

DELAWARE RIVER BASIN

NATIONAL PARK SERVICE | NATIONAL WILD AND SCENIC RIVERS SYSTEM | US DEPARTMENT OF THE INTERIOR

NATIONAL WILD AND SCENIC RIVER VALUES



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WILD AND SCENIC RIVER VALUES OF THE DELAWARE RIVER BASIN

OUTSTANDINGLY REMARKABLE VALUES

Outstandingly remarkable values (ORVs) are defined by the Wild and Scenic Rivers Act as the characteristics that make a river worthy of special protection. Thus, the foundation for wild and scenic river management is a clearly defined set of ORVs. The Interagency Wild and Scenic Rivers Coordinating Council has issued criteria for identifying and defining these values. The criteria guidance states that:

- An ORV must be river related or dependent. This means that a value must
 - be in the river or on its immediate shorelands (generally within 0.25 mile on either side of the river),
 - contribute substantially to the functioning of the river ecosystem, and
 - owe its location or existence to the presence of the river.
- An ORV must be rare, unique, or exemplary at a comparative regional or national scale. Such a value would be one that is a conspicuous example from among a number of similar values that are themselves uncommon or extraordinary.

Based on these criteria and a careful analysis of the designated reaches of the Delaware River and its tributaries, the National Park Service has determined that several ORVs are present. The analysis concluded that the designated segments of the Delaware River basin contain the following ORVs: cultural, ecological, geological, recreational, and scenic. A set of broad statements has been developed that articulates each ORV for the collection of all designated segments of the Delaware basin. These narratives capture the overall, combined values of the river system, as protected under the Wild and Scenic Rivers Act.

An evaluation process for each ORV was then used to determine which river segments contain the different ORVs. The results of this evaluation were used to develop segment-specific ORV statements providing further evidence and support for the broad ORV statements. These segment-specific narratives provide a higher level of detail for the ORVs that are present in each designated segment. The following matrix summarizes the evaluation results and provides organization to the ORV statements and segment-specific descriptions that follow. It indicates which segments of the Delaware River basin possess the above-mentioned ORVs.

In addition to ORVs, the free-flowing condition and water quality of the Delaware and its tributaries are also integral to its designated status. Because free-flowing condition and water quality support the integrity of the ORVs and are key components of future management, they are included as part of this ORV statement.



Photo: Scott Rando

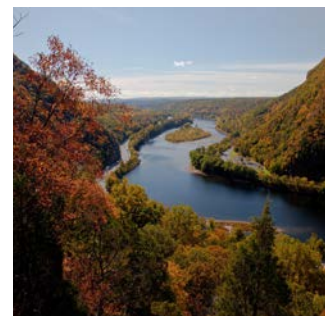
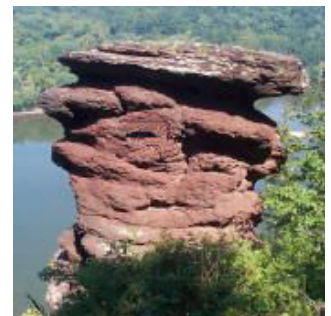


Photo: Dan Mohr



For the purpose of ORV analysis, the designated rivers of the Delaware River basin were divided into the following seven segments. The location map identifies these seven analysis segments. The segments are defined as follows:

Upper Delaware Scenic and Recreational River: From the confluence of the east and west branches (below Hancock, New York) to the existing railroad bridge immediately downstream of Cherry Island in the vicinity of Sparrowbush, New York (73.4 miles)

Middle Delaware National Scenic and Recreational River: Northern boundary of Delaware Water Gap National Recreation Area to the southern boundary (approximately 40 miles)

Musconetcong National Wild and Scenic River: The 3.5-mile stretch from Saxton Falls to the Route 46 bridge and the 20.7-mile stretch from King's Highway bridge to the railroad tunnels at Musconetcong Gorge (24.2 miles)

Lower Delaware National Wild and Scenic River: From river mile 193.8 to the northern border of the city of Easton, Pennsylvania; from just south of the Gilbert Generating Station to just north of the Point Pleasant Pumping Station; from just south of the Point Pleasant Pumping Station to a point 1,000 feet north of the Route 202 bridge; from 1,750 feet south of the Route 202 bridge to the town of Washington Crossing, Pennsylvania (totaling 38.9 miles)

Tinicum Creek: Headwaters of its two upper branches to the Lower Delaware River confluence south of Erwinna and north of Point Pleasant (14.7 miles)

Tohickon Creek: From the Lake Nockamixon dam to the Lower Delaware River confluence near Point Pleasant (10.7 miles)

Paunacussing Creek: Portions passing through Solebury Township to the Lower Delaware River (approximately 3 miles)

RIVER SEGMENT	ORV CATEGORY				
	Cultural	Ecological	Geological	Recreational	Scenic
Upper Delaware River	●	●	●	●	●
Middle Delaware River	●	●	●	●	●
Musconetcong River	●	●	●	●	●
Lower Delaware River	●	●	●	●	●
Tinicum Creek	●		●		●
Tohickon Creek	●	●	●	●	●
Paunacussing Creek	●				●

UPPER

DELAWARE SCENIC AND RECREATIONAL RIVER

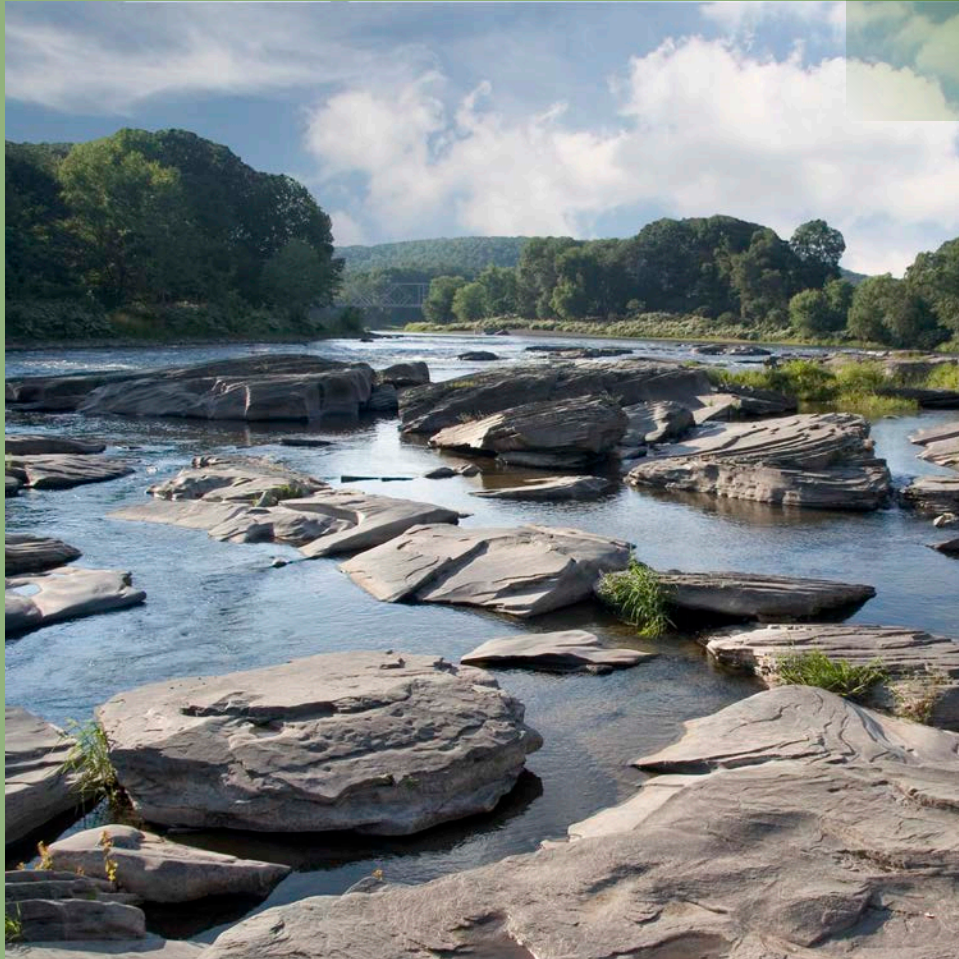
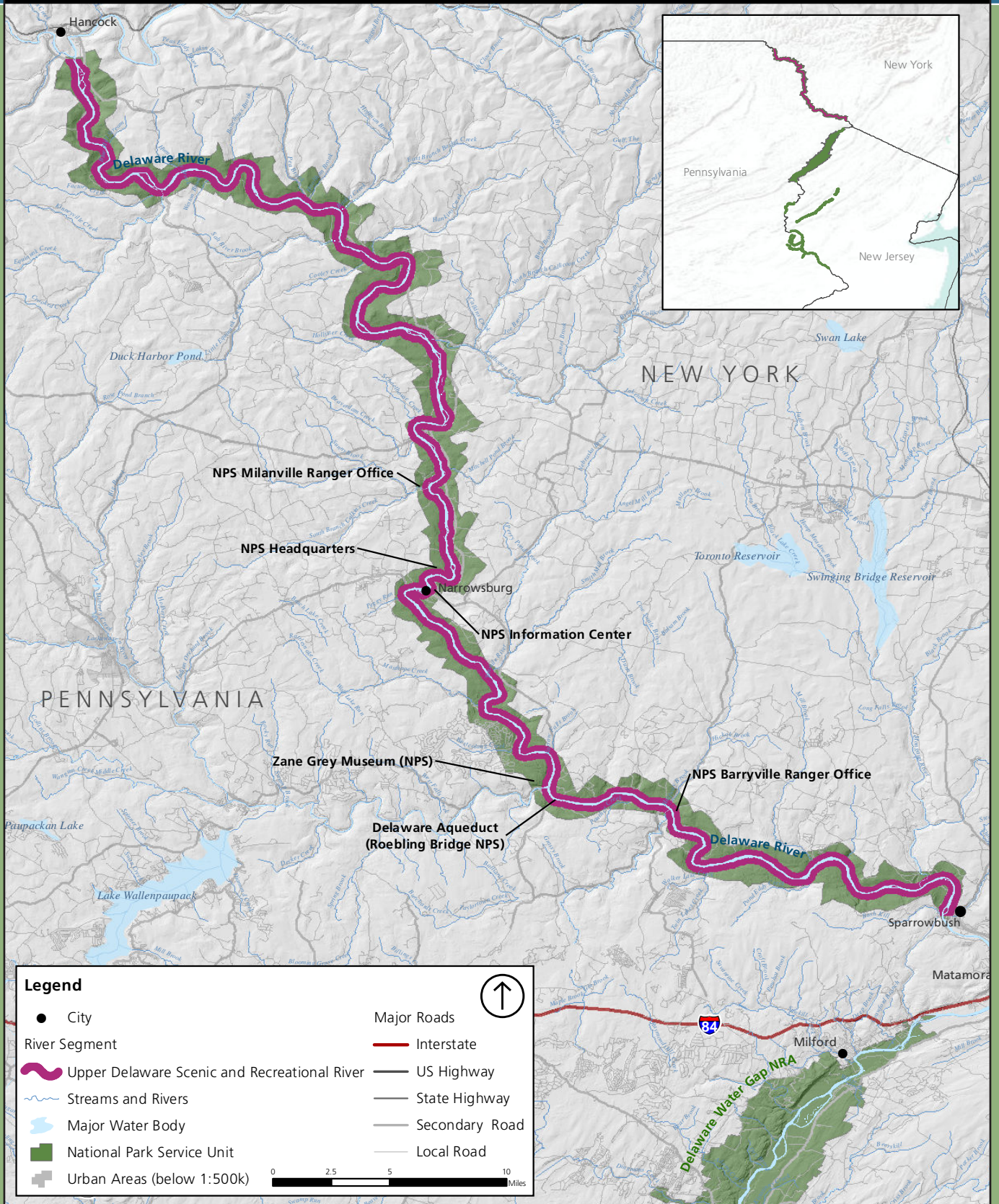


Photo: David B. Soete

Upper Delaware Scenic and Recreational River

Pennsylvania, New York

National Park Service
U.S. Department of the Interior



UPPER DELAWARE SCENIC AND RECREATIONAL RIVER

The outstandingly remarkable values that make the Upper Delaware Scenic and Recreational River worthy of protection under the Wild and Scenic Rivers Act are described on the following pages.

CULTURAL

"Although it lies just to the west and northwest of the Boston-to-Washington urban corridor, the Upper Delaware River appears relatively untouched by the frenetic pace of the mid-20th century. The Upper Delaware and its riverside communities have managed to retain those qualities and values of earlier times which elsewhere have passed into memory, perishing in the onslaught of industrialization, modernization, urban sprawl, and other similar forces of contemporary life. The counties which form the ...region have remained essentially rural... some of these qualities and values may still be seen as they appeared to earlier eyes. This special quality, this pace of daily life, is easily discernible by comparison with the large cities and suburban overflows of the Eastern Megalopolis ..."¹

Dating from the paleo through the transitional period, 437 documented pre-contact archeological sites record a rich cultural tapestry of riverine occupation of aboriginal people who used the river as a trade route. Eighteen archeological sites worthy of more detailed investigation and one site eligible for listing in the National Register of Historic Places (NRHP), taken collectively with the archeological sites on downstream segments, are exemplary of Munsee peoples and their predecessors. Several privately owned archeological sites illustrate the history of early European settlers who arrived in the mid-18th century. Remnants of the early settlements along the river help to convey the history of the early subsistence period to the mid-1700s, including small-scale rural hydro-powered industry in the northeast, while the NRHP-listed Minisink Battleground Park tells the story of a Revolutionary War battle between local residents and militia, and Indians and Tories under the command of Joseph Brant.

Extractive industries dependent on water power and water-related transportation spurred an industrial economy, contributing to a pattern of hamlet settlement identifiable today. The timber rafting industry was introduced in the 1760s to transport ship's mast-length logs to Easton and Philadelphia. From the end of the Revolutionary War to the early 1900s, this industry fed the local economy, stripping the hillsides of white pine and hemlock, while contributing to the growth of colonial America.

Early 1800s technological development spurred construction of historic transportation routes dependent on the river and valley geology for defining their routes, each contributing to the cultural profile of the Upper Delaware. Timber, coal, and bluestone transported to coastal markets contributed to growth of the early American economic centers.

¹ The Upper Delaware River, A Wild and Scenic River Study, U.S. Bureau of Outdoor Recreation, 1973



Photo: Don Hamilton



Photo: David B. Soete



The first business in the United States to be capitalized for a million dollars, the Delaware and Hudson (D&H) Canal operated from 1829 to 1898. The 171-mile-long engineering feat included 16 miles of gravity railway, 108 locks over 108 miles, and four cable-suspension aqueducts to connect the coal fields of Pennsylvania with the Hudson River and New York City markets. Roebling's Delaware Aqueduct carried the canal across the Delaware between Lackawaxen, Pennsylvania, and Minisink Ford, New York. North America's oldest existing wire suspension bridge, this NPS-owned National Historic Landmark and National Historic Civil Engineering Landmark received the Presidential Design Award for its adaptive reuse restoration as a one-lane vehicular bridge known locally as Roebling Bridge. The D&H traversed the southern river corridor, paralleling the river for 25 miles between Lackawaxen, Pennsylvania, and Port Jervis, New York, before veering to the northeast. The stone remnants can easily be seen by both boaters on the river and tourists along the Upper Delaware Scenic Byway. Of particular note is Corwin Farm, eligible for listing in the National Register of Historic Places and owned by the National Park Service, a canal-era lock tender's house and barn along an intact portion of the canal.

The Erie Railroad, America's first long line railway, connected New York City with the Great Lakes and west. The Port Jervis line traversed the entire river corridor, spurring thriving hamlets as it progressed north and westward, carrying immigrants to the frontier. It also provided transportation to the Upper Delaware region for city workers who found fresh air, restful landscape, and good home cooking at local farms and boarding houses, contributing to "the Catskills and the Poconos," geographic areas famous for hospitality for nearly 150 years. Two early depots, the NRHP-listed Old Cochection Station and the Callicoon Depot, remain. One notable vacationing fisherman, author Zane Grey, stayed on to establish a home on the Delaware at Lackawaxen, Pennsylvania, where he wrote his earliest articles and books, including *"Riders of the Purple Sage."* The National Park Service owns and manages a museum at the NRHP-listed Zane Grey House.

The railroad, and later New York State Route 97 (the Upper Delaware Scenic Byway), led to construction of several notable NRHP-listed historic bridges using petite and through-truss steel construction methods as well as stone arch construction on nearby tributaries. Many of the homes and commercial buildings dating to the late 1800s and early 1900s are extant; of note are National Register of Historic Places districts in Cochection, Damascus, Milanville, and Equinunk, in addition to a number of individual National Register of Historic Places listings. Eighty-six historic archeological sites, in addition to 73 individual structures, were identified during a NPS-funded cultural resource survey.

Four-lane highways of the 20th century divert much of today's industrial transportation around the Upper Delaware River corridor, leaving behind an unsullied testimony to a culture dependent on the bucolic Upper Delaware Scenic and Recreational River.



Photo: David B. Soete





Photo: David B. Soete

ECOLOGICAL

The Upper Delaware River exhibits some of the highest ecological integrity found in any of the large rivers of this region. As the least-developed section of the last major river on the Atlantic Coast, undammed the entire length of its mainstem, the Upper Delaware's wild and scenic, largely ecologically intact, free-flowing character supports key components and processes that contribute to the superb natural resources found here. Exceptional water quality, resulting from a predominately forested landscape, sustains high quality fish and aquatic insect assemblages. Excellent in-channel conditions result in an abundance of riffles, runs, and pools, and a diversity of in-stream habitats. These aquatic conditions, combined with good riparian habitat that is coupled with a functioning floodplain, provides great hydrological connectivity, structure, and function.

The unobstructed river affords access to the full complement of sea-run migratory fish into and above this segment, thus allowing historic fluxes of nutrients, energy, and biomass to and from the ocean. These features combine to provide a complex food web, a wide variety of habitats, and a healthy diversity of species.

The riparian area along the river supports rare terrestrial plant communities, such as ice scour rock outcrop, seep communities, and bitternut hickory lowland woodland. The river itself sustains diverse and healthy native aquatic plant communities, including a plentiful population of threadfoot riverweed, a relatively rare aquatic plant that is indicative of excellent water quality. A diversity and extraordinary abundance of freshwater mussels further contribute to water quality and nutrient processing. The Upper Delaware provides habitat for a sizeable population of the federally endangered dwarf wedgemussel, as well as several state threatened and endangered species including bridge shiner, and brook floater mussel.

The Upper Delaware River's ecological value extends beyond this segment of river. It provides regionally important high quality historic spawning and rearing habitat for sea-run migratory fish, helping to buttress their larger range-wide populations. In addition to native brook trout, the river and tributaries support thriving recreational fisheries for naturalized rainbow trout and brown trout. The river corridor is also regionally important inland bald eagle wintering habitat for birds from as far away as the maritime provinces of Canada, and serves as a migratory bird stopover along the Atlantic flyway. The Upper Delaware provides drinking water for millions of people, all helping to underscore the Delaware's significance beyond its own watershed.



Photo: Scott VanArsdale



Photo: David B. Soete



Photo: David B. Soete

GEOLOGICAL

The Upper Delaware Scenic and Recreational River is an exceptional example of a deep, narrow river valley cutting across the Small Lakes section of the glaciated portion of the Appalachian Plateau. The overall landscape is a fluvial or stream-cut landscape modified by stream derangements from glacial deposits burying portions of preglacial valleys. Examples of significant geologic features include sandstone cliffs, barbed tributaries, glacial deposits, glacial outwash terraces, diverse channel morphologies, exposed ancient bedrock, bedrock knobs, cutoff incised meanders, island complexes, gorges, and fossils.

The area's rolling hills vary in elevation from 800 to 2,000 feet and are characterized as a series of indistinct and irregular escarpments. Relief is generally between 300 and 500 feet, although it ranges to 700 feet in a few locations. Point Mountain, defining the northernmost extent of the wild and scenic river designation, is an isolated bedrock knob formed by glacial meltwater that eroded through a ridgeline between the east and west branches of the Delaware River. Sandstone cliffs, clearly evident at places like Hawks Nest, show ancient river channel deposits that have a wide variety of bedding features, including three types of cross-bedding, ripple marks, current lineation, tool marks, mud cracks, and conglomerates. Fossilized plant and animal remains are found here, such as bony plates from the armored fish of Devonian times, brachiopods and mollusks, a few types of coral, bryozoans, cephalopods, and rare trilobites.

Glacial deposits partially fill many of the tributary valleys, especially those that are oriented transverse to the direction of the most recent ice age glacier. The post-glacial Delaware River cut into the bedrock and glacial materials at least 200 feet. Many of the tributary valleys have narrow, deep gorges with a series of waterfalls. These steeper-sloped tributaries have deposited alluvial or debris flow fans on the floodplain. Barbed tributaries, including Shehawken Creek, Calkins Creek, and Callicoon Creek, are another unique geologic anomaly where the streams enter the river in an unusual upstream direction. These barbed tributaries are evidence that the drainage pattern of the river once flowed to the north and were then reversed to the south by erosional forces.

The Upper Delaware River has a variety of channel patterns ranging from pool-riffle chains in straight reaches to elongated pool-riffle chains in incised meander reaches to anastomosing channel reaches with a number of islands to short bedrock gorge reaches. For example, the Narrows is a short gorge cut through the bedrock of a preglacial ridge that once occupied the site.



Photo: David B. Soete

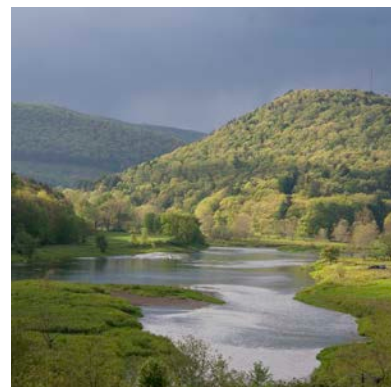


Photo: David B. Soete



Photo: David B. Soete

The Narrowsburg Pool is a plunge pool at the downstream end of the Narrows, possibly formed from a submerged waterfall. During flood flows, the river may scour down 150 feet into glacial deposits, subsequently refilling the pool with sediment transported from upstream to an approximate depth of 113 feet at normal flow levels. Skinners Falls, Shohola Rapids, and Staircase Rapids are examples of bedrock-floored rapids where the river has incised through glacial fill and cut into the bedrock of the valley side, in essence bypassing its pre-glacial channel.

The convoluted drainage pattern of the Delaware River system provides a rare combination of drainage anomalies that challenge various explanations of how Appalachian river systems evolved over geologic time. The diversity of valley orientations has produced an equal diversity of geologic hypotheses that try to explain how the pattern came to be.



Photo: David B. Soete

RECREATIONAL

The Upper Delaware River is known for its outstanding recreational activities from tubing the rapids on a hot summer day to relaxing on a hidden deck, slope side in the Pocono or Catskill mountain forests. The river's close proximity and accessibility attracts visitors from major metropolitan areas along the northeast corridor, including Boston, New York City, Philadelphia, and Washington, D.C.

The Upper Delaware provides a relatively undeveloped and varied river setting that is ideal for families and recreationists of all levels.

The river corridor offers a wide variety of recreational activities ranging from heavily used accesses at Skinners Falls, Narrowsburg, Mongaup, and Sparrowbush, to opportunities for solitude while hiking or canoeing various other stretches of the river. River reaches from Lordville to Callicoon, and Narrowsburg to Lackawaxen provide some of the most remote and serene experiences along the Upper Delaware.

The Upper Delaware segment is surrounded primarily by privately owned property, but there are 18 well-marked and easily accessible public access points. These developed boat and canoe launches on both sides of the river are available to the public approximately every 5 river miles. Privately owned and operated access points also exist along the river. All of these facilities, easily accessible by rural roads, include river information and amenities during the periods of heaviest visitor use. Four of the public access sites are staffed by NPS personnel during peak periods, making it easy for visitors to obtain information about recreation opportunities.

River activities include canoeing, kayaking, boating, tubing, rafting, SCUBA diving, snorkeling, swimming, and hunting waterfowl. The Upper Delaware's cold water fishery between Hancock and Callicoon attracts anglers from around the world, especially those interested in fly fishing for its world renowned wild trout. This type of fishing experience is seldom found elsewhere in the region.

Other recreational activities include photography, wildlife viewing, bird-watching, picnicking, hunting for both small and big game, and hiking/cross-country skiing at places such as Jensens Ledges, Tusten Mountain Trail, Game Lands 316, Buckhorn Natural Area, Damascus Forest, and Minisink Battleground Park. Sightseeing can be found at numerous scenic overlooks such as Jensens Ledges, Peggy Runway, Indian Ledges, and Hawks Nest, as well as at historic sites such as Roebling's Delaware Aqueduct (known locally as Roebling Bridge) and Zane Grey House. Auto touring and cycling along the Upper Delaware Scenic Byway (New York State Route 97) and New York State Bicycle Route 17 is also popular. Camping at both primitive and developed commercial campgrounds, fall foliage viewing, resorts, downhill skiing, geocaching, scientific research, education activities, and ranger-led activities are also popular. Eagle watching is particularly popular in the Lackawaxen area. The Eagle Institute, a project of the Delaware Highlands Conservancy, operates eagle viewing platforms and provides interpretive services in the area.

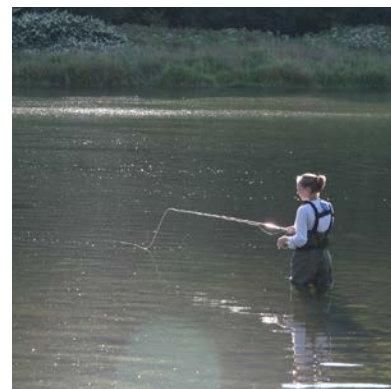


Photo: David B. Soete

Experienced commercial outfitters provide canoe, kayak, and raft rentals, as well as transportation between access points. Guided trips are also available. Commercial fishing guides provide guided fishing trips for both warm and cold water fish species. These guides and outfitters provide opportunities for beginners as well as experienced river users to easily explore the river. The mixture of class I and II rapids (Skinners Falls, Staircase, Mongaup, and Butlers Rift) with riffles, runs, and pools offer a varied and quality recreational experience on the river. Beginners to expert boaters alike can find something on the Upper Delaware to challenge their skills and provide an outstanding boating experience.

The exceptional water quality provides the recreationist remarkably clean water for swimming, tubing, and boating in quiet eddies or swift-moving rapids. The exceptional clarity of the water provides the swimmer, tuber, boater, and SCUBA diver or snorkeler remarkable subsurface visibility. SCUBA diving and snorkeling are particularly popular activities at Narrowsburg and Skinners Falls.



Photo: David B. Soete

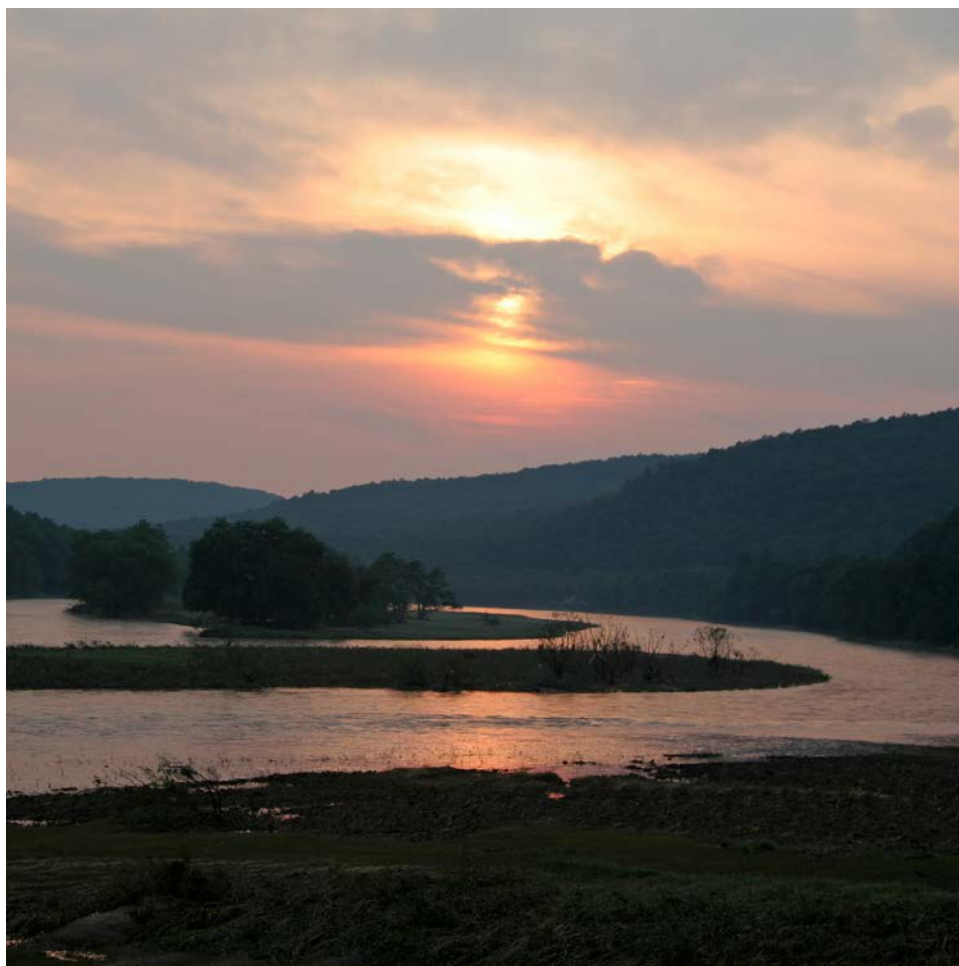


Photo: David B. Soete

SCENIC

The scenic quality of the Upper Delaware River is recognized as regionally significant due to its picturesque gorge, riparian vegetation, steep forested slopes and gently rolling hills. The agricultural fields and livestock pastures add variety to this tranquil scene.

The riffles, runs, rapids, and pools of the river provide an ever-changing visual stimulus that is enhanced by the water clarity providing for amazing views of the landscape, the river bottom, and aquatic life.

Rock outcroppings, cliff faces, and exposed unusual sedimentary formations add to the stimulating visual variety of the Upper Delaware. A number of cascading waterfalls, including Peggy Runway with the largest drop of any waterfall in Pennsylvania, delight the viewer. The contrasting hardwood forest and evergreen stands provide a rich variety of colors and textures across the four seasons. Additional outstanding natural features, landforms, and topographic features include, but are not limited to: Hawks Nest, York Lake Falls, Jensens Ledges/Bouchoux Trail, and Point Mountain. Dark night skies are prevalent.

The Upper Delaware scenery is rich in structures and sites that reflect its history of agricultural and transportation-based development. The historic canal, railroad, petite truss bridges, hotels, inns, taverns, homes, a hillside seminary built with local bluestone, and other unique structures provide beautiful scenic backdrops and a feeling of nostalgia for early American ingenuity. Particularly notable are the Roebling's Delaware Aqueduct (Roebling Bridge) and the privately owned prominent, stately and historic buildings; remnants of the Delaware and Hudson Canal; and Cohecton Station. The Hawks Nest stone wall along the Upper Delaware Scenic Byway provides the best overlook of the unspoiled river valley.



Photo: David B. Soete

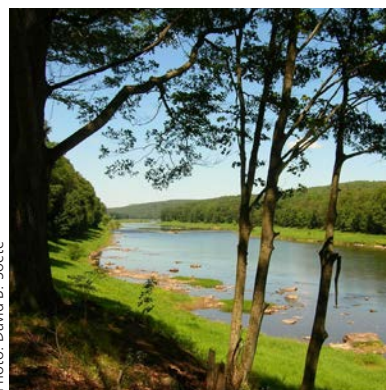


Photo: David B. Soete



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