

The River as an Employer

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❖ Commercial Fisheries as Employers

The Delaware River watershed supports diverse interests and purposes. A clean and healthy Delaware River creates and supports. To support the diversity and quality of jobs the Delaware needs to be clean, healthy and free-flowing.

"In 1991, over 9 billion pounds of fish and shellfish with a value of over \$3 billion were harvested by commercial fishermen in the United States."²⁵⁶ This commercial catch includes freshwater species as well as ocean catches, but it is estimated that nearly three-quarters of all commercially harvested fish and shellfish depend directly on coastal estuaries and river basins for spawning grounds or nurseries. The Delaware River and Bay provide temporary home and spawning ground for species that are later harvested for use all over the eastern U.S. In the late 19th century, the Delaware River had the largest annual commercial fish catch of any river on the Atlantic coast. But over-fishing and/or pollution has often threatened the fish of the Delaware River including Shortnose Sturgeon, Atlantic Sturgeon, River Herring (including Blueback and Alewife), Striped Bass, and American Shad.²⁵⁷

Early European settlers wrote letters home telling their families and friends about the bounties of fish within the Delaware River and tributaries, at sizes often much larger than typically found in Europe.²⁵⁸ Tales of almost effortless fishing and brush netting fish into crates became well known in the Delaware River Valley.²⁵⁹

By the mid-20th century, a combination of an increasing human population, loss of natural forest wetlands, and inadequate sewage and industrial waste treatment created an ecological barrier, a 20-mile oxygen dead zone that impeded the ability of fish to migrate upriver to spawn in the Philadelphia/Camden portion of the River.²⁶⁰ Improved technologies and laws that required their use, including the Federal Clean Water Act of 1972, forced the cleanup of a variety of pollution sources to the River. As a result, the nutrient pollution which was the primary cause of the River's oxygen problem was largely abated, allowing fish to once again migrate upstream from the ocean and lower stretches of the estuary.



SHAD ARE MAKING THEIR WAY BACK UP THE DELAWARE AND ITS TRIBUTARIES AGAIN BECAUSE CLEAN WATER IS ALLOWING THEM TO RETURN TO THEIR SPAWNING GROUNDS AFTER A LIFE IN THE ATLANTIC OCEAN. PHOTO CREDIT: ART EASTON 2008



SHAD FISHING: LUMBERVILLE, PA
PHOTO CREDIT: ART EASTON 2008

Today, a viable commercial fishery is still maintained along the Delaware River and Bay. In 1998, statewide, New Jersey's commercial fisheries harvested 196 million pounds at a value of \$90.9 million statewide; New York harvested 57.5 million pounds at a value of \$84.3 million; and Delaware harvested 7.8 million pounds at a value of \$5.6 million.²⁶¹ According to New Jersey's Department of Fish and Wildlife, efforts to clean up rivers and reservoirs have created the best trout fishery New Jersey has ever had.²⁶² Striped Bass has been declared recovered in the Delaware River by the Atlantic States Marine Fisheries

Commission compared to historic levels.²⁶³ American Shad have also recovered enough to support commercial fishing in the Delaware River, although not enough to supply the current demand.²⁶⁴ Other species commercially caught from the Bay and tributary waters include Alewife, Atlantic Croaker, Blueback Herring, Carp, Spot, Striped Bass, White Perch and Blue Crab.²⁶⁵

Lewis Shad Commercial Fishery

The Lewis Shad commercial fishery has survived in the Delaware River for over 108 years. A family run business located above the head of tide in Lambertville, NJ, the Lewis Shad fishery is the oldest commercial shad fishery on the Delaware River.²⁶⁶ Although its annual shad catches no longer support commercial demand in the Philadelphia and New York markets, this family fishery remains in operation, still using the same fishing methods and practices it used when it first began.²⁶⁷ The Shad catch is very low, but the family continues their traditions to keep Shad fishermen trained and ready for when the Shad return in greater numbers.²⁶⁸ The traditional practices used by the Lewis Shad fishery are demonstrated every year at the Lambertville Shad Fest and are a big draw for those in attendance. Each year Shad make the journey up river from the ocean with the fishery improving as water quality and obstacles to migration improve in the Delaware River.²⁶⁹

Lewis' approach to the shad market demonstrates a strong conservation ethic. "We don't try to catch enough even to sell to the markets of Philadelphia and New York," said Lewis. "We try not to catch more than we can sell right here. For the price you get in the markets, the fish are more valuable going up the river. A shad roe that you might get 50 cents a pound for in the market, might spawn 150,000 eggs; big difference in value there."²⁷⁰

Shellfisheries

Shellfish are also part of the economy sustained by the Delaware River. In 1880, the Delaware Bay brought in a harvest of 2.4 million bushels of oysters. In the 1930's, more than 1 million bushels were harvested. Numbers decreased as natural surfaces in the Bay were reduced, limiting the places where oysters can attach and grow. In the late 1950's, MSX (Multinucleated Sphere unknown affinity X), a deadly shellfish disease, depleted 90-95% of the oyster population in the Bay.²⁷¹ After minimal recovery and decades of building resistance to the disease, Dermo (Perkinsus marinus), a second shellfish parasitic disease, again decimated the oyster population in 1980.²⁷²

While Dermo continues to plague the adult oyster population, the Delaware Bay Oyster Restoration Task Force (a total of 12 public and private agencies from NJ and DE including representatives from Rutgers University, the New Jersey Department of Environmental Protection, the Delaware Department of Natural Resources and Environmental Control, the Delaware River Basin Commission, and the Delaware River Bay Authority) have invested heavily in efforts to restore the Bay's oyster populations and the oyster industry. As much as \$5 million of federal funds have been invested to restore the oyster beds of the Delaware Bay.²⁷³ In 2004, \$1.55 million worth of oysters were landed on the New Jersey side of the

Bay.²⁷⁴ In 2006 it was reported that oyster harvesting generated \$535,000 of income for harvesters, and a total \$3 million of economic benefit locally.²⁷⁵ Numbers of oysters and successful shell placement and economic benefits continue to markedly increase. The estimated overall economic impact to the industry for 2007 is estimated at \$90 million.²⁷⁶



OYSTER LARVAE REQUIRE A CLEAN, HARD SURFACE UPON WHICH THEY CAN ATTACH OR "RECRUIT." DUE TO A STORAGE OF THESE NATURAL RESOURCES, THE DELAWARE BAY OYSTER RESTORATION TASK FORCE HAS "PLANTED" SURF CLAM, OCEAN QUAHOG, AND MARYLAND OYSTER SHELL IN AN EFFORT TO REVITALIZE THE DELAWARE BAY OYSTER POLLUTION. PHOTO CREDIT: BAYSHORE DISCOVERY PROJECT.

Case Study: Backwoods Angler Fishing Guides

Blaine Mengel Jr. and Associate Guide Chris Gorsuch know the Delaware River up and down. Both are Delaware River fishing guides for a company called The Backwoods Angler, a fishing guide service owned and operated by Blaine. In operation since 2000, this guide service is based on a healthy catch & release smallmouth bass fishery. Their range spans from Belvidere, NJ north and south.

People come from Pennsylvania, New Jersey, New York, and all over the U.S. to experience the Delaware River. "People are amazed to find such a clean and scenic valuable resource within such a close distance to a metropolis like NYC" said Chris Gorsuch, Associate Guide. The Backwater Angler offers both kayaking trips and jet boat trips from 4-8 hours long for groups of 1-2 people. "We regularly see a variety of turtles, beaver, deer, eagles, osprey, great blue heron and other water fowl; we have even had a number of black bear sightings in the past few years along the banks of the Delaware," Gorsuch reports.

As Gorsuch explains, "Our business is truly sustained by the River and its ecosystem. It is a delicate balance, the aquatic plants, insects and invertebrates all thrive in clean water. These insects and other minnows such as darters, provide the forage that sustains a healthy smallmouth bass population. Without a healthy fish population, there are no eagles, no osprey, no blue heron, and without a quality fishery there are no fishing guides. We have to be able to take people to where the fish are, and understand what parts of the river offer the best fishing opportunities depending on the time of year and the water flow. A healthy Delaware is vital to our being able to do this. Without clean water, we don't have jobs".

There are only a handful of fishing guides along the Delaware; most are trout guides in the West Branch Delaware River. Backwoods Angler operates 7 days a week 12 months out of the year, and successfully gets about 500-600 people out on the River annually. To learn more about the Backwoods Angler Fishing Guide Service, visit their website at www.backwoodsangler.com



Dylan Hechendorf and his father Darin booked the Backwoods Angler guide service in early August. This was Dylan's first Delaware River Smallmouth. His dad says; "Dylan's hooked for life!"

Additional Commercial Businesses

Many businesses throughout the watershed are supported by the River, but aren't directly along its banks. The Crab Connection in Little Creek, Delaware sells fresh seasonal seafood as well as bait for Delaware Bay fishermen.²⁷⁷ In Easton, Pennsylvania Laini Abraham has created a Pocket Guide to tourism in the area and along the River, and runs a tourist shop in the downtown district providing information to recreationists and visitors to the River and City of Easton from throughout the region.²⁷⁸



BOWERS BEACH, DE RUSSELL'S CHARTER FISHING BOAT MISS SHYANNE TAKES A GROUP OUT ON A FISHING TOUR ON THE DELAWARE.

Charter boats and charter fishing companies thrive in all seasons along the Delaware Bay. Russell's Charter Fishing, Inc. in Bowers Beach, Delaware takes tourists and locals out into the Bay to fish for whatever is in season. Captain Sonny Sullivan owns a bait and tackle shop in Bowers Beach supplying the necessities to Charter fishing boats while also using his own boat to catch bait for sale at his shop.



BOWERS BEACH, DE CAPTAIN SONNY SULLIVAN CUTTING BAIT FOR SONNY'S BAIT AND TACKLE SHOP THAT CATERES TO RECREATIONAL AND COMMERCIAL FISHERIES.

The Philadelphia seafood market, located in the Italian Market at 9th and Washington, is "the oldest and largest working

outdoor market in the United States". The outdoor market supplies seasonal fresh fish and shellfish from the Delaware River and Bay, as well as from other waterways around the

world.²⁷⁹ Similarly the Reading Terminal Market in downtown Philadelphia brings thousands out each weekend to buy locally grown produce, fresh meats, and fish from the Delaware River.²⁸⁰

The Delaware's commercial fishery doesn't just provide jobs, it supports a way of life. It is a historic and present day culture that is unique unto itself and worthy of respect and protection, not only for the dollars it generates, but for the culture it brings.

❖ Agriculture and the River

Agriculture has a long history in the Delaware River Valley. Pennsylvania is known for its dairy; New Jersey for its peaches, tomatoes, cranberries and blueberries; New York homesteads for their maple syrup, sheep, eggs, and dairy cows; and Delaware State for its poultry.

Farming Culture

There are thousands of farms throughout the basin providing local restaurants and farm markets with an abundance of local produce, vegetables, grass-fed meat, eggs, dairy products, and more. In New Jersey, "Jersey Fresh" has become emblematic of family farming and marketing throughout the state. Water provided by the Delaware River system and the



BEDMINSTER, BUCKS COUNTY, PA PRESERVED FARMSTEAD, ONE OF 917 FARMS IN BUCKS COUNTY PRESERVED TO ENSURE THE RURAL HERITAGE AND FARMING TRADITIONS OF THE REGION.

unique river valley soils throughout the basin have supported the farming tradition in each of the basin states producing a wide variety of foods, goods, and jobs.

In 2006, the Bucks County Open Space Task Force celebrated preserving its 100th farm. Today, Bucks County, Pennsylvania, has over 917 farms containing more than 76,000 acres and generating over \$60 million in agricultural products.²⁸¹ Preserving farmland provides a sense of identity for the county. Historic barns and outbuildings, grazing livestock, and open fields continue to define the character of the county while, when managed appropriately, helps to maintain meadowlands, streambeds, and forests for natural habitat.²⁸²

Monmouth County, New Jersey recently preserved its 10,000th acre of farmland, and is the seventh county in the state to do so. The Gerald Rottkamp Farm in Cumberland County, New Jersey produces sweet corn, tomatoes, peppers, melons, and blueberries, and uses 2,200 gallons of water per day from the Delaware River. Likewise, other farms throughout the state and the basin rely on the Delaware River its tributaries and agriculture to provide irrigation and to sustain farming traditions.²⁸³



NEW JERSEY FARM MARKET RT 48 SALEM COUNTY. "JERSEY FRESH" HAS BECOME EMBLEMATIC OF NEW JERSEY AGRICULTURE THROUGHOUT THE STATE.

Buying Local

Agriculture close to or within urban areas is also uniquely valuable and important. It creates green spaces for trees and water filtration, while providing a local food supply to urban residents. Local farms provide educational opportunities for children and decrease the amount of transportation needed to supply homes, local groceries, restaurants, stores and markets with fresh produce.

In agriculture, contamination of water sources could lead to sickness and infection of both humans who consume the food and to livestock that use the water for drinking. Pre-treating irrigation water is a costly endeavor.

Current methods of irrigation take in water from the River and apply it directly onto agricultural fields. Many agricultural fields use ground water wells for irrigation rather than direct surface water intakes, but contamination can still happen. The importance of clean water in irrigation was proven in the fall of 2006 when over one hundred people became sick after consuming spinach that was irrigated with contaminated water in California. The irrigation sources were infected from fertilizer runoff and animal waste.²⁸⁴



JERSEY FRESH RED POTATOES SOLD IN SALEM COUNTY FOR \$2.50 A BOX

For a great guide to New Jersey food see Edible Jersey, a quarterly magazine that celebrates "local foods from the Garden State, Season by Season." (www.ediblejersey.com)

Livestock and Factory Farming

Agriculture is a significant part of the Delaware River watershed economy and culture. While watershed farmers need to do their part to protect the streams and rivers of the watershed; the watershed community needs to do its part to support local farmers with clean water and community support.

Many livestock and farm animals drink from the water provided by the Delaware River and its tributaries. Clean water is needed in order for them to stay healthy and sanitary. "High levels of sulfates in drinking water can contribute to decreased egg production in chickens."²⁸⁵ "Many species of animals are susceptible to nitrate poisoning, especially cattle", which has been associated with miscarriage and other reproductive problems, anorexia, lower blood pressure, and reduced lactation for dairy cattle."²⁸⁶



CONFINED ANIMAL FACTORY FARM BEING INUNDATED WITH FLOOD WATERS. THE FARM'S LAGOONS CONTAIN MANURE AND CONTAMINANTS THAT, WHEN FLOODED OR OVERTOPPED, POLLUTE THE NEARBY WATERWAY.

And agriculture must take due care to ensure that it does not itself become a source of pollution to waterways in the watershed. Animal agriculture produces byproducts like manure and chemical waste that should be properly treated, recycled as fertilizer or compost and kept away from waterways. Rain washes livestock waste containing bacteria and pathogens into water sources. Excessive nutrients from animal byproducts destroy river habitats by creating excessive algal blooms resulting in reduced oxygen levels that suffocate fish and impact wildlife. Livestock should always be kept away from streams and rivers.



WITHOUT FENCING, EVEN SMALL ANIMAL OPERATIONS CAN DEGRADE STREAM QUALITY.

Every effort should be made to avoid the operation of confined animal feeding operations (CAFO's) or factory farms in our watershed and communities. Factory farms introduce a variety of chemicals, pharmaceuticals, growth hormones, antibiotics, bacteria and contaminants onto the land and into the nearest waterway.²⁸⁷ Factory farms create water, noise and odor pollution, and they inflict morally reprehensible abuse on the animals they house. Preventing the construction and operation of factory farms is one important strategy for protecting drinking water supplies, the environment and communities.

❖ Where our Drinking Water Comes From

A clean and healthy Delaware River, including the River's corridor, provide for our basic human needs: water, food, safety and health. About 5 percent of the U.S. population or 15 million people rely on the Delaware River for their drinking water supply. Major cities and small communities alike drink from the River.



NEVERSINK RIVER, NY THE NORTHERN REACHES OF THE DELAWARE RIVER WATERSHED HELP TO SUPPLY MILLIONS OF NEW YORKERS. PHOTO CREDIT: DAN L. PERLMAN/ECOLIBRARY.ORG

The Philadelphia Water Department has three drinking water treatment plants that draw water from the Delaware and Schuylkill Rivers. The Baxter plant, which draws an average of 200 million gallons a day from the mainstream Delaware, provides drinking water to 60% of Philadelphia's population, as well as serving a portion of lower Bucks County. The Belmont and Queen Lane treatment plants together draw an average of 110 million gallons per day (40 MGD and 70 MGD respectively) from the Schuylkill River to support the other 40% of Philadelphia's drinking water needs.²⁸⁸ Not all of the 15 million people drinking Delaware River water live in the watershed, in fact a large portion live in other River basins. Residents of central New Jersey reside in the Raritan River Basin, and New York City residents are in the Hudson River Basin – yet both drink water supplied by the Delaware River.

Clean Drinking Water

Clean Delaware River water, free from toxins, bacteria, pathogens, mercury, PCB's, and various other known and unknown chemicals is critical for supporting a healthy drinking water supply for residents throughout the watershed as well as business and commercial uses. The health impacts of water contamination for both humans and wildlife range from acute illness, to diseases such as cancer and metabolic disorders. Waterborne diseases are a major problem in surface water. Gastroenteritis, acute respiratory symptoms, and dermatitis are among the acute illnesses that can result from contaminated drinking water.²⁸⁹ Both ground and surface water can become polluted with pesticides, petrochemicals, bacteria, nutrients, synthetic organics, acidification, heavy metals, chemicals (manmade and naturally occurring), and waste products. Toxins and contaminants have serious health consequences when consumed. Accidental pollution releases, legally permitted pollution discharges, illegal discharges, as well as pollution washed from the land during rain events are all potential sources of contamination of our drinking water supply.

In 2008, The Associated Press reported that 56 pharmaceuticals or byproducts have been found in Philadelphia's drinking water supply.²⁹⁰ According to authorities this issue may not be a major issue now, but over time and without fully understanding where the byproducts are originating, it could be a substantial threat.²⁹¹

Cleaning Dirty Water: Water Treatment

The cost of water treatment is high. Maintaining our drinking water supplies to the highest specifications of water safety and cleanliness not only provides health and quality of life benefits but it also ensures a more cost effective source of drinking water. In New York, residents have long enjoyed the untreated, high quality waters from the upper Delaware River system. In 1996, New York City faced the choice of building a water filtration plant to filter its water supply, or of protecting the watershed that drains to the City's drinking water reservoirs in order to maintain its high quality drinking water. Economically, the decision was an easy one. The cost of building and operating a water filtration plant would cost the City \$6 to \$8 billion at that time.²⁹² Rather than invest in a water filtration facility, New York City, with the support of the U.S. Environmental Protection Agency (EPA), entered into its Watershed Memorandum of



NEW YORK CITY DECIDED TO PRESERVE RIPARIAN LAND IN THE UPPER DELAWARE TO MAINTAIN CLEAN WATER VS. BUILDING A MULT- BILLION WATER FILTRATION PLANT. PHOTO CREDIT: JON NAIL

Agreement in 2007. The Watershed Plan that was created invested in protecting riparian buffer zones and watershed lands around their City's reservoirs in order to help protect their water source from non-point source pollution, including nutrients and pesticides resulting from stormwater runoff, septic tanks and agriculture.²⁹³ The City invested in repairing and installing community sewage treatment plants throughout the counties that drain to their reservoirs. Protecting the watershed was estimated to only cost the City around \$1 to \$1.5 billion dollars with \$250 million invested in acquiring land and setting aside special protection areas.²⁹⁴ This land purchase has been complemented by regulatory protections (New York City's Rules and Regulations for the Protection from Contamination, Degradation, and Pollution of the NYC Water Supply and its sources Chapter 18 and landowner incentives for land protection.²⁹⁵

The watershed program choice has not only provided New York City with some of the cleanest and best tasting water nationwide, but it has provided tremendous benefits to the Delaware River as a whole, reducing the level of pollution that is dumped into the system from deforestation and development.

Today it is estimated that building a water filtration plant could total as much as \$10-20 Billion; New York City residents' annual water bills would increase by at least 11.5%. This would make the average water bill \$699, annually.²⁹⁶ Protecting the watershed is still the most cost effective and attractive solution for the City.

***“...clean water is the fuel
that powers the nation’s
economic engine.”***



Researchers in other communities recognize the benefits of watershed protection from a community water supply and pollution prevention perspective, finding that every \$1 invested in watershed protection could save between \$7.50 and \$200 in costs for new filtration and water treatment facilities.²⁹⁷ “In 1991, the cost of treating contaminated water was estimated to be \$10-\$15 per month for a family of three.”²⁹⁸ Communities in Washington D.C. spend as much as \$3 to \$5 per pound to remove nitrogen from wastewater, a process that forested buffers provide naturally.²⁹⁹



NEW YORK CITY'S WATER SUPPLY SYSTEM



The map above shows some of the water storage reservoirs along the Delaware. These reservoirs hold the public supply of water used for drinking, cleaning, lawn care, and for industries such as food production and automobile manufacturing. Several communities manage their own water supply through reservoir operations including Wilmington and Newark in Delaware, Bethlehem, Pennsylvania, and the largest water user from our basin, New York City, which exports water from the headwaters of the Delaware River. Other communities in addition to Philadelphia take in water directly from the River including: Morrisville, Trenton, Burlington, and Bristol.

❖ Industry on the River

Although industry has changed along the Delaware River over the years, the River has always been a fundamental resource for the economy that spurred the growth of Philadelphia, Camden, Wilmington, Trenton, and even New York City. Industries throughout the watershed continue to bring young talented professionals and families into the region, but the River is what keeps that industry viable and its employees' quality of life high.

Industrial Beginnings

Starting in the 1760's, timber rafting was a way of transporting thousands that harvested trees from the Upper Delaware forests of New York, Pennsylvania, and New Jersey into Philadelphia and Camden. Timber from the valley fueled shipbuilding, one of the first major Delaware River industries.³⁰⁰ Other historical Delaware River industries include lumber and paper mills; tanneries; stone quarries, especially bluestone; cement-making; iron; and rubber. Many of these industries relied primarily on the River and estuary for transportation, including coal which traveled down the Lehigh into the Port of Richmond just north of Philadelphia.³⁰¹ The anthracite coal industry began in the early 19th century in the headwaters of the Schuylkill River to fuel the industrial revolution.

Many historic Delaware River industries played a large part in the demise of water quality between Trenton and Philadelphia, the decline reached its peak in the 1940's and 50's.

In the Mid to late 1800's upper Delaware River timber harvesting and tanneries that stripped tannic acid from the bark of the region's mature trees devastated the River. What was once an idyllic intact forest brimming with trout-filled streams was transformed into a logged wasteland with a river polluted by acid and choked with sediment. Many tributary streams were utterly destroyed.

Declining quality made the River an unreliable source of water. Federal laws and a greater appreciation of the River for multiple purposes resulted in the cleaning up of the Delaware River that revived industrial reliance for water supply on the Delaware, leading to greater job security and better health for its many workers. The industries that dominate the River's edges have changed over the decades.

Sectors that Consume Delaware River Surface Water



Figure 8: Sectors that Consume Delaware River Surface Water

Today's River Industries

Today, water is an essential factor in industrial production, productivity and transport. The largest water consumers on the Delaware today are electricity generation facilities, or the power industry. The power industry takes in three times more water than all other major water consumers combined, including public water supply, agriculture, and commercial businesses. **Figure 8** lists the four sectors of commercial Delaware River surface water consumers.³⁰²

The power industry consumes approximately 5.674 billion gallons per day of Delaware River surface water,³⁰³ primarily used for cooling purposes. Because most power generating facilities along the Delaware River intake water through underwater pipes, it is important that the water remain clean and clear of unnatural debris.

In April of 2007, a cooling water intake at PSE&G was forced to shut down after screens on its water intake system became clogged with assorted River debris.³⁰⁴

PSE&G is a native New Jersey electric service provider that supplies electricity for over 75% of New Jersey from Bergen, to Gloucester Counties. PSE&G employs over 10,500 people throughout its state wide service area, providing jobs for highly skilled engineers and nuclear technicians as well as hourly positions of all kinds.³⁰⁵ PSE&G takes in more than three billion gallons of water per day from the Delaware River for cooling purposes.³⁰⁶

Exelon takes in over one billion gallons per day from the Delaware River and employs thousands of men and women throughout the region.³⁰⁷ Power companies strategically locate themselves along bodies of water. A dependable flow of water is essential for power plants to remain viable.

Figure 9 shows the five largest Delaware River consumers; four of which are power companies.³⁰⁸ Connectiv, Exelon, PSE&G, and Reliant are all power companies with a combined water intake of more than 55 billion gallons of water per day.³⁰⁹ Premcor is an oil refining facility that takes in 355 million gallons per day of Delaware River surface water.³¹⁰

Every year the Salem Nuclear Generating Station kills over 3 billion Delaware River fish including:

- Over 59 million Blueback Herring
- Over 77 million Weakfish
- Over 134 million Atlantic Croaker
- Over 412 million White Perch
- Over 448 million Striped Bass
- Over 2 billion Bay Anchovy

The US Fish and Wildlife Service, in a letter dated January 10, 2001, characterizes the loss of aquatic organisms at Salem as "ecologically significant. In addition, conditional mortality rates for some Representative Important Species (RIS) are high enough to be of serious concern."

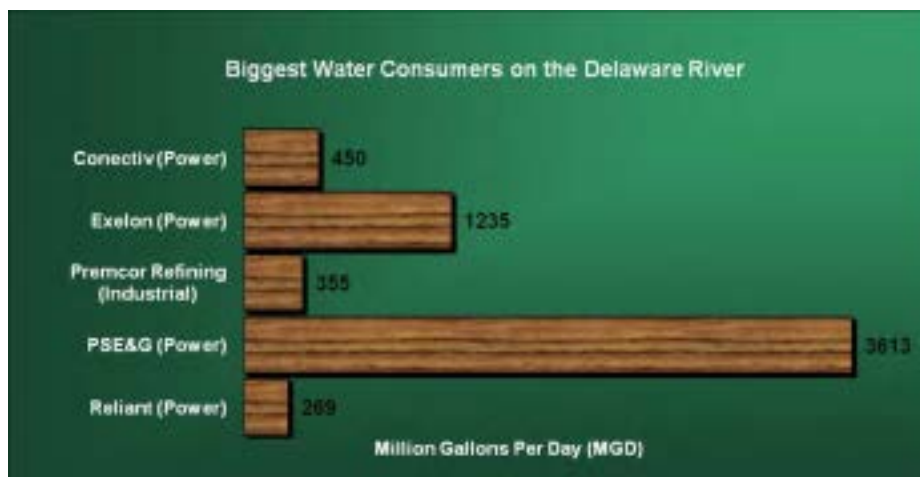


Figure 9: Five Largest Delaware River Consumers

Being the biggest water consumers on the Delaware brings with it a high level of responsibility, ensuring that their use of the River water is done so as to minimize any adverse impacts they might have on the ecosystem or others who rely on the River. PSE&G's Salem facility kills over 3 billion Delaware River fish a year including Weakfish, Bay Anchovy, Shad, and more. If PSE&G were to change the cooling water technology at the facility it could reduce those fish kills by over 95% and use 95% less Delaware River water. In addition to the ecological impacts, the commercial and recreational fishing industries and workers are forced to compete with electric generating stations for their livelihood — a day's catch. Fishing industries are dependent on a healthy and growing fish population in the Delaware Estuary and Bay and it is incumbent on PSE&G, Exelon and all other power companies to respect the right and need of others who mutually rely on the River.

Other industries that today rely on Delaware River surface water include steel manufacturing, chemical companies, paper mills, cement production facilities, and oil refineries. Chemicals are manufactured at DuPont with locations in New Jersey and Delaware. Although clean water is an essential component of DuPont's operations, DuPont's Chamber Works facility in Deepwater New Jersey is the single largest discharger of hazardous waste effluent in New Jersey.³¹¹ Industries like this do not help the River or region, but actually hurt the long term growth of the environment and economy. Rohm and Haas (now Dow Chemical) is a chemical company based out of Philadelphia. According to the industry, chemical manufacturing and research requires a reliable water source: "Water is the single most important chemical compound".³¹² The higher the level of initial contamination of the water, the more effort that must be applied before research and production can begin.



INDUSTRIAL TOWERS IN THE BACKGROUND OF A SCENIC RIVER VIEW.

Water is a basic and essential component to the local production of paper towels, tissues, copy paper and notepads. Companies such as Scott paper operating on the Delaware River since the mid 1800's rely on plentiful, good quality water.

Why Industry Needs Clean Water

"Contaminated water can increase industrial expenses as it causes steam electric power plants to operate less efficiently, clogs cooling equipment, corrodes pipes, and increases the rate at which pumps and other equipment wear out".³¹³ In November of 2008, industries along the Monongahela River flowing through Pittsburgh, Pennsylvania noticed "significantly higher water treatment costs" after microscopic contaminants, Total Dissolved Solids (TDS), were found at high levels.³¹⁴ The Pennsylvania Department of Environmental Protection said it

received several reports from industries about equipment problems and increased filtering costs to protect expensive steam boilers and turbines as well as drinking water filtration plant problems that led to water so high in TDS that it couldn't be effectively filtered. 325,000 consumers were advised to switch to bottled water for weeks and again for a period in 2009. A power industry spokesman said utility treatment costs increased because very clean water is needed for power generating facilities.

Many industries and businesses depend on the River for transportation today. Approximately 3000 cargo vessels travel the River annually.³¹⁵ About 85% of the east coast oil imports come up through the Delaware Bay and River³¹⁶. Debris impairs the ability of ships for these and other industries located along the river to safely transport and deliver their cargo, making it important to keep damaging debris out of the water.

In Philadelphia and South Jersey, the Delaware River Port Authority (DRPA) launched a “Green Ports” program with South Jersey Port Corporation (SJPC) and the Philadelphia Regional Port Authority (PRPA). The DRPA is a regional transportation and development agency that owns and operates the Benjamin Franklin, Walt Whitman, Commodore Barry and Betsy Ross bridges, PATCO, the Philadelphia Cruise Terminal and the RiverLink Ferry.³¹⁷ Initiatives to “green the ports” in several U. S. port cities have led to success economically and environmentally. Los Angeles, Mayor Antonio Villaraigosa and the mayor of neighboring Long Beach, launched a campaign to clean up port activities and reduce air emissions and water pollution. “We believe the only way to grow the port is to green the port,” says Villaraigosa. “And the only way to green the port is to grow the port....”³¹⁸

❖ Water and Commercial Use

Other commercial users of Delaware River surface water include the small businesses of the watershed like restaurants and hotels.

Hotels, restaurants, small businesses, and real estate operations rely on the Delaware River for their drinking water, wash water, maintaining their landscaping and grounds and to support onsite recreational uses including filling and maintaining swimming pools. Clean water is also fundamentally important for real estate in order to sell properties. Either real or perceived contamination, litter, garbage, or murky river conditions can influence buyer interest and the final selling price of property.

Some of the largest private consumers of Delaware River water are Waterworks Condominiums in Philadelphia, USS Real Estate owned by U.S. Steel, and River Winds in West Deptford Township, New Jersey.³¹⁹ Even the Philadelphia Airport takes in water to maintain the grounds, keep runways and airplanes clean, provide bathroom facilities for thousands of people moving throughout the airport each day, and to run the many restaurants and kitchens located within the facility.

As with all users of the River, it is important that commercial sources that benefit from a clean and healthy Delaware River do their part to protect and restore that same clean water. Their ability to do so is all about the choices they make for their day to day operations.

❖ Delaware River Ports

The ports of Philadelphia and Camden make up the busiest freshwater port in the world with annual revenue of \$19 billion.³²⁰ Over 70 million tons of cargo per year move through the ports at Philadelphia, PA; Camden, Gloucester City, and Salem, NJ; and Wilmington, DE Historically, cities such as Philadelphia and Trenton were created and supported by the products supplied through the ports. Raw timber and coal went out, and processed goods came in.

“Delaware River ports employ 4,056 workers who earn \$326 million.”³²¹ When one looks at the additional jobs and worker spending associated with these jobs the Delaware River ports are said to support “12,121 jobs and \$772 million in labor income, generating \$2.4 billion in economic output.”³²² The ports are well known for staple products like fruits, cashews, and cocoa beans, and contain the number one perishables port on the east coast. Oil comes in from the Middle East and meat comes in from Chile, Argentina, and Australia. Delaware River ports make up the largest North American port for steel, paper, and meat imports as well as the largest importer of cocoa and fruit on the east coast.³²³ The Port of Wilmington is one of the busiest container ports on the Delaware River handling Dole and Chiquita.³²⁴

A deepened main navigation channel is not needed to support this vibrant port, or new business. The success of the Delaware River ports lies in developing them as a strong niche port. In recent years record growth has been reported for the Delaware River ports, without the prospect of a deepened channel.³²⁵ While deepening the Delaware is not needed for a vital and growing port, it would threaten the other uses of the River with contamination, losing jobs and income, as well as diminishing the health of the River for others, including the people who drink and eat from it.



VIEW OF THE NAVY SHIPYARD AT SUNSET. THE PORTS ARE SHIPPING AND RECEIVING CORRIDORS FOR INTERNATIONAL TRADE AND COMMERCE. MOSTLY OIL TANKERS, WE ALSO RECEIVE PERISHABLE FOODS AND CONSUMER GOODS.

Why it Needs to be Clean Water

In the 1940's and 1950's the Delaware River was filled with sewage and garbage that clogged boat engines of incoming and outgoing ships peeling the paint from their sides, hindering traffic and port employment.³²⁶ In 2004, a large oil tanker carrying thick Venezuelan crude oil hit two submerged objects lying on the River's bottom: an old anchor and pipe. The objects ripped two gashes in the tanker's hull resulting in an oil spill of 265,000 gallons. The Athos I oil spill forced the ports to completely shut down for a period of days. The Coast Guard and others were forced to invest more than \$84 million dollars to clean up the toxic crude which impacted 115 miles of River and 280 miles of shoreline with oil, as well as over 16,500 birds and other wildlife.³²⁷

Keeping the ports healthy and functioning is important to the region's economy. The supplies that come into the ports provide jobs for watershed residents, overseas manufacturers, ship captains and their workforce, port receiving and distribution, inland transportation like truckers and railroad personnel, and all of the local suppliers relying on the products like restaurants, Hershey's chocolate factory, steel manufacturers, and more. It is important that we keep our river clean so we do not jeopardize job security or the health of these workers. Accidents and fuel or cargo spills cause injuries, death, damage to public health and the environment, and serious economic harm. It is critical that all policies, procedures and steps be taken to avoid short term catastrophic events as well as long term degradation and harm. Maintaining our port as a source of reliable employment for hundreds of thousands of workers is a priority for the region and requires a clean and healthy River.

In Philadelphia and South Jersey, the Delaware River Port Authority (DRPA) launched a "Green Ports" program with South Jersey Port Corporation (SJPC) and the Philadelphia Regional Port Authority (PRPA). The DRPA is a regional transportation and development agency that owns and operates the Benjamin Franklin, Walt Whitman, Commodore Barry and Betsy Ross bridges, PATCO, the Philadelphia Cruise Terminal and the RiverLink Ferry.³²⁸ Initiatives to "green the ports" in several U. S. port cities have

led to success economically and environmentally. Los Angeles, Mayor Antonio Villaraigosa and the mayor of neighboring Long Beach, launched a campaign to clean up port activities and reduce air emissions and water pollution. "We believe the only way to grow the port is to green the port," says Villaraigosa. "And the only way to green the port is to grow the port...."³²⁹



ABOVE LEFT: AFTER THE ATHOS I OIL SPILL TEAMS FROM ALL OVER THE REGION TOOK PART IN THE CLEAN UP EFFORTS TO WASH BIRDS AND STOP THE FLOW OF OIL FROM THE SPILL SITE. PHOTO CREDIT: DAVID SWANSON PHILADELPHIA INQUIRER: ABOVE RIGHT: ATHOS I PHOTO CREDIT: DANIELLE DEMARINO BOTTOM RIGHT: OIL SOAKED GOOSE FROM ATHOS 1 SPILL PHOTO CREDIT: DAN PRAN/THE NEW YORK TIMES