



Three Rivers Management Plan

executive summary



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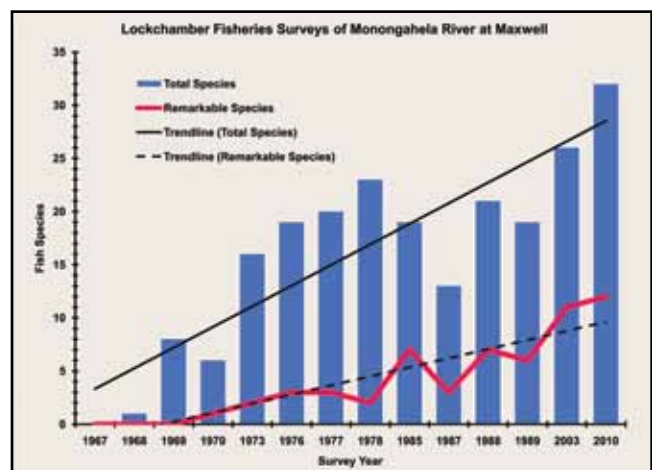
A Legacy of Change

Collectively known as the “Three Rivers,” the Allegheny River, Monongahela River and Ohio River of western Pennsylvania possess a national reputation in terms of history, location and an exceptional variety of river fish species. Formed by the confluence of the Allegheny River and Monongahela River in Pittsburgh, the Ohio River drains a 15,600 square-mile watershed in western Pennsylvania.

For more than one hundred years, the Three Rivers has supported great American industries including coal, iron, steel, oil, salt, glass and aluminum. Rivers have long served industry by providing easily accessible navigation for the shipment of natural resources and served as a convenient area of disposal for decades of municipal and industrial wastes. By the early 1900s, the Three Rivers were experiencing widespread habitat and water quality degradation. Through the 1960s, numerous fish kills were reported on the Allegheny; however, none were reported on the Monongahela. The Monongahela’s fisheries were nearly non-existent at that time, making a fish kill difficult to detect.

Concerted state and federal efforts in the 1970s eventually led to tremendous improvement in river water quality. Improved river water quality culminated in recoveries of fisheries, expressed as range expansions of native species, increases in fish population abundances and a revival of angling opportunities within historically impacted river reaches. Documentation of

the recovering fisheries can be found in an examination of navigation lockchamber fish survey findings. Initiated by the Ohio River Valley Water Sanitation Commission (ORSANCO) in 1957, 94 lockchamber surveys have been conducted on the Three Rivers. The most impressive recoveries have occurred at Monongahela River’s Maxwell Lockchamber (*Figure 1*).



(Figure 1) Lockchamber fisheries survey results at Monongahela River’s Maxwell Lockchamber depicting positive improvement trends (solid and dashed black lines) for total species richness (blue columns) and remarkable species richness (red line). Remarkable species include species classified by ORSANCO as pollution intolerant species (e.g., smallmouth redhorse), previously (e.g., silver chub) and currently (e.g., ghost shiner) protected under 58 Pennsylvania Code Chapter 75 and sport fish species maintained by natural reproduction (e.g., sauger).

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Three Rivers Management Plan

executive summary

River	Total # Fish Species	# Fish Hybrids	# Native Fish Species (% of total)	# Protected Fish Species*
Allegheny	99	3	93 (94%)	15 (7E, 4T & 4C)
Ohio	88	3	80 (91%)	8 (4E & 4T)
Monongahela	76	3	68 (89%)	5 (3E, 1T & 1C)

*58 Pennsylvania Code Chapter 75 listings (E=Endangered, T=Threatened and C=Candidate).

(Table 1) Summary of fish species collected from the Three Rivers of western Pennsylvania during the past 30 years.

Recognizing Fisheries Resources

The Pennsylvania Fish & Boat Commission (PFBC) recognizes the coolwater and warmwater fisheries resources of the Three Rivers as diverse and characteristic of a recovering, large river ecosystem. In terms of diversity of native fish species, the Three Rivers are the richest in Pennsylvania. Several of its nongame species are protected, emphasizing the importance for conservation (*Table 1*).

As an indicator of river recovery, several protected fish species have recently been removed from protected lists. Species removed by PFBC include silver chub (previously endangered in Pennsylvania); smallmouth buffalo, longhead darter, channel darter, mooneye and skipjack herring (previously threatened in Pennsylvania); and longnose gar, river redhorse (*Figure 2*) and brook silverside (previously a candidate in Pennsylvania).

Sport fisheries resources of the Three Rivers have become valuable. Pittsburgh and the Three Rivers hosted two major bass tournaments: the 2005 Bassmaster Classic, which generated \$29 million in revenue for the city of Pittsburgh, and the 2009 Forrest L. Wood Cup, which provided \$37 million. The most sought-after sport fish species of the Three Rivers are walleye (*Figure 3*), smallmouth bass (*Figure 4*) and sauger (*Figure 5*). The PFBC's nighttime boat electrofishing surveys reveal that both the upper free-flowing and lower impounded Allegheny River sustain a more productive walleye fishery (*Figure 6*). The free-flowing Allegheny River and Monongahela River sustain more productive smallmouth bass fisheries (*Figure 7*). The Monongahela River maintains the best sauger fishery in Pennsylvania (*Figure 8*). Other popular sport fish species of the Three Rivers include muskellunge, tiger muskellunge, white bass (*Figure 9*), hybrid striped bass, channel catfish and flathead catfish (*Figure 10*).



(Figure 2) Pollution-intolerant river redhorse collected by PFBC biologists from the Allegheny River during a daytime boat electrofishing survey.



(Figure 3) Legal-size walleye collected by PFBC biologists from the Allegheny River during a nighttime boat electrofishing survey.



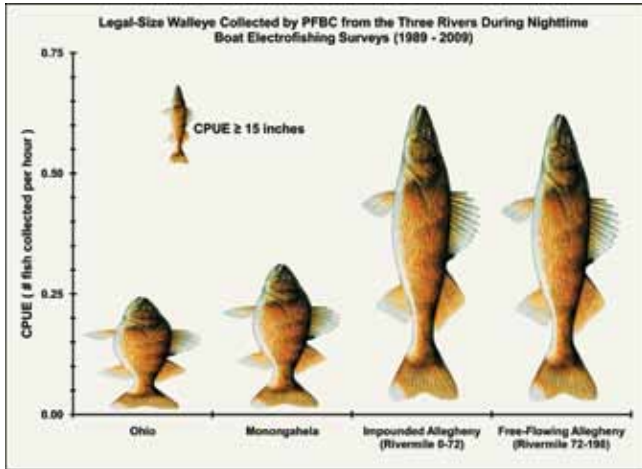
(Figure 4) Legal-size smallmouth bass collected by PFBC biologists from the Ohio River during a nighttime boat electrofishing survey.



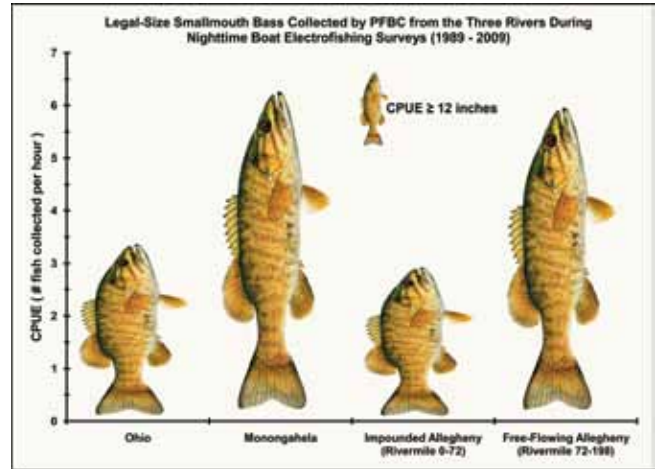
(Figure 5) Legal-size sauger collected by PFBC biologists from the Monongahela River during a nighttime boat electrofishing survey.

Three Rivers Management Plan

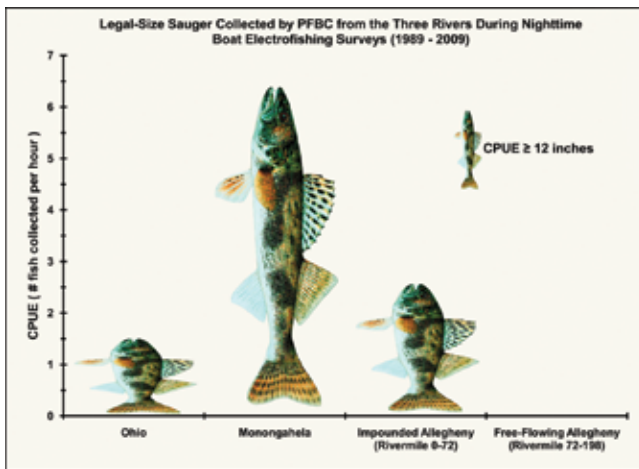
executive summary



(Figure 6) Catch-per-unit-effort (CPUE) of legal-size walleye among the Three Rivers.



(Figure 7) CPUE of legal-size smallmouth bass among the Three Rivers.



(Figure 8) CPUE of legal-size sauger among the Three Rivers.



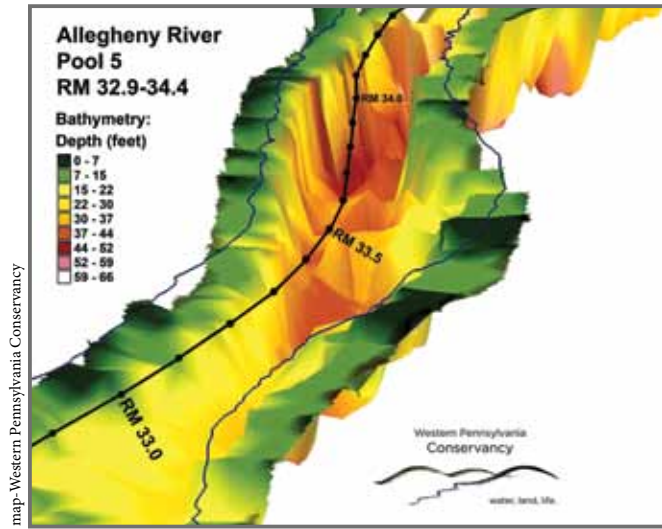
(Figure 9) White bass collected by PFBC biologists from the Monongahela River during a lockchamber survey.



(Figure 10) Flathead catfish collected by PFBC biologists from the Monongahela River during a gill net survey.

Three Rivers Management Plan

executive summary



(Figure 11) Allegheny River Pool 5 bathymetric profile depicting an extensively dredged reach characterized by sheer vertical walls and exceptional depth.

Historic impacts and threats continue to hamper the Three Rivers. The lock and dam system that facilitates commercial river navigation impedes upstream movement for fish species considered to be migratory. Commercial sand and gravel dredging in the Allegheny River and Ohio River has eliminated instream habitats and further deepened the channels of these two systems (Figure 11). Upstream range expansions of Asian carp within the Ohio River is the most likely pathway for invasions of this aquatic invasive species into Pennsylvania. The modified flows and elimination of instream and riparian habitats continues to impact the functioning of the Three Rivers as large river ecosystems.

Comprehensive Fish Management

To better manage its river species, PFBC fisheries biologists developed the Three Rivers Management Plan to function as a comprehensive management approach for the fisheries resources of the Three Rivers.

During development of the plan, existing information on the Three Rivers fisheries resources, including scientific data, conservation efforts and current and past fisheries management strategies, were compiled and evaluated. Data gaps were then identified and collaborative research opportunities were formulated. The plan was prepared with the purpose of proposing and prioritizing management actions designed

to address ongoing and identified needs and achieve realistic goals for stewardship of fisheries resources of the Three Rivers.

The management plan is also designed to serve as a tool for stakeholders of the Three Rivers to become more knowledgeable about issues affecting fisheries resources and to serve as a mechanism to stimulate involvement in stewardship. Stakeholders include government agencies, academic institutions, conservation groups, anglers and concerned citizens.

The plan's proposed management actions deal with several issues affecting Three Rivers' fisheries including fish passage, water quality, fish health, commercial dredging, degraded habitats and aquatic invasive species. The proposed management actions also promote stewardship of Three Rivers' resources including existing habitats, nongame fisheries and sport fisheries. Several management actions proposed involve collaborative research initiatives with fisheries scientists from academic institutions (Figure 12) and other state and federal agencies (Figure 13).



(Figure 12) Benthic trawling survey of the Monongahela River in downtown Pittsburgh with scientists from California University of Pennsylvania.

(Figure 13) PFBC and PA DEP biologists collecting fish during a lockchamber survey of the Monongahela River at Braddock.



Three Rivers Management Plan

executive summary

PRIORITY 1

Ongoing activities or recommendations to be implemented within one year of the management plan.

- Assist the U.S. Army Corps of Engineers (USACE), Pittsburgh District with conducting an ecological risk assessment that evaluates the likelihood of Asian carp invading the upper Ohio River and assess potential ecological impacts of such an invasion.
- Request that USACE conduct annual assisted fish passage lockages throughout the spring spawning season at Allegheny River Locks and Dams 5 through 9 and finalize a Memorandum of Agreement for these lockages, depending upon the results of the Asian Carp risk assessment.
- Provide recommendations concerning the upper Ohio River for PFBC's *Draft Aquatic Invasive Species Action Plan-Asian Carp Complex*.
- Serve on the Upper Ohio Interagency Working Group and provide recommendations to the USACE with input on fish passage structures and habitat enhancement mitigation projects, which were proposed at the Emsworth, Dashields and Montgomery Locks and Dams on the upper Ohio River.
- Assist scientists from the U.S. Geological Survey Leetown Science Center during research investigations of fish health and levels of intersex within the Three Rivers.
- Assist biologists from the Pennsylvania Department of Environmental Protection (PA DEP) Southwest Regional Office with fish collection activities on the Three Rivers for Pennsylvania's Fish Consumption Advisory Program.
- Evaluate the biological integrity of the Three Rivers using fish assemblage structure as the barometer with protocols developed by ORSANCO (i.e., Modified Ohio River Fish Index) or other methods developed by PFBC.
- Expand the Monongahela River Monitoring Study in conjunction with research partners and expand routine monitoring of the Allegheny River and Ohio River as feasible.
- Conduct targeted surveys of young-of-the-year (YOY) and adult smallmouth bass, walleye and sauger, and collect abundance, age and growth data at historic fixed sites on the Allegheny River and Ohio River.
- Establish new fixed sites for YOY and adult smallmouth bass, walleye and sauger, and collect abundance, age and growth data on the Monongahela River Section 03 (Charleroi Pool), Ohio River Sections 03 (Montgomery Pool) and 04 (New Cumberland Pool).
- Employ procedures developed and used by the Ohio River Fisheries Management Team (ORFMT) and assist biologists from the Ohio Department of Natural Resources, Division of Wildlife, with September surveys for smallmouth bass and November surveys for walleye and sauger at tailwaters of Montgomery and Dashields Locks and Dams on the Ohio River.
- Conduct targeted surveys of channel catfish and flathead catfish using baited, tandem hoop nets (*Figure 14*) on the Three Rivers.
- Post Three Rivers sport fisheries information annually on the PFBC's website at **www.fishandboat.com**.



(Figure 14) PFBC biologists retrieving baited, tandem hoop nets from the Allegheny River.

Three Rivers Management Plan

executive summary

- Continue statewide regulations for Commonwealth inland waters for the Three Rivers as well as special regulations for trout on Allegheny River Section 07 (confluence of Conewango Creek upstream to Kinzua Dam). Adjust these regulations for individual fisheries when needed.
- Resurrect the annual beach seine surveys of Ohio River Section 03 (Montgomery Pool), initially conducted from 1991-2001.
- Evaluate the success of Pennsylvania's Paddlefish Restoration Program. This investigation should determine paddlefish movement and improve methods to distinguish hatchery-reared fish from fish produced from natural reproduction.
- Work with participating states of the ORFMT to update and produce a web-based Ohio River Fishing Guide.

PRIORITY 2

Recommendations to be implemented within three years of the management plan.

- Reevaluate the impacts of commercial dredging on fisheries and ecological functioning at historic dredge sites of the upper Allegheny River (Franklin, Oil City, Tionesta and Warren) and lower Allegheny River (Pools 3 through 9).
- Conduct biological and bathymetric surveys of Montgomery Slough on the Ohio River and manmade embayments on the Allegheny River to characterize assemblages and determine ecological use and productivity.
- Evaluate samples collected for molecular analysis including fish tissue as well as environmental DNA (eDNA) extracted from river water samples for selected fish species of management (e.g., Asian carp) or conservation (e.g., paddlefish) importance.
- Determine the extent and degree of natural reproduction and recruitment of muskellunge on the upper Allegheny River.
- Prepare and submit articles annually on fisheries resources of the Three Rivers for *Pennsylvania Angler & Boater* magazine, summaries of fisheries surveys and research activities conducted.
- Assist with the development of new access areas on the Three Rivers in accordance with the *2010 Pennsylvania Fishing and Boating Access Strategy*.

PRIORITY 3

Recommendations to be implemented within five years of the management plan.

- Direct a comprehensive Recreational Use Survey of the Three Rivers, which includes angler use, angler opinion, fish harvest, recreational boating and economic benefits study components. This study should be similar in design and scope to investigations conducted on the Susquehanna River and Juniata River in 2008.
- Determine fish passage through lock structures of the Three Rivers.
- Investigate the potential of redesignation of the free-flowing upper Allegheny River (river mile 72 at East Brady upstream to river mile 198 at Kinzua Dam) from Warm Water Fishes (WWF) to High Quality–Warm Water Fishes (HQ-WWF).
- Determine use of bulkhead structures and bridge piers as artificial fish habitats within the Three Rivers.

Three Rivers Management Plan

executive summary

- Petition the Pennsylvania Natural Heritage Program to classify additional areas as Biologically Diverse Areas for county inventories, if and when data are supportive.
- Promote research for an assessment of the status of hellbenders and mudpuppies in the Three Rivers in collaboration with partners.
- Evaluate the put-grow-take trout fingerling program in terms of abundance and survival, as well as angler use of Allegheny River Section 07 (confluence of Conewango Creek upstream to Kinzua Dam).
- Prepare stock assessment reports that evaluate status of sport fish populations (primarily walleye, sauger and smallmouth bass) of the Three Rivers including analysis of size structure, age structure, estimated total annual mortality, stocking programs and fishing regulations.
- Develop and expand a habitat restoration approach that focuses on river reaches impacted by past industrial disturbances. This approach must incorporate new and enhancing existing access areas on the Three Rivers including boat launches and shoreline facilities.
- Provide data, expertise and other support as appropriate to community development projects that involve the Three Rivers including water trails, riverfront parks, and pedestrian and bicycle trails along the rivers.



Allegheny River at Sharpsburg



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PFBC Mission:

The mission of the Pennsylvania Fish & Boat Commission is to protect, conserve and enhance the Commonwealth's aquatic resources and provide fishing and boating opportunities.

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