with the courtship ritual.

Mother Nature is generous with her spring spectacles. All are free for the observing.

On a warm spring evening, plan to stop by pond or marsh and be enthralled by the exuberant chorus of spring peepers and other frogs. From a nearby field may come the sweet, sad call of a meadowlark or the gentle solo of a vesper sparrow. Search out an alder-choked stream or wander through a Barrens road, and for a few minutes you might be enthralled with the joyous maneuvers of the love-struck little woodcock.

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