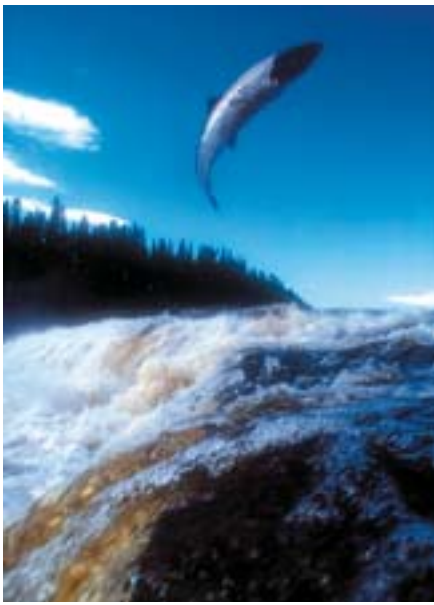


THE
SEA-RUN FISHERIES
OF THE
PENOBSCOT RIVER





COMMERCIAL FISHING for the migratory fish of the Penobscot River was a booming industry in the early nineteenth century. Each spring, hundreds of fishermen drifted large nets and built elaborate weirs to capture salmon, shad and alewives at sites from Castine to Old Town. At the wharves of Bangor, sailing sloops waited at anchor to carry the catch, fresh or salted, to the markets of Connecticut, Boston, Newburyport and the West Indies.

Rufus Buck, born in 1797, described the fishing industry at Bucksport, the town founded by his family:

“The principal business of the first settlers of this town was fishing and little attention paid to farming.. The Penobscot abounded with salmon, shad and [striped] bass and all the small streams with alewives. They were first taken by spearing and by nets and then by what was called half tide weirs. These were laid from point to point across deep coves and great numbers of shad and bass were taken in them. The bass were salted and dry cured and sent to Boston for market. In 1811 one Harnley Emerson came

On the morning of May 26, 1826 the Kennebec Journal informed its readers: *“A true fish story – Seven thousand shad and nearly a hundred barrels of alewives were taken in Eddington last week by Luther Eaton, Esq. at one haul – Bangor Register.”*

Until the 1830s, there were no dams on the Penobscot. Salmon, shad and alewives travelled 100 miles upriver to Shad Pond in Millinocket, Island Falls on the Mattawamkeag, and Monson on the Piscataquis. Twenty pound striped bass ranged as far upriver as Enfield and Howland. Atlantic sturgeon were taken at the falls in Old Town.

The State Fisheries Commissioners estimated that in the early 1800s the Penobscot produced annual runs of 100,000 salmon and two million shad.



here from Phippsburg and built the first three pound weir at the mouth of Marsh River on Treat's Flats... From this time the fishing interest became one of the most important sources of income to the town, amounting at one time (in the year 1820), to \$30,000.”

By the 1850s, dams crossed the Penobscot at Veazie, Basin Mills Rips in Orono, Great Works Falls in Old Town, and Old Town Falls. Very few shad, alewives or salmon were able to reach their spawning grounds above Old Town. The State Fisheries Commissioners noted in 1869:

“At the present time, as stated in our last report, salmon (the most vigorous ones, that come at the right season, and do not get caught at the traps set at the falls), can reach the headwaters of some of the upper branches. But the decrease of shad has

never ceased. They are growing constantly less, and instead of exporting shad by the cargo, the people of the Penobscot Valley are forced to import from other rivers shad for their consumption.”

By the late 19th century, the provision of crude fishways or small breaches in the lower Penobscot dams allowed salmon to rebound enough to rejuvenate the commercial weir fishery in Penobscot Bay. In 1880, the Penobscot commercial harvest exceeded 10,000 salmon caught at 230 weirs and traps set from Lincolnville to Winterport.

The decline of the great Penobscot fisheries continued in the early 20th century due to overfishing and pollution associated with industrial development along the river. During the 1920s and 1930s, most riverfront communities stopped using the Penobscot for drinking water. The Penobscot's commercial salmon fishery was closed by the Legislature in 1948. A total of 40 salmon were caught that year. The once enormous shad and alewife fisheries had already become a fading memory.

Today, the stage is set for restoring the sea-run fisheries of the Penobscot River. The elimination of log drives, improvements in water quality and laws setting harvest limits have all improved river health. Pennsylvania Power and Light Corporation is working with local, state and federal stakeholders to develop a shared vision for restoring the fisheries to the river while balancing the demand for hydropower production.

Below are descriptions of the Penobscot Indian Nation and the environmental groups working collaboratively with others to restore the river. Together, they bring a substantial amount of experience in river restoration including expertise in citizen involvement, engineering, legal and biological issues.

Atlantic Salmon Federation: The restoration of the Penobscot River is central to their mission of restoring native salmon runs in Maine. Through an office in Brunswick and a Maine Council representing salmon clubs along the river, ASF has been working to restore the Penobscot watershed for over 20 years. ASF brings extensive scientific and policy expertise in Atlantic salmon restoration. (website: www.asf.ca)

Penobscot Indian Nation: The Penobscot River is the ancestral home of the Penobscot Indian Nation. Restoration of the river's migratory fish stocks is necessary to comply with sustenance fishery rights guaranteed by the 1980 Maine Indian Land Claims Settlement Act and treaties between the Penobscot Nation, Massachusetts, and Maine. Penobscot tribal members have used the watershed and its abundant natural resources for physical and spiritual sustenance for 10,000-12,000 years. (website: www.penobscotnation.org)

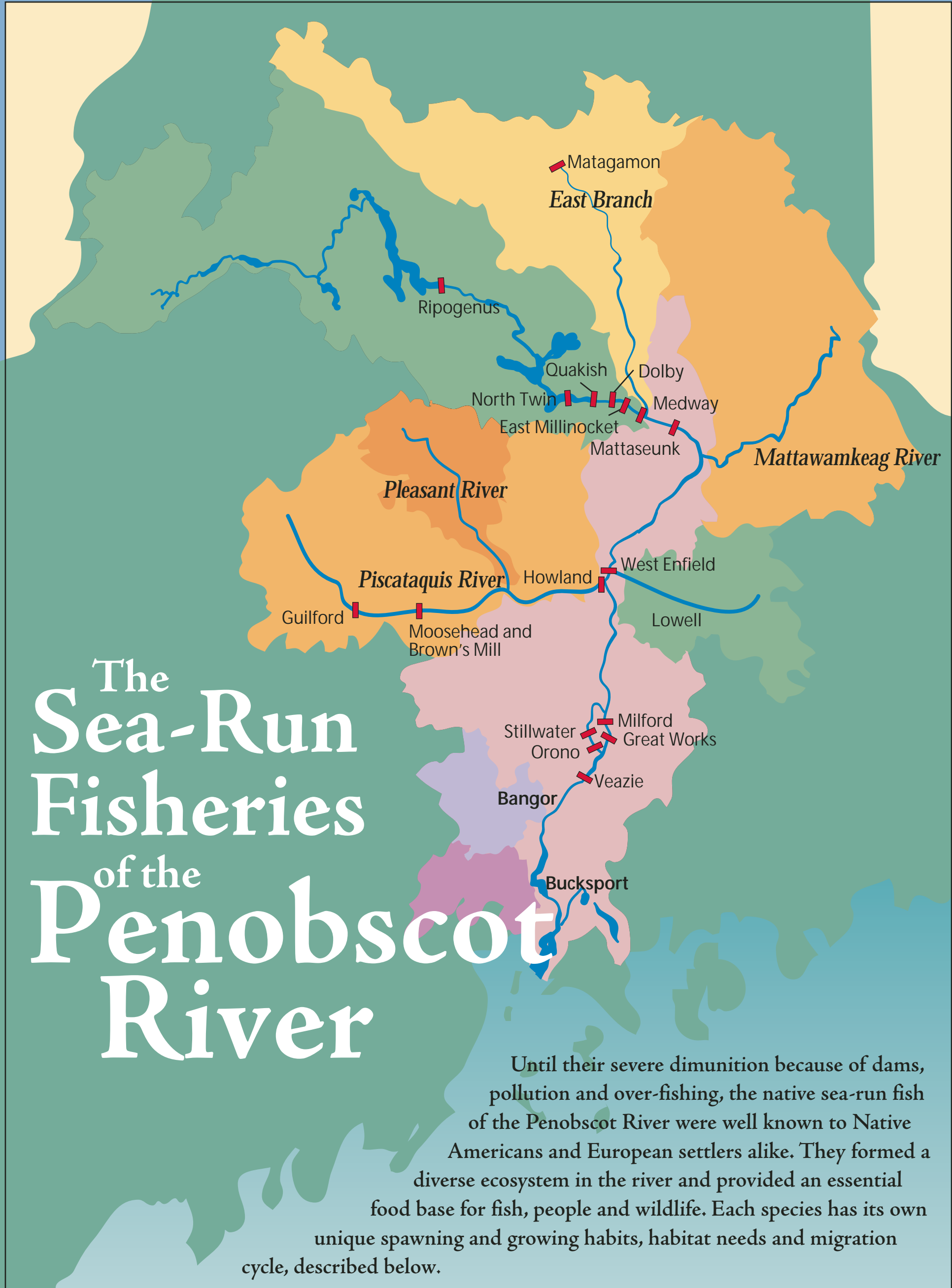
Natural Resources Council of Maine: The Council is a statewide membership organization committed to the of Maine's waters, air and forests. The Council's work on the Penobscot River has included support for: land protection on the West Branch, the elimination of mercury contamination, the elimination of dioxin and other pollutants from paper mills and the Penobscot Indian Nation's cultural right to a healthy Penobscot River. The Council has produced the "*Citizens Guide to River Restoration*," which is available on its website: www.mainenvironment.org

Trout Unlimited: Trout Unlimited (TU) is national conservation organization whose mission is to conserve, protect, and restore North America's coldwater fisheries and their watersheds. TU has an office in Augusta, with 8 chapters and over 1500 members in Maine. In 2002, they worked with the Sennebec Lake Association on the St. George River to replace an old dam with an innovative rock ramp that allowed free fish passage and maintained lake water levels. (website: www.tu.org)

American Rivers: American Rivers is dedicated to protecting and restoring America's river systems and to fostering a river stewardship ethic. They have extensive experience working in Maine on both the Kennebec and Presumpscot Rivers. Along with TU, they recently published, *Exploring Dam Removal: A Decision-Making Guide*. (website: www.americanrivers.org)

Maine Audubon: Maine Audubon works to conserve Maine's wildlife and wildlife habitat by engaging people of all ages in education, conservation and action. The organization has worked extensively to keep free-flowing the upper St. John River and portions of the Penobscot River. With a 160-year history, Maine Audubon is supported by 8,000 members, seven local chapters and more than 2,000 volunteers statewide. (web site: www.maineaudubon.org)

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The map illustrates the Penobscot River watershed, showing its major tributaries and the locations of various dams. The Penobscot River flows from the south towards the coast. Tributaries include the East Branch (top), Quakish, North Twin, East Millinocket, Mattaseunk, Pleasant River, Piscataquis River, and Bucksport. Dams are marked with red rectangles along the river and its tributaries. The map is color-coded by region: yellow for the northern part, orange for the central part, pink for the lower part, and purple for the southern part. The background is a light green and blue gradient representing land and water.

The Sea-Run Fisheries of the Penobscot River

Until their severe diminution because of dams, pollution and over-fishing, the native sea-run fish of the Penobscot River were well known to Native Americans and European settlers alike. They formed a diverse ecosystem in the river and provided an essential food base for fish, people and wildlife. Each species has its own unique spawning and growing habits, habitat needs and migration cycle, described below.



ATLANTIC STURGEON

(*Acipenser oxyrinchus*)

The largest sea-run fish in eastern North America. Atlantic sturgeon may reach 800 pounds, 14 feet long and live for 50 years or more. They enter fresh water in early summer at age 15 or older. Atlantic Sturgeon were once common in the Penobscot from Old Town to the sea. Because Atlantic sturgeon depend on riverine areas above the head of tide for spawning and do not use fishways, the construction of dams in the lower Penobscot River has virtually eliminated the river's population.



SHORTNOSE STURGEON

(*Acipenser brevirostrum*)

A federally listed endangered species. Shortnose sturgeon reach three to four feet long and may live for 80 years or more. Females do not spawn until 15 years old. While one shortnose sturgeon was captured in Penobscot Bay in 1978, little is known about their existence today in the Penobscot River. Historically, both species of sturgeon were an important part of the culture and diet of the Penobscot Indians and European settlers.



ATLANTIC SALMON

(*Salmo salar*)

Until the early 1800s, more than 100,000 salmon ascended the Penobscot each spring, travelling up to 200 miles to spawn in swift-flowing reaches of the main-stem and countless tributaries. The Penobscot hosted the last commercial fishery for the species in the United States (closed in 1948). Atlantic salmon spend two to three years in their home river before embarking on a one to three year journey to the North Atlantic, often travelling 6,000 miles before coming home to spawn. In the United States, Atlantic salmon have been reduced from an estimated historic population of 500,000 adults to less than 1,500 in recent years, most of which return to the Penobscot. A restored salmon run would provide significant economic and recreational opportunities to the people of Maine.

TOMCOD

(*Microgadus tomcod*)

A close relative to the Atlantic cod, except much smaller (rarely over a foot long), with a life history very similar to rainbow smelt. Called "frostfish" because it appears in the lower Penobscot after ice begins to coat the river. Spawns in December near or above the head of tide.



AMERICAN SHAD

(*Alosa sapidissima*)

The largest member of the river herring family, shad can grow to 10 pounds and over two feet in length. The Penobscot once hosted a run of nearly 2 million shad, which spawned in June up to 130 miles above the river's head of tide. Adults spend up to five years at sea before returning to their home river to spawn. While other rivers along the eastern seaboard host popular shad festivals, dam construction and pollution almost completely eliminated the Penobscot's shad population by the late 19th century. A tiny remnant population is believed to remain near the river's head of tide. Restoration of the Penobscot River could once again provide a commercial and recreational fishery.



STRIPED BASS

(*Morone saxatilis*)

Striped bass are long-lived and can exceed 80 pounds and six feet in length. They feed in saltwater along the Atlantic coast and move far up into large rivers to feed on migrating river herring and eels. Striped bass spawn in early summer in the freshwater portions of large rivers. They do not use fishways or lifts. Large striped bass once ascended the Piscataquis River above Howland and Penobscot near Enfield. The Maine Department of Marine Resources believes the Penobscot is only one of two Maine rivers with the potential to support a resident, spawning population of striped bass. A resurgence in striped bass could produce a burgeoning recreational fishing industry on the Penobscot.



ALEWIFE

(*Alosa pseudoharengus*)

Once so abundant in the Penobscot they were given away by fishermen. Alewives are born in upriver lakes and ponds, migrate to sea after a few months in freshwater and return three to five years later in May and June as 10-14 inch adults. They are eagerly devoured by striped bass, eagles, osprey, great blue heron and are an important source of bait for the lobster industry. The Penobscot once hosted runs of over 6 million adult alewives.



BLUEBACK HERRING

(*Alosa aestivalis*)

Nearly identical to the alewife in appearance, the blueback herring differs by spawning in moderate to fast-flowing river reaches instead of lakes and ponds. They are devoured in great numbers by striped bass and fish-eating birds during their early spawning summer migration. Scientists suspect that a small remnant population exists in the Penobscot below the river's first dam.

SEA LAMPREY

(*Petromyzon marinus*)

The most misunderstood native fish of the Penobscot. Juvenile lamprey live for up to eight years in freshwater, eating organic debris, and live in saltwater for two years before returning to the Penobscot to spawn in late May and early June where they dig nests in shallow gravel beds of the river. Like Pacific salmon, sea lamprey die immediately after spawning and their carcasses provide important nutrients to local stream environments.



AMERICAN EEL

(*Anguilla rostrata*)

Unlike most sea-run fish, eels spawn in salt water, migrate as tiny juveniles to freshwater and live for 30 years or more in freshwater rivers and ponds before completing their lifecycle by returning to the ocean. They grow to be three to four feet long. Because some juveniles are able to pass over dams, eels are still found throughout the Penobscot River drainage and support a small commercial fishery for adults. River restoration could result in a markedly increased commercial catch of the highly valuable juveniles (elvers)



RAINBOW SMELT

(*Osmerus mordax*)

Rainbow Smelt enter the lower Penobscot River in early winter to feed on small fish and crustaceans. They spawn soon after ice-out in rocky streambeds and grow to one foot in length. Smelt cannot use fishways. Important food and recreational fishery in addition to being target for eagles and ospreys.