

## 3. Introduction

### Mission of the Triple Divide Trail System

To restore, protect, and enjoy the Genesee River and Pine Creek by raising their profile as resources for outdoor recreation and sustainable economic development.

### Scope and Terminology

The *Triple Divide Trail System* is an emerging system of conservation, natural recreation, and sustainable economic development stretching ca. 230 miles from Lake Ontario in Rochester, NY, to the Susquehanna River in Williamsport, PA, by way of the Genesee River and Pine Creek. The system's conservation goals will be achieved through strategies that will recruit stakeholders who may be more interested in the recreational features or the potential for business development.

The name "Triple Divide Trail" derives from the associated trail's passage over a *triple continental divide* separating the headwaters of three watersheds of national significance: the Allegheny River, which empties into the Ohio River and thereby the Mississippi River; the Genesee River, which empties into Lake Ontario; and Pine Creek, which is the largest tributary of the West Branch of the Susquehanna River and thereby a major feeder of Chesapeake Bay. The most precise reference point for the triple continental divide is a site on a hilltop in Potter County, PA. But the entire headwaters region in north central PA and southwestern NY is more broadly implied in the phrase "triple divide."

The adoption of "Triple Divide Trail" to refer to the entire system from Rochester to Williamsport corresponds with the current transition to a more formal integration of this system into the planning documents of state, regional, and other agencies. Previously this system was often described with rough provisional terminology, such as "Rochester to Williamsport Greenway." This sometimes created confusion with designated routes for bicycles and automobiles that follow paved highways (e.g., I-390, US Route 15, or roads in the NYSDOT State Bicycle Route System). As a solution to such problems, the name "Triple Divide Trail" was suggested in a meeting on the NY side of the headwaters region. Formally identifying the system as "Triple Divide Trail" better signals a unique route along the Genesee River and Pine Creek by way of a point near their sources in PA. The name and its origin illustrate the collaboration across state boundaries implied in the trail system.

Calling it the "*Triple Divide Trail System*" accommodates the trail's incorporation of existing trails with established reputations. These include the Genesee Riverway Trail, the Genesee Valley Greenway, and the Pine Creek Trail. These will retain their names and corporate autonomy. Distinctive terminology for the trail system as a whole prevents disruption of current marketing and funding practices for these existing trails. At the same time, "Triple Divide Trail" creates a new profile to market and fund these trails by emphasizing their connections to a headwaters region shared by both the Genesee River and Pine Creek.

Many other local and regional trails capitalize on similar patterns of dual identity. For example, approximately 420 miles of the Finger Lakes Trail in NY is synonymous with a section of the 4600-hundred mile North Country Trail. Similarly, the Mid-State Trail in PA constitutes just one section of the nine-state Great Eastern Trail. In such cases, continued use of the historic name for the smaller section preserves local support, while association with the much larger system attracts the resources of outside stakeholders.

"Triple Divide Trail System" is also more comprehensive. The phrase "triple divide" cannot be explained without reference to the Genesee River and Pine Creek. The trail system includes *greenways* that follow these streams, i.e., conservation corridors with recreational trails for bicycles and other minimally invasive modes of transportation. It also includes two *blueways*, which refers to water trails

for canoes, kayaks, and other small watercraft. The Genesee River flows northward from the triple divide. Pine Creek flows eastward and southward. Yet these two blueways present a unique opportunity for conservation and recreation because they originate next to each other.

The allusion to three major national watersheds in the phrase "Triple Divide Trail" draws attention to their unique value. It reminds people in urban areas downstream that the majestic rivers that reflect their city skylines originate in a headwaters region that nourishes a sizeable proportion of the nation's population. The reference to a watershed marker that is "continental" in its implications calls upon stakeholders outside the region to protect these national water resources starting at their very sources.

"Triple Divide Trail" explicitly refers to a "trail" associated with this headwaters region. This implies an invitation to travel and experience the scenery, wildlife, and other natural resources along and in the Genesee River, Pine Creek, and the highlands where they both begin.

Like the name, the Triple Divide Trail itself showcases these natural resources. It invites eco-tourism and sustainable business development. This will protect these resources by offering economically productive alternatives to more destructive ways of addressing the economic needs of the surrounding communities. This is especially vital to the rural communities in the headwaters region. The vitality of these communities has much broader implications than their small size suggests. They guard the very sources of major rivers crucial to the large cities downstream. A large proportion of the nation's population will benefit if these headwaters communities are revitalized by investing in the Triple Divide Trail's program of conservation, recreation, and sustainable economic development.

### **History**

Plans for a system of conservation and recreation stretching along the Genesee River and Pine Creek build on the demonstrated success of much older and established systems. Among these are the recreational resources of Lake Ontario and Rochester. Rochester is the third largest city in NY. The Genesee River cascades over three falls inside the city limits. The Genesee boasts another three spectacular falls upstream in Letchworth State Park in NY, which attracts from 700,000 to a million visitors per year. Recreational investments in Pine Creek Gorge in PA are more recent. But it has already become an economically productive system (Knoch and Tomes 2006; Tomes and Knoch 2009). Near its southern end is Williamsport, which is a hub for the many natural recreation areas around the city. These include the massive Susquehanna River Trail, which is being developed in both NY and PA.

The proposal to connect these and other recreational systems stretching along the Genesee River and Pine Creek all the way from Rochester to Williamsport was being discussed by various individuals at least as early as the spring of 2008. These initial discussions evolved into the Genesee River Wilds Project later that summer. Letchworth State Park and Pine Creek Gorge were two of the models that this project followed in articulating its program for combining conservation, recreation, and economic development. Each includes forested riparian (streamside) buffer zones with sustainable recreational infrastructure that attracts eco-tourism and other business. These riparian buffers improve water quality, enhance habitat for fish and wildlife, mitigate flooding and erosion, and reduce damage when inevitable floods do occur. It was emphasized that following the model of Letchworth State Park and Pine Creek Gorge for the more undeveloped sections of the Genesee River and Pine Creek would link these two mature recreational systems together. In addition, proposals for further work on the Genesee Valley Greenway, the Pine Creek Trail, and other trails along the Genesee River and Pine Creek were already being discussed by planning commissions in both NY and PA. These factors suggested creating a unified trail and recreational system from Rochester to Williamsport.

Discussions about this proposal in 2008 benefitted from the participation of appropriate specialists. These included administrators already managing some of the existing recreational systems that will be connected. Among them were officials in the New York State Department of Environmental Conservation (NYSDEC), the New York State Office of Parks, Recreation and Historic Preservation

(NYSOPRHP), the Pennsylvania Department of Conservation and Natural Resources (PA DCNR), planning commissions, state and county legislatures, and representatives of non-profit organizations, academic institutions, and other groups in both NY and PA.

Over the next two years, the proposal for connecting together trail and recreational systems along the Genesee River and Pine Creek was gradually incorporated into the official planning discussions of state, regional, county, and municipal organizations in both NY and PA. By the end of 2010 the system appeared in documents produced with aid from relevant agency headquarters in Albany and Harrisburg for planning at all points from Rochester to Williamsport. Thus while this document is only a rough working tool, the program it describes is already advancing with official support in both NY and PA.

### **Future Expansion into the Allegheny River Watershed?**

One major limitation of this plan is the conspicuous absence of any significant treatment of trail and recreational systems associated with the Allegheny River. This omission may seem particularly egregious because the Allegheny River is implied in the very name of the Triple Divide Trail System.

This omission is due to three factors: (1) the history of the program, which began with the goal of connecting trail and recreational systems along the Genesee River and Pine Creek; (2) limitations in staffing, funding, and time, which make it impossible to pursue more fully the connections with systems along the Allegheny River; (3) the arguably greater need along the upper Genesee River and Pine Creek/West Branch of the Susquehanna River, which do not have the protections and recreational resources that the Allegheny River enjoys in Allegheny National Forest (PA) and Allegany State Park (NY).

This omission does not preclude giving more attention to connections with recreational systems along the Allegheny River at some future time. Appropriate agencies and planning commissions in NY and PA have already developed trails, nature parks, and riparian buffers that eventually may be joined to form a single system along the Allegheny River reaching from the site of the triple divide to Pittsburgh. Pittsburgh would be the obvious counterpart to Rochester and Williamsport in the system described in this document. A trail system to Pittsburgh would connect the Triple Divide Trail System to the Great Allegheny Passage and possibly other trail systems, such as trails being constructed along the Ohio River in Wheeling, WV.

Resources for planning such connections are readily available. One of the maps that appear later in this document shows trails connecting to the Allegheny River near the site of the triple divide ("Planned and Existing Trails, Northeastern Potter County, PA"). More extensive planning for trails along the upper Allegheny River would require consultation of the source of this map, which is the new Greenways plan for the North Central Pennsylvania Regional Planning and Development Commission ([www.ncentralgreenways.com](http://www.ncentralgreenways.com)). Additional resources include statewide trail maps ([www.ptny.org](http://www.ptny.org); [nysparks.state.ny.us/recreation/trails](http://nysparks.state.ny.us/recreation/trails); [www.pagreenways.org](http://www.pagreenways.org); [www.explorepatrails.com](http://www.explorepatrails.com)). Allegheny National Forest (PA) and Allegany State Park (NY) are well documented. A recent addition to these resources is the new master plan for Allegany State Park and its trail systems (NYSOPRHP 2010).

Advocates of the Allegheny River who want to develop a branch of the Triple Divide Trail System along the Allegheny River would be warmly welcomed. Such a third branch would complement the two branches along the Genesee River and Pine Creek. It also would advance the goals of the Triple Divide Trail System. Should work on this third branch reach an advanced stage, the mission of the Triple Divide Trail System may have to be adjusted to incorporate a reference to the Allegheny River.

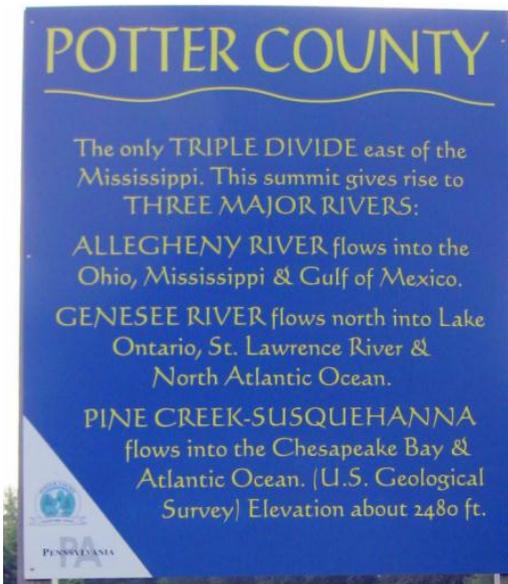
Integrating recreational systems along the Allegheny River into planning for the Triple Divide Trail System is, however, far beyond the scope of the present document. The current plan is more than enough to keep supporters busy for years to come. Connections to resources along the Allegheny River must be left to others.

**Right:  
Genesee River in  
Headwaters Region  
North of Triple  
Divide (Allegheny  
County, NY)**

Photo courtesy Sherry Grugel,  
Allegheny County Tourism



**Below:  
Sign on Hill of the  
Triple Divide  
(Potter County, PA)**



**Above:  
View North into the  
Genesee River Valley  
from the Hill of the  
Triple Divide**

**Left:  
Pine Creek in  
Headwaters Region  
Southeast of Triple  
Divide (Tioga or  
Lycoming County, PA)**

Photo courtesy Gary Tyson and  
Tiadaghton Audubon Society

## 4. Approach

### Pragmatic, Inclusive, and Integrative Strategies

The approach taken in this program is pragmatic. It recommends relatively inexpensive strategies, compromise, accommodations for existing development, respect for the budgetary concerns of local legislators and landowners, and other practices that help generate support from as many stakeholders as possible. Most notably, the approach taken to environmental conservation emphasizes the integration of recreational development that will promote economic revitalization. This includes creating new jobs in construction of minimally invasive recreational infrastructure, promoting ecotourism, and increasing the accessibility of natural resources so that nearby communities can attract and retain educated professionals.

This presents a direct contrast to more idealistic preservationist approaches to conservation. Such approaches often fail to recruit support because they do not address financial concerns that generate ambivalence about conservation efforts. Creating riparian (streamside) buffers along major river systems can most effectively be accomplished through conservation easements, purchase of lands, and zoning that directs development out of floodplains. But attempts to institute these practices in impoverished rural communities are often resisted. Even the most sympathetic local officials are wary of losing property tax revenues. Farmers struggling to eke out a living often try to maximize meager profits by cultivating to the very edge a stream bank. Many do so with regret because they recognize that this increases erosion, flooding, and deposit of fertilizers and other nutrients into the stream.

This strategic plan addresses these concerns by emphasizing development of inexpensive natural recreational infrastructure that promotes tourism and other sources of revenue. This plan also advocates generous financial incentives that compensate farmers and landowners for any loss that might result from willing sale or self-imposed restrictions on the use of property along the Genesee River and Pine Creek. Its emphasis on riparian buffers and zoning that directs construction away from the floodplains also promises natural flood control that reduces the devastating impact that flooding can have on federal, state, local, and family budgets. This plan targets economic needs to win support for conservation.

### Cost/Benefit Efficiency

Estimates of the costs of completing this conservation and recreational system appear in the provisional **budget** (*section below*). This lists only expenses. But the benefits are undeniable. Flood damage alone can quickly dwarf the costs of any investment in prevention. Residents of the watersheds of the Genesee River and Susquehanna River can cite floods in 1972 from Hurricane Agnes, which left the nation with 122 dead and the inflation-adjusted equivalent of \$10 billion in damage (NOAA 2007).

Quantifying benefits would require more elaborate study of bicycling, kayaking, wildlife watching, and other activities promoted by this plan. For example, bicycle tourism in NY generates at least \$300 million per year in retail sales and another \$700 million per year in indirect benefits to the environment, transportation network, and health of NY residents (NYSOPRHP 2010 [SCORP], pp. 161-62). In 2006, over \$3.2 billion was spent in NY on fishing, hunting, and wildlife watching (US Dept. of Interior, Fish and Wildlife Service 2008). In the same year, over \$4.3 billion was spent in PA on these activities (US Dept. of Interior, Fish and Wildlife Service 2008). In both states, a sizeable proportion of this revenue came from non-residents. Studies have also demonstrated the value of specific trail and recreational systems, such as the Pine Creek Trail (Knoch and Tomes 2006; Tomes and Knoch 2009).

Investment in infrastructure that makes outdoor activities more accessible is thus guaranteed to generate significant returns. A number of factors indicate that the benefit achieved per person in this particular plan is far superior to many other programs of much more limited scale.

First, the program is cost-efficient because it connects large natural recreation areas that are already fully developed and that already have proven success in their respective states. These include Letchworth State Park in NY, Pine Creek Gorge in PA, the park systems of Rochester and Williamsport, and other nearby parks and recreational systems. Existing multi-use trails (rail-trails) that will be connected by this program include the Genesee Riverway Trail in Rochester (NY), the Genesee Valley Greenway (NY), Park Road in Letchworth State Park (NY), the WAG Trail (trail on Wellsville-Addison-Galeton Railroad bed from Wellsville, NY, to NY/PA state line), the Pine Creek Trail (PA), and the Lycoming County Trail and Bikeway (PA). The most developed of these recreational systems are already popular for bicycle and horseback riding, hiking, skiing, camping, canoeing, fishing, and other minimally-invasive recreation.

Second, the program is also cost-effective because it seamlessly integrates diverse but complementary goals (conservation, recreation, and economic development). The plan's emphasis on riparian buffers that perform environmental, recreational, and economic functions is the primary example of this multi-purpose approach. The multi-functionality of various features in this plan also creates opportunities for capitalizing on projects only tangential to the plan. For example, landscaping that is required by the construction or repair of a bridge provides an opportunity for inexpensive construction of a boat launch or small streamside nature park. Similarly, restrooms and parks constructed for roadside rest-stops can do double-duty if they are strategically located to accommodate users of bicycle trails and waterways.

Third, the program provides a much greater return on investment because of its emphasis on the headwaters region of the river systems that it addresses. Riparian buffer lands in the rural headwaters region cost far less per acre than waterfront property in the more populated areas downstream. Yet investment in the protection of the headwaters benefits more people. Protecting rivers at their sources benefits not only the rural communities in the headwaters region, but also the populated areas far downstream to which these rivers flow.

Fourth, the cost-efficiency of this program is enhanced by its use of natural, relatively inexpensive, and low-maintenance methods for achieving its goals. Creating riparian buffers with minimally-invasive forms of recreational infrastructure is among the least expensive ways of generating immediate construction jobs, attracting long-term tourism, reducing flood damage, improving water quality, protecting wildlife, and achieving the other goals of this program.

Fifth, the long-term benefits outweigh initial costs and require relatively modest investment to sustain. For example, forested riparian buffers created by purchasing inexpensive rural lands along the Genesee River reduce the need for more expensive artificial flood control and reduce flood damage when inevitable floods occur. They also reduce the costs of maintaining dams, rock embankments, and other short-term flood-control mechanisms. The initial costs of building campsites, trails, and other natural forms of recreational infrastructure are far less than those required to construct sports stadiums and similar recreational infrastructure. They are also far less expensive to maintain.

Sixth, the program also includes cost-effective investment in education. It will stimulate the interest of children and youth in biology, geology, water resource management, and other natural and applied sciences by expanding access to wildlife, awe-inspiring scenery, and other features of the natural world. In this plan, recreational infrastructure provides the research equipment for the laboratory of the outdoors. Few indoor laboratories can provide as much educational benefit for as little cost per student.

Seventh, the program has other benefits for which the budgetary implications may be more difficult to evaluate. For example, the relief from economic distress that it offers will provide policy makers more time to sort out appropriate approaches to new techniques for natural gas drilling already occurring in the Marcellus Shale. These promise jobs, royalties for land use, and reduced national dependence on foreign energy sources. They also risk stressing limited water resources and provide occasions for costly human error (Soeder and Kappel 2009; see more below). This could have a

negative impact on the Allegheny River, the Genesee River, and the Pine Creek/Susquehanna River systems. Constructing riparian buffers that include sustainable recreational infrastructure along the upper Genesee River and Pine Creek adds a layer of environmental and economic protection against such hazards and their unforeseen costs.

### **Rural Poverty and the Risk of Disproportionate Implementation**

State conservation and park agencies in both Pennsylvania and New York formally acknowledge that poverty and environmental degradation are often so intertwined that they must be addressed together. For many years the PA DCNR has strategically developed state parks and other economically productive recreational resources near declining coal mining towns and struggling rural communities. One of the most dramatic examples is the PA Wilds Initiative launched in 2003 (Pennsylvania Wilds Team 2010; Econsult 2010). The *2009 New York State Open Space Conservation Plan* also explicitly integrates "environmental justice" into its discussion of the conservation needs of the Genesee River corridor (NYSDEC and NYSOPRHP 2009, p. 108).

In spite of these policies, one danger in this program for conservation and recreational development is that it might perpetuate the environmental neglect and economic disparities that it seeks to address. Cities on the scale of Rochester, Harrisburg, and Baltimore can successfully wield an arsenal of professional staff and powerful political clout in pursuing federal funds and state grants. They also have large pools of wealthy donors, trained volunteers, and aggressive advocacy groups. This contrasts with impoverished rural communities far upstream from these cities in Allegany County, NY, Potter County, PA, and Tioga County, PA. Human resources are so limited in these areas that trained specialists often have to be shared across impractical distances. Allegany County, for example, consistently ranks at the *very bottom* (62 out of 62) in per capita income among all counties in NY (Bureau of Economic Analysis 2010 [ranking, 2008]). Potter County and Tioga County respectively rank only 52nd and 66th in per capita income among the 67 counties in PA (Bureau of Economic Analysis 2010 [ranking, 2008]). Other indices of economic vitality present a similar picture.

This rural poverty hinders the use of the best practices for managing environmental resources. It also has a more direct impact on urban communities downstream than many of the leaders in these communities recognize. It is the rural communities upstream that nurture the sources of the river systems upon which urban areas downstream depend for clean water, healthy beaches, edible fish, safety from flooding, and waterfront aesthetics. Representatives of populated areas will be best served by this strategic plan if they resist the temptation to look only to their own backyard. Partnerships that they foster with struggling rural communities upstream will have mutual benefits. Water does, after all, flow downstream.

Areas along the upper Genesee River and Pine Creek arguably merit even higher priority than urban areas downstream. More is required to offset previous decades of neglect in these upstream areas, especially along the upper Genesee River. Investment in these areas also offers the most cost-effective way for achieving long-term results. For example, the entire 70 miles of the Genesee River from the river's sources in Potter County, PA, to the southern boundary of Letchworth State Park in NY could be protected with significant riparian buffers at the same price as the purchase of just a few large office buildings and the adjacent acres of land in downtown Rochester. The benefits of protecting the upper river also reach much farther per dollar. They extend all the way downstream across western NY to Rochester itself. Investments in the health of the Pine Creek watershed have similar implications. Everyone in Harrisburg, Baltimore, and communities around Chesapeake Bay lives downstream.

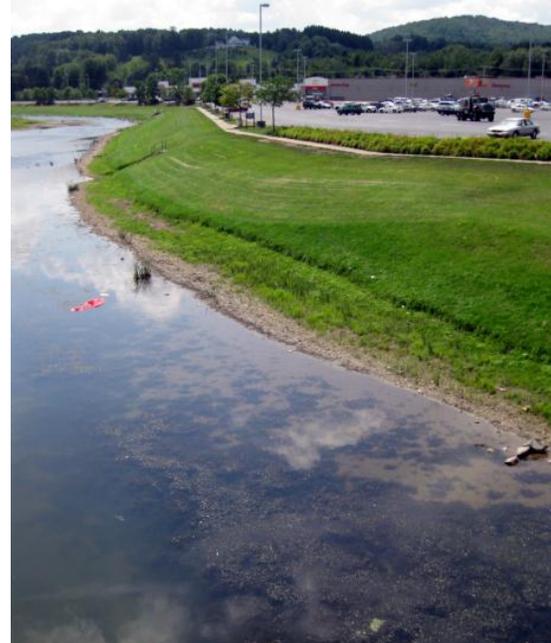
Genuine progress has been made in protecting both Pine Creek and the Genesee River. For example, two Finger Lakes in the Genesee River watershed (Canadice and Hemlock) were recently acquired by NYSDEC, which assures their permanent protection as drinking water resources. But this

good news does not obscure other challenges (e.g., photos below). Riverside oil refineries, toxic waste facilities, sewage leakage, acid mine drainage, and even nuclear dumps have already polluted or threatened the headwaters of the Allegheny, Genesee, and Susquehanna Rivers. In rare cases, local residents have been able to marshal heroic responses to perceived environmental crises (as in the epic narrative of Peterson 2001). But a more effective strategy is to provide additional layers of protection that safeguard these rivers in advance of any crisis. These include recreational infrastructure that attracts influential outside stakeholders who can add leverage to local efforts to protect the region's natural resources. Powerful people protect the places they play.

### **An Example of Why the Upstream Matters Downstream:**

#### **Algae Clogs Genesee River Next to Parking Lot Over 100 Miles upstream from Rochester**

Much of the upper Genesee River and its tributaries does not have sufficient forested buffers to minimize deposit of agricultural nutrients and runoff from parking lots and other construction in the floodplain. This promotes floods, erosion, and algae growth (photos 8/2010, Wellsville, NY). High water from storms dislodges millions of *tons* of such algae and sends it downstream to Lake Ontario. There it rots and feeds other algae and bacteria already in the lake and at shoreline. This contributes to closings of Rochester beaches. The city pays with higher county water treatment costs, beach maintenance, tourism loss, and emigration of young professionals. Downstream cities like Rochester can help themselves if they invest in the headwaters region.



On Genesee River, see NYSOPRHP 2010b (maps figs. 1, 4); Slack et al. 2010; Genesee/ Finger Lakes Regional Planning Council et al. 2007; Genesee/ Finger Lakes Regional Planning Council 2004; Domske, Peet, et al. 2002; Moran and Roebig 2000. On Pine Creek, see Knoch and Tomes 2006; Lycoming County Planning Commission et al. 2006; Pine Creek Watershed Council 2005; and <http://www.pinecreekwatershedrcp.org>. On Susquehanna River, see <http://www.susquehannarivertrail.org> and <http://www.srb.net>. On Chesapeake Bay watershed, see <http://www.chesapeakebay.net>. On trail connecting Genesee River and Pine Creek, see Genesee River Wilds Project, <http://www.geneseeriverwilds.org>; and North Central Penn. Regional Planning and Devel. Commission, Greenways Plan, <http://www.ncentralgreenways.com> (Potter County, p. 3-179 and map trails No. 1 and 7).

## 5. Specific Goals

- (1) Economic Development:** Jobs in nature park and trail construction, tourism, hospitality, environmental science education, and other fields. This benefits large populations of Rochester and Williamsport. Also benefits impoverished rural counties in between, which include areas ranking among highest in unemployment and lowest in per capita income in NY and PA.
- (2) Water Resource Conservation:** Protection for two river systems that hold national significance because of their relationships to one of the Great Lakes (Genesee River) and Chesapeake Bay (Pine Creek, largest tributary of West Branch of Susquehanna River). Inclusion of a unique triple-divide headwaters area offers increased attention to need for protecting a third major river system (Allegheny River, which flows into Ohio River and thence to Mississippi River).
- (3) Improved Fishery and Wildlife Habitat:** Forested riparian buffers enhance unique ecological corridor along wilderness river systems, which offer habitat for native brook trout, bald eagles, river otters, and other species that live in and along the Genesee River and Pine Creek.
- (4) Natural Flood Control:** Establishing forested riparian buffers, low-impact nature parks and trail systems, and policies that direct unsustainable development away from the floodplain offer inexpensive ways to assure economic productivity of floodplains while reducing erosion, flooding, and damage to property and infrastructure when inevitable floods do occur.
- (5) Infrastructure for Bicycles, Horseback Riding, Canoes, Kayaks, and Other Sustainable Transportation:** Creates major trail systems on land and water that attract tourism and other business, reduce highway traffic, have other benefits.
- (6) Recreation, Health, and Other Enhancements of Quality of Life:** Natural forms of recreation improve the quality of life in local communities and make them more attractive for young professionals and others from outside the area who can offer skills desperately needed in these communities.
- (7) Education and Internships in Geology, Environmental Science, History, and Other Fields:** Trail system increases access to geological riches of Letchworth State Park, rare wildlife species along upper Genesee River and Pine Creek Gorge, and cultural heritage such as Native American sites, the Erie Canal, Genesee Valley Canal, and remnants of the 19th-century logging industry.
- (8) Raised Profile that Increases Stakeholders for Conservation, Recreation, and Business:** Sheer size of the unified recreational system will help increase numbers of persons outside the region interested in protecting the natural resources of the area, improving recreational infrastructure for tourism and other business, and in other ways promoting sustainable development in the area.
- (9) Cost/Benefit Efficiency:** Forested riparian buffers that improve water quality, furnish health benefits, provide natural flood control, and promote the other goals described above offer a maximum of benefits to the greatest number of people at among the lowest possible costs per person served. This includes both the initial costs and long-term maintenance associated with natural flood control, natural forms of recreational infrastructure, and other minimally invasive infrastructure development.

## 6. Existing Attractions to be Connected by This System

**(1) Rochester:** Third largest city in NY, riverside parks and boating, three major waterfalls, beaches on Lake Ontario, museums and other urban attractions, aggressive bicycling community, and prestigious educational institutions such as Rochester Institute of Technology and University of Rochester.

**(2) Williamsport:** Major hub city in PA, parks and recreation facilities on Susquehanna River, educational institutions such as Pennsylvania College of Technology and Lycoming College, with proximity to Penn State University and others.

**(3) Letchworth State Park, the "Grand Canyon of the East":** Three majestic waterfalls, deep gorge, Mt. Morris Dam, infrastructure for recreation on land and water, over 700,000 visitors per year.

**(4) Pine Creek Gorge, the "Grand Canyon of Pennsylvania":** One of PA's most treasured trout streams, one of the top-ranked rail-trail systems in the USA, established water trail infrastructure for multi-day trips by canoe and kayak (with rafting in high water season), proven economic benefits for nearby communities.

**(5) Trail Systems:** Genesee Riverway Trail (Rochester, NY), Genesee Valley Greenway (NY), Park Road in Letchworth State Park (NY), WAG Trail (trail on Wellsville-Addison-Galeton Railroad bed, from Wellsville, NY, to NY/PA state line, acquired by NYSDEC 11/2009), Pine Creek Trail (PA), Lycoming County Trail and Bikeway (PA). Land-based trail connections include Finger Lakes Trail (section of Great North Trail), Mid-State Trail, and others. Connected waterways include Lake Ontario, Erie Canal, and Susquehanna River Trail.

**(6) Wilderness Areas for Fishing, Hunting, Wildlife Observation, and Other Outdoor Recreation:** Abundant deer, wild turkey, great blue herons, native brook trout, smallmouth bass, and relatively rare species such as bald eagles, river otters, bobcats, and others.

**(7) Lake Ontario:** Beaches, fishing, boats, shipping lane, and many other attractions, including transport across the lake to Canada.

**(8) Erie Canal:** A historic route across New York State connected to Genesee River in Rochester (host of 2010 World Canals Conference). Still used as water trail and has parallel trails for bicycling.

**(9) Susquehanna River:** Major fishery. Includes Susquehanna River Trail, a water trail that ultimately will stretch across as many as 22 counties in PA and NY, with camping areas and other features.

**(10) Links to other major recreation areas nearby:** In close proximity are Allegany State Park, NY; Allegheny National Forest, PA; Denton Hill State Park, Lyman Run State Park, Leonard Harrison State Park, and other state parks in Potter County, Tioga County, Clinton County, Lycoming County, and nearby areas in PA; Finger Lakes in NY; and over 55,000 acres of state forests and wildlife management areas in Allegany County, NY. Not much farther are attractions such as Niagara Falls, NY; restored elk population with viewing areas in northwestern PA; and many others.

## **7. Kids, Outdoor Recreation, and Education: The Future of the Sciences and Natural Resource Conservation**

Education in the natural sciences uses laboratories that offer direct experience with nature. The outdoors itself often functions as the laboratory. But even the laboratory of the outdoors requires equipment. For children and youth, much of this laboratory equipment can take the simple and relatively inexpensive form of recreational infrastructure that provides access to wilderness areas. "Laboratory equipment" thus includes bicycle trails, campgrounds, wildlife viewing platforms, nature parks, and boat launches. These are educational tools. They help future generations develop an interest in the natural sciences and natural resource conservation.

The need to invest in such educational infrastructure is more urgent than ever. Fewer children and youth experience sustained contact with nature than ever before. Urbanization, shifts in subsistence modes, and new technologies take youth out of farms and forests. Television, electronic social networks, and computer games keep youth inside for longer hours. Poverty prevents urban minority children from vacationing in distant wilderness areas. With fewer outdoor experiences, many children do not develop the kind of fascination with the natural world needed to pursue study in the natural sciences. They also do not develop an appreciation for the value of protecting natural resources.

This does not bode well for the future. These same youth are growing up to become national leaders who formulate policies that directly impact natural resources. Our national security and the survival of our species may be at stake in our present choices about how much or how little to invest in recreational infrastructure that connects kids to nature.

### **Philadelphia Zoo: The Closest Many Kids Get to Farm Animals and Wildlife**



### **Girl Skipping Stones, Genesee River, Belfast, NY**



Photo courtesy Sherry Grugel, Allegany County Tourism

### **Kids Rafting on Pine Creek: Unforgettable Lessons in the Natural Sciences**



Photo courtesy Curt Weinhold Photography and Jon Dillon, Pine Creek Outfitters