CONSERVE

VOLUME LVXIV • WINTER 2021

Preservation and Restoration

Western Pennsylvania Conservancy®

water, land, life.

CONTENTS

Cover Photo: Fallingwater

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The Western Pennsylvania Conservancy protects and restores exceptional places to provide our region with clean waters and healthy forests, wildlife and natural areas for the benefit of present and future generations. To date, the Conservancy has permanently protected more than 260,000 acres of natural lands. The Conservancy also creates green spaces and gardens, contributing to the vitality of our cities and towns, and preserves Fallingwater, a symbol of people living in harmony with nature.

Western Pennsylvania Conservancy

waterlandlife.org

Message from the President

In this issue, we focus on the Western Pennsylvania Conservancy's work to restore some of the most important resources in the region. This includes efforts by our conservation staff to restore many of the most ecologically significant areas in our region, and our work to preserve and restore one of the best known cultural sites in all Western Pennsylvania, Fallingwater.

We implement a wide array of restoration projects that touch all aspects of our organization and across the region.

The Conservancy might be best known for protecting properties by setting them aside to protect them from development, for planting gardens and for stewarding Fallingwater. But much of our work involves restoration and preservation—restoring our rivers, our streams, important habitat, important ecological properties, and preserving Fallingwater. Here are just a few examples covered in this issue:

- We are about to undertake a substantial preservation initiative at Fallingwater, which was added to the UNESCO World Heritage List, to further strengthen our commitment to help this treasure live on.
- Our watershed conservation team has been working in the Chesapeake Bay watershed for many years, partnering with landowners and farmers on best management practices to restore streams on farmlands. This issue describes a current project on a farm in Blair County that is a part of this bay restoration initiative.
- We are restoring part of one of our preserves in Crawford County, the Helen B. Katz Natural Area, from former farm fields to wetlands. This project will help improve water quality in the French Creek watershed.
- In one of the most populated and developed counties in our region, Allegheny County, we are working with partners to restore the urban tree canopy, restore areas overrun by invasive plants and enhance green spaces in county parks.
- Ongoing partnership projects at state parks are restoring lands back to their natural setting. Vernal pools, wet meadows and native plantings are welcoming salamanders, frogs and other wildlife in many acres of re-established lands.

The Conservancy's preservation and restoration work are important to the future of our region. Thank you for your support, which is allowing us to restore the health of our rivers, streams, forests and habitats and preserve our region's most notable sites and resources. We appreciate your enthusiasm and interest in our work, your volunteer time and your support in so many ways that help us restore natural areas and resources in Western Pennsylvania.

Thomas D. Saunders

Impacts of deep mining are being remediated with native trees and an abandoned mine drainage treatment facility at WPC's Bennett Branch Forest in Clearfield and Elk counties.

PRESERVING AND RESTORING OUR REGION'S IMPORTANT PLACES

Your support helps the Western Pennsylvania Conservancy conserve, restore and preserve our region's most exceptional places, helping to enhance the quality of life in the region and in local communities. Our work helps preserve the region's natural heritage, features and landscapes, formed thousands of years ago, and cultural treasures, such as Fallingwater.

But as you know, some of these important local natural areas and ecosystems are still degraded from decades of past use and current impacts. These factors have contributed to reduced biodiversity, contaminated rivers and streams, fragmented forests and reduced populations of native species across Western Pennsylvania.

In addition, a changing climate is further altering wildlife and natural habitats. And according to a recent World Meteorological Organization study, the problem is only getting worse. In 2020, carbon dioxide levels rose by more than the prior 10-year average despite a decrease in emissions and other activity related to the COVID-19 pandemic.

The Conservancy's senior director of conservation science, Charles Bier, says understanding the land and landscape, and using tools like field assessments, research and monitoring, provide insights into nature's problems and finding the right restoration solutions.

"There's no one-size-fits-all approach when it comes to restoring nature and our waterways. Many factors include understanding how those natural areas became degraded in the first place and then determining the best ways to help restore them to their original state," Charles says. "Ideally, we'd want nature to recover on its own, but for a lot of places in our region, that's not feasible nor possible," he adds.

Most of the Conservancy's restoration work is done by the experienced watershed conservation staff that has spent countless hours working with state and local partners and private landowners restoring 3,000 miles of local rivers and streams.

To restore streams, the team replants streamside areas, called riparian buffer zones, with native trees and shrubs to help filter and reduce pollutants entering waterways. They also restore streams by removing barriers such as culverts and dams that fragment watersheds and disrupt natural pathways and movement of aquatic species.

Newer restoration methods are also used, such as a technique called large woody material restoration where fallen or cut trees are strategically placed into streams. This helps stabilize streambanks and improve aquatic habitat, stream ecosystem health and floodplain function. Restoring streams helps improve water quality, increase fish and aquatic habitat and ensure clean water for humans and wildlife.

Ecosystem or habitat restoration is another method used by Conservancy staff to help land rebound. This type of restoration involves planting trees, shrubs and other vegetation to re-establish natural areas, or removing invasive plants to then replant with native species. This type of restoration occurs regularly on our preserves, most recently Wolf Creek Narrows Natural Area in Butler County, and a project is currently underway at the Helen B. Katz Natural Area in Crawford County. Read more about this work on pages 8 and 9.

In addition to our work to restore land and waterways, the Conservancy is committed to the preservation of Fallingwater. Our ongoing and proactive efforts to safeguard the structural elements of Fallingwater help ensure that it will be available as a public treasure and one of the world's greatest examples of art in nature. Read more about important preservation work at Fallingwater on pages 4, 5, 14 and 15. ■

FALLINGWATER PREPARES FOR MAJOR PRESERVATION INITIATIVE

TWENTY YEARS AGO, FAILING CANTILEVERS PUT FALLINGWATER IN DANGER OF POTENTIALLY TUMBLING INTO THE RUSHING WATERS OF BEAR RUN. FALLINGWATER ADMIRERS AND SUPPORTERS FROM AROUND THE WORLD AS WELL AS THE FOUNDATION COMMUNITY CAME TO THE RESCUE, AND MAJOR REPAIRS WERE MADE TO THE CANTILEVERS AS WELL AS FALLINGWATER'S STONEWORK, CONCRETE SURFACES, ROOFS AND TERRACES.

Since this important work began more than two decades ago, building systems like the roof and terrace waterproofing have reached the end of their useful lives, and the effects of time and weather on the materials that meld the house to its landscape have created additional preservation issues we must address.

These challenges come at a momentous time in Fallingwater's history; just two years ago, the United Nations Educational, Scientific and Cultural Organization (UNESCO) inscribed Fallingwater and seven other Frank Lloyd Wright-designed sites to the UNESCO World Heritage List. This international recognition places Fallingwater even more prominently on the world stage and affirms that Fallingwater is an important place that should be preserved for the enjoyment and education of future generations.

In seeking and accepting this historic designation, the Western Pennsylvania Conservancy acknowledged its longstanding responsibility to preserve and protect Fallingwater—its architecture, landscape and diverse collection of art and furniture. However, World Heritage inscription is purely honorific and is not accompanied by any funding from UNESCO.

Gaining World Heritage status will further expand our audience base and attract cultural heritage travelers from around the world. To ensure all of our visitors receive the most authentic experience possible, we must further strengthen our commitment to protect Fallingwater's integrity. The more we protect the building from the damaging effects of time and weather, the better we are able to demonstrate the highest of stewardship standards to our expanding worldwide audience.

A 20-year preservation plan, completed in 2019, provides a comprehensive update to the plan Fallingwater commissioned from Architectural Preservation Studio in 1999. Two decades of wear and tear have gone by, and the updated plan closely examines the building from top to bottom and provides a preservation roadmap for the coming years. The following are among the findings and recommendations:

- **Stone Walls:** Fallingwater's stone walls were constructed by hand using Pottsville sandstone quarried from the site and laid in irregular patterns to mimic the natural formations found in the landscape. Seasonal expansion and contraction caused by fluctuations in temperature creates hairline cracking in the mortar joints, allowing water to find its way inside the walls. That water travels through voids inside the walls and then finds its way out, often causing damage to interior surfaces, woodwork and even art objects. In an effort to mitigate this water infiltration, the main stone walls of the house will be injected with liquid grout. The grout will fill all the voids inside the walls and prevent the possibility of water migrating to the inside. Mortar joints will also be repointed with new mortar and waterproofed.

- **Flat Roofs:** Wright used strong horizontals in Fallingwater's design; however, nature has taken its toll over the past 20 years and all roofing and roof roll waterproofing membranes need to be replaced. Priority areas include: Edgar Kaufmann jr.'s roof, the pottery terrace and master bedroom roof, the guest house roof and the servants' quarters roof.

- **Terraces:** Fallingwater's terraces carry the indoors to the outdoors; however cracking mortar joints in the stonework and failures in the underlying waterproofing membranes and flashings let water seep inside. Flagstones will be lifted up to access the waterproofing underneath. Once the membranes are replaced, the flagstones will be reset and repointed. Then, flashings will be repaired and sealed with caulk.

- **Concrete:** Wright viewed reinforced concrete as a "plastic" material, one with limitless potential that could take any form. When constructed, Fallingwater was Wright's most expansive use of reinforced concrete in a residential application, and he used the material to stretch conventional notions of building and living. Because Wright pushed the limits, Fallingwater's reinforced concrete presents many preservation challenges. The area requiring immediate attention is the southwest corner of the master bedroom terrace. Because it is cantilevered over the falls almost 40 feet in the air, this is an extremely challenging location to repair.

- **Steel Window and Door Frames:** A key feature of Fallingwater's design is the extensive use of glass to create transparency. This blurs the line between inside and outside and integrates the house with nature. To secure the glass for windows and doors, Wright used steel frames that eventually corrode in the moist environment. Repairs to the steel and glass require rust remediation, some steel replacement and installation of new sealants.

We expect to begin these multi-year, phased repairs next year, and to accomplish that, we have raised nearly $1.7 million in individual and foundation gifts for this first phase of implementation of the 20-year preservation plan.

Recognizing the economic impact of Fallingwater as a tourism resource, the Commonwealth of Pennsylvania generously granted Fallingwater an additional $1 million through the Redevelopment Assistance Capital Program, which invests in regional economic, cultural, civic, recreational and historical improvement projects. That brings our total to just under $2.7 million and leaves us with a little more than $300,000 to raise in order to address the most urgent preservation needs at Fallingwater.

Fallingwater is all of ours to conserve, keep open as a public treasure, and celebrate as one of the world's greatest examples of art in nature, and nature made even more inspiring through art. Undertaking these projects will ensure Fallingwater's long-term preservation and its ability to live on.

To learn how you can be part of this legacy, contact Julie Holmes, director of development, at 412-586-2312 or **jholmes@paconserve.org** or visit our website at **Fallingwater.org/WorldHeritagePreserved.** ■

Previous repairs on Fallingwater's Wright-designed concrete walls.

Wright used glass to integrate the house with nature. Steel frames were used to secure the glass in place and have corroded in the humid environment.

FARMER, WPC AND PARTNERS STABILIZE TROUT STREAM, REDUCE POLLUTION

The mudsill crib creates a stable undercut bank effect that provides wild trout with protection from predators. The cross vane directs water to the center of the stream, providing a deeper pool in which fish can swim. Both structures help prevent streambank erosion.

THE SCOTTISH HIGHLANDS CATTLE ON JACK KRIDER'S FARM IN MARTINSBURG, BLAIR COUNTY MUNCH ON NATIVE PLANTS IN PASTURES KEPT FRESH BY ROTATIONAL METHODS, AND ON SWELTERING DAYS BASK IN THE SHADE OF NATIVE TREES ALONG CLOVER CREEK, A WILD TROUT STREAM THAT MEANDERS THROUGH THE PASTURE.

In 2015, Jack worked with the Blair County Conservation District (BCCD), the Pennsylvania office of the U.S. Department of Agriculture's Natural Resources Conservation Service and the Conservancy to restructure the grazing system on his farm, Highland Meadows.

The Conservancy's watershed conservation team partners with local conservation districts and the NRCS to offer agriculture best management practices (ag BMPs), including on-site consultation and suggestions such as streambank fencing, stabilized stream crossings, roof runoff management, waste storage and nutrient management plans (NMP).

In developing NMPs, Conservancy staff identify non-point source pollution, which results when rainfall or snowmelt runs over land or through the ground, picks up pollutants such as excess nutrients and fertilizers and deposits them into rivers, lakes, wetlands or groundwater. They study the nutrients, look for erosion issues and write the NMP, an extensive report with recommendations to help limit pollution entering rivers and streams.

Scottish Highland cattle on Highland Meadows farm enjoy native grasses and plants grown on rotational grazing pastures.

In 2015 and 2016, the Conservancy worked with Jack and 11 other farmers in the Morrison Cove region of Bedford and Blair counties to write NMPs and to install ag BMPs to reduce nutrient and sediment loads, says Jennifer Farabaugh, watershed manager for the Conservancy.

The project on Jack Krider's farm included a spring development, four watering systems and several thousand feet of fencing to create a rotational grazing system, in which a large pasture is divided into smaller paddocks so livestock can be moved easily among paddocks.

"Morrison Cove is fertile but is lined with porous limestone, which allows the nitrates to go down into the water table," Jennifer explains. "By working with the farmers and our partners, we reduced nitrogen loads by 9,148 pounds per year, phosphorus loads by 305 pounds per year, and sediment loads by 72 tons per year." The reduction in sediment and nutrients helps to improve water quality in the Chesapeake Bay watershed. On the Krider farm, the team completed nutrient management on 28 acres.

The nutrients on Jack Krider's farm were managed, but although he had fenced off the stream to prevent the cows from wading in, he still wished to address the erosion that had previously occurred while allowing them to stay cool in Clover Creek and access both sides of the pasture. Conservancy staff approached Jack about helping him with the erosion problem and creating more habitat for the wild trout.

"Once we started looking at ideas to manage erosion, we really got pumped about it," says Jack. "The Conservancy and partners had the expertise and showed us the various improvements we could do."

In 2020, the Conservancy, working with the PA Fish and Boat Commission, stabilized 1,000 feet of Clover Creek by installing a stabilized cattle crossing, three modified mudsill cribs and four cross vanes to prevent erosion. The mudsill crib also creates a stable undercut bank effect that provides wild trout with protection from predators, and the cross vane directs water to the center of the stream, providing a deeper pool in which fish can swim.

Working with the BCCD, the Conservancy watershed conservation team stabilized the streambank and planted 67 native trees, including red maples, persimmons, black locusts, silky dogwoods and willows, as well as shrubs and live stakes as riparian buffer. Jack wanted to provide pollinating plants to support the honeybees he raises. "The streambank is so beautiful when the black-eyed Susan bloom all along the sides," he says.

A water trough and fences are part of the rotational grazing system on Jack Krider's Highland Meadows farm.

A stabilized cattle crossing installed on Clover Creek on Highland Meadows farm in Martinsburg, Blair County helps prevent streambank erosion. Its gradual sloping bank is covered with 65 tons of large rock and smaller stone to resist the impact of cattle and machinery.

The streambank stabilization design was put to the test in September when remnants of Hurricane Ida caused extensive flooding. "Just the top of the fenceposts were sticking out and both sides of the bridge were underwater," Jack recalls, noting that the design was meant to withstand a 25-year flood, but this flood was more extensive. "I was really concerned a lot of the work would be undone, but even the cattle crossing was fine. We had to do some quick repairs but everything held."

Jack and his wife, Renee, worked the farm for many years when it belonged to his in-laws, before Jack retired from teaching eight years ago and took over the farm full time. Their goal is to make the farm a better place than it was when they started with it. Their conservation efforts garnered them the Outstanding Conservation Farm Award from the BCCD in 2016.

"This stream stabilization was just another thing we could do to improve the farm," Jack says. "Our grandkids and others that follow us, whether family or not, will benefit."

The Kriders have seen quail return to the farm to enjoy the native grasses, and a flock of young ducks use wood duck boxes that Jack installed. "We've seen three generations of trout in this stream," he notes. "The resiliency of what we have is a real blessing." ■

FOREST AND WETLAND RESTORATION
EFFORTS AT KATZ NATURAL AREA HELP WATER QUALITY

At the 552-acre Helen B. Katz Natural Area in Crawford County and the 40 other nature preserves the Conservancy owns, manages and makes available to the public, our land stewardship staff works to not only improve the preserves for recreational use with trails, parking lots and other enhancements, but also to restore and reestablish plant and animal habitats to help species thrive.

The combination of floodplain, wetland and upland forest associated with Cussewago Creek, which crosses through the Katz preserve, supports a diversity of wildlife. Wood ducks and beavers frequent the wetlands and creek. And as part of the PA Audubon Society Cussewago Bottom Important Bird Area, the preserve provides vital habitat for a variety of birds, including cerulean warbler, hooded warbler, marsh wren and green-winged teal. The Katz preserve, located near Meadville, lies within the important French Creek watershed.

One of several wetlands at the Helen B. Katz Natural Area in Crawford County.

That's why restoring the natural communities at this nature preserve is so vital.

Restoring Riparian Forests

Several years ago, Conservancy Watershed Projects Manager Alysha Trexler, who oversees riparian reforestation efforts on all our watershed projects across the region, worked closely with Andy Zadnik, director of land stewardship for the Conservancy, to help reforest the riparian areas at Katz. "This was a really meaningful project to restore this important natural area at one of our WPC-owned properties where the stream and forest meet," she says. "Trees make a direct impact by filtering stormwater runoff with their roots and increasing the soil's ability to absorb water, which is so important in swampy areas like at Katz."

In 2013, 3,400 trees and shrubs, which included native species such as swamp white oak, pin oak, Allegheny serviceberry and silky dogwood, were planted on 17 acres of former agricultural fields along tributaries of Cussewago Creek. The plantings provide 4,425 feet of streambank protection.

Alysha says the aesthetic beauty is secondary to the environmental benefits. "Every tree we plant matters as each serves an important role in restoring the landscape and providing benefits for wildlife. Some of our ancestors didn't know the detrimental effects of removing so many trees, but we know better. Now, it is our job to work to reverse the damage," she adds.

Restoring Wetland Habitat

About 86 acres of what is now the Katz preserve was converted to farmland decades ago, and per common farming practices of that time, the land was drained with underground clay tile or other piping structures in order to grow row crops such as soybeans and corn. The property off State Highway 98 in Vernon and Hayfield townships eventually gave way to an empty barn, silos and other structures.

These remnants of past land use existed on a 171-acre parcel the Conservancy acquired and added to the natural area in 2016, four years after the preserve was established.

Katz already hosts several wetlands. But thanks to a wetland reserve easement with the U.S. Department of Agriculture Natural Resources Conservation Service, more wetland habitat will soon be restored at the nature preserve. Through this partnership, 46 acres of previously farmed land is currently being restored to its original state as wetlands that will eventually support both aquatic and terrestrial species. The restoration involves removing the underground pipe system, recreating two small wetland depressions, and treating and removing invasive plants.

In 2013, the first trees were planted to reforest 17 acres at Katz. The restoration trees are establishing well and being supplemented by plenty of natural aspen growth.

A 46-acre wetland restoration is currently underway at Katz.

From flood and erosion control to improved water quality and wildlife habitat, wetland habitats have many important environmental benefits. Wetlands are areas that contain water on at least an intermittent basis and that support vegetation adapted to handle flooding and saturated soils. As nature's sponges, wetlands, by way of the vegetation contained within them, trap, filter and slowly release rain, stormwater, groundwater and snow back into a landscape or waterway.

"This is such a great place for wildlife; our management plan for Katz emphasizes the importance of restoring this area and removing old structures that degrade the quality of the natural ecosystems," says Andy.

In addition, another 40 acres of adjacent land will serve as a buffer for the wetlands. Buffer areas surrounding wetlands act as natural "pretreatment tanks" to the wetland by slowing the water flow, converting surface water to groundwater and providing additional capacity for water storage once the wetland it surrounds has filled. Buffers help preserve the naturally cleansing capabilities of wetlands, says Jody Lasko, a district conservationist who is leading the work at Katz for NRCS.

"Wetlands serve an important role in the watershed ecosystem for water quality and the diversity of vegetation for wildlife habitat. We're pleased to partner with the Conservancy on this important project that will make a lasting impact on Cussewago Creek and the entire French Creek watershed," Jody adds.

The restoration activities are currently underway and expected to conclude by fall 2022. ■

THREE PROJECTS HELP RESTORE NATIVE TREES, VEGETATION IN ALLEGHENY COUNTY

Eastern redbuds shine as the dominant tree species of the restoration plantings along the North Shore Riverfront Trail as part of the Pittsburgh Redbud Project.

THE RESTORATION OF PITTSBURGH'S RIVERFRONTS HAS TAKEN CENTER STAGE OVER THE PAST DECADE, WITH MANY ORGANIZATIONS AND PARTNERS WORKING COLLABORATIVELY TO MAKE THE AREAS ALONG THE ALLEGHENY, MONONGAHELA AND OHIO RIVERS IN DOWNTOWN PITTSBURGH RECREATIONAL, ENTERTAINMENT AND WILDLIFE HOTSPOTS.

The Western Pennsylvania Conservancy serves a key role in this resurgence on a variety of projects, including the Pittsburgh Redbud Project. An initiative of the Conservancy funded by Colcom Foundation, the project is helping to beautify and reforest the city's riverfronts with native trees and shrubs.

Work began in 2016 with the planting of 60 Eastern redbud trees along the Three Rivers Heritage Trail near Heinz Field. Since then, 3,267 trees have been planted as part of the project, of which 1,581 are redbuds. People who walk, run or bike along the North Shore Riverfront Trail or Three Rivers Heritage Trail enjoy the unmistakable beauty of hundreds of new trees budding pink blossoms each year.

Alicia Kanary, of Rochester, Pa., is among them. "All the natural beauty from the trees is such an important added benefit to the riverfronts," she says while noting she is seeing more birds and pollinators during her walks than ever before. "That's all due to the native trees and shrubs. You all are making a meaningful difference."

'Nature's engineer' agrees. In spring 2018, beavers gnawed 16 newly planted redbuds into pointed stumps along the heritage trail, leaving behind tiny footprints, teeth marks and a few wood chips from their handiwork.

Jeff Bergman, the Conservancy's director of community forestry, said that incident was a perfect reminder that our new trees are reestablishing vital habitat and benefiting wildlife along the rivers.

"Through this project, we've been replacing invasive non-native plant species with native species to improve the area's ecological health and habitat for pollinators and birds, but increasing the habitat for beavers is certainly an added bonus," he says. Jeff and his team now use protective wiring and tubes after each planting to ensure proper growing conditions for the seedlings and protection from additional beaver interest.

Working with partners, the City of Pittsburgh, Riverlife and Friends of the Riverfront, the Conservancy continued restoration work along the Allegheny River in 2020 to remove more invasive species like bush honeysuckle and knotweed. Those invasive species were replaced with native trees, such as birch, spruce, hophornbeam and hawthorn, and shrubs and perennial plants. These trees and plants provide food and habitat for wildlife and improve water quality. As funding becomes available, the Conservancy and its partners will continue to look for opportunities to restore areas along the riverfronts.

Restoring Local Parks with Native Vegetation

Over the past three years, the Conservancy's science and community forestry staff have worked closely with the Allegheny County Parks Foundation and Allegheny County Parks Department to undertake ecological assessment of six county parks: Boyce, South, Settlers Cabin, Hartwood Acres, Round Hill and White Oak. These studies inventoried and assessed the park's natural areas to identify and evaluate valuable biological assets such as native plants, streams and forest types. Issues such as invasive plants, tree pests and diseases, and soil erosion were also identified.

The assessments provided detailed recommendations for areas in need of restoration, such as open fields and meadows, along with management suggestions for invasive plant removal and recommendations for adding rain gardens and bioswales. Riparian tree plantings along park streams and creeks are also encouraged.

At Boyce Park, a beautiful large meadow of native wildflowers, including black-eyed Susan and purple coneflower, has bloomed for the past three springs thanks to a recommendation from the Conservancy's ecological assessment.

Conservancy staff have now planted 8,800 trees, including a variety of oak, hickory, maple and conifer species, through our TreeVitalize Pittsburgh partnership.

However, before trees could be planted, coal from the property and collapsed longwall mines had to be removed, and soil returned to the landscape, a standard best practice recommended by the Appalachian Regional Reforestation Initiative for reforesting previously strip-mined landscapes. As remediation of each acre is complete, trees are planted over the terrain to return native species to the hilltop, limit the establishment of invasive species and provide a variety of environmental and wildlife benefits.

This important project isn't yet complete. Staff continue to do tree maintenance at the site and plans for additional sapling plantings are underway. In addition, this fall, at another area at the botanic garden, staff and volunteers from FedEx planted large oaks, hophornbeams, yellow buckeyes and white fringetrees, which will add additional habitat and beauty to the site. ■

BEFORE: This location in Boyce Park was a large open mown area that provided little ecological benefit and habitat.

AFTER: With recommendations from WPC, the site was restored as a native wildflower meadow and is now a pollinator and visitor haven.

"We saw that open space as a wonderful opportunity to restore this portion of the of the park, and not only is the meadow an attraction for park visitors it's saving time and money as the resources previously used to mow the area can now be used elsewhere in the park," Jeff adds.

Reforesting Continues on a Former Strip Mine

Since 2015, the Conservancy has been partnering with the Pittsburgh Botanic Garden in Allegheny County on a restoration tree-planting project to reforest an eight-acre site that has been highly impacted by resource extraction.

Thanks to funding from the American Forests Global Relief and the Arconic Foundation Partnership for Trees,

Scan here to read and review more information in the ecological assessments.

8,800 new trees from WPC are reforesting a portion of a reclaimed mine site at the Pittsburgh Botanic Garden in Oakdale, Pa.

RARE PLANTS, ENDANGERED BIRDS AND MORE BENEFIT FROM HABITAT RESTORATION

Endangered piping plovers are nesting again at Gull Point Natural Area on Presque Isle, Erie County, thanks to efforts by the Western Pennsylvania Conservancy and multiple partners to make their habitat more desirable by removing invasive plants. The Gull Point restoration project and an invasives removal project on State Game Lands 197 in Warren County are two examples of how the Conservancy has removed invasive plants and restored habitat in recent years to help wildlife, rare plants and ecosystems thrive.

Endangered piping plovers are nesting on Presque Isle in Erie County. Photo credit: Cathy Haffner, Pennsylvania Game Commission

Giving Plovers a Fighting Chance at Gull Point

The delicate, sand-colored plovers favor sparsely vegetated sand and cobble. But invasive plants such as purple loosestrife and tall, woody native shrubs such as cottonwood and willow were taking over their nesting sites on Presque Isle, crowding and shading out native species and providing cover for predators like raccoons, coyotes and raptors.

Plovers had not nested on Gull Point since the mid-1960s and their populations across the Great Lakes had plummeted. They were granted protection under the Endangered Species Act in 1985. The U.S. Fish and Wildlife Service designated approximately a mile of Presque Isle's shoreline as Piping Plover Critical Habitat in 2001.

But invasive plants were encroaching on their protected nesting grounds. In 2012, Conservancy staff and consultants treated the area and cleared a significant amount of vegetation, including purple loosestrife, phragmites, narrow-leaved cattail, cottonwood and willows, from about 35 acres at the eastern end of Gull Point. Since then, the Conservancy has worked with Presque Isle State Park several days each year to retreat the area.

Conservancy staff has been working to clear Gull Point on Presque Isle, Erie County of cottonwood and willow trees that encroach on piping plovers' nesting area, providing cover for predators.

Jeff Wagner, director of the Pennsylvania Natural Heritage Program at the Conservancy, says, "Plovers don't like big things such as bushes and hedgerows that block their view. In an open habitat, they can see predators that are coming for their eggs." On the peninsula, he adds, wind, waves and ice scour create a constantly changing landscape and habitat. "Typically, the vegetation would have been swept away. We're trying to recreate what would have happened naturally, and keep the habitat at a quality that will attract the plovers to nest there."

Since 2021, the amount of sandplain habitat has increased substantially, which means more nesting area for the plovers. Sandplain is sand that is deposited from elsewhere by processes such as wind or ocean rather than bedrock erosion. Controlling invasive plants will help native plants get established, and over time, the areas will become stabilized dunes. Thus the work is not only bringing back the piping plover, but restoring at least some of the sandplain ecosystem.

The USFWS funded the project, a partnership between the PA Game Commission, USFWS, PA Audubon, PA Department of Conservation and Natural Resources - Bureau of State Parks and the Conservancy.

"It's a nice collaborative effort across agencies and nonprofits, all under the auspices of helping a federally endangered species," Jeff notes, adding that the goal is for piping plovers to be removed from the federally endangered list. "The numbers of piping plovers across the Great Lakes has increased every year. For the fifth consecutive year, they've successfully nested, laid and hatched eggs and reared their chicks."

Since 2017, four of 18 Pennsylvania fledgling plovers have returned to breed in the Great Lakes, As of October 2021, Great Lakes piping plovers were nesting on all five Great Lakes, in six states and one Canadian province. There are 4,000 pair of piping plovers worldwide.

Treating phragmites by hand at Shane's Fen, Warren County

Protecting Rare Plants at Shane's Fen

In nearby Warren County on State Game Lands 197 near Spring Creek, Conservancy staff recently tackled invasive plants that were taking over some of Pennsylvania's rarest wetland communities, calcareous fens. Fens are peat-forming wetland areas that formed during periods of glaciation and develop over thousands of years, often supporting rare plants, insects and wildlife. Once destroyed, they cannot easily be restored.

Jeff explains, "Fens are a big deal because they hold a huge proportion of rare plants in the state for their small size. They command a high level of attention. Shane's Fen was facing being overrun by invasive species, particularly phragmites."

Conservancy staff identified, flagged and covered the rare plants within Shane's Fen in preparation for Pennsylvania Game Commission treating the invasive giant reed, or phragmites, with herbicide. The PGC staff sprayed the densest areas of phragmites from above, which reduced the amount of herbicide that reached the ground, protecting the rare native plants. They returned later to hand-treat some remaining living phragmites.

"Working with the Pennsylvania Game Commission is great," Jeff says. "The whole idea is to guide them so they can do the treatment as part of long-term maintenance. It was a small amount of effort for a big payoff," he adds. "Everyone is happy preserving rare plants."

An eight-wheeled vehicle provided easier access into overgrown areas of Shane's Fen in Warren County and allowed for overhead treatment, which helped to protect the native rare plants on the ground.

Invasive species are everywhere, and some are not a problem, Jeff says. "But other species such as phragmites and cattails are not going to stay at the periphery. They displace natives, and of particular concern, rare species."

Jeff said the Conservancy would like to steward other fens that need management on other game lands as well as on public and private lands. Fens are generally small, and are high-quality, high-value habitats, he explains. "We can make a difference there. We're trying to keep them high quality so they remain high value. If we lose rare species then the value of the habitat declines." ■

SUMMER PRESERVATION PROJECTS FURTHER STRENGTHEN FALLINGWATER

A view of the extensive bridge work that was completed in August.

HUMIDITY, RAIN, SUN, SNOW AND ICE CONTINUE TO TOIL WITH FRANK LLOYD WRIGHT'S MASTERPIECE. UNDAUNTED BY THE CONSTANT CHALLENGES, SCOTT PERKINS, FALLINGWATER'S DIRECTOR OF PRESERVATION AND COLLECTIONS, IS DEDICATED TO MAKING SURE ALL PRESERVATION PROJECTS MEET THE HIGHEST STANDARDS OF PRESERVATION PRACTICE. HE SAYS IT IS A DAILY PRIORITY TO DEMONSTRATE THE EXCELLENT STEWARDSHIP AND PRACTICES IN PLACE TO PROTECT THE BUILDING MATERIALS—SPECIFICALLY THE CONCRETE, STONE AND GLASS—THAT MAKE FALLINGWATER ARCHITECTURALLY UNIQUE.

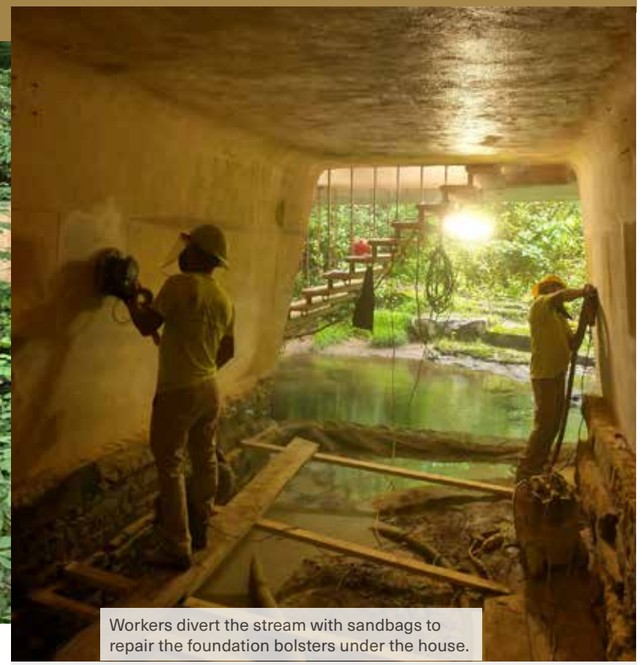
"The preservation team continually identifies and addresses issues with the house related to concrete and stone repair, window and roofing systems, paint coating systems, interior finishes and more," says Scott, who adds the team also safeguards and curates the Kaufmanns' vast collection of artifacts, paintings, sculptures, furniture and textiles, which provide context for Fallingwater's lived history.

If you had the chance to visit Fallingwater this spring or summer, you observed preservation work happening on the bridge that spans Bear Run near the house. This was one of two major preservation projects that took place in 2021. Originally planned for 2020, the projects were funded in part by the Pennsylvania Historical and Museum Commission through its Keystone Historic Preservation Grant Program. Generous individuals donated the matching funds required for the Keystone grant.

Repairing and Replacing Bridge Abutments

The bridge across Bear Run from the forest path to Fallingwater was built in 1937, the same year as the house, and its concrete walls were a composite of cement, smooth river rock and steel reinforcement. Moisture rising from Bear Run, seasonal freeze-thaw cycles and summertime humidity and condensation were eroding the integrity of the bridge's concrete. Hairline cracks allowed moisture to further corrode the reinforcement material, and past surface patchwork was failing.

Preservation work began in May to replace the concrete parapets and repair the masonry bridge abutments, which support the weight of the bridge at its four corners. Contractors completed much of the work at night and on Wednesdays, when the site is closed to visitors, to lessen visitor impact. They erected an impressive scaffold system to carry out the work and installed barricades to create a pathway for visitors to cross. Work activities on the bridge will conclude this year.



Workers divert the stream with sandbags to repair the foundation bolsters under the house.

Reinforcing Fallingwater's Foundation

In a parallel Keystone and donor-funded preservation project, we also began repairing the concrete bolsters beneath the house this spring. Fallingwater's bolsters are the main concrete supports that lift the house from Bear Run. Built on Pottsville sandstone footings, the angled bolsters were formed and cured before the cantilevered floor of the living room was poured above them. Over the last decade, the bolsters showed fine horizontal cracks primarily along the cold joint where the bolsters meet the cantilever. These structures were monitored annually from 2014 through 2020, and while there was no unusual movement other than seasonal fluctuations, the cracks needed to be repaired to prevent moisture from further expanding them.

Workers used sandbags to divert stream water away from the house before the project began. Then, workers prepared the concrete surfaces for the application of a flexible fiber mesh, which was applied over the areas showing cracking. Fallingwater maintenance workers will soon re-stucco the surfaces of the bolsters to conceal the mesh and unify the surface. Early next spring, the project will be finished with a fresh coat of paint.

Repairing and Repatching The Barn's Silo

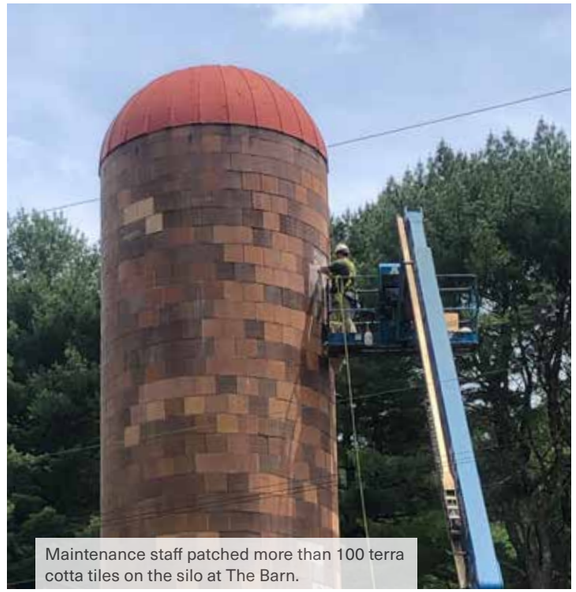
Thanks to a generous grant from the Richard King Mellon Foundation, our maintenance crew completed a range of projects on ancillary buildings and infrastructure across the site. At The Barn at Fallingwater, staff recently completed a multi-month undertaking of reconstructing the artful wooden trellis in front of the building, which had deteriorated beyond the point of repair. They also patched terra cotta tiles on the silo that stands at the entrance of The Barn.

Since the silo serves as such a visual landmark along the approach to Fallingwater, the team worked diligently to restore its original form, carefully matching the texture and colors of the historic tiles.

"We learned that the silo was still in good shape, but weather had taken a toll on a number of the tiles," says Mike Kuzemchak, director of operations at Fallingwater.

This spring and summer, Fallingwater maintenance staff patched the deteriorated clay tiles and Mike says using the skills of the in-house team was vital from a cost savings, time efficiency and project management perspective.

"It took three months to complete this effort. The work of patching each tile, matching the clay and shaping the patching material took time and great craftsmanship. Our crew did an outstanding job on this important project," he says. ■



Maintenance staff patched more than 100 terra cotta tiles on the silo at The Barn.

Amphibians such as this gray tree frog are enjoying their improved wetlands habitat at Ohiopyle State Park.

WILDLIFE ENJOYING IMPROVED HABITAT WITH OHIOPYLE WETLAND RESTORATION

An area in Ohiopyle State Park, Fayette County that once held remnants of a swimming pool and fishing pond now features a vernal pool, wet meadow and native plantings that support a variety of wildlife. Wild brook trout, ducks, frogs, salamanders and even some rare dragonflies are enjoying improved habitat in the park, while native perennials such as black chokeberry, soft rush, turtlehead and swamp milkweed bloom in the wet meadows.

Conservancy staff and partners planted more than 700 native plants.

It's all thanks to a two-year wetland and stream restoration effort by the Conservancy's Natural Heritage Program staff and partners to restore habitats at six locations in the park. The project was a collaboration between the Pennsylvania Department of Conservation and Natural Resources - Bureau of State Parks (BSP), Wetland Restoration LLC, Beran Environmental and the Conservancy.

The restoration began in July 2018 with surveys by WPC's Natural Heritage Program staff and BSP's resource management team and was completed in August 2020. The result is a diversified habitat for an array of species and a beautiful landscape where visitors can hike, fish and observe wildlife. Important habitat for Long Run Creek, a forested stream that supports naturally reproducing native brook trout, was restored.

Part of the restoration occurred on a 1,300-acre property that the Conservancy acquired in 2008 and conveyed to the park. A portion of the property was named the B.K. Simon Family Forest to honor a significant donation towards the property's purchase from family members in memory of B. Kenneth Simon, a Pittsburgh businessman who founded All-Pak Inc. and was a philanthropist and longtime member of WPC.

Manmade dams, ponds and other stream impoundments constructed many years ago on Long Run Creek were impacting habitats for wildlife species that need cool, free-flowing mountain streams and vernal pools to breed and survive. JoAnn Albert, natural heritage program operations manager says, "Our goals were to restore wetland and stream habitats with more natural hydrology and vegetation."

The partners removed four dams and a clogged road crossing, which were blocking aquatic organism passage and causing sediment to bury critical brook trout spawning habitat. The Conservancy's watershed conservation program staff helped to monitor fish passage and contributed funding from a National Fish and Wildlife Foundation grant.

By removing those stream impoundments, "We reduced water temperature and restored significant in-stream trout habitat, allowing for aquatic organism passage, and enhancing long-term watershed resiliency," JoAnn explains. The removals also allowed for the restoration of a floodplain.

The partners also removed an old concrete swimming pool, restoring the area to a natural spring-fed wetland and wet meadow, which created a more natural, diverse and resilient habitat for wildlife. Environmental educators can now use the area as an outdoor classroom, providing students with real-life learning opportunities.

Remnants of a concrete swimming pool were removed, creating a half acre of wetlands that provide improved habitat for a variety of wildlife.

"Removing the swimming pool created a half-acre of wetlands that provide improved habitat for waterfowl, amphibians, reptiles and invertebrates including dragonflies and pollinating insects," JoAnn says. Wildlife species such as wood frogs, spotted salamanders and comet darner dragonflies do well in small, fish-free wetlands, while native pollinators such as brown-belted bumble bees, goldenrod soldier beetles and eastern calligrapher flower flies thrive in wet meadows.

Conservancy staff and partners seeded the area with a native wetland seed mix and planted more than 700 native wildflowers, sedges, shrubs, and trees such as goatsbeard, fox sedge, buttonbush and witch hazel.

Due to a lack to ephemeral wetlands in the park, frogs and salamanders and other vernal pool amphibians had been using road ruts as breeding habitat. But within weeks of the restoration, new plants were growing and several species of frogs and salamanders had moved in to their new home.

In 2021, Conservancy staff visited the park to check on water levels and flow and to assess the progress of the plantings. "We re-seeded a drier upland section in the wetland," JoAnn says. A fence that had been installed to protect small areas of plantings in the wetland area from possible deer browse was slated to be removed by park staff in fall 2021 as they did not see evidence of deer issues in other parts of the wetland.

The restoration included removing four dams and a road crossing on the stream, restoring trout habitat and allowing for aquatic organism passage.

"We're pleased with the condition of the wetland and stream restoration sites," JoAnn notes, "and we'll continue to monitor the areas with the help of Ohiopyle State Park staff." Meanwhile, the fish, frogs, salamanders and myriad other wildlife should continue to thrive in their improved home.

The project was supported with funds from the Pennsylvania Bureau of State Parks, DCNR Community Conservation and Partnerships Program and the National Fish and Wildlife Foundation. ■

IN MEMORIAM

The Western Pennsylvania Conservancy and the greater community lost four wonderful, caring, talented and remarkable people in 2021. Their support and dedication to the Conservancy and Fallingwater will never be forgotten. We will continue to keep them in our hearts and their families in our thoughts.

Jean Carlisle Ackerman Robinson

Longtime Conservancy Board Member Jean Carlisle Ackerman Robinson passed away on Jan. 19 after a short illness. She was 86. Jean served on the board beginning in March 1983 and devoted many years to advancing the Conservancy's work across the region. Long before then, starting in 1966, she became a Conservancy member. Through her good nature and faith, she led by example by always giving her time, counsel and support to the Conservancy and many other nonprofits and causes in the Pittsburgh region. She was known to always put others first.

Elsie Henderson

Born in 1913, Elsie Henderson lived a life full of rich social, cultural and familial experiences, and chief among them was her culinary merit. She learned baking and cooking techniques from her mother, and from 1947 to 1963, Elsie elevated Fallingwater through her culinary storytelling and expertise in creating memorable meals that were eventually the focus of the Fallingwater Cookbook. Elsie was a talented, wonderfully charismatic and passionate person who formed lasting relationships with the Kaufmanns and Fallingwater, and everyone she encountered. She passed away March 20 at the age of 107.

Steve Guinn, Ph.D.

Longtime Conservancy Board Member and Fallingwater Advisory Council Member Steve Guinn was kind, thoughtful and generous. He consistently took time out of his busy schedule to support the causes he cared so passionately about, including helping people, nature and Fallingwater thrive. A board member since 2008, Steve led and served on many committees and chaired the Conservancy first comprehensive campaign. Steve was generous in sharing his expertise in the areas of management and leadership development. He passed away Sept. 1 after a long battle with cancer. He was 73.

James C. Finley, Ph.D.

Jim was a longtime Conservancy board member who gave selflessly of his time and talents to advance conservation and Fallingwater. He was a forest conservation and management expert, informing the decisions of foresters, private landowners and conservation professionals from across the state, including the Conservancy's board and staff. Also, as an extension of all his expertise and kindness, he turned bowls and other beautiful wooden pieces made from fallen trees on the Fallingwater landscape, to be sold in the museum store to benefit the Conservancy. Jim passed away Oct. 2 while cutting down a tree on his property. He was 72.

field notes
by Charles Bier

A Most Important Word

Roland on the Paper Mill Bridge over Pennypack Creek in Montgomery County

I love the feel of chubby toes digging into my side. I squeeze and hold on to Roland's small body a little tighter. We are leaning over and peering down from a parapet wall of the ancient 1817 stone constructed Paper Mill Bridge. Below is the murky and somewhat odoriferous flow of Pennypack Creek. This bridge is now on a hiking trail through 852 acres of conservation lands managed by the Pennypack Ecological Restoration Trust. The creek is in eastern Pennsylvania and feeds the Delaware River.

While we are gazing at the tainted water, I consider composing a story, "If This Bridge Could Talk," for this toddler, who, after less than 18 months of life, has developed a love for being outdoors. Once upon a time, this bridge was new and the Pennypack waters flowed under her, clear and fresh. The fish were all clean and native, and the rich bottomland forest was not choked with exotic invasive plants. But then the watershed was not sustainably managed and everything changed. Finally, a conservation group with "restoration" in its name came in 1970 and began to expend much effort to improve the land and water—back to what the bridge had known many years before.

A few blue jays flit by, screaming their heads off, and take our attention from the creek and the bridge's tale. Okay, well, that's probably best. I have a lot of work to do before the tale is worth telling. However, the story's thread about the concept of restoration is one that will certainly be central. Yes, restoration and an even more important word are in our conservation vocabulary. In fact, this other word is one of the most important in the world: sustainability. My simple definition of sustainability is to conduct activities without depleting or impacting other resources and values over time.

Human history includes many stories of people using the Earth's resources in one way or another and then regretting the resulting conditions, sometimes with guilt about what is left for future generations. Not to mention the fixes are expensive, and do not always work.

Take, for example, our collective efforts to correct the legacy of coal mining. PA Department of Environmental Protection's fact sheet on its website indicates that we have spent more than $670 million as of 2018 to address thousands of coal legacy problems and there is still more than $5 billion of additional need. Although this issue has some attention and investment, funding is never enough and still doesn't typically restore the landscape and its ecology, nor related economic issues, from mining impacts. So, we need to continually expand what restoration accomplishes for landscape ecology and our communities.

Plant and animal restoration projects are also many and expensive. Some classic examples include the California condor. Starting in 1976 with 45 birds remaining, more than $45 million has been expended to save this bird; now it numbers only around 270. When it was discovered in 1985 that the black-footed ferret was indeed not extinct, it was estimated there were 18 left. A recovery program has now expended more than $12 million, or $40,000 for each ferret released. Today's pitifully small population numbers around 350.

Clearly, it is less expensive to protect and manage than to attempt restoration, especially when restoration attempts are uncertain at best and are documented not to work in other cases.

WPC is involved in a number of types of restoration efforts with various partners. However, it is the Conservancy's other work in terms of land protection, water conservation and stewardship that is most important for sustainability and the benefit of future generations.

And now we are caught up, beyond our collective means and consensus, in how to restore and sustainably manage Earth's atmosphere. It could be our greatest tribute to our legacy and to future generations.

As Roland grows up, I will try to make sure that his grandfather teaches him about sustainability, and hope. ■

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note to printer:
FSC placement

GIVE BACK TO NATURE THIS HOLIDAY SEASON

Nature has given us endless opportunities to be inspired, escape our screens and safely gather outdoors with others during this past year.

Nature near you needs you. As you think about your year-end charitable giving this holiday season, consider giving back to nature by making a special donation to support the Conservancy. Your gift will help us continue the 90-year legacy of protecting the places you love in Western Pennsylvania.

It's easy to do. You can use the enclosed envelope, or you can give online by clicking "Donate" at **WaterLandLife.org**. To learn more about membership benefits and giving levels, contact the WPC development office at 1-866-564-6972 or **membership@paconserve.org**.

Please make your donation by December 31.

Thank you for making a difference!

STAY INFORMED!

Please share your email with us to stay up to date about hikes and other special events—and to get our monthly enewsletter—throughout the year.

Email **kpatrignani@paconserve.org** to add your email address.

Be assured that we will not share or exchange your email address.