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MAHONING RIVER RECREATION BENEFIT ANALYSIS

STUDY AUTHORITY & PROJECT LOCATION

The Mahoning River in Ohio is listed as one of five priority areas for removal and remediation of contaminated sediments in Section 312 of the Water Resources Development Act (WRDA) of 1990. The Mahoning River Environmental Project area consists of approximately 33 miles of river in Trumbull and Mahoning Counties, Ohio, starting in Warren, Ohio at river mile 42.0 and traveling southeastwardly to the Ohio-Pennsylvania State line.

RECREATION BENEFIT ANALYSIS

The proposed Mahoning River Environmental Dredging Project potentially may contain recreation features that meet the criteria for recreation development at ecosystem restoration projects, as described in Appendix B, Engineer Pamphlet (EP) 1165-2-502, dated 30 September 1999. As a result, a recreation benefit analysis of the Mahoning River project area was conducted.

In conjunction with the Mahoning River Environmental Study, the Corps of Engineers estimated recreational activity on the Mahoning River using the Unit Day Value (UDV) approach. The UDV approach relies on expert or informed opinion and judgment to approximate the average willingness to pay of recreational users. The recreation benefit analysis was conducted in accordance with Economic Guidance Memorandum (EGM) 03-04 (Unit Day Values for Recreation, fiscal year 2003), dated 1 March 2003.

RECREATION SUBCOMMITTEE

As a result of the large project area and the associated complexity of estimating recreation activity along the Mahoning River, a Recreation Subcommittee was created to analyze recreation benefits. This expert panel consisted of local, state, and federal representatives as well as local interest groups and citizens. The following individuals and their respective organizations participated as part of the Recreation Subcommittee:

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Table 1
Recreation Subcommittee Team Members

Name	Organization
Stephen Avery	Mill Creek Metro Parks
Jeff Benedict	U.S. Army Corps of Engineers, Pittsburgh District
Alex Bobersky	Local Historian and Citizen
James Brammer	Outdoor Recreational Equipment
Nancy Brundage	Audubon Society/Mahoning Valley
Robert Davic	Ohio Environmental Protection Agency
Joe DeLucia	U.S. Army Corps of Engineers, Pittsburgh District
Chris DePaola	Muskies Inc. Cleveland Chapter 23
Stephanie Dyer	Eastgate Regional Council of Governments
Bill Flynn	Trumbull County Metro Parks
Phil Hillman	Ohio Department of Natural Resources
Kim Mascarella	Eastgate Regional Council of Governments
Trish Nuskievicz	Trumbull County Planning
Gerald Quintiliani	City of Warren
Justin Rogers	Mill Creek Metro Parks
Carmen Rozzi	U.S. Army Corps of Engineers, Pittsburgh District
Lauren Schroeder	Mahoning Valley Consortium
Don Stoeckel	United States Geological Service

RECREATIONAL ACTIVITIES ALONG THE MAHONING RIVER

The Recreation Subcommittee identified a series of recreational activities that are currently taking place along the Mahoning River project area. In addition, the Recreation Subcommittee identified recreational activities that are not currently being pursued along the Mahoning River because of its degraded state, but potentially would be undertaken if the Mahoning River were environmentally restored. Those recreational activities that are not currently taking place, but may occur once the Mahoning River is restored include camping and swimming. Table 2 identifies the recreational activities that were identified by the Subcommittee for the “without” project condition and the “with” project condition. The “X” designation signifies under the “without” project condition that these recreational activities are currently taking place along the Mahoning River. The “X” designation signifies under the “with” project condition that these recreational activities may take place along the Mahoning River once it has been environmentally restored.

In addition, Table 2 separates the recreational activities into one of four potential categories: General Recreation, General Fishing and Hunting, Special Recreation, and Special Fishing and Hunting. The overwhelming majority of recreational activities along the Mahoning River fall within the general categories. No recreational activities were identified within the Special

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Recreation Category, however Muskellunge (Muskie) fishing was identified by the Recreation Subcommittee as a Special Fishing and Hunting activity.

Table 2
Recreational Activities
Mahoning River

Recreational Activities	Without Project	With Project
General Recreation		
Bicycling	X	X
Bird Watching	X	X
Boating (Motorized)	X	X
Camping		X
Canoeing/Kayaking	X	X
Educational Activities	X	X
Flora/Fauna Sightseeing	X	X
Hiking/Walking/Jogging	X	X
Picnicking	X	X
Swimming		X
General Fishing & Hunting		
Fishing (General)	X	X
Hunting/Trapping	X	X
Special Fishing & Hunting		
Muskie Fishing (Special)	X	X

MUSKELLUNGE – SPECIAL FISHING

According to the Muskies Inc. Cleveland Chapter 23 website, Muskellunge are identified as “A long, slender fish with a large mouth and numerous teeth. Scales on cheeks are found only on the upper half and gill cover. Muskies lack a spiny dorsal fin, but do have a soft-rayed fin and soft-rayed ventral fin, both just in front of the tail. Muskies have 7-11 sensory pores on the underside of each side of the lower jaw.” It is considered a trophy fish with males typically ranging from 22-39 inches, and weighing 3-21 pounds; and females typically ranging from 22-50 inches, and weighing from 3-40 pounds.

According to both Phil Hillman of the Ohio Department of Natural Resources and Bill Kurey of the U.S. Fish and Wildlife Service, Muskellunge should be considered as part of the Special Fish category. Muskies are not considered a commonly found fish in most waters. According to the Muskies Inc. Cleveland Chapter 23 website, Muskellunge’s range and habitat are “Historically abundant in Lake Erie and larger streams in the Ohio River drainage. Today found primarily in lakes where they have been stocked and occasionally in Lake Erie and Ohio River tributaries. Ideal habitat is heavily vegetated with submerged stumps, brush, and logs and water 3-4 feet

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deep.” The Mahoning River is one of only a few inland river systems in Ohio known to contain Muskies.

In addition to Muskies not being found in most waters, it also requires Special fishing equipment and fishing techniques. The most popular way to fish for Muskies is by bait casting and trolling large plugs, spoons, and spinner baits.

Finally, there is historical significance concerning Muskies and the Mahoning River. There is documentation indicating that the first Muskellunge identified anywhere in the country took place in the Mahoning River (see Attachment 1). Spencer F. Baird and Jared P. Kirtland, Ichthyologist (zoologist that study fish), collected and identified several species of fishes that were unique to North America along the Mahoning River and Yellow Creek in Ohio. Among the 41 species of fish collected by Baird and Kirtland in 1853 included the Muskellunge being first identified in the Mahoning River.

Photograph 1
Muskellunge Fish
Caught Along Mahoning River in Warren, Ohio



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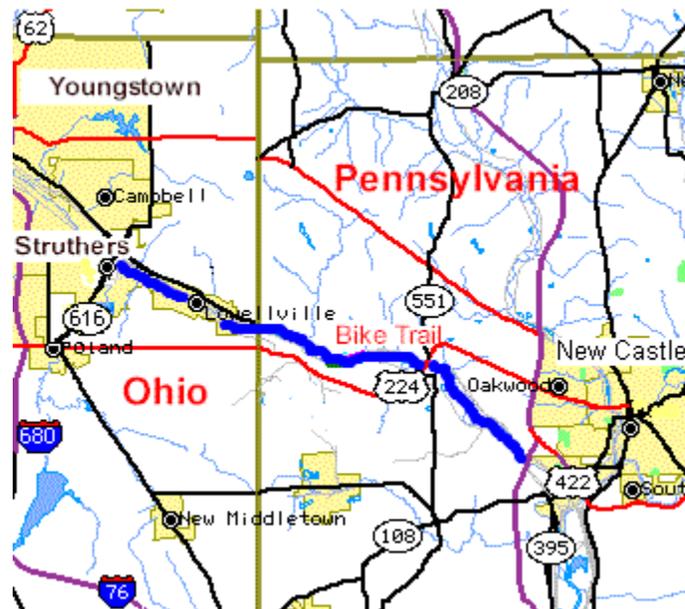
WITHOUT PROJECT – VISITOR DAYS

For each of the recreational activities identified for the “without” project condition the Recreation Subcommittee estimated the number of visitor days that are occurring within the project area of the Mahoning River environmental study. The Recreation Subcommittee utilized existing data, past studies of the Mahoning River, studies of comparable water systems, and expert elicitation to estimate visitor days. The “without” project analysis was conducted in accordance with the Institute of Water Resource (IWR) Planning Manual (IWR Report 96-R-21, dated November 1996). As prescribed in IWR Report 96-R-21, proper “without” project condition analysis includes a comprehensive, rational, alternative future oriented, honest, and inclusive evaluation. The preceding portion of this recreation benefit analysis documents the procedures utilized by the Recreation Subcommittee to estimate “without” project visitor days for the identified recreational activities in Table 2.

BICYCLING – WITHOUT PROJECT VISITOR DAYS

The only formal bike trail along the Mahoning River in the environmental restoration project area is the Stavich Bicycle Trail. The Stavich Bicycle Trail is an asphalt paved, 12 mile long, approximately 8-foot wide, bike trail next to the CSX train line. It extends from the Youngstown area community of Struthers, Ohio to New Castle, Pennsylvania. The Stavich Bicycle Trail was built on an old electric rail route that parallels two active CSX train tracks. Most of the trail is level to a gentle grade; there are a couple of fairly short hills with gradual inclines and descents. Figure 1 contains a map of the Stavich Bicycle Trail.

Figure 1
Stavich Bicycle Trail Map



It was estimated by the Recreation Subcommittee that the average number of bicyclist per day utilizing Stavich Bicycle Trail was approximately 20. It was further estimated by the

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Subcommittee that the Stavich Bicycle Trail is accessible approximately 250 days per year, accounting for inclement weather. Consequently, the Recreation Subcommittee estimated 5,000 annual visitor days for bicycling along the Mahoning River for the “without” project condition.

Photograph 2
Stavich Bicycle Trail



BIRD WATCHING – WITHOUT PROJECT VISITOR DAYS

The Recreation Subcommittee identified four locations where the Mahoning River is accessible for bird watching. The four locations identified include the Stavich Bicycle Trail, along the B & O Railroad, Perkins Park and Packard Park in the City of Warren. It was estimated by Nancy Brundage of the Audubon Society of Mahoning Valley that it is reasonable to expect approximately 10 bird watchers per week along the Mahoning River Environmental Project area. Thus, the “without” project annual visitor days estimated for bird watching along the Mahoning River Project area is 520 visitor days (10 bird watchers times 52 weeks in a year).

BOATING (MOTORIZED) – WITHOUT PROJECT VISITOR DAYS

Motorized boating along the Mahoning River Environmental Project area is considered to be minimal under the “without” project condition because of the lack of accessible locations to dock motorized boats. There are a few homes along the Mahoning River that have private docks primarily near the Girard Dam, so some motorized boating does occur but on a limited basis. It is estimated that only 50 annual visitor days occur for motorized boating within the defined project area for the “without” project condition.

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Photograph 3
Pontoon Boat
Mahoning River, Girard Reach



CAMPING – WITHOUT PROJECT VISITOR DAYS

Since no formal campgrounds are available along the Mahoning River Environmental Project area, “without” project annual visitor days for camping are considered to be zero.

CANOEING/KAYAKING – WITHOUT PROJECT VISITOR DAYS

Canoe and kayak rental information for Canoe City was provided by Dave Schaffer, operator of Burg’s Bait. Burg’s bait provides canoe and kayak rentals for Canoe City, which is the oldest of the Trumbull County MetroParks, established in 1920. Canoe City is located on North Leavittsburg Road in Leavittsburg, Ohio along the Mahoning River but outside the boundaries of the Mahoning River Environmental Project area. Dave Schaeffer estimated that Canoe City rents between 200–250 canoes and kayaks per season. Assuming 1 individual per kayak and 2 individuals per canoe and also taking into account those individuals owning their own equipment, the Recreation Subcommittee estimated that approximately 500 annual visitor days occur at Canoe City for participation in canoeing and kayaking. The Canoe City rental data and annual visitor day information was used as a baseline to estimate “without” project annual visitor days within the Mahoning River Environmental Project area. Since, there are no formal areas within the project boundaries established for canoeing and kayaking, it is estimated that the annual visitor days in the project area is significantly lower than at Canoe City. It is estimated that approximately 125 annual visitor day are taking place along the Mahoning River Project boundaries for the “without” project condition.

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EDUCATIONAL ACTIVITIES – WITHOUT PROJECT VISITOR DAYS

The Mahoning River Education Project is a partnership between Youngstown State University, the Mahoning River Consortium, Earth Force, and local school districts. School districts involved in the Mahoning River Education Project during the 2002-2003 school year included Girard, Struthers, Youngstown, and Campbell. In addition, school districts in Niles and Lakeview are scheduled to begin participation in the Mahoning River Education Project during the 2003-2004 school year.

According to Youngstown State University's Mahoning River Watershed website, "The overarching goal of the Mahoning River Education Project is to create an institutionalized process between Youngstown State University, local school districts, and community agencies & organizations by which students across disciplines and in grades K-12 learn about their Mahoning River watershed, its history, current condition, future and how its condition affects our collective quality of life and economic vitality; further, that students will, through this process, not only understand the interconnectedness of local natural systems, built structures, and social systems, but will also engage in student-generated civic-action processes, and will help educate the broader community by writing articles, creating powerpoint presentations and videos, collecting and airing oral histories, and producing public service announcements for television and radio, and by showcasing these end products at public events such as the YSU Mahoning River Fair." According to information provided by Holly Burnett, Research Associate, for the Center for Urban and Regional Studies at Youngstown State University, it is estimated that approximately 3,825 students currently participate in the Mahoning River Education Project. This includes approximately 2,500 middle school students that make 1 field trip visit per year to the Mahoning River. Consequently, the annual visitor days that take place for educational activities along the Mahoning River for the "without" project condition is 2,500 students.

FLORA/FAUNA SIGHTSEEING – WITHOUT PROJECT VISITOR DAYS

The Horticultural classes at the Trumbull County Vocational School utilize Perkins and Packard Parks in the City of Warren to study local flora and fauna growing in the area. It is estimated that an average class size of 25 students visits the parks approximately 6 times per year. The annual visitor days for the "without project" condition are estimated to equal 150 (25 students times 6 visits per year) to study native flowers and plants growing within the Mahoning Valley.

HIKING/WALKING/JOGGING – WITHOUT PROJECT VISITOR DAYS

The Recreation Subcommittee identified three locations where the Mahoning River is accessible for hiking, walking, and jogging. The three locations identified include the Stavich Bicycle Trail, Perkins Park, and Packard Park. Hiking would be minimal since there are not any developed trails. However, a large number of joggers and walkers use Perkins Park primarily, to a lesser degree Packard Park, and to a minor extent Stavich Bicycle Trail. It is estimated that on average approximately 75 walkers and joggers per day use Perkins Park, 50 use Packard Park, and 15 use Stavich Bicycle Trail along the Mahoning River. It was further estimated by the Subcommittee that these facilities are accessible approximately 250 days per year, accounting for inclement weather. Consequently, the Recreation Subcommittee estimated 35,000 (140

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walkers/joggers times 250 days) annual visitor days for hiking, walking, and jogging along the Mahoning River for the “without” project condition.

PICNICKING – WITHOUT PROJECT VISITOR DAYS

Picnicking within the Mahoning River Environmental Project area takes place primarily at Packard and Perkins Parks. Both Parks in the City of Warren currently have 2 picnic pavilions available for rentals. In addition, each park is expected to build an additional pavilion. The pavilions were rented 92 times during 1993. Average capacity of each of the pavilions is estimated to equal 35 people. The pavilion rental picnickers is estimated to equal a total 3,220 annual visitor days (35 people times 92 rentals). Assuming that each additional pavilion slated to be built will attract the same amount of picnickers as the pavilions currently at the park, it is estimated that an additional 1,610 picnickers can be expected. An additional 1,170 picnickers are estimated to account for non-rental picnicking in the Warren Parks, picnicking at Stavich Bicycle Trails where a picnic table is available, and any other picnicking that might informally take place along the Mahoning River. A total of 6,000 (3,220+1,610+1,170) annual visitor days for picnicking is estimated to take place along the Mahoning River Environmental Project area.

SWIMMING – WITHOUT PROJECT VISITOR DAYS

The Ohio Department of Health has issued a Dermal Contact Advisory for the Mahoning River from NW Bridge Road in the City of Warren to the Pennsylvania State border because of Polycyclic Aromatic Hydrocarbons (PAHs). Taking into account the Dermal Contact Advisory, it is assumed that no swimming is taking place along the Mahoning River Environmental Project area for the “without” project condition.

FISHING (GENERAL) – WITHOUT PROJECT VISITOR DAYS

The Ohio Environmental Protection Agency (EPA) has issued a Fish Consumption Advisory for certain fish species along the Mahoning River in Mahoning and Trumbull Counties. From Berlin Dam to the Pennsylvania state border, the Ohio EPA has issued a one meal per month consumption advisory on Smallmouth Bass because of Mercury and Polychlorinated Biphenyls (PCBs) contaminants. A one meal per month consumption advisory has also been issued for Walleye and a do not eat advisory has been issued for Channel Carp and Common Carp from NW Bridge Road in Warren, Ohio to the Pennsylvania state border because of PCBs. The Fish Consumption Advisory in conjunction with the Dermal Contact Advisory deters fishing along the project portion of the Mahoning River to a great extent.

In spite of the advisories, fishing along the project reach of the Mahoning River does occur. According to Phil Hillman of the Ohio Department of Natural Resources, fish species that would typically be fished for in the Mahoning River would include walleye, smallmouth bass, rock bass (a smaller panfish that usually is less than 10"), channel catfish, a variety of sucker species, carp, largemouth bass (in slower moving or pooled areas).

A determination was made by the Recreation Subcommittee that the majority of fisherman fishing the Mahoning River along the project area would come from one of the five following

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counties: Columbiana County, Mahoning County, Portage County, Stark County, and Trumbull County. The Annual Residential Fishing Licenses (see Attachment 2) issued in these five counties in 2002 are listed in Table 3.

Table 3
2002 Annual Residential
Fishing Licenses

Annual Residential Fishing Licenses	Total
Columbiana County	6,600
Mahoning County	9,412
Portage County	11,684
Stark County	26,647
Trumbull County	17,393
Total	71,736

A 10% factor was utilized to estimate 7,175 annual visitor days for general fishing along the Mahoning River Environmental Project area.

HUNTING/TRAPPING – WITHOUT PROJECT VISITOR DAYS

The only location to lawfully hunt and trap along the Mahoning River is in the Warren Wildlife Area which is a State Game Lands located just below the City of Warren going into the City of Niles. According to Tom Henry, Assistant Wildlife Supervisor at the Ohio Department of Natural Resources located in Akron, Ohio; there are not many hunting opportunities since the Warren Wildlife Area is only 45 acres and there is private property bordering it. For those individuals having access to the Warren Wildlife Area, there is potential for beaver and muskrat trapping, deer hunting, waterfowl hunting, and rabbit hunting. Since, hunting and trapping in the Warren Wildlife Area would be minimal, the Recreation Subcommittee estimated that approximately 350 annual visitor days occur within the project area for the “without” project condition.

MUSKELLUNGE FISHING (SPECIAL) – WITHOUT PROJECT VISITOR DAYS

The Cleveland Chapter of Muskies, Inc. conducted a survey (see Attachment 3) at the Cleveland Chapter of Muskies banquet on 21 February 2004. Muskie fishermen from the following 3 clubs were represented: Cleveland, Akron/Canton, and Penn/Ohio. A total of 75 surveys were distributed with 57 surveys returned (76% return rate). A total of 31 (54%) of the 57 fishermen that returned surveys indicated that they had fished the Mahoning River in the past 4 years. The number of times that the Mahoning was fished is indicated in Table 4.

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Table 4
Cleveland Chapter of Muskies, Inc.
Number of Times Fishing the Mahoning River

Fishing Trips	Fishermen	Percentage
10 or More Trips	15	26%
5-9 Trips	6	11%
1-4 Trips	10	18%
Never	26	46%
Total	57	100%

There are 4 chapters of Muskies Inc. located in Ohio or northwestern Pennsylvania with a combined membership of 722 fishermen (see Attachment 4). Assuming that approximately 50% of the Muskies Inc. members (361) of the 4 local chapters fish the Mahoning River, and in addition approximately 361 non-member also fish the Mahoning River an average of 2.5 times per year, then the estimated annual visitor days for Muskie fishing along the entire Mahoning River area is 1,805 visitor days. Assuming 1 of 3 fishermen are fishing within the boundaries of the Mahoning River Environmental Project area (primarily in Lowellville), then the visitor days within the project area are estimated to be 600.

Photograph 4
Muskellunge Fish
Caught Along Mahoning River



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WITHOUT PROJECT – VISITOR DAYS BY ACTIVITIES

Table 5 summarizes the estimated annual visitor days by activities along the Mahoning River Environmental Project area for the “without” project condition. In addition, Table 5 estimates annual visitor days by the three identified categories: General Recreation, General Fishing and Hunting, and Special Fishing and Hunting.

Table 5
Without Project
Visitor Days by Activities

Recreational Activities	Without Project Visitor Days
Bicycling	5,000
Bird Watching	520
Boating (Motorized)	50
Camping	0
Canoeing/Kayaking	125
Educational Activities	2,500
Flora/Fauna Sightseeing	150
Hiking/Walking/Jogging	35,000
Picnicking	6,000
Swimming	0
General Recreation Total	49,345
Fishing (General)	7,175
Hunting/Trapping	350
General Fishing & Hunting Total	7,525
Muskie Fishing (Specialized)	600
Specialized Fishing & Hunting Total	600
Grand Total	57,470

WITH PROJECT – VISITOR DAYS

For each of the recreational activities identified, the Recreation Subcommittee estimated the number of projected visitor days that might be expected to occur within the project area of the Mahoning River environmental study for the following two distinct “with” project conditions: 1.) sediment removal only and 2.) both sediment and dam removal. In accordance to the “without” project condition, the Recreation Subcommittee again utilized existing data, past studies of the Mahoning River, studies of comparable water systems, and expert elicitation to estimate visitor days for each of the “with” project alternatives for the Mahoning River. The

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preceding portion of this recreation benefit analysis documents the procedures utilized by the Recreation Subcommittee to estimate “with” project visitor days of dredging the Mahoning River and the “with” project visitor days for dredging the Mahoning River in conjunction with dam removal for the identified recreational activities in Table 2.

BICYCLING – WITH PROJECT VISITOR DAYS

Recreation benefits are anticipated to occur as a result of environmentally restoring the Mahoning River to a more naturalistic condition. As the river is restored, it is reasonable to expect over time that the fish, wildlife, flora, and fauna population and diversity will also improve. This would make recreation activities such as bicycling along the Mahoning River more attractive to Mahoning Valley residents and also individuals outside the Mahoning Valley.

The belief of the Recreation Subcommittee is that it is logical to expect a similar increase in visitor days for bicycling along the Mahoning River regardless if the river is restored through a dredging only alternative or a combination of both sediment and dam removal. It is reasonable to expect that biking along the existing Stavich Bicycle Trail would increase as a result of restoring the Mahoning River to a more naturalistic condition. Justin Rogers of Mill Creek MetroParks estimates that Stavich Bicycle Trail would realize approximately 150% increase in facility use as a result of restoring the Mahoning River. This would increase visitor days for bicycling along Stavich Bicycle Trail from 5,000 “without” project visitor days to approximately 7,500 “with” project visitor days.

Although currently the only formal bike trail along the Mahoning River in the environmental restoration project area is the Stavich Bicycle Trail, potential exists that additional bike trails could be constructed in Mahoning and/or Trumbull Counties as a result of the Mahoning River becoming more attractive to bicyclist spurred by the more naturalistic condition of the river and the surrounding area. There is a proposed bike trail in Mahoning County by Mill Creek MetroParks that potentially could be constructed along the Mahoning River. The potential project would begin at the north extent of Mill Creek Park (the Fellows Riverside Gardens area) near the confluence of Mill Creek with the Mahoning River. Utilizing Price Road (a city road) to access the facility, the proposed trail would traverse east along the southern bank of the river for approximately 5,800 feet (1.10 miles) past the Youngstown Water Department, the B&O Station to the Spring Commons Bridge. The intention of the project would be to connect to the new Health and Wellness Center at Youngstown State University. According to Justin Rogers approximately 10,000 bicyclists could be expected to annually use the proposed bike trail in Mahoning County if the Mahoning River were environmentally restored.

According to Bill Flynn, Chairman of Trumbull County MetroParks, a bike trail is slated to run through the City of Warren in Trumbull County. The bike trail through Warren will follow one of three possible routes: 1.) parallel to North Park (quite a distant from the river), 2.) parallel to Mahoning Avenue with some close proximity to the river, but only a glimpse or 3.) along the riverbank including two crossing of the Mahoning River. According to Bill Flynn, the second option is currently the primary plan. However, Mr. Flynn further stated that, “With a clean river, I could see that the route definitely being revised to the third option otherwise most likely not since it is a more expensive option.” According to Mr. Flynn approximately 12,500 bicyclist

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could be expected to annually use the proposed bike trail in Mahoning County if the Mahoning River were environmentally restored.

Taking into account increased usage of the existing Stavich Bicycle Trail and the potential construction of additional bike trails in both Mahoning and Trumbull Counties as a result of environmentally restoring the Mahoning River, it is estimated that approximately 30,000 (7,500+10,000+12,500) annual “with” project visitor days for biking could reasonably be expected along the restoration project area for both the “with” project condition of sediment removal only and the “with” project condition of both sediment and dam removal.

BIRD WATCHING – WITH PROJECT VISITOR DAYS

The Recreation Subcommittee identified four locations where the Mahoning River is accessible for bird watching under the “without” project condition. The four locations identified include the Stavich Bicycle Trail, along the B & O Railroad, Perkins Park and Packard Park in the City of Warren. According to Carmen Rozzi, Project Manager of the Mahoning River Environmental Study and Chief of Plan Formulation for the Pittsburgh District Corps of Engineers, a number of access points to the Mahoning River are expected to be implemented as a result of the study. In addition, it is reasonable to expect that the population and diversity of bird species will increase as a result of the Mahoning River being restored to a more naturalistic condition. It was estimated by Nancy Brundage of the Audubon Society of Mahoning Valley that it is reasonable to expect approximately 50 bird watchers per week along the Mahoning River Environmental Project area if additional access points were available and the river was cleaned through dredging. Thus, the “with” project annual visitor days estimated for bird watching along the Mahoning River Project area is 2,600 visitor days (50 bird watchers times 52 weeks in a year) if the Mahoning River were restored through sediment removal.

In addition, the removal of dams from the Mahoning River would make a safer environment for bird watching along the Mahoning River in those areas where pools would be eliminated and water depths lowered. Consequently, the Recreation Subcommittee expects a slightly higher number of “with” project annual visitor day for the alternative of both sediment and dam removal versus the “with” project condition of sediment removal only. It was estimated by Nancy Brundage of the Audubon Society of Mahoning Valley that it is reasonable to expect approximately 70 bird watchers per week along the Mahoning River Environmental Project area if additional access points were available and the river were cleaned through both dredging and dam removal. Thus, the “with” project annual visitor days estimated for bird watching along the Mahoning River Project area is approximately 3,650 visitor days (70 bird watchers times 52 weeks in a year) if the Mahoning River were restored through both sediment and dam removal.

BOATING (MOTORIZED) – WITH PROJECT VISITOR DAYS

Motorized boating along the Mahoning River Environmental Project area is considered to be minimal under the “without” project condition because of the lack of accessible locations to dock motorized boats. If access points to the Mahoning River are increased as expected under the Environmental Restoration Project then it is reasonable to expect that motorized boating would also increase. The Recreation Subcommittee estimates that approximately 500 annual visitor

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days could reasonably be expected for motorized boating within the defined project area for both the “with” project condition of sediment removal only and the combination of sediment and dam removal. However, the estimated increase in motorized boating would be primarily the result of the proposed increase in access points that would allow additional boat dockings.

CAMPING – WITH PROJECT VISITOR DAYS

As the river is restored, there exists the potential for camping along the Mahoning River. With the expected increase in fish, wildlife, flora, and fauna population and diversity; as well as proposed access points to the river the Mahoning River would become a more attractive location for informal camping as well as having potential for small-scale formal campgrounds. In order to estimate potential “with” project annual visitor days for camping along the Mahoning River, a comparison was made to the Corps of Engineers’ three northeast Ohio Reservoirs that have campgrounds available. The three Corps of Engineers’ Ohio Reservoirs include Berlin Lake, Mosquito Creek Lake, and M. J. Kirwin Dam and Reservoir.

Berlin Lake has the largest campground of all the Corps projects in the Pittsburgh District. The Mill Creek Recreation Area Campground at Berlin Lake has 347 sites, of which, 47 are electric hookup sites. The Mill Creek Recreation Area is located on the east side of the lake, south of Route 224 and off of Bedell Road in Berlin Center, Ohio. Ohio's Mosquito Lake State Park operates a campground with 234 non-electric campsites. This campground is located on the southwestern shore of the lake off of Hoagland-Blackstub Road and about a mile from Route 305 in Cortland, Ohio. The campground at M.J. Kirwan Reservoir is operated by West Branch State Park. It is located on the north shore of the lake on the peninsula just past the state park office in Wayland, Ohio. This campground has 103 sites that can handle either tents or trailers. The fiscal year 2002 visitation summary of camping (see Attachment 5) at the three northeastern Ohio reservoirs can be found in Table 6.

Table 6
Fiscal Year 2002
Corps of Engineers
Northeast Ohio Reservoirs
Campground Visitation Days

Fiscal Year 2002	
Campgrounds	Visitation Days
Berlin Lake	31,841
Mosquito Creek Lake	113,179
M. J. Kirwin Dam and Reservoir	10,225
Total	155,245

The Recreation Subcommittee estimated that approximately 1% of the campers might be expected to utilize the Mahoning River for camping if the river were environmentally restored through removal of contaminated sediment. Consequently, the “with” project annual visitor days

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for camping along the Mahoning River restoration project area is estimated to equal 1,550 days for the sediment removal only alternative.

Again the Recreation Subcommittee believes that the removal of dams from the Mahoning River would make a safer environment for camping along the Mahoning River in those areas where pools would be eliminated and water depths lowered. The Recreation Subcommittee estimated that approximately 2% of the campers might be expected to utilize the Mahoning River for camping if the river were environmentally restored through removal of contaminated sediment and the removal of dams. Consequently, the “with” project annual visitor days for camping along the Mahoning River restoration project area is estimated to equal 3,100 days for the combination alternative of sediment and dam removal.

CANOEING/KAYAKING – WITH PROJECT VISITOR DAYS

Although, the Dermal Contact Advisory issued by the Ohio Department of Health along the Mahoning River from NW Bridge Road in the City of Warren to the Pennsylvania State border probably adversely impact the use of the river for such activities as canoeing and kayaking; according to James Brammer, of Outdoor Recreational Equipment, the biggest obstacle to canoeing and kayaking the Mahoning River is the numerous low-head dams. Nine low-head dams currently impound eight pools along the lower Mahoning River in Ohio within the river area to be restored (project area). Table 7 lists the nine low-head dams and their respective river mile location within the project reach.

Table 7
Mahoning River Dams
Located Within Project Reach
Environmental Restoration

Dam Name	USACE River Mile	Dam Height (feet)*
Warren-North River Road Dam	42.89	1.00
Warren-Summit Street Dam	40.05	9.40
Warren-Main Street Substation Dam	36.79	4.25
Girard-Liberty Street Dam	26.97	7.35
Youngstown-Crescent Street Dam	23.14	4.85
Youngstown-Mahoning Avenue Dam	21.11	3.05
Haselton-Center Street Dam	18.20	2.35
Struthers-Bridge Street Dam	16.28	2.20
Lowellville-1st Street Dam	13.05	3.30
Note: *Crest to tailwaters at low flows		

With the expected increase in fish, wildlife, flora, and fauna population and diversity; as well as proposed access points to the river the Mahoning River would become a more attractive location for canoeing/kayaking. However with a sediment removal only alternative, the biggest impediment (nine low-head dams) to canoeing/kayaking would remain an obstacle that would

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continue to deter this activity to a great extent. Accordingly, the “with” project annual visitor days for canoeing/kayaking along the Mahoning River restoration project area is estimated to equal 1,000 days.

Photograph 5
Youngstown-Crescent Street Dam
Mahoning River



However, the removal of some of the nine low-head dams would favorable impact canoeing/kayaking to a great extent. To estimate “with” project annual visitor days along the Mahoning River if the river were environmentally restored through both sediment and dam removal a comparison was made to the canoeing/kayaking taking place at Camp Hi Canoe Livery located along the Upper Cuyahoga River in Hiram, Ohio. The Upper Cuyahoga River was designated an American Heritage River in 1999. Additionally, the 25 miles of the Upper Cuyahoga River used by Camp Hi is designated as State Scenic River. According to Dave Becker of Camp Hi approximately 12,000 canoes are rented per season (does not account for those individuals owning their own equipment). Taking into account the better scenery along the Upper Cuyahoga River, and the fact that the section of the Upper Cuyahoga River along Camp Hi has never been polluted, it is reasonable to estimate that the project portion of the Mahoning River once it has been environmentally restored through sediment and dam removal could expect somewhere in the neighborhood of 4,000 (1/3 of Camp Hi) or more canoes/kayaks per season. Assuming 1 individual per kayak and 2 individuals per canoe, the Recreation Subcommittee estimated that approximately 10,000 annual visitor days for canoeing/kayaking would occur along the Mahoning River restoration project boundaries for the “with” project condition of sediment and dam removal.

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EDUCATIONAL ACTIVITIES - WITH PROJECT VISITOR DAYS

According to information provided by Holly Burnett, Research Associate, for the Center for Urban and Regional Studies at Youngstown State University, it is reasonable to expect that if the Mahoning River were environmentally restored that all the schools located within Mahoning and Trumbull County would participate in the Mahoning River Education Project. Assuming that all middle school students within Mahoning and Trumbull Counties would make 1 field trip visit per year to the Mahoning River then annual visitor days that take place for educational activities along the Mahoning River for the “with” project condition of dredging the river and the “with” project condition of both sediment and dam removal would be approximately 23,100 students.

Table 8
Middle School Students
Mahoning County & Trumbull County, Ohio

County	Middle School Students
Mahoning County	11,911
Trumbull County	11,191
Total	23,102

FLORA/FAUNA SIGHTSEEING – WITH PROJECT VISITOR DAYS

As the river is restored, it is reasonable to expect over time that the flora and fauna population and diversity will also improve. The Horticultural classes at the Trumbull County Vocational School currently utilize Perkins and Packard Parks in the City of Warren to study local flora and fauna growing in the area. It is reasonable to expect that in conjunction with the environmental restoration of the Mahoning River that the river will experience increased use by local schools, interest groups, and individuals for the purpose of flora and fauna sightseeing. The Recreation Subcommittee estimated that the annual visitor days for flora and fauna sightseeing along the Mahoning River environmental project area could be expected to increase from 150 “without” project visitor days to 450 “with” project visitor days if the river were restored through either dredging only or a combination of sediment and dam removal.

HIKING/WALKING/JOGGING – WITH PROJECT (SEDIMENT REMOVAL ONLY) VISITOR DAYS

In the judgment of the Recreation Subcommittee, it is reasonable to expect a similar increase in visitor days for hiking/walking/jogging along the Mahoning River regardless if the river is restored through a dredging only alternative or a combination of both sediment and dam removal. The Recreation Subcommittee identified three locations where the Mahoning River is currently accessible for hiking, walking, and jogging. The three locations identified include the Stavich Bicycle Trail, Perkins Park, and Packard Park. As the river is restored, it is reasonable to expect over time that the fish, wildlife, flora, and fauna population and diversity will also improve. This would make hiking/walking/and jogging along the Mahoning River more attractive to Mahoning Valley residents. It is reasonable to expect that walking and jogging along the existing locations of Perkins Park and Packard Park would increase as a result of

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environmentally restoring the Mahoning River. However, the Recreation Subcommittee anticipates that walking and jogging along the existing Stavich Bicycle Trail would remain relatively stable because of its long length with little opportunity to circle back for walkers. Hiking would continue to be minimal unless trails were developed. It is estimated by the Recreational Subcommittee that on average approximately 275 walkers and joggers per day would use Perkins Park, 138 would use Packard Park, and 15 would use Stavich Bicycle Trail along the Mahoning River if the river were environmentally restored. It was further estimated by the Subcommittee that these facilities are accessible approximately 250 days per year, accounting for inclement weather. Consequently, the Recreation Subcommittee estimates 107,000 (428 walkers/joggers times 250 days) annual visitor days for hiking, walking, and jogging at existing facilities along the Mahoning River after environmental restoration.

In addition, the potential exists that additional bike trails could be constructed in Mahoning and/or Trumbull Counties as a result of the Mahoning River becoming more attractive to bicyclists spurred by the more naturalistic condition of the river and the surrounding area. There is a proposed bike trail in Mahoning County that potentially could be constructed along the Mahoning River as well as a proposed bike trail in Trumbull County. These proposed bike trails would be available to walkers and joggers. Assuming that each bike trail would accommodate an average of approximately 100 walkers/joggers for the estimated 250 days per year, then the annual visitor days for walking and jogging at each of the proposed bike facilities would equal 25,000 days. Consequently, the Recreation Subcommittee estimates a total of 157,000 (107,000+25,000+25,000) annual visitor days for hiking, walking, and jogging along the Mahoning River after environmentally restoring the river.

PICNICKING – WITH PROJECT VISITOR DAYS

Picnicking within the Mahoning River Environmental Project area takes place primarily at Packard and Perkins Parks. Both Parks in the City of Warren currently have 2 picnic pavilions available for rentals, and each are expected to build an additional pavilion. A picnic table is also available along Stavich Bicycle Trail. In addition to the formal picnic locations, informal picnicking can take place along the Mahoning River. With the environmental restoration of the Mahoning River as well as proposed access points, the Mahoning River would become a more attractive location for both formal and informal picnicking. The Recreation Subcommittee estimates a total of 18,000 annual visitor days for picnicking could reasonably be expected along the project area if the Mahoning River were environmentally restored through sediment removal only. In addition, the removal of dams from the Mahoning River would make a safer environment for picnicking along the Mahoning River in those areas where pools would be eliminated and water depths lowered. The Recreation Subcommittee estimates a total of 36,000 annual visitor days for picnicking could reasonably be expected along the project area if the Mahoning River were environmentally restored through both sediment and dam removal.

SWIMMING – WITH PROJECT (SEDIMENT REMOVAL ONLY) VISITOR DAYS

The Ohio Department of Health has issued a Dermal Contact Advisory for the Mahoning River from NW Bridge Road in the City of Warren to the Pennsylvania State border. In a report conducted by Richard S. Thorn titled *A Study of the Social and Economic Benefits Resulting*

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from the Implementation of the Best Available Technology Economically Achievable on the Mahoning River dated December 15, 1981; the report states “It is unlikely the Mahoning River and Beaver River will ever be used for swimming even if the standards are attained.” The Recreation Subcommittee recognizes the negative connotation associated with the Dermal Contact Advisory, and the associated difficulty in overcoming the perception that the Mahoning River will always be unsafe for swimming even if the Dermal Contact Advisory is lifted. However, the Recreation Subcommittee believes that if the Dermal Contact Advisory were lifted as a result of environmentally restoring the Mahoning River, it is reasonable to expect that the negative connotation associated with the Dermal Advisory could be overcome to a least a moderate degree.

In fact, some success has been realized along the Black River located in Lorain County, Ohio. Like the Mahoning River, the Black River previously had both a Fish Consumption Advisory and a Dermal Contact Advisory. The Fish Consumption Advisory (Common Carp, one meal per month, PCBs) and Dermal Contact Advisory (PAHs) for the Black River extended from the 31st Street Bridge in Sheffield, Ohio to Lake Erie. Point source contaminants such as factories, waste water treatment plants, etc. significantly polluted and degraded the ecosystem of the Black River.

An Ohio EPA press release date April 22, 2004 states, “First, a 21-year-old contact advisory on the lower five miles of the river (between the mouth and the E. 31st Street bridge) has been lifted by the Ohio Department of Health. The advisory was issued in 1983 because bottom-feeding fish caught there had excessive numbers of liver and lip cancers. The tumors were linked to toxic industrial wastes in river bottom sediments. In 1990, 50,000 cubic yards of contaminated sediment were removed from the river bottom. Over time, water quality and the fish community have gradually improved, leading the State to lift the contact advisory. In addition, U.S. EPA has just declared the Black River to be “in recovery” for fish tumors and deformities -- one of several reasons for which the river was considered impaired by IJC. Ohio EPA and the Black River Remedial Action Plan Coordinating Committee (Black River RAP) documented the improved health of the fish community in a February 2004 application to U.S. EPA. The upgraded status recognizes that no additional actions are necessary to further reduce fish tumor incidences and natural processes should complete the recovery.”

Assuming that the Dermal Contact Advisory will eventually be lifted along the Mahoning River as a result of sediment removal, it is estimated by the Recreation Subcommittee that 500 annual visitor days for swimming could reasonably be expected during a 3-4 month period that weather permits swimming along the environmental project reach of the Mahoning River. In those areas where pools would be eliminated and water depths lowered as a result of dam removals, a safer environment would be created for swimming. Consequently, the Recreation Subcommittee estimates that annual visitor days for swimming along the Mahoning River would increase to 1,000 for the restoration alternative of both sediment and dam removal.

FISHING (GENERAL) – WITH PROJECT VISITOR DAYS

A determination was made by the Recreation Subcommittee that the majority of fisherman fishing the Mahoning River along the project area would come from one of the five following

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counties: Columbiana County, Mahoning County, Portage County, Stark County, and Trumbull County. The Annual Residential Fishing Licenses (see Attachment 2) issued in these five counties in 2002 are listed in Table 9.

Table 9
2002 Annual Residential
Fishing Licenses

Annual Residential Fishing Licenses	Total
Columbiana County	6,600
Mahoning County	9,412
Portage County	11,684
Stark County	26,647
Trumbull County	17,393
Total	71,736

A 40% factor was utilized to estimate 28,7000 annual visitor days for general fishing along the Mahoning River Environmental Project area if the river were environmentally restored through dredging only.

A safer environment would be created for fishing in those areas where pools would be eliminated and water depths lowered as a result of dam removals. More importantly spawning opportunities for fish along the river would be improved by the removal of dams. As a result of the safer fishing environment and the improved spawning opportunities for fish, a 120% factor was utilized to estimate 86,100 annual visitor days for general fishing along the Mahoning River Environmental Project area if the river were environmentally restored through both sediment and dam removal.

HUNTING/TRAPPING – WITH PROJECT VISITOR DAYS

The only location to lawfully hunt and trap along the Mahoning River is in the Warren Wildlife Area which is a State Game Lands located just below the City of Warren going into the City of Niles. Information provided by Tom Henry of the Ohio Department of Natural Resources, Division of Wildlife indicated that hunting and trapping in this area would be minimal under the “without” project condition. The Recreation Subcommittee estimated that approximately 350 annual visitor days occur within the project area for the “without” project condition. The Recreation Subcommittee felt that it would be reasonable to expect hunting and trapping within the environmental project area to double if the Mahoning River were environmentally restored through dredging. Thus, the “with” project, estimated, annual visitor days for hunting and trapping is expected to be 700 days for sediment removal only. The Recreation Subcommittee felt that it would be reasonable to expect hunting and trapping within the environmental project area to quadruple if the Mahoning River were environmentally restored through dredging and dam removal. Thus, the “with” project, estimated, annual visitor days for hunting and trapping is expected to be 1,400 days for the sediment and dam removal alternative.

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MUSKELLUNGE FISHING (SPECIAL) – WITH PROJECT VISITOR DAYS

The Cleveland Chapter of Muskies, Inc. conducted a survey (see Attachment 3) at the Cleveland Chapter of Muskies banquet on 21 February 2004. Muskie fishermen from the following 3 clubs were represented: Cleveland, Akron/Canton, and Penn/Ohio. A total of 75 surveys were distributed with 57 surveys returned (76% return rate). A total of 31 (54%) of the 57 fishermen that returned surveys indicated that they had fished the Mahoning River in the past 4 years. Additionally the survey indicated that there would be a large increase in use of the Mahoning River for Muskie fishing if the river were environmentally restored. A total of 55 (96%) of the 57 fishermen that returned surveys indicated that they would fish the Mahoning River for Muskies if the river were environmentally restored. Based on the fact that more fishermen would be expected to fish the Mahoning River and that the expected number of fishing trips per year would also be expected to increase, the Recreation Subcommittee estimated that this would translate into approximately 3,600 annual visitor days for Muskie fishing within the project reach of the Mahoning River if the river were environmentally restored through dredging.

A safer environment would be created for Muskie fishing in those areas where pools would be eliminated and water depths lowered as a result of dam removals. More importantly spawning opportunities for Muskellunge along the river would be improved by the removal of dams. As a result of the safer fishing environment and the improved spawning opportunities, the Recreation Subcommittee estimated that approximately 7,200 annual visitor days for Muskie fishing within the project reach of the Mahoning River could reasonably be expected if the river were environmentally restored through both sediment and dam removal.

WITH PROJECT – VISITOR DAYS BY ACTIVITIES

Table 10 summarizes the estimated annual visitor days by activities along the Mahoning River Environmental Project area if the river were environmentally cleaned through dredging and if the river were environmentally restored through the combination of sediment and dam removal. In addition, Table 10 estimates annual visitor days by the three identified categories: General Recreation, General Fishing and Hunting, and Special Fishing and Hunting.

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Table 10
With Project
Visitor Days by Activities

Recreational Activities	With Project Visitor Days Sediment Removal Only	With Project Visitor Days Sediment & Dam Removal
Bicycling	30,000	30,000
Bird Watching	2,600	3,650
Boating (Motorized)	500	500
Camping	1,550	3,100
Canoeing/Kayaking	1,000	10,000
Educational Activities	23,100	23,100
Flora/Fauna Sightseeing	450	450
Hiking/Walking/Jogging	157,000	157,000
Picnicking	18,000	36,000
Swimming	500	1,000
General Recreation Total	234,700	264,800
Fishing (General)	28,700	86,100
Hunting/Trapping	700	1,400
General Fishing & Hunting Total	29,400	87,500
Muskie Fishing (Specialized)	3,600	7,200
Specialized Fishing & Hunting Total	3,600	7,200
Grand Total	267,700	359,500

CRITERIA EVALUATION OF RECREATION ACTIVITIES ALONG THE MAHONING RIVER

Each of the recreation activities identified along the project portion of the Mahoning River were evaluated and assigned a point value for the following five criteria: recreation experience, availability of opportunity, carrying capacity, accessibility, and environmental. All recreation activities, with the exception of muskie fishing, were evaluated and assigned a point value in accordance with EGM 03-04, Table 1 (see Attachment 4). Muskellunge fishing was evaluated and assigned a point value in accordance with EGM 03-04, Table 2 (see Attachment 5). The criteria evaluation was completed for each recreation activity for the “without” project condition, the “with” project condition of sediment removal only, and the “with” project condition of both sediment and dam removal. Members of the Recreation Subcommittee were asked to

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independently rate each recreation activity and assign a point value to each of the five criteria. The individual point values provided by the members of the Recreation Subcommittee were then averaged to determine a composite value. The total average composite value for each recreation activity for the “without” project condition, the “with” project condition of sediment removal only, and the “with” project condition of both sediment and dam removal can be found in Table 11. A breakdown of the total average composite value by evaluation criteria for each recreation activity is available in Attachment 6.

Table 11
Criteria Evaluation
By Recreation Activity

Recreational Activities	Without Project	With Project Sediment Removal	With Project Sediment & Dam Removal
General Recreation			
Bicycling	14.1	46.1	58.3
Bird Watching	9.2	44.1	55.6
Boating (Motorized)	6.0	33.4	51.0
Camping	3.6	32.9	42.4
Canoeing/Kayaking	12.1	36.9	58.6
Educational Activities	18.2	43.3	54.1
Flora/Fauna Sightseeing	12.7	39.5	49.8
Hiking/Walking/Jogging	13.8	44.3	51.9
Picnicking	16.1	41.0	54.3
Swimming	1.7	24.0	30.4
General Fishing & Hunting			
Fishing (General)	9.2	45.3	59.0
Hunting/Trapping	6.6	28.7	39.2
Specialized Fishing & Hunting			
Musky Fishing (Specialized)	7.3	50.0	66.9

CONVERSION OF POINT VALUES TO DOLLAR VALUES

In accordance with EGM 03-04, Table 12 converts the point values for each of the four potential recreation categories (General Recreation, General Fishing and Hunting, Special Recreation, and Special Fishing and Hunting) into dollar values.

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Table 12
Conversion of Points to Dollar Values

Point Values	General Recreation Values	General Fishing & Hunting Values	Special Recreation Values	Special Fishing & Hunting Values
0.0	\$2.94	\$4.23	\$11.95	\$20.58
10.0	\$3.49	\$4.78	\$12.68	\$21.13
20.0	\$3.86	\$5.15	\$13.60	\$21.50
30.0	\$4.41	\$5.70	\$14.70	\$22.05
40.0	\$5.51	\$6.25	\$15.62	\$22.60
50.0	\$6.25	\$6.80	\$17.64	\$24.81
60.0	\$6.80	\$7.53	\$19.48	\$27.02
70.0	\$7.17	\$7.90	\$23.52	\$28.67
80.0	\$7.90	\$8.45	\$27.38	\$30.87
90.0	\$8.45	\$8.64	\$31.24	\$33.08
100.0	\$8.82	\$8.82	\$34.92	\$34.92

Comparing the point values assigned for each recreation activity in Table 11 to the price conversion table (Table 12), the following dollar values in Table 13 are assigned to each recreation activity for the “without” project condition, the “with” project condition of sediment removal only, and the “with” project condition of both sediment and dam removal.

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Table 13
Dollar Value
By Recreation Activity

Recreational Activities	Without Project	With Project Sediment Removal	With Project Sediment & Dam Removal
General Recreation			
Bicycling	\$3.64	\$5.96	\$6.71
Bird Watching	\$3.45	\$5.81	\$6.56
Boating (Motorized)	\$3.27	\$4.78	\$6.31
Camping	\$3.14	\$4.73	\$5.69
Canoeing/Kayaking	\$3.57	\$5.17	\$6.72
Educational Activities	\$3.79	\$5.75	\$6.48
Flora/Fauna Sightseeing	\$3.59	\$5.46	\$6.24
Hiking/Walking/Jogging	\$3.63	\$5.83	\$6.35
Picnicking	\$3.72	\$5.58	\$6.49
Swimming	\$3.03	\$4.08	\$4.45
General Fishing & Hunting			
Fishing (General)	\$4.74	\$6.54	\$7.46
Hunting/Trapping	\$4.59	\$5.63	\$6.21
Specialized Fishing & Hunting			
Musky Fishing (Specialized)	\$20.98	\$24.81	\$28.16

ANNUAL RECREATION VALUE

The annual recreation value along the project portion of the Mahoning River for the “without” project condition, for the “with” project condition of sediment removal only, and the “with” project condition of both sediment and dam removal can be estimated by multiplying the corresponding estimated dollar value for each recreation activity in Table 13 times the equivalent estimated annual visitor days for each recreation activity (Table 5 for the “without” project condition, and Table 10 for the “with” project conditions). Table 14 summarizes the estimated annual recreation value by recreation activity along the Mahoning River Environmental Project area for the “without” project condition, for the “with” project” condition of restoring the river through environmental dredging only, and the “with” project condition of sediment and dam removal.

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Table 14
Annual Dollar Value
By Recreation Activity

Recreational Activities	Without Project	With Project Sediment Removal	With Project Sediment & Dam Removal
Bicycling	\$18,209	\$178,842	\$201,195
Bird Watching	\$1,792	\$15,115	\$23,937
Boating (Motorized)	\$164	\$2,392	\$3,153
Camping	\$0	\$7,330	\$17,632
Canoeing/Kayaking	\$446	\$5,169	\$67,230
Educational Activities	\$9,483	\$132,922	\$149,584
Flora/Fauna Sightseeing	\$538	\$2,455	\$2,806
Hiking/Walking/Jogging	\$127,071	\$915,027	\$997,656
Picnicking	\$22,294	\$100,512	\$233,514
Swimming	\$0	\$2,040	\$4,454
General Recreation Total	\$179,997	\$1,361,804	\$1,701,160
Fishing (General)	\$33,981	\$187,741	\$642,048
Hunting/Trapping	\$1,608	\$3,940	\$8,688
General Fishing & Hunting Total	\$35,588	\$191,681	\$650,736
Musky Fishing (Specialized)	\$12,589	\$89,316	\$202,741
Specialized Fishing & Hunting Total	\$12,589	\$89,316	\$202,741
Grand Total	\$228,000	\$1,643,000	\$2,555,000

Utilizing the Unit Day Value Method, the Recreation Subcommittee estimated that the annual value of recreation along the project portion of the Mahoning River for the “without” project condition is equal to approximately \$228,000. In contrast, the Recreation Subcommittee estimated that the annual value of recreation along the project reach would equal approximately \$1,643,000 if the Mahoning River were restored through dredging only. If the Mahoning River were environmentally restored through a combination of both sediment and dam removal, the Recreation Subcommittee estimates that the annual value of recreation along the project segment would be equivalent to approximately \$2,555,000.

The annual recreation dollar benefit can be estimated by subtracting the estimated annual recreation dollar value of the “without” project condition from the estimated annual recreation dollar value for the “with” project condition. Table 15 displays the average annual recreation benefit for the “with” project condition of sediment removal only, and the “with” project condition of both sediment and dam removal.

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Table 15
Average Annual Recreation Benefit

Alternatives	Recreation Value		
	With Project	Without Project	Average Annual Benefits
Sediment Removal Only	\$1,643,000	\$228,000	\$1,415,000
Both Sediment & Dam Removal	\$2,555,000	\$228,000	\$2,327,000