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People in Nature: Environmental History of the Kennebec River, Maine

Daniel J. Michor

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**PEOPLE IN NATURE: ENVIRONMENTAL HISTORY OF THE
KENNEBEC RIVER, MAINE**

By

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B.A. University of Wisconsin, 2000

A THESIS

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Arts

(in History)

The Graduate School

The University of Maine

May, 2003

Advisory Committee:

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By Daniel J. Michor

Thesis Advisor: Dr. Richard Judd

An Abstract of the Thesis Presented
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The quality of a river affects the tributaries, lakes, and estuary it feeds; it affects the wildlife and vegetation that depend on the river for energy, nutrients, and habitat, and also affects the human community in the form of use, access, pride, and sustainability. In an age of mass consumerism and materialism, dwindling natural resources and wild spaces, and advanced technology, the ability to make a living and at the same time enjoy the benefits of rural living is increasingly difficult. Using the entire Kennebec River watershed as the scale of investigation with particular focus on the river corridor itself, my project looks at the interconnectedness of the river and the surrounding human community in a whole ecosystem analysis.

Through coordinated efforts in the 1960s and 1970s in pollution abatement control and natural resource management, the communities of central Maine improved water quality in the Kennebec River from what was once described as an “open sewer” to conditions that provide for thriving aquatic life and improved access, enjoyment and economic health for the people. Vibrant commercial districts

appeared, and tourism, fishing, boating and swimming all increased as a result of the improved river quality.

Based on Mainer's values of economy, rural living, and environmental health, management of the Kennebec met the needs and values of the whole ecosystem (social, economic, biogeophysical). Providing the river with conditions necessary for clean water, the people were in turn, sustained by the it as a natural resource; this resembles cutting-edge ecological theory called supply-side sustainability: maintaining, or fostering the development of, the systemic contexts that produce the goods, services, and amenities that people need or value, at an acceptable cost, for as long as they are needed or valued. My project provides an example of how people can translate their values of economic well being, ecological integrity, and the enjoyment of nature in their everyday lives into a sustainable system which provides for their every value.

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ABBREVIATIONS

BOD	Biological Oxygen Demand
DEP	Maine Department of Environmental Protection
DMFR	Maine Department of Marine Fishery Resources
DIFW	Maine Department of Inland Fisheries and Wildlife
DO	Dissolved Oxygen
EIC	Maine Environmental Improvement Commission
EPA	United States Environmental Protection Agency
FERC	Federal Energy Regulation Commission
MDOT	Maine Department of Transportation
NKRPC	North Kennebec Regional Planning Commission
PPM	Part Per Million
RM	River Mile
SKVRPC	Southern Kennebec Valley Regional Planning Commission
WAEIC	Maine Water and Air Environmental Improvement Commission
WIC	Maine Water Improvement Commission

PREFACE

As a recent college graduate working my first real job as a sixth grade assistant teacher in the Chicago suburbs, I knew that I needed to satisfy my desire to not only explore my interest in higher education in the field of environmental history, but to do so in a place away from the urban environment I had known my whole life. My love of nature coupled with the fine program in environmental history, drew me towards the University of Maine at Orono. I never visited the campus before I moved in the fall of 2001, because I trusted that the rural simplicity and natural beauty would remind me that I made the right choice.

In the modern world of consumerism, materialism, and advanced technology Maine provides an escape from the pressures and anxieties of development, urbanization, and industrial filth. Much of Maine is unique in this way, especially in contrast to the greater northeast United States, and the character of many of its people reflect a land ethic. A *Maine Times* article in 1975 depicted this aspect of Mainers: "I am convinced that most people in Maine have a personal commitment to the state, feel a certain kinship with it. That is not true in most states. In other words, people in Maine are here because they choose to be here". Maine people "are willing to put up with long, cold winters, with high fuel costs, and jobs that pay less than elsewhere in America because Maine is something special. Money is important, but it's not everything. Maine people don't ask more than to get by. Many are not devoted to the typical American imperative of getting ahead."¹ When asked what Mainers liked and disliked about their state in a 1973 survey, they responded with scenic beauty, un-

¹ *Maine Times*. March 12, 1975.

crowded open spaces, climate, clean air, four seasons, and the slower, more relaxed pace of living.²

Human life, and the natural world it depends on, is a sacred human value. The current debate on whether or not to drill in the Arctic Wildlife Refuge provides a good grasp of this fundamental and invaluable concept. The region is of unprecedented natural beauty, both physically and biologically, and sustains native populations in a way that has remained relatively unchanged way for thousands of years. What has persisted in the far north, thousands of miles away from the most resource-consuming nation in the world, has been a way of life woven within the fabric of the natural ecosystem. It has a beautiful habitat, abundant and impressive wildlife, and a subsistence culture of sustainability.

The area also has historic value beyond compare in the modern world. The caribou herds, around 140,000 individuals, have migrated 700 miles each year to and from the coastal plain for over 20,000 years, enough to have a geologic effect on the Earth in its route. The natural world is part of the native's local economy, subsistence base, and world-view. A people's sacred tradition would be lost in exchange for six months' supply of oil for the United States.³ This is the real value that has no monetary equivalent. This region has all the elements of what it means to be sacred.

The story of the Kennebec River is about the relationship between human values and the natural world. The Kennebec River is the center of a larger ecosystem and the people that live among it are recipients of its bounty. State Planning Office

² *Maine Sunday Telegram*. Nov. 27, 1983.

³ Defenders of Wildlife. *Arctic Wildlife Refuge Presentation*. University of Maine: Feb. 13, 2003. Presentation. This was a presentation on the Maine campus that illuminated some very important ideas about politics, energy, ecology, history, and human life that put into perspective what is at stake when

river specialist Alec Griffin commented on the importance of Maine's rivers in 1982: "We take our rivers for granted. We are so close to them, we don't realize how unusual our rivers are nationally...Atlantic salmon, undeveloped rivers, opportunity for extended canoe trips, beautiful scenery, heavy white water -- a combination not found elsewhere."⁴ Maine's natural beauty, the unique character of its people, and their ability to sustain themselves within their natural environment were a large inspiration for this paper.

it comes to people's connections to their own land and natural surroundings.

⁴ *Maine Sunday Telegram*. Dec. 26, 1982.

INTRODUCTION

The Kennebec River has an impressive history, with a number of natural and cultural attributes. The Kennebec once featured the greatest Atlantic salmon run in the East.⁵ It empties into the largest freshwater tidal bay on the eastern seaboard north of the Chesapeake Bay, and provides a unique habitat for many rare and significant plant, wildlife, and bird species.

Native American tribes lived along the river for millennia; forts provided protection during the French and Indian War; and Benedict Arnold used the river for navigation on his march to Quebec in the Revolutionary War. Commercial, industrial, and cultural relics exist from a time when the nation's largest shipbuilding industry operated and where ice production set the standard for the nation. Many of the historic buildings and dwellings remain as symbols of an era gone by.⁶

With such impressive natural and cultural features, the Kennebec River has a magnificent environmental history. The title of this paper alludes to the environmental history of the Kennebec River, but it is important to note that this work is not intended to provide a comprehensive overview of the major environmental events of the river's history. Instead, it is focused on the connections in river and human life-quality, as illuminated by the Clean Water Act of 1972 as the hinge of change.

Cutting-edge ecological theorists suggest that a new synthesis of discourse and management strategy is needed to insure our quality of life. To use rivers sustainably requires new aggregations of ideas linking economics, history, natural

⁵ New England River Basins Commission. *Kennebec River Basin Overview*. Boston, MA: The commission, 1979. This document is very good at providing general information on the basin.

resources, and political science. This calls for the “whole ecosystem” approach, which incorporates the needs of the social, economic, and biogeophysical components that constitute an entire ecosystem.⁷ I argue that the people of Maine exhibited this approach in their effort to clean up the Kennebec River 30 years ago. Through cooperation among multiple levels of government and across many community groups, the people came to understand the need for clean water in an entire ecosystem context, took the appropriate steps to achieve it, and sustained the entire ecosystem, including their own values. Maine took a chance in implementing strict and demanding environmental protection laws in the 1960s and 1970s when other states were not so ambitious. Former Maine Senator Edmund Muskie praised Maine in 1977 for leading the nation in cleaning up its lakes, rivers and ponds.⁸

Town and State government was set up in a very effective way. The New England town meeting system gave every resident a direct say in matters affecting them, and this political culture influenced state politics. A state politician described the government as, “permanently established as the State’s granite bedrock.”⁹ Democratic leadership made the State of Maine a national example of the wisdom of water pollution control efforts.¹⁰ Maine has two State slogans: “The way life should

⁶ New England River Basins Commission. Kennebec River Basin Overview. 12.

⁷ Allen, T. F. H., Joseph A. Tainter, and Thomas W. Hoekstra. Supply-Side Sustainability. New York: Columbia University Press, 2003. 20-22, 31-33, 50.

⁸ *Maine Times*. Feb. 25, 1977. Muskie was proud of his home state as a leader in environmental legislation and success.

⁹ North Kennebec Regional Planning Commission. The land use element of a comprehensive plan. By Allen Cox. Winslow, ME: The Commission, 1977. A politician from the late 1970s from Maine named Plumer praised the system.

¹⁰ Southern Kennebec Valley Regional Planning Commission. Augusta to the Atlantic: A Recreational use strategy for the Kennebec River. By Mallar Development Services, Inc. Augusta, ME: The Commission, 1982. 1.

be” and “Vacationland.” After reading this story about Maine, you will understand why these ideals are important.

In addition to outlining the pollution problems, the first chapter provides a structural overview of the major environmental and historical events that occurred in the river valley before the 1940s, but does not attempt the complete story. Mary Calvert’s works, Dawn over the Kennebec, The Kennebec Wilderness Awakens, and Black Robe on the Kennebec, along with Jennie Everson’s work Tidewater Ice on the Kennebec, as well as Kennebec: Cradle of America, by Robert P. Tristram Coffin, are very good secondary works that provide a more complete early history. The second chapter focuses on the history of environmental action and explains how people organized themselves in government agencies and citizen groups to meet the challenge of cleaning up the river. The third chapter discusses the action taken by the people and governments to clean up the river. The final chapter points out the results of these efforts and showcases the benefits the people enjoyed with their renewed resource.

My evidence includes state documents, mainly from the Department of Environmental Protection. Governmental and interest group reports, as well as many newspaper accounts of public opinion, flesh out the story.

CHAPTER 1

THE CONTEXT OF THE RIVER

Geology

Maine's bedrock geology is a complex arrangement of metamorphosed, plutonic, and volcanic rocks. They are the result of long and complicated geologic events that included sediment deposition and rock formation, igneous activity, folding, faulting, and erosion. Extensive ice sheets covered Maine in the last glaciation over 10,000 years ago. Advancing ice from the Canadian highlands scoured surfaces, deepened valleys, and deposited till. As the glacier retreated, a spectacular gorge, many cliffs, and the valley of the lower river were left behind. As the climate warmed, the ice melted and filled cavities to become lakes and ponds. The overflow became streams and rivers, draining the rain and snow melt to the sea. This, along with the invasion of marine water into the interior of Maine, filled the channel bed and created the Kennebec River.¹¹

Geography

The Kennebec River, originating at Moosehead Lake (largest lake in Maine) at 4,000 feet elevation, falls 1,026 feet from headwaters to Augusta where it reaches sea level. In its 170-mile journey to sea, it drains approximately 6,000 square miles, flushing over 6,000 million gallons of water per day. It is the fourth largest river and third largest drainage area in Maine (Figure 1).¹² Starting at Moosehead Lake, the

¹¹ Dept. of the Army, New England Division, Corps of Engineers. Water Resources Study, Kennebec River Basin, Maine. Vol. 1. Waltham, MA: The Corp, 1990. 7-8. This report was conducted to assess the physical features of the river to provide information necessary to assess dam issues and is a good source for physical and biological features of the river.

¹² North Kennebec Regional Planning Commission. Kennebec River Corridor Project Appendix I-V. By Lyle E. Flynn. Winslow, ME: The Commission, 1978. Department of Inland Fisheries and Game.

Kennebec flows south to its first important tributary (Dead River) at what is called The Forks. As the river flows it is joined by its second big tributary (Carrabassett River) at the town of North Anson. Next is Sandy River in the town of Starks, followed by the only tributary from the east (Sebasticook) at Winslow. The next great tributary is the Androscoggin River at Merrymeeting Bay. Figure 2 outlines the towns and cities within the basin area.

The Kennebec River and the surrounding watershed involved in the hydro-cycling of the river (groundwater, tributaries, lakes, ponds) encompass an area of 6,000 square miles, (one fifth the area of the state). The basin can be separated into two areas: upper basin (Moosehead Lake to Waterville), and lower basin (Waterville to the Atlantic Ocean). Land and water combine in the Kennebec River channel to create what is called a riverine system: a place where land and water ecosystems meet to form a combined system of greater ecological complexity. The New England River Basins Commission described the area: "a unique and extremely diverse juxtaposition and combination of land, water, vegetative and cultural elements are found within the river and associated land corridors."¹³

Fish Management in the Kennebec River 1969. By Robert Foye. Augusta, ME: The Dept., 1969. 8.

¹³ New England River Basins Commission, 28. This quote emphasizes the natural uniqueness of the river in a regional perspective.

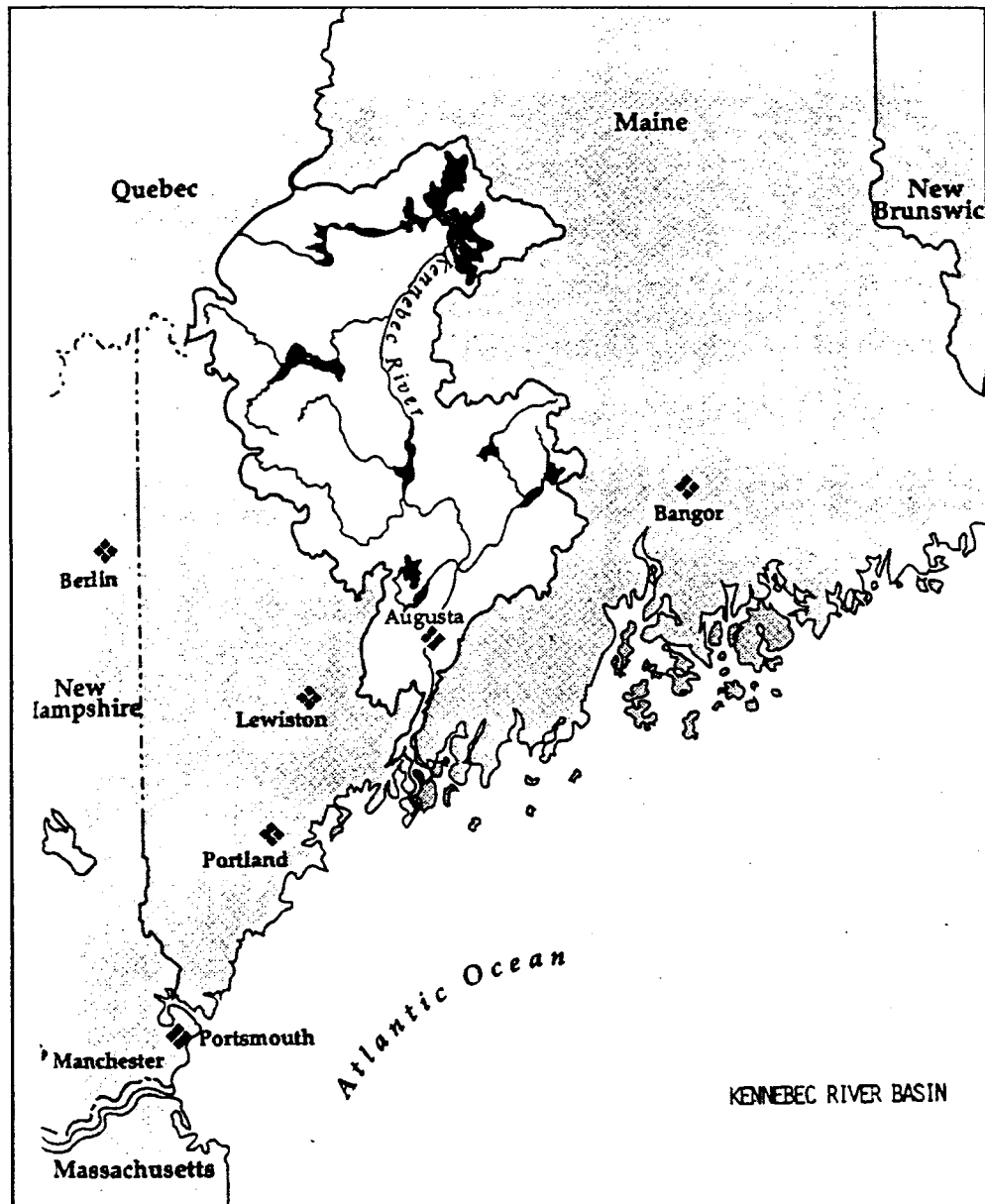


Figure 1: The Kennebec River Basin. From Department of the Army, New England Division, Corps of Engineers. Water Resources Study, Kennebec River Basin, Maine. 1990.



Figure 2: Kennebec River: Moosehead Lake to the Atlantic Ocean. From Calvert, Mary. *Dawn over the Kennebec*. Lewiston, ME: Twin City Printery, 1983.

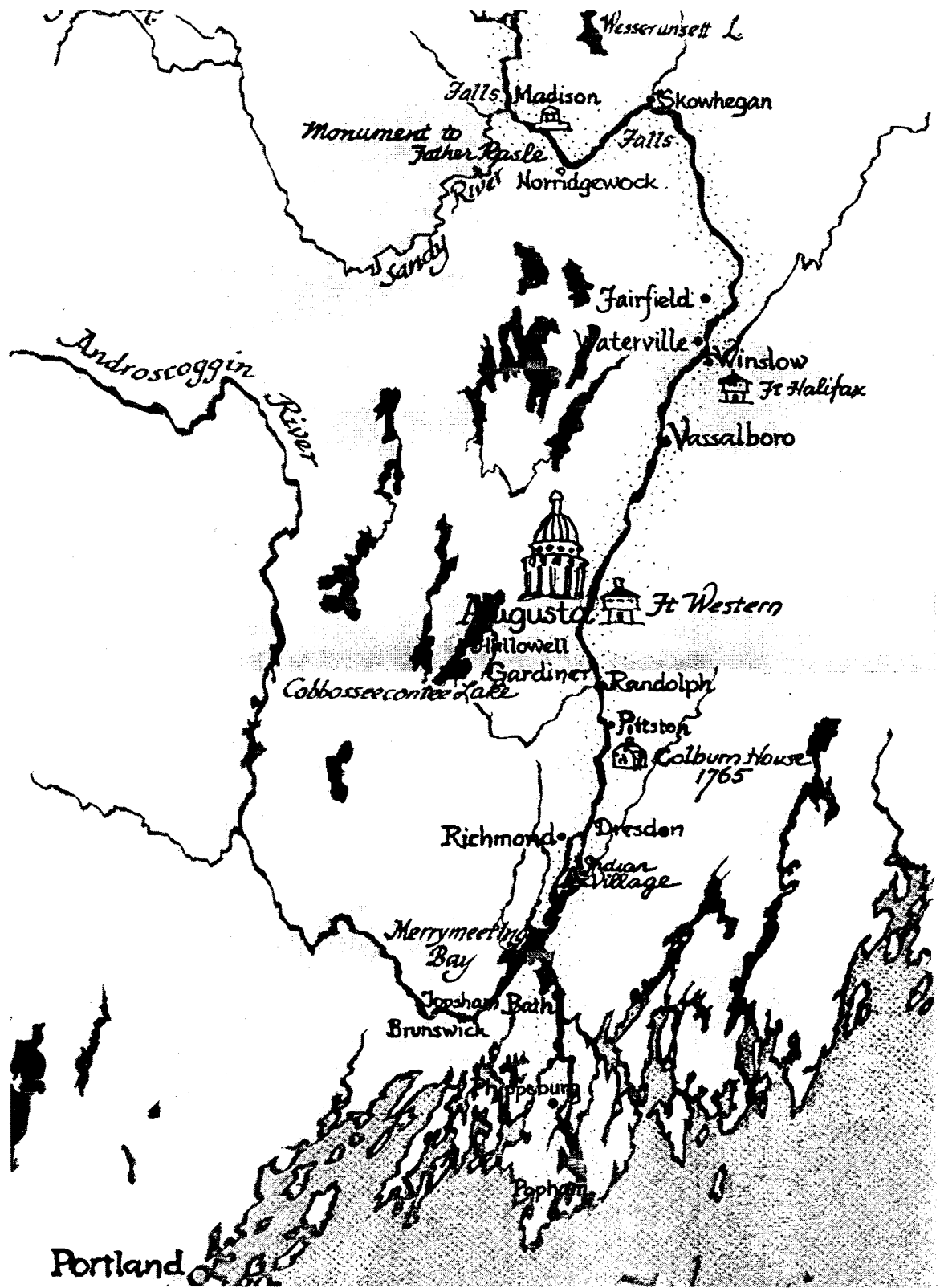


Figure 2 (Cont.): Kennebec River: Moosehead Lake to the Atlantic Ocean.

Biocomplexity of the River

The river channel and the entire basin comprise an enormous amount of habitat and complex ecology. The Kennebec River operates within a larger ecological system whose function has a great effect on the condition of the river. Surface waters, flood-prone areas, wetlands, riparian zones, wildlife, aquatic life, steep slopes, groundwater, and agricultural and forestry land are all significant components of the river. The specific climate and acidic and relatively infertile soils, but also organically rich, allow for hardwood and softwood growth, such as white pine, spruce, fir, maple, beech, and birch. The river lies in the transition zone between the hemlock and white pine forests that stretch southward from the region, and the northern hardwood, spruce-fir forests that are characteristic of regions to the north. The basin is over 70 percent forest, consisting of 6 basic types: forested uplands, forested wetlands, shrub-scrub wetlands, both persistent and non-persistent wetlands, and open fields.¹⁴

Natural Features

A diversity of rare and threatened plants grow in the tidal marsh and riparian areas near the mouth area, making it a nationally unique coastline. The estuarine segment is one of the only areas in Maine that supports significant occurrences of wild rice, and it is also a temporary home to a great number of migrating waterfowl, including the largest spring concentrations of Canada geese in Maine. The endangered piping plover nests and feeds on the coastal beaches. The lower

¹⁴ North Kennebec Regional Planning Commission. *The land use element of a comprehensive plan*, 4-6. Jacke, Susan. *Recreational Guide to the Kennebec River: including detailed maps*. Skowhegan, ME: Kennebec Valley Conservation Association, 1976. 5. Dept. of the Army, New England Division, Corps of Engineers. 2, 9. These sources provide good basin information, which is very close to the

Kennebec, a 34-mile stretch up to Augusta, is one of the three most outstanding areas for nesting and wintering populations of bald eagles in the state. There is also known use by osprey and the great blue heron.¹⁵

In the town of Richmond, the Androscoggin and Kennebec River meet in what is called Merrymeeting Bay. Six rivers combine here to make up the largest freshwater tidal bay on the eastern seaboard north of the Chesapeake Bay. There are regionally significant salt marshes along the lower tidal rivers and creeks below Bath, and along rivers draining into the bay. Hunting of waterfowl and trapping of furbearers is popular, with over a third of the state's waterfowl hunting in Merrymeeting Bay.¹⁶

The upper Kennebec consists of a 12-mile segment from Forks to Moosehead Lake. This section is the most pristine and wild of any Kennebec reach. It is one of the ten least developed corridors in the state with its very scenic and stunning natural features of geology, topography, hydrology. It consists of an 11-mile river gorge recognized by the Critical Areas Program as a prime geologic locality displaying the best example of a geomorphically youthful river and associated terrain in the state. The calcareous slate ledges provide habitat for a variety of rare and threatened vascular plants, including smooth woodsia and *woodsia glabella*, which has national significance because of scarcity of its habitat. A deer wintering zone that has visits from bald eagles and osprey is also a significant area in this reach.¹⁷

conditions of today.

¹⁵ Southern Kennebec Valley Regional Planning Commission. Augusta to the Atlantic: A Recreational use strategy for the Kennebec River, 12. Mallar is a private firm that was hired by the SKVRPC to investigate and assess the use options for the river in 1982.

¹⁶ Department of Conservation. Maine Rivers Study. Augusta ME: The Dept., 1982. This State document is useful in cataloging the distinct features of the river.

¹⁷ Ibid. 93. Bureau of Parks and Recreation. Maine Rivers Access And Easement Plan. By Joseph

Wildlife and Birds and Habitat

The area's most productive wildlife habitat, primarily in the upper reach, is the riparian and wetland vegetation along the river's edge. This habitat provides nesting and feeding for migratory and resident birds, cover and movement corridors for small mammals, particularly fur bearers, food for terrestrial insects, and shade and cover for near-shore, shallow water fish in particular life stages. Mammal populations include raccoon, striped skunk, porcupine, red fox, river otter, mink, muskrat, beaver, snowshoe hare, eastern chipmunk, woodchuck, and gray and red squirrel, shrews, mice, and voles. White-tailed deer, black bear, moose (Figure 3), bobcat, fisher and marten also inhabit the river basin.



Figure 3: Moose on the Kennebec. From Calvert, Mary. The Kennebec Wilderness Awakens. Lewiston, ME: Twin City Printery, 1986.

Hardy. Augusta, ME: The Bureau, 1985. These works clearly state the unique features of the upper reach.

Bird species are also prevalent in the basin. Spotted sand piper, great blue heron, mallard, black duck, common merganser, double crested cormorant, herring gull, black-backed gull, belted kingfisher, common loon, American crow, blue jay, black-capped chickadee, cat bird, yellowthroat, American robin, song sparrow, yellow warbler, yellow-rumped warbler, winter wren, cedar waxwing, ruffed grouse, red-tailed hawk, brown creeper, nuthatch, and kestrel all frequent the basin.¹⁸

Habitat quality and availability is critical for migratory waterfowl such as wild ducks and Canada geese. Wetlands for breeding, migratory stops in Merrymeeting Bay, and several islands in the river between Bingham and Madison provide such habitat. Bald eagles nest in the lower basin from Merrymeeting Bay to Augusta and require undisturbed habitat for their survival.¹⁹

Fish

In the channel itself, there are many fish species, including the habitat for several anadromous fish species. Anadromous species (species that migrate upstream) include American shad, alewife, blueback herring, rainbow smelt, striped bass, and Atlantic salmon. Other fish species in the basin include pickerel, white perch, smallmouth and largemouth bass, white and yellow perch, brook, brown, and rainbow trout, and landlocked salmon.²⁰

The Kennebec River is also home to exotic species of carp and catfish. The accidental introduction of carp by Russian immigrants in the 1880s caused problems in the ecological community. Carp uproot water plants on the river bottom making

¹⁸ Dept. of the Army, New England Division, Corps of Engineers. Vol. 2, 2. Excellent natural inventory information.

¹⁹ New England River Basins Commission, 93.

²⁰ Southern Kennebec Valley Regional Planning Commission. Augusta to the Atlantic: A Recreational

them unavailable for wildlife. The increased turbidity makes it difficult for fish and birds to see through the water to feed. The carp can survive on low amounts of dissolved oxygen (DO), but most other commercially valuable species cannot.²¹ Overall, the river has high species diversity and overall fish abundance, giving it recreational and commercial importance.²²

Early Human Use

American Indian

Native American tribes were the first humans to use the river. Paleoindian sites (11,000 B.C.-6,000 B.C.) have been found (Figure 4), in addition to Archaic (6000 B.C. to 1500 B.C.), Woodland or Ceramic period (1500 B.C. to 1600 A.D.) and even early historic (1600-1750). The river basin has received nearly continuous use as a habitation/resource exploitation area for at least the past 6000 to 8000 years.²³ The Abnaki Indians occupied the Kennebec River Valley at the point of first European contact. The Abnaki were a confederation of tribes, one of which was the Norridgewock. They supplied the river with its name “kenebec,” which means “snaky monster” or “long quiet water” based on the way it twisted through the landscape on its course. The natives were farmers of squash, corn, beans, and pumpkins and worshiped many gods.

use strategy for the Kennebec River, 12.

²¹ Bureau of Water Quality Control. *Kennebec Basin Interim Water Quality Plan, 1972*. Augusta, ME: The Bureau, 1972. The carp story is an interesting piece of environmental history.

²² Department of Conservation. 10. The rating of the river was done by the State. Dept. of the Army, New England Division, Corps of Engineers. Vol. 1. The Army Corp of Engineers, in its assessment of the river for dam issues, needed to be sure to emphasize the fragility of species.

²³ *Ibid.* The federal report is fairly extensive in its inventory of the river, everything is taken into account.



Figure 4: Ancient native petroglyphs along the bank of the river at Embdem. From Calvert, Mary. Dawn over the Kennebec. 1983.

European

The Kennebec was one of the first rivers to be explored by Europeans in the New World. In 1524, Italian explorer Giovanni Verrazzano visited the mouth of the river, but hostile Indians prevented his party from landing. It was not until 1604 that the first Europeans settled the Kennebec region. The Kennebec River was of interest to both the French, led by Samuel de Champlain, and the English, led by George Weymouth, for resources and a route to the interior. In 1607, the Plymouth Company expedition, with members mainly from English jails, landed on the west shore of the river's mouth and set up the Popham settlement. The harsh winter forced their departure a year later; they described the region as "stored with grapes, white and red,

good hops, onions, garlick, okes, walnut, and soile good.”²⁴ The English eventually settled along the banks and inland and began using the river for transportation and commerce for mainly fish and furs. Plymouth pilgrims set up a fur-trading post in 1628 at Cushnoc, which lasted for forty years, in what is now Augusta. By 1680, more than 100 white families had settled along the river, using the river (Figure 5) for food, transport and business, and the fertile adjacent land for farming.²⁵ Settlers carried furs and fish as far up as Solon in these early days. Small sawmills converted raw spruce and pine to lumber for home and ship construction. Mills for textile production, as well as gristmills for settlers to grind their wheat into flour, also lined the tributaries of the river.²⁶



Figure 5: Early settlers on the Kennebec. From Calvert, Mary. The Kennebec Wilderness Awakens. 1986.

²⁴ Jacke, 3. Southern Kennebec Valley Regional Planning Commission. Augusta to the Atlantic: A Recreational use strategy for the Kennebec River.

²⁵ Ibid. New England River Basins Commission, 32.

²⁶ Calvert, Mary R. The Kennebec Wilderness Awakens. Lewiston, Maine: Twin City Printery, 1986. 8.

Within the years of 1675-1763 many wars took place involving the Indians, the English, and the French. These wars caused havoc amongst both settlers and the natives, and led to the construction of Fort Western at Augusta and Fort Halifax at Winslow in 1754 to protect the settlers. The Treaty of Paris in 1763 ended the wars and put the English in control of the river. Two years later, Benedict Arnold led 11 Bateaux's and 1,100 men up the river in his famous march to Quebec in the Revolutionary War. After the war, land in the basin was sold for \$1.00 an acre to soldiers and immigrants, creating new farming and commercial opportunities along the banks of the river. From the 1680s until the Revolution, the British harvested the King Pine trees (Figure 6) for ship's masts in His Majesty's Royal Navy. Landowners and traders grew wealthy from the natural riches and power the river provided.²⁷



Figure 6: King Pine. From Calvert, Mary. Dawn over the Kennebec. 1983.

²⁷ Southern Kennebec Valley Regional Planning Commission. Augusta to the Atlantic: A Recreational use strategy for the Kennebec River. Jacke, 4.

Post Revolution

The post-Revolution years saw rapid commercial activity and development along the river. The abundance of wood, the waterpower to mill it, and the river to transport it made a perfect combination for a prosperous lumbering business. After the mast trade ended, individual farmers and lumberman ran logs down the river to the nearest sawmill. In the 1820s, extensive spruce forests in the northern region boosted the basin's lumber industry when large lumber and logging associations replaced individual operations. This created the need for organization of log transport from cutting yards to mills. Lumberman and mill owners formed the Kennebec Log Driving Company in 1834 to control all log drives on the river. The company transported an estimated 330,000 cords per year down the river. As wood-pulp replaced rag fibers as the prime material in paper, fir became valuable timber along with spruce and pine, thus increasing the demand for the northern basin's timber.²⁸ Pulp and paper, lumbering, and other wood-consumer industries dominated the region.

The wood industries relied on the power of the river to operate mills for their business. The first of many major human infractions on the river was the construction of the Augusta Dam in 1837. The dam provided power for sawmills, textile mills, and other industry. At one time, any town of size above Augusta had a pulp and paper mill, and some had two. The Kennebec Water Power Company was formed in the late 1800s when hydroelectric power was a new technology. The company operated dams for power and manufacturing, electricity, and flood damage

²⁸ New England River Basins Commission, 23-24. Shows the changes in forestry business and growth of large-scale industry. North Kennebec Regional Planning Commission. The land use element of a

reduction. As many as eleven dams were built on the main stem of the river, including East Outlet Dam at Moosehead Lake, Harris Dam at the foot of Indian Pond, Wyman Dam in Moscow, Williams Dam in Solon, the Upper and Lower Dams at Madison, Weston Dam, Shawmut Dam, and two dams in Waterville, and one in Augusta; nine of these remain today.²⁹

The railroad reached the area in 1848 at Waterville. The Androscoggin and Kennebec line connected Waterville with Lewiston via Belgrade, Readfield, and Winthrop. In 1851, the Kennebec and Portland Railroad reached Augusta. A few years later rails extended from Augusta to Waterville and Skowhegan. The railroad was important in bringing people to the area and supporting industrial activities along the river.

By 1855, Bath was the fifth largest port in the U.S. and shipyards between Gardiner and Waterville produced one half of America's ship tonnage. Richmond was the largest ship-producing business in the country in the early 1800s. Alternative transportation developments hurt the shipbuilding economy around the turn of the century, but the harvesting of ice sustained the river communities. From 1870 to 1919, ice production was huge (640,000 tons in 1880), the product being known as "white gold," or "Kennebec diamonds." The business (Figure 7) brought fame to Maine when blocks of ice were shipped all over the world insulated in sawdust.³⁰ The invention of refrigeration killed the industry, but the memory persists in folklore and popular memory. Remnants of this time of shipbuilding and ice harvesting can be seen from the water, exclaimed a viewer in 1982: "The spectacular homes and

comprehensive plan, 65. This report gives land use history.

²⁹ Calvert, Mary R. The Kennebec Wilderness Awakens, 4, 156.

historic districts of the communities along the Kennebec remain as silent testimony to the wealth and power attained during this period.³¹

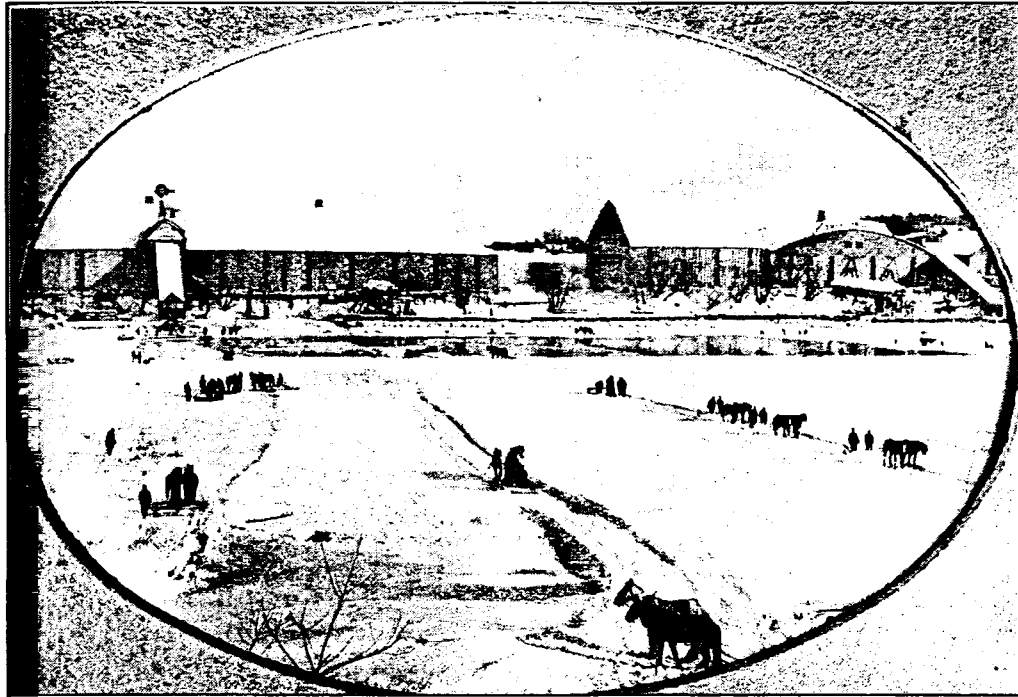


Figure 7: American Ice Company operating on the Kennebec. From Everson, Jennie. Tidewater Ice on the Kennebec River. Freeport, ME: Maine State Museum, 1970.

Lower Basin Activity

The present-day character of the basin was established in the nineteenth century. Industrial development and the site of the State capitol in Augusta (chosen in 1827) brought people to the towns and cities along the southern waterways. The lower basin's wide and rolling valleys and milder climate allowed poultry and dairy production. This reach is still the most heavily developed on the river, with major

³⁰ Ibid. 150.

³¹ Southern Kennebec Valley Regional Planning Commission. Augusta to the Atlantic: A Recreational use strategy for the Kennebec River, 4. This study examines the historic value of the river and how traveling on the river the only way to perceive and enjoy the views of history. New England River Basins Commission, 23. The Augusta Dam was the first major infraction on the naturalness of the

cities at Augusta and Waterville, and heavy industry, such as pulp and paper mills and food processing all along the river. Logging roads did, however, provide good access for recreational use of the river, contributing to the development of tourism in the late 1800s. Resorts sprung up around the river and the lakes, which drew people from all over New England.³² The lower reach of the Kennebec, however, was dominated by industrial uses and was not nearly as wild as up-river.

Upper Basin Activity

The upper basin, with its rugged topography, scenic mountain vistas, vast stands of spruce-fir forests, and pristine waters, drew both business and pleasure seekers. The largest section of the basin (north of Bingham), which includes Moosehead Lake, Dead Lake, Moose Lake, and Carrabassett River, is primarily rural due to the paper companies' purchase of the land for softwood in the mid-1800s. Abundant raw material made pulp and paper production the largest manufacturing industry in the basin. Tourism grew to be a major component to the upper basin's economy, each year drawing thousands of travelers. This area has depended historically upon the maintenance of its natural resource base (primarily private ownership), which continues to be an important element of resource management in the basin.³³

river, wreaking great havoc, and becoming a highly debated issue for many decades.

³² Southern Kennebec Valley Regional Planning Commission. Augusta to the Atlantic: A Recreational use strategy for the Kennebec River, 26-38. New England River Basins Commission. A fine overview of the natural resources reasons for why settlement occurred where it did.

Fish History

The Kennebec River has a tremendous history of fish populations and commercial and recreational fishing activity.³⁴ The Plymouth Pilgrims in 1624 found fish to be abundant in the waters. New England's principal shad stream was the Kennebec.³⁵ The river was once a major Atlantic salmon spawning run, thought by some to be the finest in the country. Thousands of adult salmon swam past Merrymeeting Bay each year to reach the numerous spawning grounds.

Populations of shad, alewives, and salmon supported a thriving fishing industry. Shell-fishing was also a prominent business in the mid-1880s. However, dams for power generation, built in the late 1700s through the nineteenth century, halted anadromous fish migrations. The dams were originally built with fish ways to allow the anadromous species to reach their spawning grounds, but in several cases dams washed away by flooding were replaced by structures without fish passage capabilities.³⁶

The Augusta Dam, built in 1837, had an immediate impact on the fish populations. John Holbrook of Newport reported that by 1839 the alewife run on the Sebasticook (a tributary upstream) had greatly diminished and within a few years was entirely gone. A man who reported catching 500 salmon at Augusta in 1838, stated that by 1850 a good year might bring four or five salmon. At Augusta, a seine that had taken 700 shad in one day in 1822 captured only 3,000 shad for a whole season in 1857. By 1867, the shad industry was a total failure in Augusta. By 1880, only 12

³³ Southern Kennebec Valley Regional Planning Commission. Augusta to the Atlantic: A Recreational use strategy for the Kennebec River, 36-37.

³⁴ Department of Inland Fisheries and Game. Fish Management in the Kennebec River 1969, 11-13.

³⁵ *Kennebec Journal*. Feb 28, 1961.

fishermen worked the sturgeon industry on the lower Kennebec and their catch had declined to 12,000 pounds per year, compared with 320,000 pounds per year in the early 1800s.³⁷

First River Pollution

The natural resources of the river basin were why European people initially settled the area. Water was used for processing, waste removal, power, and transport. The Kennebec River has a large capacity to receive and assimilate adequately treated industrial wastes and therefore offers the region's greatest potential for development of wet-process industries.³⁸ Many of Maine's industries were "wet process" in nature, requiring large quantities of water. The wet industries included pulp and paper, textiles, potato processing, poultry processing, tanning, fishery products, and miscellaneous food processing. They required several millions of gallons of water each day, creating tremendous waste. Because of this, the growth of industry accompanied the increase in water pollution.³⁹

Municipal waste, industrial waste, and log drives seriously affected the water quality and the aquatic organisms it supported as far back as the late 1800s. In 1889, the Fish and Game Commissioner described the river in the following way:

³⁶ Bureau of Water Quality Control. Kennebec Basin Interim Water Quality Plan, 1972. 13.

³⁷ Natural Resources Council of Maine. www.maineenvironment.org, March 28, 2003. The Fisheries and Fishery Industries of the United States, U.S. Senate, 47th Congress (1881-82).

³⁸ Edward C. Jordan Co. Inc. 1969. Maine Water Resources Plan: water supply and sewerage facilities analysis. Vol. 2. Regional Water Resources Plan, 1969. 86. This company conducted many resource reports. It gives historical perspective to point out the central focus water has in Maine.

³⁹ Edward C. Jordan Co. Inc. 1969. Maine Water Resources Plan: water supply and sewerage facilities analysis., Vol. 1. 1969. The river was abused for many years all the way up the year of this source, 1969.

Let anyone explore the river from Waterville to Augusta in the summer. It more resembles the water of a neglected wood-yard than a river....The exploitive nature of the industrialization occurring along the Kennebec in a relatively short time managed to render the Kennebec useless for purposes other than industry and the transportation of pulpwood, sewage and waste. By the turn of the century the once impressive shad, alewife and salmon fisheries had been ruined, clam-flats in the lower Kennebec were beginning to show the ill effects of bacterial pollution, thus threatening the then lucrative shell fishing industry, and the waters itself had become unfit for drinking, swimming or boating.⁴⁰

Industrial Pollution

The pulp and paper industry was the single largest user of the Kennebec waters. They engaged in two activities that contributed to the polluted waters: log driving and waste discharge from the pulping process. The pulping process created the greatest amount of pollution stress on the river. Pulp mills took in large quantities of water and later returned the water full of waste pulp-processing chemicals and woody fibers.⁴¹ These wastes exerted a heavy oxygen demand. Digester liquors from the sulfite pulping process were highly acid (pH 2.0) and the chemicals drew oxygen from the receiving water as they oxidized. This resulted in the growth of fungal organisms called *Sphaerotilus*. This growth affected the river in winter months, clogging screens, trash racks, and sand filter beds. Scott Paper Company's original mill in Winslow was the largest source of this pollution, exerting waste equal to a city of 2 million people. The additional load of wastes with high biological oxygen demand (BOD) wastes caused the dissolved oxygen (DO) levels to plunge to near zero in some stretches in hot weather.⁴²

⁴⁰ Bureau of Water Quality Control. Kennebec Basin Interim Water Quality Plan, 1972. This quote was taken from Foye's work in 1969 on the fish management study which is referenced in this work.

⁴¹ *Ibid.* 5-7.

⁴² Water Improvement Commission. The Kennebec River, a tentative classification report (1959) : with 1966 addendum. Augusta, ME: The Commission, 1967. 7. This source is excellent for environmental conditions, sources, and numbers. BOD is the amount of oxygen that the biological

The river was used for log driving for almost 200 years before the last drive in 1976. Bark and sunken wood accumulation along the route and at the mill caused serious ecological degradation. Robert Foye of the Department of Inland Fisheries and Wildlife wrote that the log drives caused “significant water quality degradation from materials leaching from the woodbark stockpiles on land or in watercourses...the tanning fraction of the leached organic matter from bark deposits reaches values which suggest that they alone may render the water useless as a fish habitat”.⁴³

Other major sources of industrial pollution included textile and food processing industries. The textile industry was once a major polluter, discharging highly toxic waste before the closing of some textile factories and changes in practices and treatment methods. Finally, poultry packing plants dumped chicken parts (entrails, feathers, and legs) and blood directly into the river.⁴⁴

Municipal Pollution

With the increases in population came another serious pollutant: human waste. The river was used for the municipal discharge and treatment center combined, which resulted in high coliform bacterial counts. Most sewer systems in Maine were installed in the late 1800s or early 1900s, and basically consisted of a pipeline over the shortest distance to discharge into the nearest convenient watercourse, in this case the Kennebec River. Little or no consideration was given to the effect of sewage discharge on the watercourse of the area. Bacterial pollution induced by municipal

matter of the river demands to live.

⁴³ Department of Inland Fisheries and Game. Fish Management in the Kennebec River 1969, 43.

⁴⁴ Bureau of Water Quality Control. Kennebec Basin Interim Water Quality Plan, 1972. Water Improvement Commission. The Kennebec River, a tentative classification report (1959) : with 1966

waste forced the closing of many clam-flats for public health reasons. It was not until the late 1960s that towns and cities began building treatment plants for municipal waste.⁴⁵

Nonpoint Pollution

Pollution may be a direct discharge from domestic and industrial waste (point source) or runoff from urban and agricultural land areas (nonpoint sources). The main sources of nonpoint pollution were forestry, construction, agriculture, septic tank sludge, and solid waste disposal. Nonpoint pollution affected the quality of the Kennebec as long as human settlement; however, the intensity and effect of such pollution was related to population increase and development. Nonpoint sources were significant and important to monitor and abate to improve water quality.⁴⁶

1950 Conditions

River basin pollution and disturbances degraded the ecological integrity of the Kennebec River in the nineteenth and first half of the twentieth century. Commercial fisheries were ruined, municipal water supply was threatened, shell-fishing industry was crippled, and water was rendered unsafe and unappealing for swimming. At low flow, obnoxious odors made it unpleasant for boating, and fish populations were greatly reduced due to the river flow change brought on by the dams.⁴⁷

addendum. The river was once extremely filthy and unattractive for the people that lived or worked near it. Dead chicken parts in the river was not exactly considered pleasant swimming.

⁴⁵ Edward C. Jordan Co. Inc. Vol. 1. 36. Sewers were not built to handle high populations. They were very inadequate and had no treatment capacity. The river was overwhelmed by the municipal waste.

⁴⁶ Ibid.

⁴⁷ Bureau of Water Quality Control. Kennebec Basin Interim Water Quality Plan, 1972, 5. The river could not support the amount of pollution and devastating changes brought on by over a century of

By 1950, the river region economy was mostly manufacturing, farming, lumbering, and tourist trades. Pulp and textile mills in Waterville and Augusta, and shipyards in Bath were the more important economic influences. Pollution was highest in the lower reach, mainly as a result of industrial waste (sulphite pulp liquors, sawdust, and wool dyeing and washing), but also from the accumulation of sanitary sewage, which reached a maximum at Gardiner. Shell-fishing was an important industry in Bath, but sewage from the city's 11,260 people caused excessive bacterial contamination and the closing of clam digging.⁴⁸ In 1950, 65,500 people contributed sewage to the river, and 30,000 to its tributaries.

The highly polluted Kennebec River became useless for all public and commercial use other than as a treatment system for pulpwood, a conduit for wastewater discharge, and hydro-power. A river that was once of significant natural and cultural value to the people had become a blemish and embarrassment to the community and the state. But with advances in technology, increased awareness, the involvement of the people, and a more active role for federal and State government, the condition of the Kennebec River was changed in the second half of the twentieth century. The people turned to their State government to get their river back.

human disturbance. It was seen as a major blemish to the people and their livelihoods.

⁴⁸ Department of Health and Welfare, Division of Sanitary Engineering. Report on Water pollution in the state of Maine 1950. Augusta, ME: The Dept., 1950. 50. This was the first major pollution assessment report for the state's waters. It was clearly dominated by disgust and contamination.

CHAPTER 2

ORGANIZATION BY THE PEOPLE

Prior to 1941, no agency in Maine had responsibility for water pollution regulation. However, harsh but consequently unenforceable laws did exist against pollution activities statewide. Between 1820 and 1944, 33 laws were passed to protect state water.⁴⁹ An 1841 statute prohibited

the erecting, continuing or using any building or other place for the exercise of any trade, employment or manufacture which, by occasioning noxious exhalations, offensive smells or other annoyances, become injurious and dangerous to the health, comfort or property of individuals or the public...the obstructing or impeding, without legal authority, the passage of any navigable river, harbor or collection of water or the corrupting or rendering unwholesome or impure, the water of any given river, stream or pond or unlawfully diverting the same from its natural course or state, to the injury or prejudice of others.⁵⁰

In the late 1880s, more laws were passed to control pollution from sawdust, slabs, and similar wood refuse; however, many were repealed because of industrial resistance and their ineffectiveness in controlling grandfathered companies. In 1885, The Lockwood Company in Waterville brought a lawsuit against firms above the mill for depositing sawdust and slabs into the Kennebec River. The decision reads:

Every proprietor upon a natural stream is entitled to a reasonable use and enjoyment of such a stream as it flows through or along his own land, taking into consideration a like reasonable use of such streams by all other proprietors above or below him. The rights of the owners are not absolute but qualified and each party must exercise his own reasonable use with a just regard to the like reasonable use by all others who may be affected by his acts.

⁴⁹ Sanitary Water Board: First Annual Report, 1946. Augusta, ME: The Board, 1946. The Sanitary Board was more of an advisory board than an enforcement agency. It is, however, a major step in what is to come in government involvement in water issues.

⁵⁰ Legislative Research Committee. Second summary report to the 105th legislature. Augusta, ME: The Legislature, 1971. 1.

In 1891, a statute was enacted barring all parties “knowingly and willfully poisoning, defiling or in any way corrupting a water supply for domestic purposes for man or beast”. These charges resulted in either a fine, force of removal, or court order. However, because of the many loopholes, these statutes and rulings were never fully enforced.⁵¹

Sanitary Board Created 1941

In 1941, the Sanitary Water Board was created in response to public concern over pollution in the Androscoggin River. The board recognized that river water served many purposes--water power, transportation for wood products, a haven for fish and waterfowl, a sportsman’s paradise, a refuge for the pleasure seeker, recreational facilities in the form of boating, canoeing, swimming and resting for Mainers and vacationers. The board, organized for the purpose of “controlling, preventing, and abating pollution of state waters,” recognized that action was needed if Maine was to attract industry, protect its agricultural and dairy interests, and retain and enhance its position as the land of remembered vacations. The Sanitary Board concentrated on preventing new sources of pollution and cleaning up and eliminating existing ones.⁵²

By 1945, the board was authorized to license permits to discharge into bodies of water. The function of the board was to study and investigate river conditions, classify them, and recommend ways to improve their quality. But many loopholes

⁵¹ Sanitary Water Board: First Annual Report, 1946, 2-3. The first year of the board had in its report an extensive history of previous legislation. Also, it made it clear that these previous statements were never upheld, and it should be the job of the new board to create new ones and enforce laws. However, it was not until years later when strong and enforceable laws were passed and enforced.

made for a very ineffective pollution control agency. Those establishments already discharging into waters were grandfathered and thus exempt from changing their actions, but the board could deny a permit if the discharge was inconsistent with the public interest. But the ambiguity of what the public interest meant, the lack of specific guidelines relative to water quality standards for receiving waters, and crucial staff and appropriation shortages limited the effectiveness of the board. In 1947, the discharge of most potato parts into waters was prohibited except for potato pulp derived from starch. Also exempt were waste products associated with the manufacture of wood, wood products, and oil.⁵³ In 1946, 76,800 gallons (100 percent) of untreated waste was released into the Kennebec and its tributaries. Firm but reasonable legislation was needed.⁵⁴

As pollution increased in the 1940s, legislation followed. The signing of the Water Pollution Control Act by President Truman in 1948 was a milestone for the nation's water resources, and gave Maine's pollution problem national recognition. Most major waterways in Maine were of no recreational use and some were a health menace. Under growing public pressure and increased federal and state funding, Sanitary Board activity increased.⁵⁵

⁵² Ibid. 1.

⁵³ Legislative Research Committee. Second summary report to the 105th legislature. 1971. Industry was exempt from the discharge laws because public interest was vague and easily manipulated in court, industries had no cost-effective option were allowed to discharge based on the fact that they had been doing it before the laws were passed. The power of the industries was substantial, therefore translating into political power.

⁵⁴ Sanitary Water Board: First Annual Report, 1946. The need to integrate economy and ecology are beginning to be voiced in this early report. This also gains momentum, and this is an early stage.

⁵⁵ Sanitary Water Board: Second Annual Report 1947. Third Annual Report 1948. The second and third year of the board shows growing problems, concern, and multi-lateral involvement in water matters. Momentum continues to build.

Water Improvement Commission 1951

In 1951, the Water Improvement Commission (WIC) replaced the Sanitary Board. It was the commission's job to study and investigate pollution of the rivers, waters, and coastal flats of the state by the deposit of municipal sewage, industrial waste and other substances to evaluate its effect on public health and animal, fish, and aquatic life, and to recommend changes. Its mission was to improve the state's water conditions as a valuable natural habitat and as a common resource for the people. Its mandate suggests that the people of Maine were developing a more sophisticated sense of ecosystem needs at this time.⁵⁶

The State Department of Health conducted the first water pollution control survey in 1950. The report indicated that Maine's waters were highly polluted and suggested that action be taken to control it. In 1951, the first significant pollution control legislation, the classification system, was passed.⁵⁷ State statutes established water quality objectives in a classification system applied to various reaches of the river (Appendix A). The system was used to assure maintenance of at least minimum quality standards with the objective to improve water quality to allow reclassification to higher standards.⁵⁸ The State gradually strengthened its standards so that by 1953, it was unlawful for any person, corporation, municipality, or other legal entity to

⁵⁶ Water Improvement Commission. Second Annual Report, 1953. Augusta, ME: The Commission, 1953. The WIC is now a stronger sector for water regulation in the state. The rhetoric is a good indication of the momentum and collaboration of interests I have been arguing.

⁵⁷ Legislative Research Committee. Second summary report to the 105th legislature. 1971. The classification system was a major step for government. It was clear and effective in the years to come, even up to today.

⁵⁸ Bureau of Water Quality Control. The Kennebec River 1978 Water Quality: an Historical Perspective. Augusta, ME: The Bureau, 1979. This is a very good source giving good historical records of the river. There is not clear, annual documentation on river conditions, but a few reports in the 50s, 60s, and 70s does give an understanding of change and pollution effects.

dispose of any sewage, industrial or other waste in such a manner that would lower the quality of the waters below the minimum requirements of such classification.⁵⁹

First Major Steps by the People

Government was the vehicle for addressing the voice of the people. A 1970 *Maine Times* article pointed out the importance of the State's environmental agency at that time, the Environmental Improvement Commission (EIC): "In fact, there are probably few state agencies in the nation that have such powers to influence a state's destiny."⁶⁰ Local citizens had formed throughout Maine in 1953 as the driving force in a campaign to clean up the state's rivers. They argued that pollution abatement was important to Maine tourism, fishing, hunting, which at that time brought \$275,000,000 into the state annually. Pollution was also a serious threat to public health. A woman from a local parent teacher association stated in 1953 that the "once-lovely Kennebec River" now harbors "killing diseases that threaten our children and adults alike."⁶¹

In his 1955 inaugural address as Governor, Edmund Muskie emphasized the growing concern for State water quality and listed the benefits that could result from stream improvement: "[river improvement] has undoubted advantages as an inducement for new industries to locate in this State." He argued that we [Maine] should "improve our position in this respect as quickly as possible." He felt that clean

⁵⁹ Legislative Research Committee. Second summary report to the 105th legislature. 1971. The first law of the classification system. It was brilliant, because it exists today in basically the same way.

⁶⁰ *Maine Times*. April 17, 1970. People realized how important the environment was for their life-quality and empowered the EIC with their voice. It is recognized that the EIC, through the people, controls the foundation of the state-natural resources and wild spaces.

⁶¹ *Kennebec Journal*. April 2 and May 5, 1953. Citizen activist groups start getting into the mix. They served an important role in educating others of the problems with the river pollution and enlightening them with the positive possibilities that could result from clean up. The word was getting around and people started to question things and take action for the river that was theirs.

water could bring recreation, industry, and revitalize the shellfish industry. However, he understood the need for a multi-lateral front and urged "patience, ingenuity, and cooperation on the part of all those interested will be required before the problem is brought under control."⁶²

In 1961, facing enormous challenges, the people of Phippsburg organized a Maine Water Improvement Association for the purpose of addressing Kennebec River pollution. A *Kennebec Journal* article proclaimed that this effort "deserves statewide applause and support" as the group was "not content to surrender in face of the enormity of the task." The people had had enough: "This proud community near the point where the Kennebec churns into the Atlantic wants to restore the river's noble heritage instead of degenerating into its foul mouth."⁶³

The classification system of 1951 was not applied to the Kennebec until the people made it happen in a 1961 hearing. A hearing room filled with people pleading the case for a clean Kennebec River resulted in the decision to classify the river.⁶⁴ In classifying the Kennebec, the EIC knew it would have heavy opposition from the pulp and paper industries, so it classified reaches near industry as D (suitable for transportation of waste, without creating a nuisance). At this time, industrial waste received some primary treatment, but in most riverside communities industries discharged straight into the river. But when low water flow and major fish kills in the early 60s resulted in odors in the lower river, Governor John Reed admitted: "The

⁶² *Kennebec Journal*. Jan. 7, 1955. Edmund Muskie was a major player in Maine environmental improvement, and later became a major player in federal environmental politics. He was the central proponent for the Clean Water Act of 1972. He grew up along the Androscoggin in Rumford and undoubtedly had personal inspiration from the conditions of the river in forging his position in water clean-up.

⁶³ *Kennebec Journal*. Jan. 11, 1961.

⁶⁴ *Maine Times*. Oct. 10, 1969.

sewer had in fact become a nuisance (conditions so bad that no public use is safe)," and suggested reclassification to class C. Class C required conditions to support recreational boating and fishing, and fish and wildlife habitat.⁶⁵

Governmental Changes

After several revisions and tighter restrictions on pollution control, the Water Improvement Commission became a major state agency in 1967, and changed its name to the Water and Air Environmental Improvement Commission (WAEIC). Water purity statutes were quickly tightened to make classifications more precise and demanding, which included the power to raise the classification of any water area.⁶⁶ At the federal level, Congress enacted the Water Quality Act in 1965 that required states to establish water quality standards, with the approval of the Federal Water Pollution Control Administration within the Department of the Interior. In 1967, Maine revised its laws and classifications to meet federal guidelines.⁶⁷ In 1970, the Environmental Improvement Commission (EIC) replaced the WAEIC. The EIC was then changed in 1972 to the Department of Environmental Protection (DEP). The DEP, which exists today, consists of three bureaus: Air, Water, and Land. The water quality bureau contains seven divisions: municipal services, industrial services, oil conveyance services, water quality evaluation and planning, licensing and enforcement, laboratory and field services, and lakes and biological studies.⁶⁸

⁶⁵ *Maine Times*. May 10, 1974. This shows the early working of the classification system. Industry had strong pull, rightly so since it supported the economy of many of the community members.

⁶⁶ *Ibid.* 12. More organization and collaboration in the regional sector. The screws were being tightened as more levels of government get on board and the people back it.

⁶⁷ Edward C. Jordan Co. Inc. 1969. Vol. 1. 12. Now with the federal government involved, Maine had plenty of pull in enforcing its standards.

⁶⁸ *Maine Times*. Feb. 20, 1970. This article talked about how the EIC replaced the WAEIC, emphasizing how power of government over water in the state was growing. Bureau of Water Quality Control. The Kennebec River 1978 Water Quality: an Historical Perspective. The DEP was the major

Distribution of Power and Control

Regulatory powers over the Kennebec River Basin were extensive and far-reaching, but also collaborative and close to home. The federal government was in charge of the Environmental Protection Agency, which controlled discharge; the Army Corps of Engineers controlled dredging and dams; and the Geological survey conducted surveys and inventories of land and water. Regionally, the New England River Basins Commission oversaw planning, funding and management. At the State level, the DEP supervised water quality, and the Land Use Regulation Commission, Department of Inland Fish and Wildlife (DIFW), Department of Agriculture, and the Bureau of Parks and Recreation oversaw their respective interests.

At the county level was the Soil and Water Conservation District. Locally, there were five Regional Planning Commissions in the basin, each of which dealt with issues of water quality, economic development, recreation, and land use. The 165 municipalities in the basin brought an array of local planning boards that controlled zoning, resource use, land access, erosion control, and sewage treatment standards. The private sector also had a hand in river activities: academic research groups, statewide conservation groups such as the Natural Resources Council of Maine and Maine Audubon Society, lake associations, and citizen and industry advisory groups all played a role in river-related issues.⁶⁹

agency in the state in the green decade of the 1970s. The DEP remains today as a string influence in State policy.

⁶⁹ New England River Basins Commission, 38-42. I thought it would be helpful to show how many people and agencies were involved in the fate of the river. You can sum it up as bureaucracy.

1960s: The Decade of Worst Pollution

Despite advances in the regulatory front, the Kennebec was far from clean and accessible in decade of the 1960s. A 1963 *Kennebec Journal* article on Maine fisheries described the Kennebec as "now lifeless water, saturated with sawdust and bark."⁷⁰ The 1966 addendum to the WIC Kennebec River Classification Report determined that pollution on the Kennebec had "never been paralleled in its severity." Fish kills occurred in 1947, 1957, 1963, and 1965, and odors were prevalent for over four years. Oxygen depletion, scums, sludge blankets, and odors characterized most of the river. This report became famous for characterizing the river as an "open sewer."

The reason for the highly polluted condition was increased industrial discharge, especially from pulp and paper mills. Scott Paper Company increased its production by 90 tons and Hudson Paper Company increased its 15 tons, causing an increase of 58,000 pounds of biological oxygen demand (BOD) daily. From Madison to Waterville, coliform bacteria was high, and floating, suspended, and settleable solids were a problem. The river from Madison to Skowhegan was classed D quality because bottom deposits caused problems for fish and other aquatic life. Skowhegan to Waterville was class C, but low dissolved oxygen (DO), high bacteria counts, and significant amounts of floating and suspended matter between Waterville and Augusta made that stretch class D, and nuisance conditions existed below Augusta.⁷¹

Nonetheless, the river is important to many people and cooperation and collaboration is key.

⁷⁰ Ibid. The fisheries on the Kennebec was a series of articles describing how great the fisheries once were and how in 1963 they are in very bad shape. The article makes reference to the past accounts of the vast fishery as being one of the best in the world.

⁷¹ Water Improvement Commission. The Kennebec River, a tentative classification report (1959) : with 1966 addendum, 8. This report gave the hard facts on the devastating effects that had resulted on the river from human use over the years. It was firm in declaring that 1966 was the worst the river has

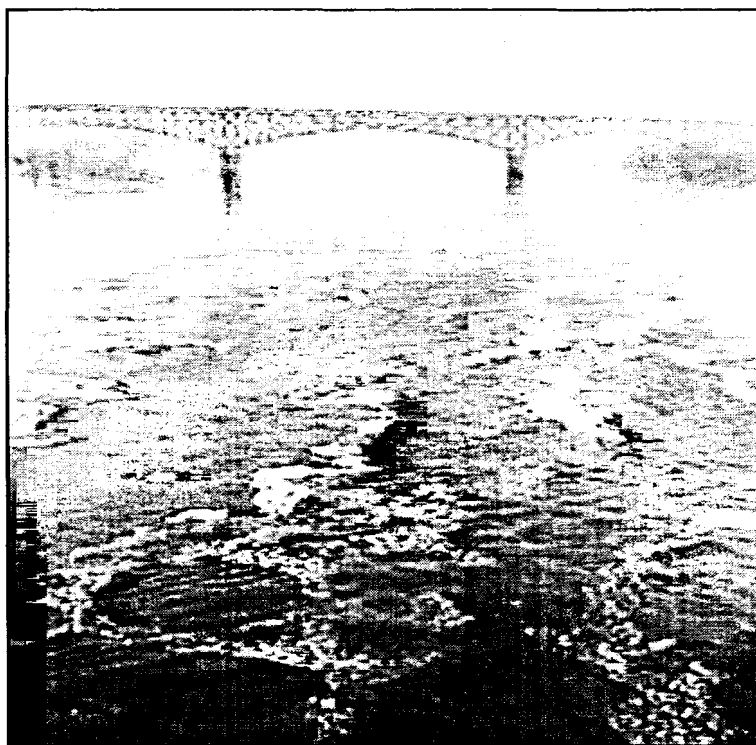


Figure 8: Foam from an upstream paper mill in Augusta. From www.mainerivers.org. Photo by D.S. Miller.

The Kennebec River basin human population in 1970 was 160,000. Textiles, tanning, milk and food processing, as well as the ever present pulp and paper operation left the basin waters in a condition well below many of their established classifications. In the north, above Skowhegan, the flow was regulated by the Central Maine Power Company's operation at Wyman dam. The Kennebec River Pulp and Paper Company at Madison, Hartland Tannery near the Sebasticook basin, and several chicken and milk processing operations were major pollution dischargers. But the most polluted area was the 35-mile stretch from Waterville to Gardiner. Pulp and paper mills, textile operations, meat and poultry processors, along with

ever been.

municipalities of over 20,000 people with no sanitary waste treatment overwhelmed the capacity of the river.⁷²

The subsequent reaction from the community increased political pressure on the EIC in the later years of the 1960s. A farmer from Dresden complained "pollution has upset the balance which nature created for his river." He expressed anger and contempt that his pastimes of feeding ducks, smelt fishing, and watching kids swim in the water were no longer possible. The slimy and mucky river bottom depleted the oxygen necessary for wild rice growth, and the ducks disappeared. He complained that gnat-like flies and foul smells made his yellow house paint turn muddy and deprived him of sleep.⁷³ A concerned citizen wrote in the early 1970s that the river could provide a fascinating trip with enormous recreation potential if it was not the "the recipient of untold amounts of sewage outflow." Instead, the river was "brownish and uninviting," with a "noticeable amount of foreign matter [and] countless small shapeless globs floating down toward Merrymeeting Bay."⁷⁴

People Envision a Clean River

If government leaders were to abate pollution, especially when powerful industries were involved, they needed to be convinced of the benefits of such a pursuit. Were the benefits of pollution abatement going to exceed the costs of such abatement? This was the central issue in the battle that ensued over the Kennebec River into the 1960s and the 1970s. Senator Jon Lund voiced this theme: "It's time

⁷² Bureau of Water Quality Control. Kennebec Basin Interim Water Quality Plan, 1972. This was the last report before the river began to seriously improve.

⁷³ *Maine Sunday Telegram*. Jan. 7, 1968.

⁷⁴ *Maine Times*. Oct. 7, 1975. The battle to clean up the river was in full swing in the mid-70s, with much emphasis on how the foulness of the river takes so much away from the people.

the state recognize the potential value of the Kennebec and convert it from a liability into an asset."⁷⁵

The WIC in 1961 proclaimed that even a little upgrading of the Kennebec waters could bring significant advantages. One such advantage was nostalgia; to return the river to its conditions of long ago.⁷⁶ A citizen described the nostalgic potential of floating the river: "Then one could imagine a simpler time, salmon and Arnold's expedition to Quebec, through a country in which a river like this was not just a corporate asset or an open sewer."⁷⁷ The potential for beauty and aesthetics was also a major component of the argument. A 1963 resident urged this aspect: "Scenically, the Kennebec from Augusta to the sea is beautiful indeed." He stated that Maine had great "vacationland potential" and clean water could "give Maine's economy a boost that's impossible to estimate."⁷⁸

Fishery Potential

People voiced hope that the river would some day return to conditions similar to the year of 1867, when 180,000 shad were caught. They saw this hope for a renewed fishery as a way to help Maine attain greater economic stabilization. A fisherman said in 1963: "With fishways past the dams, and cleaned-up rivers, Maine could regain much of this business that's been sacrificed to "Progress."⁷⁹ Anglers noted that if clean, the Kennebec River "would support bass, perch, pickerel, suckers,

⁷⁵ *Waterville Sentinel*. Dec. 3, 1968. The potential value of the Kennebec for the people of Maine was a major driving force in the fight for its revival. It made the cause personal, meaningful, challenging and worth pursuing.

⁷⁶ *Kennebec Journal*. Feb. 28, 1961. Many aspects of clean river benefits were voiced in the battle for the river in the 60s.

⁷⁷ *Maine Times*. Oct. 4, 1975. Nostalgia is part of human values, and the river is focal point for important history.

⁷⁸ *Kennebec Journal*. Feb. 27, 1963. This was part of the series on Kennebec fisheries.

⁷⁹ *Ibid.* Feb. 27, 1963. This is another article in the fishery series on the Kennebec.

etc...and if proper dissolved oxygen levels were maintained, striped sea bass would provide sports fishery.”⁸⁰

Ecological Importance

Not only would clean water support fish habitat, but it would maintain the ecological integrity of the biological community. Habitat protection and management was critical to more abundant and healthy fish, waterfowl, and wildlife. Habitat was also significant to people. People valued fish, birds, and wildlife, which they equated with overall life quality. To ensure habitat protection, people wanted game sanctuaries, preserves, and wildlife management areas in balance with regulated hunting, fishing, trapping, water levels, distribution of food and cover, and other public use.⁸¹

⁸⁰ Ibid. Feb. 28, 1961. Fishery potential was a convincing argument because of the large amount of people interested in such activity.

⁸¹ New England River Basins Commission, 97. Habitat for all life was an idea I think the people were conveying without really knowing it. It appears that way in retrospect.

Natural Beauty

The people also wove aesthetics into their arguments. An Augusta native took a five-hour boat trip on the river and described the experience from the water:

Once afloat on the river, a whole new world opened which seemed unimaginable...on a broad flowing river, shepherding, literally herds of ducks, gannets and even great blue herons before us on our southerly journey...banks angling sharply down from the high hills which form the Kennebec Valley...no impression of road at all and very little of human existence...steep wooded hillsides which muffled to the vanishing point the expected sounds of automobile traffic, chain saws and other human activity...occasional small rapids, surprising number of birds...looking up at the hills and along the imposing river valley through which the Kennebec flows...finally rounded a bend to straight mile-long stretch revealed the church spires of Augusta and the dome of the capitol against the sky, over the hills...The mills were not yet in sight and the impression was very like that of a picture postcard...fascinating, worthwhile trip, What a trip it would be if the river were clean.⁸²

Recreation Potential

Despite the persistent demand for fisheries, ecological integrity, habitat, or natural beauty, corporate and economic arguments were still a major, if not the most important factor in the debate. Many people felt that recreational business would eventually have the greatest economic benefit. The recreation lobby was strong because it combined an appeal to individual access and enjoyment of the river with a promise of business-oriented growth. The Salmon Restoration Commission in 1969 projected that clean water could provide "for the near future a vast scenic area opened up to recreation and its attendant service enterprises including motels and restaurants, supply stores, fishing camps, picnicking, canoeing, summer cottages and increased land values -- all without the drawbacks of toxic fumes or industrial pollution."⁸³

⁸² *Maine Times*. Oct. 4, 1975.

⁸³ *Maine Times*. May 23, 1969. Salmon Commission was pushing its own interests for Salmon restoration. They pushed the positives the clean river would provide to enhance the case for clean-up;

The Kennebec Valley north of Augusta had wild stretches that the clean-up effort would make desirable for recreational use. The stretch of the Kennebec between Augusta and Waterville was in 1974 considered a prime area for residential development and low-impact recreation such as fishing, hunting, canoeing, and hiking. It was a 15-mile corridor of relatively undeveloped shoreline with thick forests, ducks, geese, songbirds, and upland game.

Lakes in the Kennebec basin also suffered from river pollution. Lake towns depended on water quality for their economic base in recreational use.⁸⁴ The North Kennebec Regional Planning Commission (NKRPC) 1970 Progress Report suggested that the best land usage for the region for every interest was recreation.

Other Economic Potential

The Kennebec River was a focal point in community development. As far back as 1961, people envisioned that a clean river could increase property values along the banks, provide an attractive asset to present and future industry, and at the same time assure future citizens a useful and economic natural resource.⁸⁵ The rafting industry saw great economic potential in the white-water rapids of the upper reach, promising a return of \$2 million a year.⁸⁶ A concerned citizen stated, "The rafting and canoeing business is the type of economically beneficial, non-polluting enterprise that we in Maine should welcome...[it will bring] pleasure and profit for future generations."⁸⁷

it was in their best interest.

⁸⁴ North Kennebec Regional Planning Commission. *Progress Report, 1969-1970*. Waterville, ME: The Commission, 1970. 54. *Maine Times*. Dec. 13, 1974. The Kennebec River Corridor Plan was commented on and was documented as stating the recreational potentials of the river as very good.

⁸⁵ *Kennebec Journal*. Feb. 28, 1961.

⁸⁶ *Maine Times*. Aug. 19, 1977.

⁸⁷ *Ibid.* Aug. 10, 1978. This rhetoric was seen from the 60s even up to today. The origins were from

Maine as Special Place

Maine people began to see the connection between a healthy environment and a healthy economy. This sentiment was expressed in a WIC statement: "If Maine industry won't keep Maine waters clean, then it's not the kind of industry that's right for Maine." A 1968 *Maine Times* writer also reflected on the idea: "That was a radical idea a decade ago; a radical speech five years ago. But now it just about represents what many Maine people are thinking."⁸⁸ Citizens became involved in public debates over issues of industry, development, and environmental health. A concerned Mainer stated in 1970 that economic development and environmental preservation are "not incompatible"; and economic growth could proceed without "tearing apart the delicate wilderness quality for which our state has been noted."⁸⁹

A 1969 Gallop Poll showed that 85 percent of Maine people surveyed were concerned about the state of the environment; of that 85 percent, 51 percent were deeply concerned about water pollution and 75 percent were willing to pay additional taxes to improve natural surroundings. The following quote from State Representative Peter Kyros in 1969 sums up what Mainers were thinking at this time: "Maine's citizens are certainly more aware than residents of most other states about the problems of water pollution. Perhaps this is because our natural environment has remained unspoiled, to the extent that we do not regard pollution as inevitable."⁹⁰

the 50s and 60s.

⁸⁸ *Maine Times*. Oct. 24, 1968.

⁸⁹ *Lewiston Evening Journal*. Jan. 15, 1970.

⁹⁰ *Maine Times*. May 10, 1974. The quote from Kyros is from 1969, in compliment of the gallop poll

In order to protect their river resources, environmentally conscious state planners and conservationists advised river development programs to protect against over-development and population pressure once the river was clean and desirable. The Kennebec Valley Conservation Association took initiatives to protect the river corridor in the most complete way. Their objectives in 1970 were to "foster the orderly development of the recreation and industrial potential of the valley; eliminate industrial and municipal pollution from the river and its tributaries; to eliminate use of the river for storing and transporting pulpwood; develop adequate public camping areas; establish "wild areas" to be preserved forever."⁹¹

People Come Together

In the late 1960s the Kennebec River played a major role in the economy in the Kennebec Valley. However, some areas of the river were taxed to their capacity to handle the amount of discharged waste. To avoid nuisance conditions, the State took action to restrict discharge from industry and sanitary plants. Better treatment discharges from pulp and paper companies were imminent, as were treatment facilities for industrial and sanitary wastes in Waterville, Augusta, and Winslow.⁹²

results. Mainers established their position by the beginning of the 1970s.

⁹¹ *Kennebec Journal*. Dec. 4, 1969. River Corridors are being discussed at this time for Maine rivers. Corridor projects were aimed to protect the entire river under one comprehensive umbrella plan. *Morning Sentinel*. Feb. 27, 1970. The KVCA was one of many other groups that formed to look out for what is best for the people in regard to the river.

⁹² Water Improvement Commission. The Kennebec River, a tentative classification report (1959): with 1966 addendum, 16.

The willingness of Maine citizens to take action was the key to Kennebec River revival. A 1969 fish management study stated that:

Management of the fishery resources in the drainage cannot be fruitful without the willingness of Maine citizens to support and cooperate in programs designed to improve habitat and living conditions for aquatic life. . . . Maine citizens must take positive action to prevent further despoilment of the Kennebec's natural resources. . . . Water serves man's many needs in many ways. Water must be shared, money must be spent to abate pollution, and constructive thinking must replace the negative thinking of those who are willing to be intimidated by the question, "Would you rather have pickerel or payrolls?"⁹³

The goal of the people was multiple-use, where no usage of the river excluded another. Besides tremendous recreational and economic potential, a clean river promised other advantages, such as protection against water-borne diseases and decreased cost of water treatment.⁹⁴ A 1969 state report sums up the State's position towards its water resources:

While it must be recognized that it is impossible to support civilization without the creation of pollution, or changes in water quality, the degree of pollution must be limited to that consistent with legitimate usage of the water resource and provision of a desirable human environment. Limiting water pollution through the optimization of the many varying demands on the resource while maintaining both economic development and a desirable environment must be the goal of the states water pollution program.⁹⁵

A 1966 report estimated that \$45 million dollars was needed for pollution abatement on the Kennebec. State legislators responded to the priorities people expressed and spent accordingly.⁹⁶ The people wanted change; they made their case, and they were willing to fight for it.

⁹³ Department of Inland Fisheries and Game. Fish Management in the Kennebec River 1969, 51. The battle over the river had a lot to do with nature vs. economy. Payroll or pickerel? The challenge and solution would require both.

⁹⁴ Ibid. 30.

⁹⁵ Edward C. Jordan Co. Inc. 1969. Vol. 1, 45.

⁹⁶ Department of Inland Fisheries and Game. Fish Management in the Kennebec River 1969, 40.

CHAPTER 3

PICKEREL AND PAYROLLS

The late 1960s and early 1970s were years of reckoning for the Kennebec River. Intense lobbying through the legislature and in the media culminated in a vibrant campaign to change the condition of the river. Senator Edmund Muskie commended his state: "Maine has a chance to lead...in spite of its water pollution problem, Maine has an advantage: we are not caught up in the rapid concentration of population which has resulted in virtual destruction of our natural resources in other parts of the country."⁹⁷ The southern commission described the clean-up campaign by saying "far sighted and responsible Maine citizens turn back their rivers in the 1960's, reclaiming their heritage with some of the first and strictest water clean-up laws in the nation."⁹⁸ Three anti-pollution bills passed in 1969 by the 104th legislature, An Act Creating Civil Liability to the State for Pollution of Waters, An Act Revising the Water and Air Environmental Improvement Laws, and An Act Relating to the Water and Air Environmental Commission, were described as saving the state "from the crunching forces of rampant progress and haphazard development that have burned up so much of the eastern seaboard to the south."⁹⁹

Clean Water Act of 1972

Water quality legislation at the federal level was initially implemented in response to concern for public health. Urban water supplies had come from the same source of water that was used for municipal waste discharge, but raw sewage

⁹⁷ *Maine Sunday Telegram*. Feb. 15, 1970.

⁹⁸ Southern Kennebec Valley Regional Planning Commission. Augusta to the Atlantic: A Recreational use strategy for the Kennebec River, 12.

⁹⁹ *Maine Times*. May 9, 1969. The 104th Leg. was the government that moved Maine in the right

discharge needed to be proven as harmful in order for action to be taken by cities, and very little data had been collected to prove and warrant change. Sewage treatment did not receive much attention until New Deal public-works programs in the 1930s, and most cities did not take action until funding became available in the early 1960s.¹⁰⁰

After World War II, industrial waste discharge into rivers became a major concern, as did its effect on aquatic life. In 1961, the Public Health Service began to issue annual reports on fish kills attributed to industrial discharge. But, federal efforts to study the effects of industry on aquatic and human health met stiff resistance from industry in the 1960s. An industry-dominated committee as part of the federal Bureau of the Budget delayed the collection of discharge data for eight years. The federal government did not have legal authority to require discharge information from industry until the Clean Water Act of 1972.¹⁰¹

In response to concerns for lack of scientific expertise in water pollution research and management, control was placed under the jurisdiction of an assistant secretary in the Department of Health in 1965, and then transferred in 1966 to the Department of the Interior. Within these changes, streams were not only a concern for water sources, but also for in-stream uses and quality. Swimming, fishing, and protection of the aquatic environment required high water quality standards.

direction.

¹⁰⁰ Hays, Samuel P. Beauty, Health, and Permanence: Environmental Politics in the United States, 1955-1985. New York: Cambridge University Press, 1987. 76-79.

¹⁰¹ *Ibid*, 78.

Most streams were considered important in the 1920s for waste disposal, with very little concern for their value as recreational and aesthetic resources. The prevailing sentiment in the 1960s was that waste disposal was no longer a legitimate use of the stream, and the Clean Water Act of 1972 reflected that opinion. Rising public interest in water pollution ultimately led to the federal legislation, and technology standards greatly enhanced the effectiveness of the Act. The Act had emphasized municipal and industrial discharges, but it also made clear that nonpoint pollution was a significant cause of water pollution. Attention turned to nonpoint sources after the control of point sources improved.¹⁰²

The Federal Water Pollution Control Act of 1970 and the Federal Water Pollution Control Act Amendments of 1972, known as the Clean Water Act, was primarily formulated by Maine Senator Edmund Muskie. Muskie was a major player in Washington at this time as one of the leaders of the Clean Water Act campaign.

The federal Act was aimed at

restoration and maintenance of chemical, physical and biological integrity of nation's waters; with national goals for achievement of objective that includes discharge of pollutants eliminated by 1985, water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water by 1983, discharge of toxic pollutants in toxic amounts be prohibited, federal funds for waste treatment works for public, develop and implement waste treatment management planning to control source of pollutants in each state, major effort for technology development to eliminate pollutant discharges, and develop control programs for all pollution sources.¹⁰³

¹⁰² Ibid, 79.

¹⁰³ Federal Water Pollution Control Act 1972. Congressional declaration of goals and policy. 33 USCS 1251. Washington DC: U.S. Government Printing Office, 1972. This was the piece of legislation that saved the nation's waters. This is the most powerful agent of change and is the most important action taken to improve the Kennebec.

The Act was also very clear on where the regulatory power would rest: the state. Maine was called to develop water quality management plans for all navigable rivers in the state. The governor of Maine designated the Department of Environmental Protection, Bureau of Water Quality Control, to develop such plans. The DEP was responsible for submitting an annual state strategy to the United States Environmental Protection Agency containing the following:

- 1- A State-wide assessment of water quality problems and the causes of these problems.
- 2-A listing of the geographical or discharge priorities of these problems.
- 3-A listing of the priorities and scheduling of permits, construction grants, basin plans, and other appropriate program actions.

The Kennebec River assessment noted poor DO levels (between zero and one) and a coliform problem.¹⁰⁴

The Water Quality Bureau was the largest office in the DEP in 1972, with over \$600 thousand in state funds and \$160 thousand in federal funds.¹⁰⁵ This helped to fund municipal treatment facilities to reduce waste discharge to levels required by the state and federal governments. Plans were made for construction and collaboration of municipal district treatment facilities. This was the major step in returning the Kennebec to the people.

Log Drive Case

Another significant action taken to regain access of the Kennebec came in the termination of log drives. Logs had been transported on the Kennebec for over 200 years, and many people considered it a local tradition (Figure 9).

¹⁰⁴ Bureau of Water Quality Control. Federal Water Pollution Control Act Amendments of 1972. Title III, Section 303(e), Augusta, ME. The Bureau, 1973. The State and the federal government reinforced each other in the pro-environment stance of the 1970s.

¹⁰⁵ Ibid.



Figure 9: Logs and a steamer float pass Nahumkeag Island. Picture taken by Analdo English on Sept. 10, 1916. From Grant, Gay M. Along the Kennebec: The Herman Bryant Collection. Dover, NH: Arcadia Publishers, 1995.

The potential value of a log-free river was important: it offered economic gains in recreational business and increased riverfront property, and human gains in improved access, aesthetics, and pride. But the effect of ending the drives was a complex issue--assessment of the ecological factors in water quality, aquatic life, riparian zones, watershed, as well as human interests in economy, access, nuisance, health, and safety needed to be evaluated. Cost was also an important consideration--the cost for industry to transport logs by truck and the cost to clean up the decades of log deposits. Overcrowding the Maine highway system was also a serious concern. Despite the growing concern among citizens, little was done until the 1970s.

The story of ending the log drive begins with environmentalist Howard Trotsky. As a University of Maine aquatic biology graduate student in 1968, Trotsky studied trout in the Kennebec just below Wyman Dam. He noticed significant trout population declines and attributed it to the log drives and associated bark deposits. Being a transplanted Mainer (originally from New York) with a house on the

riverfront, Trotsky used his riparian rights to initiate legal action against the largest contributor to the log drive, Scott Paper Company. Despite being called a radical conservationist, he gained significant public support when he sued the company in November of 1970 to have the logs removed. His case rested on the fact that he had the right to take his boat down river without hazard to navigation.¹⁰⁶

The subsequent debate over log drives became a major controversy. Some people argued that the log drive was a valued tradition, but Trotsky considered this aspect to be “over long ago...by now a yearlong drive, completely mechanized, nothing romantic about it...the wood industry had simply outgrown the river.” Trotsky insisted that the people wanted the rivers cleaned up; methane gas emissions and the clogged up river prohibited public access. In an interview in 1970, he stated that the “River benefits people. Stock the river with fish, construct campgrounds, allow canoeing. This is one of the most beautiful stretches of river in Maine. We can’t allow one company to spoil the river for everyone else. This is the time to clean up river and stop the drive.”¹⁰⁷

The Kennebec Log Driving Company deposited large quantities of bark and sunken logs in the rivers, contributing substantially to the pollution load. Almost 2 percent (12,000 cords) of wood fell to the bottom of the river each year. The drive lasted from the ice-out until late August. Log-jams and booms (Figure 10) prevented

¹⁰⁶ *Bangor Daily News*. Sept. 9, 1995. Howard Trotsky was a Maine Senator for 8 years. Last Log Drive on the Kennebec. Maine. Public Broadcasting Channel, 1976, Videocassette. This video depicts the Trotsky battle and all the factors that went into the debate. It was considered a great victory for the environmentalists.

navigation by boat for fishing, waterskiing, waterfowl hunting, and other recreational uses.¹⁰⁸

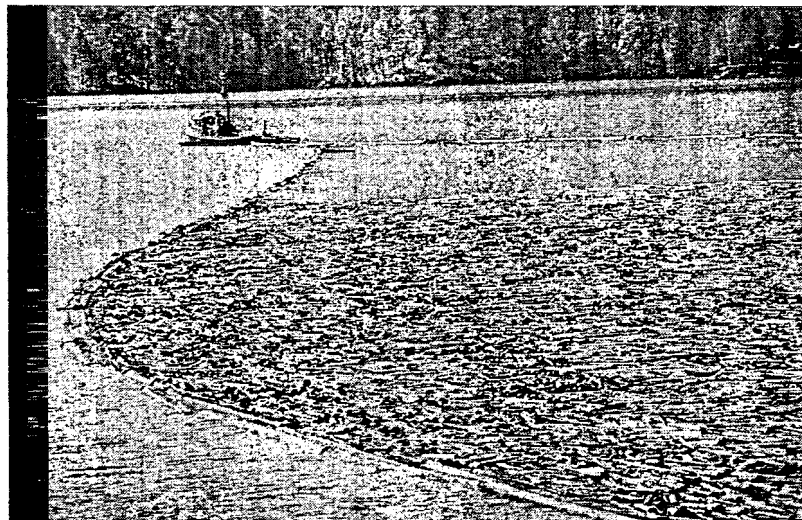


Figure 10: Log Boom. From Calvert, Mary. The Kennebec Wilderness Awakens. 1986.

The accumulation of sunken pulpwood logs affected water quality and the physical structure of the habitat; it introduced bark and wood fibers to the sediment, and it influenced biomass, composition, and distribution of benthic macro-invertebrates.¹⁰⁹ Wood bark leaching caused water quality degradation from organic and inorganic materials, which lowered DO, and changed the color, odor, alkalinity, and acidity in the water. One waste bark pile at flow of 4,000 gallons per minute carried at least 9,500 pounds per day of oxygen demand to the receiving waters, greatly lowering available oxygen for aquatic life.¹¹⁰

¹⁰⁸ Legislative Research Committee. Report on waterway use for logs and pulpwood to the 105th legislature. Augusta, ME: The Legislature, 1971. 25-30.

¹⁰⁹ Eiler, Paul. "Effects of Sunken Pulpwood Logs on the benthic habitat and macro invertebrates in Wyman Lake, a reservoir on the Kennebec River. Maine." (masters thesis, University of Maine. n.d.) 1986.

¹¹⁰ Legislative Research Committee. Report on waterway use for logs and pulpwood to the 105th legislature, 33-36.

Log drives were detrimental to the Kennebec fish populations. Bark deposits and sunken pulpwood on the riffle areas and in the deeper pools made the habitat unsuitable for spawning, for nursery areas for juvenile fish, and for cover for both juveniles and adults. Wood deposits also decreased insect populations and other fish food.¹¹¹ A local resident complained that the river "once was excellent salmon fishing here but, after the big sluiceway went in, the salmon gradually went away and the salmon fishing is no longer good."¹¹² Siltation and bank erosion was another problem. Bulldozing and outflowing logs back into the Kennebec caused bank erosion and siltation on the river bottom, and camp owners were deprived full use of their beaches and waters fronting their camps.

Logging and pulp and paper industry spokespeople argued that they had molded their operations around the flow and characteristics of the river for many years. Companies built structures around the use of the river as means of transport to mill (Figure 11).

¹¹¹ Department of Inland Fisheries and Game. Fish Management in the Kennebec River 1969, 43.

¹¹² *Waterville Sentinel*. Jan. 20, 1971. People had a major problem with the log drive, and their opinion was very important.

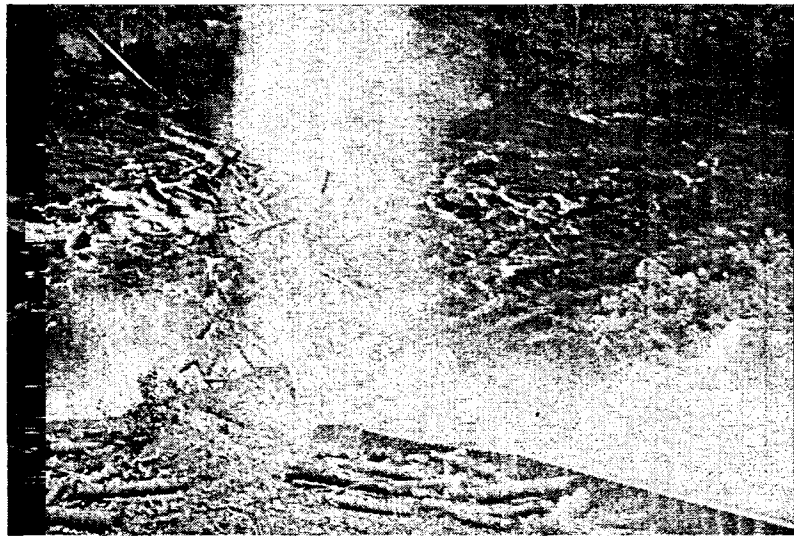


Figure 11: Logs being shot down the river to the mill. From Calvert, Mary. The Kennebec Wilderness Awakens. 1986.

Halting log drives would complicate all phases of operation between the forest and wood preparation facilities. They also argued that truck traffic would be a problem on Maine roads, fuel for the trucks would be costly, and the trucks would emit pollution. Despite these concerns, the Maine Legislative Research Committee decided that the log drives be subject to legislative debate, particularly at a time of landmark environmental laws and when municipal pollution abatement facilities were being planned.¹¹³

Science and public opinion supported the Trotsky case, and legislators were convinced to act on the issue. The Maine Legislative Research Committee noted that “a large segment of concerned citizens who felt that the Kennebec River, being a principal artery of the State some 200 miles in length, has unlimited recreational and business potential but as it exists today due to pollution by pulp, sawdust and bark

¹¹³ Legislative Research Committee. Report on waterway use for logs and pulpwood to the 105th legislature, 33-55. This report assessed public opinion and delivered those concerns to the legislature.

deposits and logging operations, it is closed and locked away from use by the public.” In response to public opinion and the pending court case, the State of Maine passed an Act in 1971 prohibiting log drives. “An Act Phasing out Log Driving in the Inland Waters of the State” stated that “no person, firm, corporation or other legal entity shall place logs or pulpwood into the inland waters of this State after October 1, 1976 for the purpose of driving the same to pulp mills. Also for the purpose of storage or curing the same, or for other purposes incidental to the processing of forest products.”¹¹⁴ This was considered a major victory for environmentalists, and praised by Ralph Nadar as a symbol “in the young environmental movement of the triumph of the little guy over the corporate giant.”¹¹⁵

Legislators were sympathetic to the notion that since a good deal of money was to be spent in other water improvement means, it seemed only logical to stop the log drive and contribute to the clean-up effort rather than go against it. Momentum between and among different water improvement efforts fed off each other and snowballed as the public and government pushed for a clean and accessible river in the 1970s.

The federal government brought a suit against the Kennebec Log Driving Company and reinforced the termination of the log drives by 1976. The Kennebec Log Driving Company had been exempt from the Rivers and Harbor Act of 1899 (which forbid obstruction to navigability, construction of boom, deposition of refuse matter and floating of loose timber and logs) because it was the principal form of

Also, extensive ecological reports were supplemented.

¹¹⁴ Public Laws. An ACT Phasing out Log Driving in the Inland Waters of the State. Title 38, Section 418, Chapter 355, 602. Augusta, ME: The Legislature, 1971.

¹¹⁵ *Bangor Daily News*. Sept. 9 and 10, 1995.

navigation on the Kennebec River. The log driving company was defeated in 1973 based on its breach of the Rivers and Harbor Act of 1899. Trotsky convinced the court that people had a right to navigation access, and this superceded log drives as the principal form of navigation.

In addition, log drives also did not comply with the Clean Water Act, due to pollution caused by log refuse. The company appealed the case two years later but was denied. They were initially ordered by the federal government to submit a plan “for the restoration of the Kennebec River to it natural condition,” but after it was deemed uneconomical to remove the enormous amount of debris in the river from decades of deposits, it was not ordered by the court. It was also determined that the removal of such objects (estimated at almost 2 million cords) had the potential to cause even greater environmental damage due to the new environment and habitat that decades of debris had provided for aquatic organisms.¹¹⁶

Industrial Waste Action

Once the treatment facilities for municipalities were underway and the log drives ended, the last major obstacle in the restoration effort of the Kennebec was industrial waste. In 1973, The U.S. Environmental Protection Agency (EPA) and Maine DEP assessed the largest pollution source on the river, Scott Paper Company. The agencies ascertained that Scott discharged 33 million gallons of untreated waste a day containing about 437,000 pounds of BOD and 44,000 pounds of suspended solids. In a public hearing application by Scott Paper Company to discharge in the Kennebec River, officials decided that the company would discontinue industrial

¹¹⁶ Kennebec Log Driving Company vs. United States. Civ. No. 12-77. March 7, 1973. Kennebec Log Driving Company vs. United States. Appeal, Aug 7, 1975.

waste discharge and spent sulfite pulp discharge by October 1, 1976. Scott built new pulp mills in Fairfield and Skowhegan to replace the mill in Winslow. The mills conformed to state and federal regulations by developing sophisticated systems to treat effluent discharge. In accordance with the Clean Water Act of 1972, the EPA issued Scott a permit to discharge treated waste. This translated into reductions of 400,000 pounds per day of the BOD (less than about 9,900 lb per day) and 90 percent of the suspended solids in the Kennebec River; a 70-80 percent decrease in total waste.¹¹⁷

Advances in waste treatment technology enabled the paper companies to effectively meet state and federal requirements, while at the same time maintaining cost-effectiveness. The new Scott mill used conservation and environmental control methods such as sulfate pulping process, known as kraft to the industry. They used highly efficient recovery techniques to collect and incinerate the non-fibrous constituents and working chemicals from the processing of kraft. The effluent load from this process was low and amenable to conventional primary and secondary treatment processes.¹¹⁸ Despite the large costs of construction (\$25 million), the technological advances of switching from sulphite to kraft processing and the installation of screens to collect wood fibers from waste discharge were profitable to the company. The kraft process dumped 50 percent less organic pollution, and the metal recovery cut down another 90 percent. A *Maine Times* article reflected the

¹¹⁷ State of Maine Department of Environmental Protection and U.S. Environmental Protection Agency. Public hearing application of Scott Paper co. to discharge in class C Kennebec River. 1973. Department of Environmental Protection. Application by Scott Paper Company for an air variance and to discharge into the Kennebec River. Augusta, ME: The Dept., 1973. The company was forced to adhere to regulations, which translated into the modernization of their system.

¹¹⁸ Department of Environmental Protection. Application by Scott Paper Company for an air variance and to discharge into the Kennebec River, 7-14.

excitement of such improvement: "this happy coincidence that at least some of the paper industry pollution can be reduced profitably poses one of the best reasons for optimism that the Maine rivers have a chance of being restored."¹¹⁹

Scott's pulp and paper facilities implemented extensive environmental measures in their new mill construction plans. The company took into account soil erosion and sediment control (complying with U.S. Soil Conservation Service and the Soil Suitability Guide for land use planning in Maine), site drainage, water, solid wastes, air, noise, visual and aesthetic impact, air space, navigation, flood plain, and lighting. They even produced a brochure that emphasized their commitment to the environment. It read: "At Scott we care...Scott Paper Company is deeply concerned about the total environment, and about the needs of future generations." This statement was alongside a picture of a little girl holding up a flower. "We are committed as a company to respond positively to the ecological and social problems and opportunities of our times. As a result, the sportsman, conservationist, and recreationists can share with the forest products industry the enjoyable benefits that accrue from modern forestry practices."¹²⁰ This was as much as sign of the environmental decade as it was a push to project good business in the community and the government.

Scott Paper Co. was adamant that their new facility would have a positive economic effect on the central Maine region; they were right. The new facility resulted in a net increase in employment in the area, with construction alone employing over 1,300 people at its peak. New industrial jobs created additional

¹¹⁹ *Maine Times*. April 17, 1970.

¹²⁰ Scott Paper Company. Proposed northeast pulp mill, Scott Paper Company: Fairfield-Skowhegan,

employment opportunities within the service and retail jobs as well. This was referred to as the “multiplier effect” or “spin-off”. The newly created jobs added to the economic stability and vitality of the entire region.¹²¹

Protecting the New Resource

Progress in pollution abatement brought competition for real estate development along the clean Kennebec River. Environmentalists and developers battled for the new opportunities the river offered. Both the southern and northern regional planning commissions voiced their concerns over this issue in their annual reports in the early 70s. They were concerned that unless land use controls were implemented, the riverbanks could be overdeveloped without proper regard for preserving natural areas or assuring adequate public access. The two commissions agreed to meet with other organizations and public interests to plan for the corridor.¹²²

In 1974, in anticipation of rising recreational and residential pressures, the northern commission, with support from other organizations, came forward with a comprehensive plan to protect the entire river corridor. It was designed in the following way:

Maine. Winslow, ME: Scott Paper Co., 1973. 17-23.

¹²¹ Ibid. 59.

¹²² Northern Kennebec Regional Planning Commission. *Progress Report, 1971*. Waterville, ME: The Commission, 1971. Southern Kennebec Valley Regional Planning Commission. *Annual Report 1972-1973*. Augusta, ME: The Commission, 1973. These are the two organizations that have the most total control of the river corridor.

After the rebirth, it will be necessary to carefully manage the river and adjacent land or the pressure for improper uses may once again threaten the resources natural integrity and multiple use capacity. As the physical condition of the river improves, it may be increasingly sought for seasonal and residential dwellings, large scale recreational developments, and assorted commercial uses. The Kennebec River Corridor Plan was initiated to help channel that development pressure into the most suitable areas and to promote the concept of preserving much of the river and attendant land as a cohesive natural resource.¹²³

The corridor plan was a whole ecosystem management system that considered all amenities of the river to preserve quality of life—maximizing use while minimizing destruction. The plan designed a mix of management tools to meet the needs for an integrated river corridor, including acquisition of land (natural areas, parks, historic sites, etc.), land use, zoning, and environmental regulations (width, flow pattern, velocity, conditions of adjacent areas-slope, floodplains, soil types, etc.), police power regulation (municipal ordinances, water quality regulations), incentives (taxation, utility extensions, etc.), defacto influences (location of roads and other public facilities), and advisory functions (data gathering, planning, interest group activity).¹²⁴

Since Maine had already established regulatory and advisory mechanisms to manage land use and water quality, the corridor plan was not needed, and thus rejected. It was the opinion of corridor project people that Maine had "one of the best overall collection of land use laws in the nation."¹²⁵

¹²³ North Kennebec Regional Planning Commission. Kennebec River Corridor Plan: a management plan for a rejuvenated resource. By Lyle E. Flynn. Winslow, ME: The Commission, 1974. iii.

¹²⁴ Ibid. iv, 81-99.

¹²⁵ North Kennebec Regional Planning Commission. Kennebec River Corridor Project Appendix I-V.

Shoreland zoning laws, 250 feet buffer from shore, furthered the maintenance of safe and healthful conditions. The buffer law helped to prevent and control nonpoint source pollution, protect natural beauty, spawning grounds, fish, aquatic life, bird and other wildlife habitat, control building sites and land uses, and protect visual as well as points of access to inland and coastal waters.

In Waterville the potential for recreational use of the river was a function of water quality. Therefore, the goal of shoreland controls was to provide for the most appropriate use of Waterville's shorelands for the present and future benefits of its citizens.¹²⁶

Conservation acts also protected basin areas. The Farm and Open Space Law declared that the public interest was to preserve farmland and open space. A landowner could donate or sell their land to a governmental agency, a private group or individual, and the conservation restriction would restrict the land's use and no longer be taxed at its highest level. An Act establishing a State Register of Critical Areas was another effective measure that authorized the State Planning Office to develop a list of natural, scenic, scientific, and historic areas of overriding state interest. This allowed the government to approach a landowner or vice versa to retain a scenic view, protect a wildlife habitat, preserve a unique area, or guard against unwise development and receive a tax incentive to make the deal. Subdivision laws, the Great Ponds Act, minimum lot size laws, and regulations relating to waste disposal also safeguarded the interest of the people.¹²⁷

This document detailed how the plan was shut down.

¹²⁶ North Kennebec Regional Planning Commission. Shoreland Planning: Four typical Maine communities. Winslow, ME: The Commission, 1975. 6, 38, 55.

¹²⁷ Southern Kennebec Valley Regional Planning Commission. Open space and outdoor recreation in

Capitalizing on the New Resource

In anticipation of the clean Kennebec River, local governments and organizations made plans to utilize the resource. The Maine Historical Commission made plans for an Augusta riverfront parkway, with historic sites (Kennebec Arsenal and Fort Western) and park and picnic areas to add to the unique and pleasant experience of strolling through a historic district.¹²⁸ It was generally forested along the river, with grassy slopes going back in some areas. The State, working with the City of Augusta, considered walkways, bikeways, a beach along the waterfront, and the development of a Cony Street complex. Open space and outdoor recreation, preservation, and promotion were the goals and objectives of the planning commissions in the early 1970s.¹²⁹

The possibilities of a clean Kennebec River thrilled residents who had endured decades of disgust and restricted access. A concerned citizen wrote in 1975:

people scarcely noticed the Kennebec River; inaccessible, banks overgrown with brush, rubbish; and on hot day, until recently, river smelled; that is changing as more factories and mills comply with environmental regulations and as communities develop sewage treatment facilities and stop dumping waste into the river. . . dreams comes true, the changes will benefit the public. . . [the people] long wanted to see a greenway along the Kennebec in Augusta, providing public access to the river; parade ground, walking and bicycle trails, picnic, museums.¹³⁰

Dreams started to become reality in the mid-1970s when the City of Augusta purchased the EE Taylor Shoe Company plant near Fort Western as part of a greenbelt. Senator Katz pushed a bill in 1976 to establish the greenbelt, including

the Southern Kennebec Valley. By Susan Burns. Augusta, ME: The Commission, 1974. 57-59.

¹²⁸ Southern Kennebec Valley Regional Planning Commission. Open space and outdoor recreation in the Southern Kennebec Valley, 1-5.

¹²⁹ Southern Kennebec Valley Regional Planning Commission. Annual Report 1973-1974. Augusta, ME: The Commission, 1974

\$75,000 for development of a half-mile of riverfront property the state owned on the Kennebec. The five-mile stretch from Augusta to Randolph had magnificent potential for scenic outlooks, rest areas, trails, parking facilities, and access to the property from Stone Street.¹³¹ In the same year, the Kennebec Valley Conservation Association published a "Recreational Guide to the Kennebec River," with maps and tips on how to protect "a clean river."¹³²

In celebration of the people's vision and leadership in the fight for clean water, the State held its first annual "Clean Water Week" in Augusta. Flying on the roof of The State House was the green, white, and yellow national ecology flag. "Special kudos" went to the pulp and paper industry, the biggest polluter in the state, for its important role in the river cleanup.¹³³ The groundwork had been set; the log drive was no longer clogging the river and disturbing aquatic conditions, municipalities and industry were on track to meet the discharge requirements set by the state and the nation, multiple laws and ordinances were passed to provide for the needs of the whole ecosystem.

¹³⁰ *Lewiston Sun*. Dec. 22, 1975.

¹³¹ *Portland Press Herald*. Jan. 17, 1976.

¹³² *Kennebec Journal*. July 14, 1976. It was emphasized how important a recreation guide was since just years previous no such guide was needed because of the foulness of the river. This is the beginning of a push to utilize the renewed resource in a economically sustainable way.

¹³³ *Maine Times*. Oct. 8, 1976.

CHAPTER 4

WELCOME BACK KENNEBEC

For decades known as an “open sewer,” the Kennebec River had been an embarrassment to the people of central Maine. The rise of public awareness in the 1950s, 1960s, and 1970s, brought pollution abatement legislation and approximately \$50 million for pollution control facility construction (75 percent federal, 15 percent state, and 10 percent local funding), resulting in significant accomplishments in water quality. Historically, actual scientific measurement of the Kennebec River had been erratic; with only a few major studies ever conducted, a rigorous historical comparison of water quality in the Kennebec is difficult. Water quality parameters were seasonally dependant, and a limited data-base make it difficult to draw conclusions.¹³⁴ However, a descriptive overview of water quality changes before and after the Clean Water Act of 1972 is possible.

In a 1978 survey, water quality was examined in spring, summer, and fall discharge conditions at 18 main stem locations. Ten major point sources were examined and checked for classification compliance. The study stated that most foam had disappeared, Atlantic salmon had reappeared, and the river had been improved in all water quality scores. The river met or exceeded best DO standard (A) throughout the year at all reaches except once in October at the Waterville-Winslow Bridge where saturation dropped below 75 percent. Dissolved oxygen levels were near zero in 1959, 1966, 1971, and 1973 and as late as 1975, DO was less than 1 ppm at Augusta Dam and at South Gardiner. However, routine monitoring showed

¹³⁴ Bureau of Water Quality Control. The Kennebec River 1978 Water Quality: an Historical

substantial and dramatic increases in 1976: DO levels increased from near zero ppm upwards to 8 ppm (Figure 12). Biological oxygen demand increased down the course of the Kennebec due to pollution increases, but significant reductions were most apparent in Winslow where the Scott paper Co. closed its mill. The improvement in DO was concrete proof to the positive impact of pollution abatement on Kennebec River water quality.¹³⁵

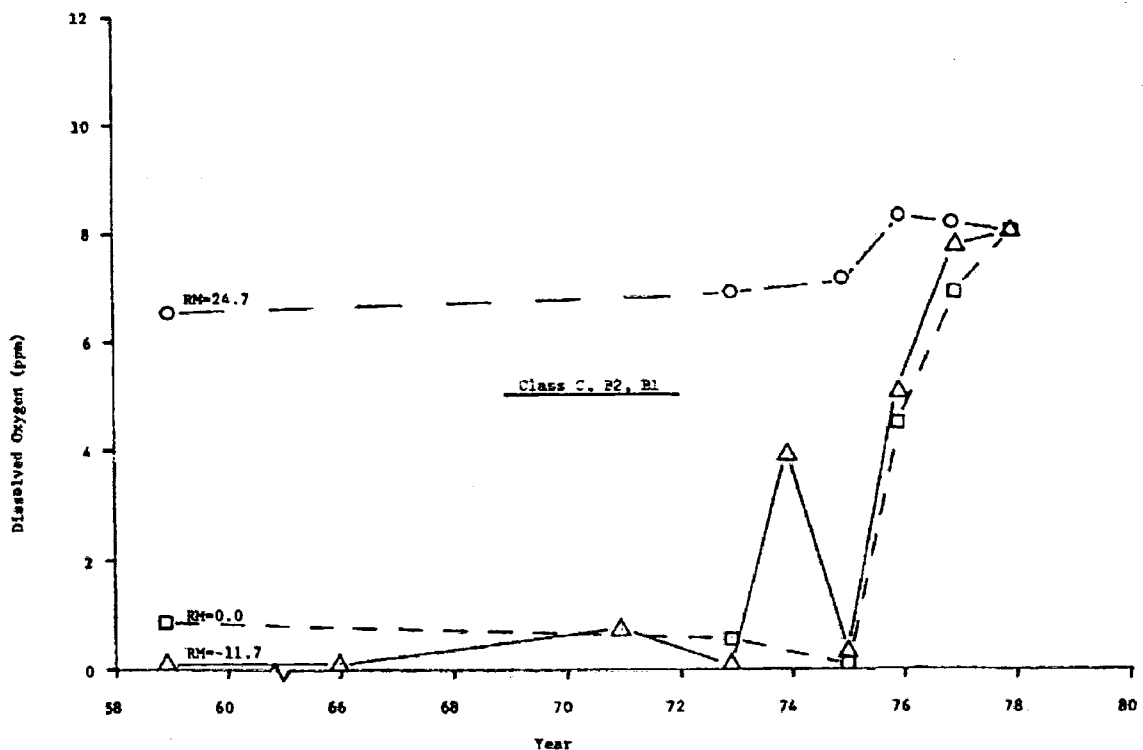


Figure 12: Dissolved Oxygen vs. Year at three different river miles (RM). From the Bureau of Water Quality Control. The Kennebec River 1978 Water Quality: an Historical Perspective. Augusta, ME: The Bureau, 1979. 54.

Perspective, 13. Historic water quality data is not complete, but the given data does show improvement since 1960s and 1970s changes.

¹³⁵ Ibid. Department of Environmental Protection. The Kennebec: The revival of a dying river. Augusta, ME: The Dept, 1986. The document was a celebration of the renewed river. It summarizes

The improvements in pH were not as drastic, but did improve nonetheless. In 1959, pH range was from 6.0 to 7.2, and by 1978, the range jumped to 6.7 to 7.1. In all cases, they were within B-1 classifications of 6.0 and 8.5. In regard to bacteria counts, the river was only able to meet the class C of 1,000 fecal coliforms per 100 ml. However, improvement was anticipated after the completion of treatment facilities in Augusta, Hallowell, Farmingdale, Gardiner, and Randolph between 1978 and the early 1980s. Nonetheless, in 1978, the maximum observed fecal coliform concentration at the Augusta dam dropped below 1,000 per 100 ml for the first time since at least 1973, representing the first case of class C compliance in that location.¹³⁶

The People and the Revived River

Citizen determination and a progressive government started to pay off in the late 1970s. "The Kennebec is Coming Alive" was the headline in a 1978 *Kennebec Journal* article describing the renewed enjoyment of the resource. Locals immediately took advantage of the revived river. Families spent summer days picnicking and grilling along the waterfront, Augusta office workers took their lunches to the banks to enjoy the view, and boaters enjoyed a ride downriver from Augusta. One family described the boat trip in joyful terms: "[we] saw people fishing, old colonial homes on banks; explored an elaborate tree house, footprints of raccoon; boat launches in Hallowell and Richmond are heavily used for outdoor lunches and sunning."¹³⁷

the changes and benefits of the cleaned up river.

¹³⁶ Bureau of Water Quality Control. The Kennebec River 1978 Water Quality: an Historical Perspective. Augusta, ME: The Bureau, 1979. 24.

Tourism and Recreational-related Growth

Besides non-monetary gains in life-quality, pride, and health, a clean river provided excellent economic opportunity and growth. Tourism and recreation made exceptional economic gains in the 1960s and especially in the clean water era (post-1972). Between 1967 and 1973, the number of tourists spending at least one day in the State of Maine on vacation tripled. In the fiscal year of 1972/73, tourism brought in \$460 billion to the state. Between 1960 and 1970, employment in restaurant businesses, lodging facilities, and amusement and recreation establishments increased by over 50 percent.¹³⁸ In response to increased recreational use, the Land Use Regulation Commission between 1971 and 1975 granted a substantial number of buildings, subdivision, and development permits.¹³⁹ Non-manufacturing employment rose 33 percent in recreational services and 30 percent in the construction sector in the first five years of the 1970s. Increased tourism through recreation attracted thousands of seasonal vacationers to the basin each year. Populations doubled and sometimes tripled in peak summer months and were sometimes 3 to 10 times greater year round. According to the Land Use Commission, "The additional residents undoubtedly contribute income to commercial establishments." Taxation tables provide evidence for the economic impact of recreational activity. Rentals and restaurants clearly show a rise in tax receipts levels, with highs in summer months (Table 1).¹⁴⁰ Increases in tourism, recreational businesses, and clean water were not coincidental; clean and accessible water spurred recreational development projects,

¹³⁷ *Kennebec Journal*. July 15, 1978.

¹³⁸ State Planning Office *Tourism in Maine: analysis and recommendations. Report to Maine Vacation Travel Analysis Committee*. By Northeast Markets, Inc. Augusta, ME: The Office, 1974. 1-6.

¹³⁹ New England River Basins Commission, 28, 142-143.

requiring numerous support facilities and stimulating secondary development such as hotels, restaurants, and residential complexes. However, there does exist the possibility that the economic growth was associated with other factors besides improved water quality, like trends in vacation activities or good economic times, but the fact that the southern commission included these links in their 1975 economic report, does suggest that it may be the case.

Month	Restaurants	Rentals	Total
January	16,228	5,614	340,588
February	23,571	741	352,325
March	22,737	5,752	408,284
April	23,148	5,346	439,940
May	29,113	6,998	483,356
June	31,975	9,544	543,356
July	31,274	12,576	495,278
August	37,538	16,081	577,642
September	34,318	9,307	500,719
October	31,953	9,071	480,902
November	24,072	5,145	475,563
December	27,379	4,411	545,100
January	23,628	1,801	375,517

Table 1: 1974/1975 State Tax Receipts Augusta Economic Area. From Southern Kennebec Valley Regional Planning Commission. Economic conditions in the southern Kennebec Valley. Augusta, ME: The Commission, 1975.

¹⁴⁰ Southern Kennebec Valley Regional Planning Commission. Economic conditions in the southern Kennebec Valley. Augusta, ME: The Commission, 1975. iii, 21, 33.

White-water Rafting

Capitalizing on one of the few heavy white-water stretches left in the state, white-water rafting outfitters invested heavily in the area above the forks. As many as 2,000 people rafted in 1977, and 4,000 rode the waters in 1978.¹⁴¹ A continuous series of class IV-V rapids and dependable water flow made the upper Kennebec gorge one of the finest big water rafting and kayaking experiences in the eastern United States. The Maine Critical Areas Program identified the gorge as one of the state's most significant white-water stretches, and it was rated as one of the highest statewide priorities in 1982. In 1981, it had 8,000 users, which was a ten-fold increase from 1976. This translated into the annual tourist dollar value from commercial recreational rafters to be over \$1 million.¹⁴²



Figure 13: Rafting on the Kennebec rapids. From Calvert, Mary. The Kennebec Wilderness Awakens. 1986.

¹⁴¹ *Maine Times*. June 30, 1978.

Fisheries

The Department of Inland Fisheries and Wildlife (DIFW) and the Department of Marine Fisheries Resources (DMFR) noted that Kennebec water quality had risen dramatically, oxygen content had improved, and fish populations had increased. William Perry of Solon, president of the Kennebec Valley Conservation Association and commercial fishery camp owner in Solon, stated that pollution abatement created new spawning and nursery areas that benefited Atlantic salmon, striped bass, and shad. Public support prompted an anadromous fish restoration project in the river that resulted in substantial economic development in shad runs from Augusta to tidewater.¹⁴³ The new fisheries added more than \$20 million a year to the state's economy.

Lack of fishways and other ecologically inconsiderate engineering on the dams did, however, impinge on the vitality of the fish populations. Dams affected fish habitat in several ways; they inundated spawning and nursery habitat, altered hydrologic regime, altered water temperature, decreased oxygen levels, changed fish communities (biodiversity), lowered productivity, created hybrid ecological zones and quasi-lakes, altered sediment transport (woody debris, nutrients, others), and blocked upstream and downstream passage for diandromous and resident fish species. In the late 1970s, citizens submitted petitions to the State government for the installation of fishways to mitigate problems for fish populations.¹⁴⁴

¹⁴² Department of Conservation. *Maine Rivers Study*, 12.

¹⁴³ New England River Basins Commission. 96.

¹⁴⁴ Dube', Norm. *Veazie Dam Field Trip*. Veazie, ME: Veazie Salmon Club, Oct 3, 2002. This was part of my river ecology class, BIO 529 with Dr. Alex Huyn. We visited the Veazie dam and listened to a talk by Norm Dube' of the Veazie Salmon Club. He mapped out the good and bad of dams, with emphasis on the conditions of the Veazie dam itself. New England River Basins Commission, 141. The commission report is very clear in laying out the maps and numbers on the dams on the river in 1979.

The economic value of dams is obvious. Dams facilitate water processing and storage, flood and ice control, irrigation, recreation, and protection against fire undesirable species. Despite public concern and the expert opinion on what was best for fish and aquatic life, dams on the Kennebec have been an ongoing battle between operators and concerned parties.¹⁴⁵

Recreational Activity

Pollution abatement had many beneficiaries, especially for the individual and family recreationists. Increased water quality generated increased recreational activity--more boating, swimming, camping, and picnicking--in every reach of the river, with particularly high demand in the middle and lower reaches due to higher population densities and dramatic water quality improvement. In 1982, the State surveyed over 65 individuals and organizations with an interest in the river and concluded that the one unifying thread was constant enthusiasm for the recreational potential of the river and the benefit such revitalization could have for municipalities, individuals, and organizations along the river.¹⁴⁶

Fishing. As the quality of the river basin waters improved, so did game species populations and sport fishing interest, especially in the lower Kennebec.¹⁴⁷ Merrymeeting Bay and its surrounding tributaries had the best winter smelt fishing in the state with more than 1,000 camps in 1985. As fishing became more popular along the river, it brought an increase in commercial activity to waterfront businesses and

¹⁴⁵ Dube', Oct 3, 2002.

¹⁴⁶ Southern Kennebec Valley Regional Planning Commission. Augusta to the Atlantic: A Recreational use strategy for the Kennebec River, 2-3.

¹⁴⁷ Department of Conservation. Maine Rivers Study, 14.

subsequently developed a stronger constituency for protecting and enhancing the natural resources of the river.¹⁴⁸

Boating. In 1979, the New England River Basins Commission identified the Kennebec River as an outstanding white water rafting, canoeing, and recreational boating resource. Encouraged by the improved water quality and rising public demand, the Department of Conservation, along with municipalities, established boat landings in Augusta, Hallowell, Gardiner, Richmond, and Bath. This caused recreational boating on the river to mushroom. As many as 150 boats passed between Augusta and Bath on a summer weekend day in 1985.¹⁴⁹ In response to increased boating, a local businessman moved his boat business from Gardiner to the riverbank in Randolph. He stated: “in 1960, there was no public access to the river, but in 1982, there were 50 boats a day on the river.”¹⁵⁰ Excursion boats, passenger cruises, and boat rentals became new growth businesses in the communities. Boating on the Kennebec was pleasurable, with picturesque communities, buildings, stories of history, open spaces, and forested slopes with diverse and scenic vistas encompassing the experience.

Natural Beauty. The beauty of the natural environment itself was a major attraction for recreational usage of the river. The Kennebec River basin had high ratings for habitat quality, quantity, species diversity and abundance, and the presence of endangered species. The upper basin was considered a valuable resource of uncommon natural beauty, providing recreational opportunities that emphasized the

¹⁴⁸ Bureau of Parks and Recreation. Maine Rivers Access And Easement Plan, 12. Anglers and hunters have historically been strong supporters and even pioneers in conservation. It can be looked at as selfish interests, but it does help and is often embraced by environmentalists.

¹⁴⁹ Ibid. Department of Conservation. Maine Rivers Study. New England River Basins Commission,

natural environment. Abundant bird populations made hunting very popular, especially for woodcock. Deer and bear populations were greater in the upper basin than any other area in Maine and provided excellent wildlife observation opportunities.¹⁵¹ The lower basin was home to significant concentrations of nesting and/or wintering populations of bald eagles. Merrymeeting Bay was the number one bird-hunting region in the state and also a popular bird watching locale.¹⁵² The federal government considered a "recreational" rating for the lower Kennebec under the Wild and Scenic Rivers Act.¹⁵³ However, due to the presence of dams in the corridor, it was never granted. The very fact that the river was even considered by the federal government was testament enough to the significance of the river.

River as Historic District. The American bicentennial in 1976 stirred a great amount of reverence for history, and the Kennebec was targeted as an historic resource of value. To commemorate the bicentennial of Benedict Arnold's march to Quebec, residents reenacted part of the voyage (Figure 14).

48.

¹⁵⁰ *Kennebec Journal*. Aug. 31, 1982.

¹⁵¹ New England River Basins Commission, 141-142.

¹⁵² Bureau of Parks and Recreation. Maine Rivers Access And Easement Plan, 41. Natural beauty and ecological integrity was a value for people; not only in the sense of its innate value, but also its value as a recreational feature.

¹⁵³ *Kennebec Journal*. July 11, 1980. The Wild and Scenic River designation was one of the highest national forms of recognition and protection a river can get.



Figure 14: Bicentennial (1975) reenactment of the Benedict Arnold march to Quebec.
From Calvert, Mary. Dawn on the Kennebec. 1983.

The river offered many historic features that could only be seen from the river. People took advantage of salt and fresh water boating to access cities and commercial districts, historic Indian settlements such as on Swan Island, and a multitude of historic features along the riverbanks. An unparalleled array of attractions existed on the lower Kennebec River from its mouth at Seguin Bay lighthouse, second oldest lighthouse station on the coast of Maine, to the head tide at Augusta. Old stories about logging days or Benedict Arnold's Revolutionary War march up the river were of significant cultural value. The Kennebec Ice Company, ruins of saw mills, abandoned granite quarries, the dock for the old Augusta Lumber Company, cement coal barge docks, slips where clippers came in, and old shipbuilding facilities eloquently expressed the history of the region and the people. Estates of prominent landowners and patriots, forts from the earliest periods of colonization, ruins from Maine's industrial past, and communities nestled on the banks all contributed to the

historic splendor of the Kennebec. The 1982 Maine Rivers Study proclaimed the Kennebec as the most historic river in Maine.¹⁵⁴

Waterfront Structures and Businesses

Development in the form of parks, docks, nature trails, picnic areas, boating ramps, restaurants, shops, marinas, and various waterfront businesses were strongly related to improved water quality. In Hallowell, restaurants built porches where diners could relax and look out over the Kennebec waters.¹⁵⁵ All along the river, planning, design, and construction of downtown revitalization projects began in the early 1980s. These projects relied upon the Kennebec as the focal point and theme for the rebirth of their commercial centers.

Industrial Gains

In addition to tourism and recreation-oriented growth, industry made significant economic gains, despite additional costs on environmental facilities and new operations. The reduction in organic loadings from the Scott Paper Company through construction of the Kraft mill, the closing of the sulfite mill, and the additional treatment of paper wastes, was a major contributor to improved water quality, but also more profitable than the previous operations. The industry's old facilities and operations were outdated and new technology offered more efficient business. The greatest pulp and paper expansion in Maine history occurred at the

¹⁵⁴ Southern Kennebec Valley Regional Planning Commission. The Kennebec: A review of options for commercial shipping and expanded recreational uses. Southern Kennebec Valley Regional Planning Commission. Augusta to the Atlantic: A Recreational use strategy for the Kennebec River, 24-25. *Waterville Sentinel*. Oct. 3, 1981. Governor King made a point to recognize the historic value of the Kennebec.

¹⁵⁵ Southern Kennebec Valley Regional Planning Commission. The Kennebec: A review of options for commercial shipping and expanded recreational uses. Southern Kennebec Valley Regional Planning Commission. Augusta to the Atlantic: A Recreational use strategy for the Kennebec River. *Kennebec Journal*. Aug. 30, 1982. The river by this point represents a powerful symbol to for the

same time that industry dramatically reduced water pollution. In 1982, the Natural Resources Council of Maine awarded workers and managers of Scott Paper Company in Skowhegan their highest conservation award for their commitment to reducing pollution (planned, designed, and constructed facilities to recycle, reuse and to efficiently control waste wood products) and their impeccable record of cooperation with State environmental agencies. From the company that once was the largest industrial polluter in New England, massive reduction of 97 percent (400,000 lbs cut to 12,500 lbs) BOD per day was now praised. Scott Paper Company had the best operating record of any large pulp and paper mill in the state and served as an example that heavy industry need not despoil the surrounding environment.¹⁵⁶ This showed that Maine could have both a clean environment and reasonable prosperity; the insurmountable dilemma of payrolls vs. pickerel had now been eroded.¹⁵⁷

Pulp and paper was the main business of the Kennebec Basin, followed by forestry, and then the growing recreation and tourist industry. The forestry business incidentally benefited recreational interests due to the presence of logging roads as means to access the river and other natural areas of the basin. Logging roads provided considerably greater access to the scenic north-country, which drew tourists year round.¹⁵⁸

people that have pride in place.

¹⁵⁶ *Maine Sunday Telegram*. June 13, 1982.

¹⁵⁷ *Ibid.* Jan. 11, 1976. This was part of comments that were made annual meeting of Paper Industry Information Office. Payrolls or pickerels was no longer the dilemma; a triumph for industry, environmentalists, and the State.

¹⁵⁸ New England River Basins Commission, 26.

People Want Naturalness and Multiple-use

Public support for better resource management and conservation was high in the 1970s. Despite strong concerns for jobs and profits from mill owners and workers, the majority of residents convinced their legislators that good water quality and access to the river was in the best interest of the people for both economic and social needs.¹⁵⁹ A 1973 survey revealed that 76 percent of the people had faith in their state government to simultaneously provide more and better jobs and adequately protect the environment. People insisted that the state needed more jobs, but not at the expense of the environment. They desired strict controls on industry and development to assure that Maine would always be a desirable place to live.¹⁶⁰

Continued protection of the Kennebec resource was imminent over the years. There was initial success in the wake of pollution abatement action, but total clean water in the Kennebec was never fully attained. A mix of success and failure, public outcry and satisfaction, and action and non-action characterize environmental issues over the Kennebec for the last 25 years.

People Continue to Fight for the River

The public, along with local and State governments, focused on protecting the future of the river.¹⁶¹ In 1981, Representative Judy Kany of Waterville submitted a bill to establish the Kennebec River Future Commission, a 38-member commission with representatives of river towns, regional planning commissioners, industry, the public, and other groups. The bill was supported by legislators, the DEP, the

¹⁵⁹ Department of Conservation. Maine Rivers Study, 7-8.

¹⁶⁰ State Planning Office Maine: an appraisal by the people: an in-depth survey of the attitudes and opinions of Maine people toward their State, its challenges, and its problems. By Northeast Markets, Inc. Augusta, ME: The Office, 1973.

Department of Conservation, Office of Energy Resources, State Planning Office, and the Department of Inland Fisheries and Wildlife.¹⁶² The Kennebec Valley Chamber of Commerce stated that Kennebec River development should be the focus of chamber concern for the next decade. It included the stipulation that "guidelines for river development must be decided by people who live on the river, work on the river, and do business on the river." In 1982, The Kennebec River Development Association, consisting of all the municipalities, the Regional Planning Commission, the Chamber of Commerce, and certain state agencies coordinated development on the river to increase recreational use and expand river-related businesses.¹⁶³

Groups and coalitions were organized to protect the best interest of the people. The Kennebec River Council was one such group; it was a private, nonprofit group fostered by the Southern Kennebec Planning and Development Council. The council was a grass roots association of naturalists, citizens, historians, land-owners, businessmen, government officials, boaters, bird watchers, and others. In addition, a wide range of organizations and agencies watched over, protected, capitalized on, and sometimes exploited the river. Such parties included the Maine Historic Preservation Commission, Department of Marine Resources, Department of Conservation, DEP, MDOT, Department of Inland Fisheries and Wildlife, towns and cities, the federal government and the private sector.¹⁶⁴

¹⁶¹ *Kennebec Journal*. Aug. 19, 1980.

¹⁶² *Waterville Sentinel*. Feb. 3, 1981.

¹⁶³ *Kennebec Journal*. Sept. 12, 1982.

¹⁶⁴ *Ibid.* July 1, 1985.

People embraced the successful river improvement, but pollutants were still present. A concerned resident in 1989 stated that "The river shouldn't have just lone canoeists, but fly fishermen and kids swimming and old couples sitting in the sun. I don't know exactly how much those things are worth, but I suspect that cleaning up the rest of the wastes will be seen, 10 years hence, as a darned good investment."¹⁶⁵ The people learned that pollution control was worth the initial investment in the short and long term.

Historically, river protection had focused on point sources (industrial and municipal waste), but once these major problems had been addressed, regulations turned to nonpoint sources (forestry, construction, agriculture, mining and urban activities). The interconnectedness of the river to its surrounding basin became more apparent when planners understood that pollution abatement involved more than just channel protection; it involved the monitoring, protection, and maintenance of the entire basin.

Whole Ecosystem Considerations

Riparian Zone. The nearest and most important component to river quality besides the channel itself is the adjacent riverbanks: the riparian zone. The riparian zone cannot be emphasized enough in its importance to the ecological integrity of the river and the basin. The zone maintains the soil and water temperature, serves as a filter for sediments, nutrients and pollutants, provides bank stability, and balances the food (energy) supply for the riparian and aquatic ecosystems. The zone contains organic detritus for bacteria and invertebrates, an important source of energy and the basis for the aquatic food web. Without the riparian zone, increased water

¹⁶⁵ Ibid. April 5, 1989.

temperature and flux of nutrient detritus can enhance the rate of lake eutrophication and algal blooms. As high as 99 percent of aquatic life energy in low order streams (lower basin tributaries) can come from this zone. Harvesting of riparian forests causes a loss in nutrients from the harvested biomass. This throws off the nutrient cycling of the riverine system in the following ways: it increases runoff of nutrients and sediment because soils are compacted and scarified, new streams form in skidder ruts, water yield increases, snowmelt and storm flow release earlier in the season and are more rapid, and soil and water temperatures increase. This has implications for shoreland development and other changes to the zone.¹⁶⁶ Slopes and hillsides are also important; if they are disturbed and stripped of vegetation then runoff increases and sediment load in channel increases, disturbing the channel balance and removing the visual opportunity.¹⁶⁷

Shoreland Protection. Improved water quality brought with it increased river usage and increased demand for shoreland property. This was good in the sense that it drove land prices up and increased local tax revenue, but it also brought the threat of over-development. The economy for the lower basin was closely tied to water quality management and was dependent on shoreland property for tax revenue in municipalities with extensive water frontage. Municipalities had mixed reactions to the new regulations, but ultimately, they understood that the resource needed

¹⁶⁶ New England River Basins Commission, 1-20. Riparian Zone is one of, if not the most critical component of the river system. The relationship between the river and riparian zone is interdependent.

¹⁶⁷ Cox, 46-50. The feeling that the river is important for non-monetary values is gaining recognition in 1977. The need to preserve the resource in its entirety is seen as wise.

protection or it would no longer support the activities that generated the tax revenues.¹⁶⁸ The Shoreland Zoning Act of a 250-foot buffer helped address this issue.

Wetlands. Wetlands are important to the riverine ecosystem. They perform valuable functions such as filtering of sediment and organic debris entering a lake or pond, absorbing storm or flood waters, thus minimizing erosion and flood damage, oxidizing chemical and biological organics and pollutants, providing of wildlife habitat (feeding and nesting areas) for birds, waterfowl, and providing of educational and recreational opportunities. They hold water in wet seasons and slowly release it in dry seasons to maintain stable levels.¹⁶⁹ Little has been done in regard to watershed management legislatively even up to today.

Agriculture. Agricultural land is very important to river bodies. Agriculture can cause water pollution through the disturbance of soils on large land areas, the addition of large amounts of nutrients to the soil (chemical fertilizers and manures), the use of pesticides, and the generation of large amounts of organic wastes.¹⁷⁰ Sediment is the biggest pollutant, not only carrying phosphorous and nitrogen, but as in reduction of light penetration. This lowers the rate of photosynthesis with the primary producers and lowers the DO levels, which can be detrimental to aquatic life. Nitrogen released in the water acts as a fertilizer for algal growth and can pollute groundwater.¹⁷¹ Sediment deposition also causes a river to be

¹⁶⁸ Southern Kennebec Valley Regional Planning Commission. Economic conditions in the southern Kennebec Valley, 53.

¹⁶⁹ Southern Kennebec Valley Regional Planning Commission. Land use trends and projections. Augusta, Me: The Commission, 1976. 44-49. The awareness of ecology and people's need to work within it is stronger and the discourse reflects it in 1976.

¹⁷⁰ North Kennebec Regional Planning Commission. Existing information on water pollution in the North Kennebec region. By Frank Fiore. Winslow, ME: The Commission, 1977. 4-5. Water pollution is well understood in 1977. Nonpoint sources are of major concern.

¹⁷¹ North Kennebec Regional Planning Commission. Nonpoint source assessment and plan. By Frank

shallower and increases the temperature, lowering the river's ability to retain oxygen and speeding up metabolism of anaerobic bottom dwelling organisms that contribute to phosphorous release and algal blooms. High temperature and low oxygen content is also problematic for trout and salmon populations, and can result in fish kills. Sediment can affect habitat by filling in the deeper pools where trout gather during warm periods. As of 1979, 75 percent (30,000) tons of soil was lost annually in Kennebec County, most of which entered the basin waters. Today, the greatest source of pollution to the Kennebec is nonpoint pollution from agriculture.¹⁷²

Forestry. Water quality integrates watershed processes and disturbances, making the maintenance of a forested landscape a very important factor for protection of water quality. Forests serve as a sponge, absorbing water and limiting runoff. Harvesting, transportation, and chemical spray management activities have significant impacts to aquatic systems. Increased water temperature (increase of 5 to 27 degrees centigrade) caused by removal of near-stream shade affects fish populations and the biological make-up of the stream.¹⁷³ Soil nitrate concentration after harvesting can go from zero mg/l up to 90 mg/l. This can lead to stream acidification with toxic aluminum concentrations, degrading necessary ecological conditions for seedlings, roots, and aquatic life. Logging roads are also a major factor in river water pollution.

Fiore. Winslow, ME: The Commission, 1979. 1-8. Nonpoint pollution is very involved and is very difficult to quantify. However, it is not debatable how serious a problem it is.

¹⁷² North Kennebec Regional Planning Commission. Existing information on water pollution in the North Kennebec region. Coutemanch, David. Interviewed by the Author, Oct. 8, 2002. David, water quality specialist for 30 years at the DEP, was an excellent man to talk to. He was very helpful and insightful into this project. He has been working as a water quality specialist for 30 years in Maine. He has seen it all. He stated that agriculture is the biggest pollutant today in the Kennebec. David was the one who introduced me to this story.

¹⁷³ New England River Basins Commission, 7. The practice of forestry is critical in its effects it can have on the river ecosystem. This is another example of the fragility and interconnectedness of the different components of the river basin.

Logging roads destabilize soil surfaces and slopes, increase gullying and channel network expansion, and increase runoff rate and sediment loads.¹⁷⁴ Direct stream disturbance by bridge construction, cross-stream skidding, and slash left in stream channels can increase sediments, deflect stream channels, impede flowing water, and create barriers to fish migration. In addition, the removal of trees along the river creates visual blight.¹⁷⁵

Nonpoint source pollution was the accumulation of multiple sources of discharge, and controlling these sources required changing the way people lived.¹⁷⁶ Since changing the way people lived required incentives and legislative force, the 1977 Water Pollution Control Act included provisions for identifying nonpoint pollution sources and methods for their control. The State mandated the DEP and DIFW to create laws protect from nonpoint pollution and erosion. Laws included the Site Location of Development Law, Alteration of Coastal Wetlands Law, Great Ponds Act, Mining and Rehabilitation of Land Law, the Stream Alteration Act, and the Shoreland Zoning Act.¹⁷⁷

The 1980s

Maine faced the “opportunity of a decade” in the early 1980s when a dozen major bills for water protection were brought before the State legislature. They were designed to strengthen the authority of state agencies in dealing with various river issues. Among them were amendments in shoreline zoning laws, a bond issue for

¹⁷⁴ Kahl, Steve. A review of the effects of forest practices on water quality in Maine. Orono, Me: University of Maine, 1996. Thanks to one of our own at Umaine, I was able to gather some good information on the effect of forestry on rivers in Maine.

¹⁷⁵ North Kennebec Regional Planning Commission. The land use element of a comprehensive plan. 41. This plan outlined many disturbances, if you will, on the Kennebec.

¹⁷⁶ Department of Environmental Protection. Watershed: An Action Guide to improving Maine waters. By Elis Shauffler. Augusta, ME: The Dept., 1990. 10.

new sewage treatment, simplified regulations for hydro-dams, and the first major revision to the state's water classification system in 20 years.¹⁷⁸

The Clean Water Act required Maine to revisit its classification system periodically. The act also set minimum standards, including a state goal of fishing and swimming suitable waters. Maine tightened its classification system by adding an additional class of AA: outstanding natural resources, which should be preserved because of their ecological, social, scenic or recreational importance. This classification prohibited all direct pollutant discharge, protected aquatic life, and maintained habitat as natural and free flowing. The DEP held a series of meetings and hearings so citizens could say how clean they wanted the river. Those who testified unanimously voiced a desire to upgrade classifications to at least class B at all reaches.¹⁷⁹

The period that saw the most dramatic gains in ambient water quality was from 1975 to 1985. For the first time in over a century, the DEP in 1988 gave the entire length of the Kennebec River a clean bill of health. Maine DEP commissioner, Dean Marriot put into context what the clean-up of Maine rivers meant for the people: "You can go to places where twenty years ago the paint was literally peeling off the houses and you can see people now have boats tied up in their backyards. I think that's a very positive sign for how much progress we've made."¹⁸⁰ The people were thrilled at the success the river had achieved by the end of the 1980s. In a 1990 DEP cost/benefit analysis survey on Maine water improvement efforts, over 75 percent felt

¹⁷⁷ New England River Basins Commission, 69, 104.

¹⁷⁸ *Maine Sunday Telegram*. Dec. 26, 1982. 1982 was considered the year for rivers in the State legislature.

¹⁷⁹ *Kennebec Journal*. Nov. 6, 1987. Department of Conservation. Maine Rivers Study.

that water improvement had been good for the economy and an overall benefit for the people of Maine.¹⁸¹

Governor John R. McKernan made a statement in 1990 reflecting on Maine's water improvement success:

In Maine, clean water is more than a resource, it is a tradition. It has shaped state history and pride. Yet it has also been compromised and abused. We can undo the damage and restore the tradition by reaffirming our commitment to clean water for Maine. It's a commitment, I believe, to protecting our special way of life. With development and industrial growth, the quality of Maine waters suffered. When the people of Maine recognized pollution as a threat to their future, they took actions to improve the environment. Maine people became more aware of issues effecting water quality and changed their actions appropriately. The Results are dramatic. Atlantic Salmon have returned and waters that were once open sewers are now safe to swim in.¹⁸²

Maine as Special Place

Being a national leader in environmental protection legislation and having enjoyed successful river improvement, Maine became an even stronger attraction for outsiders, which in turn contributed to state pride and brought dollars into the economy. In the years prior to the clean-up effort, Maine residents could not bring themselves to believe that their rather remote and rural state would be seen as a green sanctuary that would attract urban and suburban immigrants. A 1976 Bates College study found that nearly all those who moved to the state in the previous six years did so based on general environmental factors: beauty and environment, a more wholesome rural atmosphere, and a desire to get out of the city.¹⁸³ The Kennebec was described as an "oasis of rurality, with quiet old New England towns in a 10,000 acre

¹⁸⁰ Department of Environmental Protection. Regaining full use of Maine's rivers : a report to the Board of Environmental Protection ; Draft. Augusta, ME: The Dept., 1988.

¹⁸¹ Bureau of Water Quality Control. State of Maine, 1990 Water Quality Assessment. August, ME: Dept. of Environmental Protection, 1990. 89. Cost/benefit analysis was predominantly in support of the State and the good job it did in water improvement.

¹⁸² *Ibid.* 67.

water and marsh playground in gentle country of farm fields and oak and pine forest, seemingly unchanged among the push of development."¹⁸⁴

Life-quality and Pride Increase

Two out of three people surveyed by the National Opinion Research Center in 1977 preferred to live in rural areas. The 36,000 people who moved to Maine each year in the 1970s generally came to enjoy the rural way of life and natural beauty.¹⁸⁵ Life-quality is difficult to measure and assess, but evidence does suggest that the clean Kennebec River did generally improve the quality of life for Mainers. For example, the new abundance of fish was making Augusta a better place to live. Workers at the Bates mill in Augusta in their lunch hour started to carry a rod and a reel to the river to catch small mouth bass.¹⁸⁶ In celebration of the revived river, communities from Augusta to Gardiner staged the "Kennebec River Whatever Race" in 1980: an old-fashioned community Fourth of July parade with the river as the focal point. The event reflected community pride: "What better way to celebrate the river's revival than with a madcap happening like the Whatever Race?"¹⁸⁷ What was once a liability and an eyesore was now a blossoming resource that had restored pride to the people.

Augusta Dam Removal

The culmination of the Kennebec clean-up is the story of the Edwards Dam. The Edwards Dam, built in Augusta in 1837, had decimated fish populations. The structure flooded critical habitat, disrupted prime upstream spawning grounds, and

¹⁸³ Ibid. Aug. 27, 1976.

¹⁸⁴ *Maine Sunday Telegram*. Nov. 27, 1983.

¹⁸⁵ North Kennebec Regional Planning Commission. The land use element of a comprehensive plan. 22.

prevented anadromous fish from reaching their spawning beds. Given the successful recovery people witnessed from pollution-control efforts, removal of the dam became the next step in river restoration. The Edwards Dam was targeted as an unwanted, ecologically detrimental structure that impinged on the interests of the people.

In 1989, American Rivers, the Atlantic Salmon Federation, the Natural Resources Council of Maine, and Trout Unlimited formed The Kennebec Coalition for the exclusive purpose of securing removal of the Edwards Dam and restoration of the Kennebec River. After nine years of determined advocacy, the Kennebec Coalition achieved a major victory by convincing the Federal Energy Regulatory Commission (FERC) that benefits through removal of the Edwards Dam outweighed the economic value of continued operation of the dam. The dam generated only one-tenth of 1 percent of the Maine's electrical power in 1999. In its unprecedented 1987 decision, FERC denied a re-licensing request for the Edwards Dam and ordered its removal. In May of 1998, the Kennebec Coalition, owners of the Edwards Dam, the State of Maine, Bath Iron Works, the Kennebec Hydropower Developers Group, and several federal agencies announced a settlement agreement that funded the Edwards Dam removal and assisted with fisheries restoration programs. The dam was removed in July of 1999 in front of a crowd of cheering community members.

The removal brought significant improvements in all fronts. 17 miles of spawning and nursery habitat for fish were now back in the Kennebec. An estimated 2 million alewives as well as striped bass, shad, and sturgeon traveled from sea, past the old Edwards Dam site, and up to Winslow for the first time in 162 years. People

¹⁸⁶ *Maine Sunday Telegram*. Aug. 19, 1979.

¹⁸⁷ *Waterville Sentinel*. July 9, 1980.

reported seeing Atlantic sturgeon jumping above the old dam site. Mayflies and Stoneflies, an important food source for burgeoning fish populations, were rarely seen in upstream samples before the removal of Edwards, but dramatically increased in numbers after the removal.

Riparian conditions and wildlife populations also prospered with dam removal. Once inundated riverbanks greened with grasses, shrubs, and other vegetation. The renewed water levels revealed rapids, such as Six-Mile Falls, and many small islands reappeared for water birds to take refuge. Bald eagles, osprey, blue herons and cormorants were observed catching fish in the former dam area, as newly created channels, riffles, and pools became new habitat for fish.

Healthy aquatic life could not be possible without appropriate water quality. In the months prior to dam removal, the waters in that area failed to meet Maine's minimum water quality standard for a healthy river ecosystem (class C-non swimmable). Within two months after the dam's removal, water quality improved dramatically to meet class B. Besides traditional measure of water quality, such as DO or toxic analysis, biological studies are also useful. A 1999 report from the DEP stated that "By inventorying the makeup of invertebrate communities and comparing results to those found in pollution-free areas, it is possible to determine whether or not pollution is causing ecological impacts such as the loss of sensitive groups of organisms and ecological functions they perform".¹⁸⁸ In a DEP sampling study, macrobenthic invertebrates increased per sample site from 40 to 2,000 and biodiversity approximately doubled. Before the Edwards removal bottom-dwelling

¹⁸⁸ Bureau of Land and Water Quality. Biomonitoring retrospective : fifteen year summary for Maine rivers and streams. Augusta, ME: Dept. of Environmental Protection, 1999. 4.

organism counts were very low (40-50 organisms per sample). Two months after the removal, the counts went up to nearly 2000 organisms, 50 times greater than pre-dam removal. This was proof that water quality drastically improved and aquatic life had blossomed.

Recreational opportunities abounded as boaters and anglers returned to the area in great numbers to enjoy a resource of their own. In the first summer without the dam, the river was used extensively by the public to fish, canoe, birdwatch, and generally enjoy the river, its rapids, and newly exposed islands. Boaters also enjoyed a new boat launch in Sidney that the State rebuilt to meet the new needs of river users.

Communities and businesses also benefited from the removal of the dam. In Augusta, the Capital Riverfront Improvement District was established to "protect the scenic character of the Kennebec River corridor while providing continued public access and an opportunity for community and economic development." Delaine Nye, citizen appointee by Governor Angus King to the district, saw the "removal of the dam and the resulting Capital Riverfront Improvement District as a catalyst for the rehabilitation and restoration of the downtown and northern end of Augusta." The Edwards mill site was turned into a recreational park that honored the history of the site while celebrating the rebirth of the river. Guide services and local businesses improved their operations as well. Bob Dionne of Aardvark Outfitters, was thrilled at the new economic opportunities: "Last year I said we'd see 30 drift boats working there in the next five years - I'd say now it's going to be double that. No matter how optimistic initial economic predictions were, we're going to surpass them." Maine

river guide Jim Thibodeau said in 2000, "I am looking forward to a great summer season fishing this section of the Kennebec."

Cities along the Kennebec enjoyed the river restoration with new celebrations and renewed old ones. The inaugural "Voice of the Kennebec" festival was held in Waterville, with food, boating, and bike trips along the river. The "Whatever Celebration" in Augusta was now a traditional event that focused primarily on the vitality of the river itself. Fort Western's director Jay Adams promoted the event: "To help share in the celebration of the opening of the Kennebec we would like to invite you to canoe or kayak with us on July 2nd from Fort Halifax to Fort Western."

Removal of Edwards Dam represented a significant event in the history of dams in the United States. Rebecca Wodder, president of American Rivers, stated that the "Removal of the Edwards Dam reflects a shift in how our society views rivers. The Edwards Dam decision is nationally significant because it shows us that dam removal is a very reasonable and feasible option for restoring healthy rivers and saving imperiled fish." On the day of dam removal in July of 1999, Natural Resources Council of Maine executive director Brownie Carson stated: "This is a great day for the Kennebec River, the fish, Maine's recreation economy, and everyone who appreciates a free-flowing river."¹⁸⁹ The view from the south before (Figure 15) and after (Figure 16) dam removal tells the story in itself.

¹⁸⁹ American Rivers. www.americanrivers.org. March 28, 2003. Natural Resources Council of Maine. www.maineenvironment.org. March 28, 2003. The Maine Rivers Site. www.mainerivers.org. March 29, 2003. These three websites under the search "Kennebec River" revealed all the common information about the Edwards Dam removal.



Figure 15: Kennebec before Edwards Dam removal. From www.americanrivers.org.
Photo by Steve Brook.



Figure 16: Kennebec after Edwards Dam removal. From www.americanrivers.org.
Photo by Steve Brook.

2003 Conditions

Overall, water quality improvement efforts have enjoyed great success (Appendix B). Communities have benefited in a number of ways; new marinas have been built, easements and municipal parks have sprung up, and commercial alewives fisheries are in the works. However, pollution continues to be an issue. There are six paper mills, one tannery, and eighteen municipal waste treatment facilities on the river. Other inputs to the river include agricultural activity, non-point urban sources,

combined sewer overflow, and contamination from hazardous waste areas.¹⁹⁰

Agricultural is the worst pollution problem. Airborne mercury deposition is also a major problem, as is the fact that the river contains the most exotic fish species in state. This causes competition with native species that are not adapted to their presence.

Positive Feedback Loop

The relationship between the people and the river can be described as a positive feedback loop, a system that reinvests in itself to make itself grow over time.¹⁹¹ The people reinvested in themselves by improving the conditions of their own habitat: the Kennebec River. Although the theory states that the word positive does not signify good, the Kennebec positive loop does in fact include good growth, according to the values given by the people. The government took action in pollution abatement legislation and other laws to clean up the river. The river became ecologically sound, which then benefited the people in improved economy and overall life-quality. In order for the people to maintain and sustain their social and economic success, they needed continual protection of the ecological health of the river system. This was a continual cycle of positive reinforcement: positive feedback loop.

¹⁹⁰ Bureau of Land and Water Quality. Biomonitoring retrospective : fifteen year summary for Maine rivers and streams. 81.

¹⁹¹ Ford, Andrew. Modeling the Environment: An Introduction to System Dynamics Models of Environmental Systems. Washington D.C.: Island Press, 1999. 72.

Supply-side Sustainability

The Kennebec River sustained the people of Maine because their management approach provided for ecological conditions within the whole ecosystem. This form of natural resource management resembles supply-side sustainability: maintaining, or fostering the development of, the systemic contexts that produce the goods, services, and amenities that people need or value, at an acceptable cost, for as long as they are needed or valued.¹⁹²

Supply-side is an ecological concept of how human society can best fit within the environment around them. The theory requires that we manage for the functioning of the engine (the entire ecosystem) so that renewable resources can become available. When a manager gets the context right, the ecosystem does the rest and the cost is minimal. For example, swidden agriculture works within landscape cycles to sustain production and retain ecological health at the same time. In regard to the Kennebec River, clean water was the foundation for production, accounting for the entire ecosystem (fish, aquatic life, riparian zone, wetlands, wildlife, birds, and humans). Humans have their own set of complexities that operate within the larger ecosystem process. The ecological context of humans can be better understood in the following conceptual model (Figure 17).

¹⁹² Allen, 13, 14, 26.

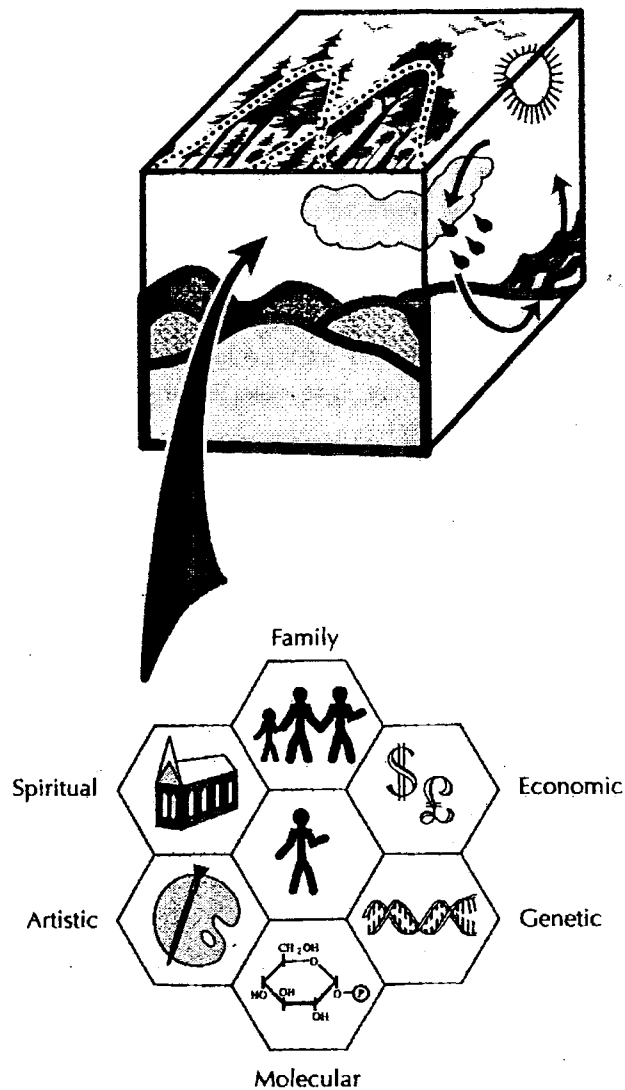


Figure 17: Humans in their ecological context. From Allen, T. F. H., Joseph A. Tainter, and Thomas W. Hoekstra. Supply-Side Sustainability. New York: Columbia University Press, 2003. 13.

Through the analysis of both quantitative and qualitative data, it is obvious that life-quality has a functional relationship with the water quality of rivers, and the structure of that engine is quite complex (affecting the entire basin). Also apparent through the research is the fact that the most effective method of natural resource management is one that reflects the best interest of the people. The town hall meeting system, described by a state representative in the 1970s as, “permanently established as the State’s granite bedrock,” was the political means by which the people made their voice heard and translated into action.¹⁹³ A clean Kennebec River was in the best interest of the people, their values as a community reflected that functional relationship, and they took the appropriate steps to protect their resource.

Cutting edge ecological theorist’s state that a community cannot be sustained unless its associated populations are healthy and social sustainability depends ultimately on ecological sustainability.¹⁹⁴ I applaud the people of Maine for a job well done in natural resource management, and I believe that something can be learned from the story of the renewed Kennebec River. The ecological, political, social, economic, and spiritual evidence suggests a broader context for understanding the natural world and a means to manage it. Henry David Thoreau said, “In wildness is the preservation of the world.” In adaptation from Thoreau I say, “In the Kennebec River is the preservation of the people.”

¹⁹³ North Kennebec Regional Planning Commission. The land use element of a comprehensive plan.

¹⁹⁴ Allen, 34, 23.

CONCLUSION

The story of the Kennebec River can be broken down into many components: abiotic--soil, water, air, nutrients; biological--humans, aquatic life, fish, riparian vegetation, wildlife, birds; social--politics, private, individual, community, business, sustainability; historical--natural, migration, Indians, Arnold march, forts, ice, shipbuilding; and spiritual--pride, place, nature, tradition, family. The fusion of all these factors embodies the whole ecosystem of the Kennebec River Valley.

Maine stands out as leader in environmentalism by representing the compatibility of social, economic, political, and ecological spheres. The story of Kennebec River restoration is filled with achievements at many levels, from the grass roots to the federal government. Through that multi-front approach, the problem was dealt with in a manner that met the needs of the whole ecosystem; the economy was more sustainable and the ecology improved for aquatic life, birds, wildlife, and riparian conditions. Recreational use increased, pride was enhanced, and property values went up, bringing more tax revenue. Tourism increased, the river became more attractive to businesses, conservation and corridor protection became more effective, and classification standards were met. The river and the people became more stable and sustained, and nature was more balanced.

A clean, functional, and most natural a river as possible allows for the most diversified and sustainable conditions for life. Human needs and values are connected to the river and the Kennebec is a great example of how this functional relationship can be understood. However, much is needed to protect natural resources and the way of life that depends on them. Maine is unique in this opportunity in the

sense that the potential exists for the conservation of complete watersheds or river ecosystems. In a world of ever-increasing urbanization and social and technological complexity, Maine people can be applauded for being contemporary pioneers in successfully balancing nature with modern society.

The Kennebec River now sustains a population in a way that the people can be proud of. Mainers protected their home and maintained it in a way that maximized the potential for a preferred life. Aldo Leopold wrote in Sand County Almanac “A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends to do otherwise.”¹⁹³ Mainers were right when it came down to what to do about the Kennebec River. They have a sustainable economy and way of life that is enjoyable and preferred, much of which is centered in their ability to enjoy the natural environment. The Kennebec River was once a great river, and is now a great river again.

¹⁹³ Leopold, Aldo. Sand County Almanac. New York: Oxford Univ. Press, 1949. 224.

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APPENDIX A: 1953 STATE WATER CLASSIFICATION SYSTEM

Class A: Shall be the highest classification and shall be of such quality that it can be used for bathing and for public water supplies after disinfection, and the dissolved oxygen content of such waters shall be less than 75 percent saturation and contain not more than 100 coliform bacteria per 100 milliliters. There shall be no sewage or other wastes into water of this classification and no deposits of such material on the banks of such waters in such a manner that transfer of the material into the waters is likely. Such waters may be used for log-driving or other commercial purposes which will not lower its classification.

Class B: Shall be the second highest classification and the dissolved oxygen content of such waters shall not be less than 75 percent saturation and contain more than 300 coliform bacteria per 100 milliliters. There shall be no disposal of sewage into such waters except from a sewage treatment plant with disinfected effluent, and no disposal of other wastes except those that will not lower the classification of the water or be injurious to aquatic life or render such dangerous for human consumption if commonly so used. Waters of this class shall be considered acceptable for recreational purposes, and, after adequate treatment for use as a public water supply.

Class C: Shall be the third highest classification and free from scum, slicks, odors and object able floating solids, and shall be free from chemicals and other conditions inimical to fish life, and the dissolved oxygen content of such waters shall not be less than 5 parts per million. During a period of temporary reduction in the dissolved oxygen content in this class water, due to abnormal conditions of temperature or stream flow, for the particular season involved, the commission shall take no action to reduce the amount of pollution from any source which is allowed in such class water under normal conditions.

Class D: Shall be the lowest classification and considered as primarily devoted to the transportation of sewage and industrial wastes without the creation of a nuisance condition and such waters shall contain dissolved oxygen content in this class waster due to abnormal conditions of temperature or stream flow for the particular season involved, the commission, provided a nuisance condition has not been created in such water and in the opinion of the commission is not likely to be created during such season, shall take no action to reduce the amount of pollution from any source which is allowed in such class water under normal conditions.

APPENDIX B. 2003 WATER CLASSIFICATIONS FOR THE KENNEBEC RIVER

Class	Location
A	From the east outlet of Moosehead Lake to a point 1,000 feet below the lake
A	From the west outlet of Moosehead Lake to a point 1,000 feet below the lake
AA	From a point 1,000 feet below Moosehead Lake to its confluence with Indian Pond
AA	From Harris Dam to a point located 1,000 feet downstream from Harris Dam
AA	From a point located 1,000 feet downstream from Harris Dam to its confluence with the Dead River
A	From its confluence with the Dead River to the confluence with Wyman Lake, including all impoundments
A	From the Wyman Dam to its confluence with the impoundment formed by the Williams Dam
A	From the confluence with the Williams impoundment to the Route 201A bridge in Anson-Madison, including all impoundments
B	From the Route 201A bridge in Anson-Madison to the Fairfield-Skowhegan boundary, including all impoundments
C	From the Fairfield-Skowhegan boundary to its confluence with Messalonskee Stream, including all impoundments
B	From its confluence with Messalonskee Stream to the Sidney-Augusta boundary, including all impoundments
B	From the Sidney-Augusta boundary to the Father John J. Curran Bridge in Augusta, including all impoundments
C	From the Father John J. Curran Bridge in Augusta to a line drawn across the tidal estuary of the Kennebec River due east of Abagadasset Point. Further, the Legislature finds that the free-flowing habitat of this river segment provides irreplaceable social and economic benefits and that this use must be maintained.
B	From a line drawn across the tidal estuary of the Kennebec River due east of Abagadasset Point, to a line across the southwesterly area of Merrymeeting Bay formed by an extension of the Brunswick-Bath boundary across the bay in a northwesterly direction to the westerly shore of Merrymeeting Bay and to a line drawn from Chop Point in Woolwich to West Chop Point in Bath. Further, the Legislature finds that the free-flowing habitat of this river segment provides irreplaceable social and economic benefits and that this use must be maintained.

BIOGRAPHY OF THE AUTHOR

Daniel Michor was born in Riverside, Illinois on November 19, 1976. He was raised in Western Springs, Illinois and graduated from Lyons Township High School in 1995. He attended the University of Wisconsin at Madison and graduated in 2000 with Bachelor's degrees in Biological Aspects of Conservation and History. Daniel took one year off from school to teach sixth grade before entering the University of Maine in the fall of 2001 to study environmental history.

After receiving his degree, Daniel will continue his studies at the doctoral level in geography at the University of British Columbia. Daniel is a candidate for the Master of Arts degree in History from The University of Maine in May, 2003.