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PENOBSCOT

FINAL



WILD AND SCENIC RIVER STUDY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF OUTDOOR RECREATION
NORTHEAST REGIONAL OFFICE

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.



**U. S. DEPARTMENT OF THE INTERIOR
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**PENOBSCOT
WILD AND SCENIC RIVER STUDY**

JULY 1976

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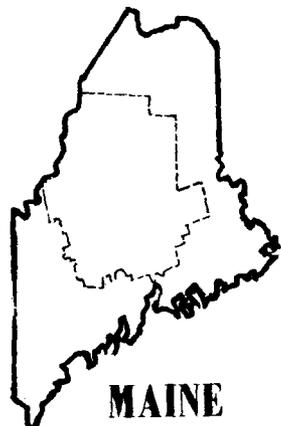
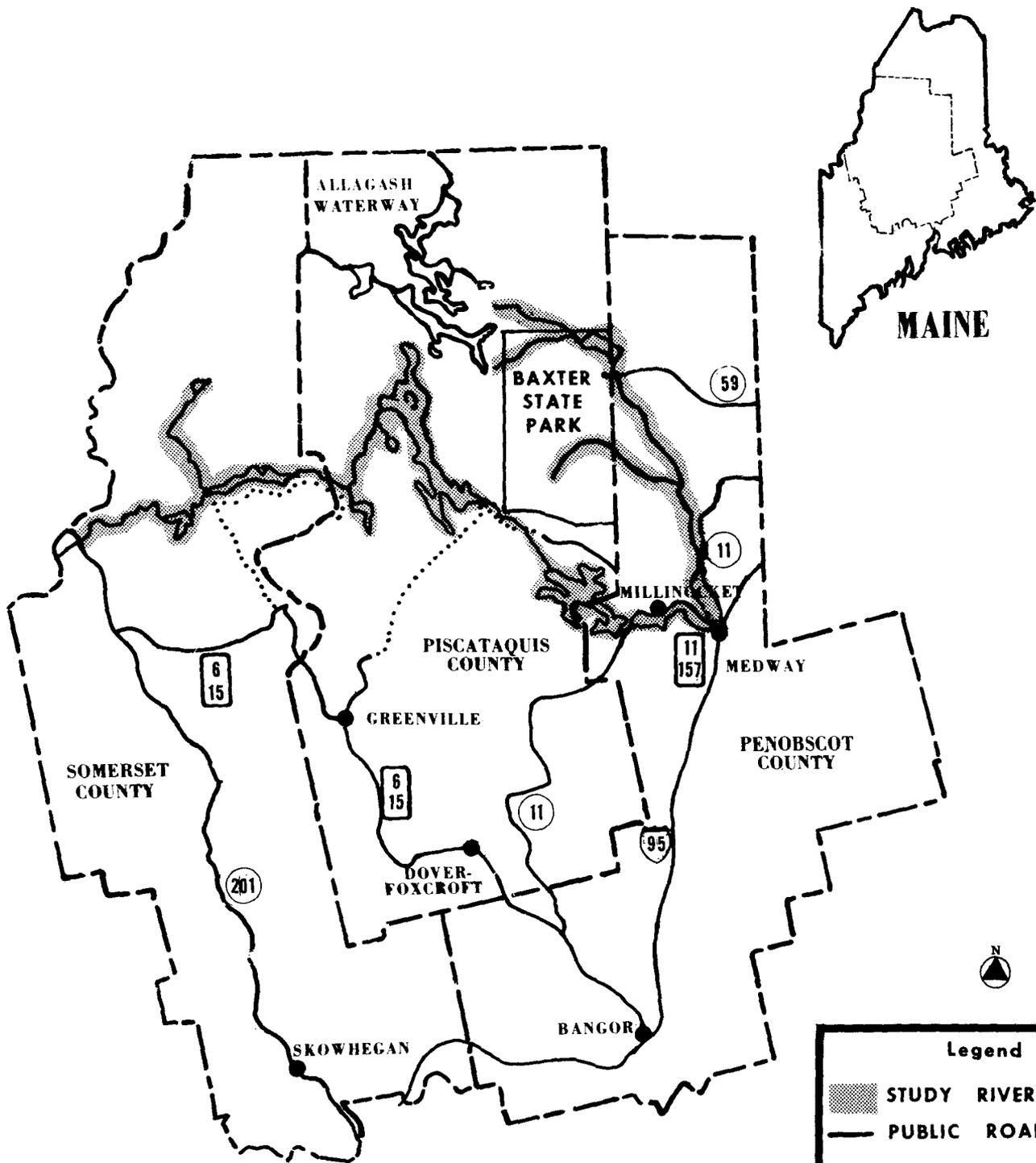
INTRODUCTION

This report on the wild, scenic, and recreational qualities of the East and West Branches of the Penobscot River in Maine was prepared under authority of the National Wild and Scenic Rivers Act of 1968, Public Law 90-542, as amended. In the Act the Congress declared it

...to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.

The Act established the national wild and scenic rivers system, designated eight rivers as initial components of the system, and prescribed methods and standards by which additional rivers would be added to the system. The Penobscot (East and West Branches) was one of 27 rivers designated initially by the Act for study as a potential addition to the national system. The study must determine the suitability of the Penobscot River for inclusion in the system, and, if it meets the established criteria, develop recommendations pertaining to management of the river and its environment.

Led by the U.S. Bureau of Outdoor Recreation, the interagency field task force is composed of representatives from the State of Maine's Department of Conservation; the Interior Department's National Park Service, U.S. Fish and Wildlife Service, and U.S. Geological Survey; the U.S. Environmental Protection Agency; the U.S. Forest Service; the Federal Power Commission; the U.S. Army Corps of Engineers; and the New England River Basins Commission. Other Federal and State agencies, recreation and conservation organizations, and interested groups have also been of assistance throughout the course of this study.



Legend

-  STUDY RIVER
-  PUBLIC ROADS
-  PRIVATE ROADS
-  CITIES AND TOWNS

SUMMARY

Overview

The 327-mile segment of the Penobscot River being studied for possible addition to the National Wild and Scenic Rivers System includes the headwaters of the East and West Branches to the town of Medway.^{1/} The study river falls within three rural counties in central Maine -- Penobscot, Piscataquis, and Somerset -- which together comprise roughly one-third of the state's area. Almost all the land within the river corridor is forested and used primarily for wood production, although compatible recreation uses are permitted where cutting is not in progress. Much of this land area is owned by a relatively small number of private corporations and trusts. Along the West Branch, the Great Northern Paper Company holds title to over 95% of the land.

Both tourists and residents find a variety of recreation opportunities throughout the three counties. Six of the state's 20 largest lakes, Baxter State Park, and the Allagash Wilderness Waterway are near the Penobscot's Branches. Popular recreation activities include fishing, camping, canoeing, snowmobiling, sightseeing, hiking, hunting, swimming, and boating.

Access to both the East and West Branches is provided over a series of private roads maintained by local landowners and the Baxter State Park Authority.

Findings

The East and West Branches of the Penobscot River, with the exception of the West Branch segment between North Twin Station and Medway, qualify for inclusion in the National Wild and Scenic Rivers System.

The Penobscot's primary values are its:

- * outstanding fishery resources, including landlocked salmon, brook trout, and Atlantic salmon habitat
- * outstanding wildlife resources, including bald eagle, moose, black bear, deer, and black duck
- * uniformly excellent water quality
- * clean air
- * extensive scenic resources both within the river corridor and visible from it
- * significant wilderness-oriented recreation opportunities due to the river's location in Maine's "wildlands"
- * consistently high quality environment along more than 300 waterway miles
- * high archeological potential, given the river's former importance as a major travelway of the Abenaki Indians

^{1/} A reference map for the river area is provided after the Summary of Recommendations to aid the reader in locating places noted in the report.

Additionally, the Penobscot weaves through two physiographic sections (White Mountains and New England Upland), has sufficient water flow during the summer for enjoyment of outdoor recreation, and unifies the Northeast's largest wilderness complex by connecting with the Allagash Wilderness Waterway as well as surrounding and flowing through Baxter State Park. It is a river unique in nature, with exceptional primitive beauty.

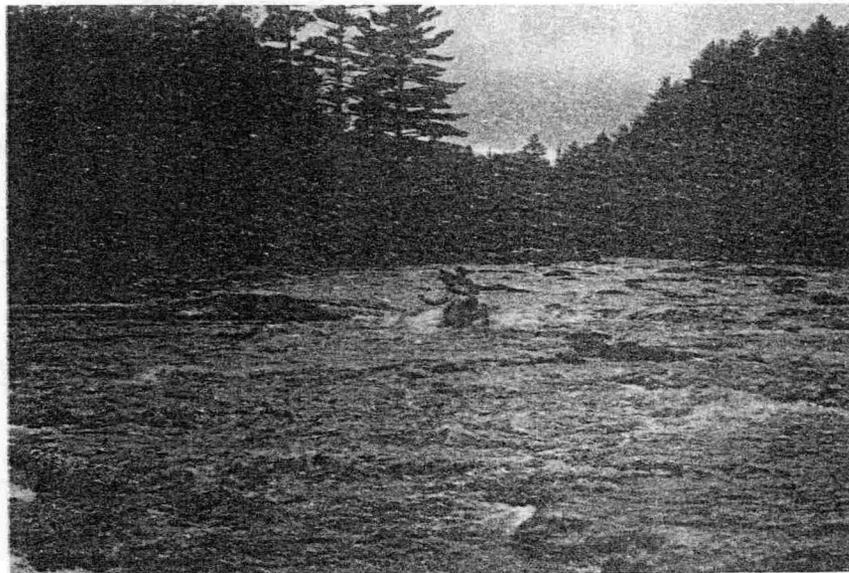
The 15 mile segment between North Twin Station and Medway has poor water quality, industrial development along the shoreline, and shallow water and log obstructions. It has been determined that this segment does not qualify for national designation.

Based on their attributes, the East and West Branches have been divided into segments and classified as WILD, SCENIC, or RECREATIONAL. A map showing the location of the classified areas is on pages 36-37. Total stream mileage in each category is as follows:

<u>East Branch</u>		<u>West Branch</u>	
Wild	- 83 miles	Wild	- 84 miles
Scenic	- 24 miles	Scenic	- 96 miles
	<u>107 miles</u>	Recreational	- 25 miles
			<u>205 miles</u>
		Not Qualified	- 15 miles

Segments of the West Branch that include Seboomook Dam and Ripogenus Dam have been classified as SCENIC. While it is recognized that impounded sections are generally classified as RECREATIONAL, a SCENIC classification here reflects the outstanding wilderness character of the resource. These segments are notable for their undeveloped shorelines, excellent scenery, Class A water quality, excellent fishery (e.g., wild landlocked salmon and trout), and historical values (Chesuncook Village and Penobscot Farm).

The RECREATIONAL segments consist of Caribou Lake and the 17 miles of the West Branch's lower Lakes (Ambajejus, Pemadumcook, North and South Twin).



Rapids
on
East
Branch

SUMMARY OF RECOMMENDATIONS

To preserve the Penobscot River's East and West Branches in their free flowing condition and to protect and enhance the river's natural values, it is recommended that:

- * 295 miles of the Penobscot's East and West Branches, together with 164,000 adjacent land acres, should be designated as a National Wild and Scenic River. The West Branch's lower lakes should not receive national designation, although this 17 mile segment does qualify.
- * The river should be State-administered and added to the national wild and scenic rivers system upon application by the Governor of Maine. In order to avoid the expiration of the Wild and Scenic River Act's moratorium on water resource developments, the State's application would have to be filed with the Secretary of the Interior prior to October 2, 1978.
- * Responsibility for land and water management should generally remain with private landowners, subject to adequate State conservation zoning and environmental regulations.
- * Maine's Land Use Regulation Commission should adopt permanent zoning standards along the river which:
 - prohibit development along the streambank zone (250 ft. from the highwater mark) through the establishment of shoreland protection districts.
 - restrict timber harvesting along the streambank zone of WILD segments to operations necessary to maintain a healthy, vigorous stand condition.
 - require Department of Conservation review and approval of all timber cutting plans within the designated river corridor. (This procedure is now followed along the Allagash Wilderness Waterway).
- * The State should acquire fee ownership of approximately 12,000 land acres. Big Bog, Pittston Farm, the shoreland between Seboomook Dam and roll dam campsite, Pine Stream Flowage, Ripogenus Gorge, the northern section of T2R10, and the beach along Debsconeag Deadwater have been identified for such acquisition.



Logan on East Branch



West Branch



I. RESOURCE EVALUATION



Physical Environment

The East and West Branches of the Penobscot River flow through the spruce-fir forests of central Maine. Their natural stream channels are well defined and stable with a river bed composed of sand, boulders, and bedrock. Diverse vegetation and topography combine to present a sometimes breathtaking, always delightful visual display as the river alternately runs swiftly through rugged terrain and flows slowly into deadwaters and lakes.

The West Branch flows through three rural counties -- Penobscot, Piscataquis, and Somerset -- which comprise the study area of this report. Along its 220 mile course, the river drains more than 2,000 square miles of land. Its northern headwaters originate above Big Bog where a man-made canal connects it with the St. John watershed while its south branch headwaters rise in the mountains on the Quebec border. The two mile long Ripogenus Gorge, immediately downstream of Ripogenus Lake, is a major scenic feature with its sheer ledge walls and undergrowth of mosses, ferns and delicate flowers. White-water stretches of note include Little and Big Ambajackmockamus Falls, the Horserace, Sourdnahunk Falls, Pockwockamus Falls, and Debsconeag Falls*.

The 107 river miles of the East Branch drain about 1,000 square miles of land. Along its course it follows to the East of the Traveler Mountain range and provides frequent views of Katahdin and its surrounding peaks. Its scenic values are enhanced by a steplike series of eight falls. Four of these - Pond Pitch, Grand Pitch, the Hulling Machine, and Bowlin Falls - occur within a 3 1/4 mile stretch.

From the outlet at Seboomook Lake, the West Branch drops a total of 830 feet in 97 miles before reaching Medway. The greatest elevation change occurs below Ripogenus Dam where the river drops 275 feet in 2.5 miles, an average of 100 feet per mile. Below Grand Lake Matagamon, the East Branch's elevation falls 414 feet in 47 miles. The greatest drop occurs seven miles downstream of Grand Lake where the river drops 130 feet in 2.5 miles, an average of 50 feet per mile.

The Penobscot River Basin covers 8,570 square miles, extending a maximum length of 125 miles and a maximum width of 115 miles. It consists of wide flat valleys with rolling hills and, especially in the northern portion, scattered monadnocks (hills or mountains of resistant rock). The river's headwaters are at an elevation of 1,040 feet mean sea level while many of the surrounding hills rise to 1,500 to 1,800 feet. At an elevation of 5,267 feet, Katahdin in Baxter State Park is Maine's highest point.

The basin's bedrock was formed about 350 to 570 million years ago. It includes sedimentary deposits which accumulated when much of the State was occupied by marine seas. Some of these sediments, such as those around Seboomook Lake on the Penobscot's West Branch, were

*Numerous place names appear throughout this report. These can be located on the Reference Map inserted after page viii.

deposited in deep water far from the ancient shoreline. Other deposits, such as those exposed along parts of Chesuncook Lake, were formed in shallow marine environments and contain well-preserved sea-shell fossils. The original horizontal layering of these rocks has been "turned on edge" by deformation processes, with the resulting folds running northeast and southwest across the basin.



Traveler & Bald Mts. from East Br.

Granites extend northeasterly into the Katahdin region from New Hampshire. Evidence of volcanic activity is also present. Pillow-shaped masses of lava are exposed on Lunksoos Mountain in the area between the confluence of the East Branch Penobscot and Wassataquoik Stream while volcanic rocks can be found on Traveler Mountain within Baxter State Park.

The surface of the Penobscot Basin has been modified by glaciation and blanketed by glacial till (i.e., unsorted clay, sand, boulders, and gravel). As the ice retreated, many lakes formed in depressions in the bedrock created by glacial scouring. The glacial till deeply filled old valleys and covered the bedrock hills. On the highlands throughout the basin the till is exposed; on the low, flat valleys it is buried under deposits of marine clay, gravel and sand. These lowland areas of marine clay and silty sand are poorly drained and, in many instances, have become bogs filled with peat and other organic material.



North Branch

Soils of the watershed have developed principally from acid shale and slate. The upland soils are generally well drained and support good stands of hardwoods and conifers, although they are too stony for agricultural use.

Six percent of the basin's total land area is classified as poor to very poorly drained. These areas consist of muck and peat soils. They support little forest vegetation but do provide good wildlife habitat and unique communities of small plants. The soils adjacent to the Penobscot are deposits from glacial streams. They are composed of sand and gravel with associated kettle holes or wide basins with poorly drained silt clay and organic deposits.

The climate of the upper Penobscot River basin is suited to four seasons of recreation use. Summer daytime temperatures are normally in the high 70's to 80's, warming the water sufficiently for swimming at least during July and August. From December through March average monthly temperatures range from 12°F to 26°F at Millinocket, with winter lows of minus 30°F recorded occasionally. During those four months, Millinocket's average snowfall is 70 inches while up to 100 inches is normal in the upper watershed. This combination of consistently cold weather and adequate precipitation provides near ideal conditions for a variety of winter sports such as ice fishing, snowmobiling, and cross-country skiing.

Archeology and History

Prior to the early European explorations, Maine was inhabited primarily by Algonquin-speaking peoples, with the Penobscot Indians living along the shores of the river bearing their name. The Penobscots' subsistence was based on hunting and fishing and their seasonal movements along the river reflected the need to follow food resources.

Archeological investigations in the late 1800's uncovered graves containing red ochre deposits and tools made of red ochre, suggesting the possible existence in the basin of a pre-Algonquin culture. A controversy soon developed regarding the nature of these "Red Paint People". The arguments were fueled by surveys along the East and West Branches conducted in the 1910's by Warren King Moorehead. Unfortunately, the general inaccessibility of Maine's interior, coupled with the inundation and resultant damage to camping and burial sites brought on by numerous logging dams, has worked against a systematic field study of the region's archeological resources. It is thought that the shorelands of the Penobscot, especially the West Branch, are rich depositories of the artifacts necessary to satisfactorily reconstruct the history of pre-Algonquin and Algonquin-speaking societies.

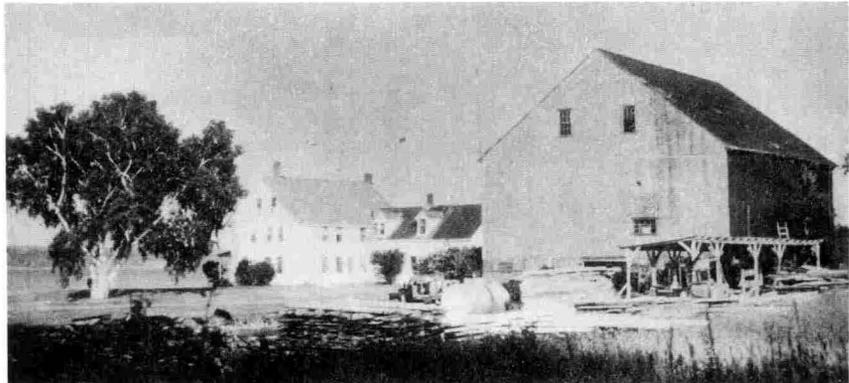
The explorer Samuel de Champlain is generally credited as the first European to visit the Penobscot. Throughout the colonial period, both the English and French contested sovereignty over the upper basin, with the dispute eventually shifting to disagreements between the United States and Great Britain over the boundary between Maine and Canada. This controversy was not officially resolved until 1842 when the Webster-Ashburton Treaty drew the boundary at the limits of the Penobscot's north and south branch headwaters.

For the past 150 years, the Penobscot's history has been intimately associated with the logging industry. Initially, lumbermen sought the tall and sturdy eastern white pine to be used as masts for ships in the King's Navy. Throughout the 1800's the industry extended its domain, harvesting spruce and fir and building numerous dams to raise stream and lake water levels so that logs could be floated downstream to the mills. Chesuncook Dam, built in 1834 at the outlet of Chesuncook Lake for logging purposes, was the first major construction on the West Branch. The original structure was submerged when Ripogenus Dam was constructed in 1917.

By 1890, 55-60 million feet of logs were cut along the West Branch yearly and an additional 40 million feet were harvested along the East Branch. In the early part of this century, numerous small lumbering operations were consolidated by the Great Northern Paper Company, which eventually came to own most of the land along the West Branch.

Two lumbering sites on the West Branch are included in the National Register of Historic Places. Chesuncook Village, at the northwestern shore of Chesuncook Lake, was first settled in the 1840's and rapidly became a focal point for lumbermen throughout the area. The Ambajejus Boom House on Ambajejus Lake served as a camp for the loggers. It is built on one of the two islands used as an anchoring point for booming the logs which were to be towed down the chain of lakes leading to the Millinocket and East Millinocket mills.

Perhaps the most renowned individual to be associated with the region is Henry David Thoreau. Between 1846 and 1857, Thoreau completed three journeys into the northern Maine wilderness. His classic, The Maine Woods, superbly describes the magnificence of "Ktaadn", the beauty of Chesuncook and the East Branch, and the character of the men who inhabited the "wildlands".



Chesuncook Village



Ambajejus Boom House

Population

Historically, Maine has been a relatively sparsely settled State, especially in the North Maine Woods where settlements are small and widely separated. In 1970, only 182,000 people resided on the over 7 1/2 million acres of the study area. Approximately 70% of this population is located in Penobscot County, where the population density of 37 persons per square mile is slightly higher than the statewide average (32), due in large part to settlement concentrations in the southern section. Piscataquis and Somerset Counties have population densities of 4 and 10 persons per square mile respectively.

Bangor, the third largest city in Maine, is the region's major population center. In 1970, 33,000 persons resided there. No other towns in the study area have populations in excess of 10,000 and only six settlements (Brewer, Millinocket, Old Town, Orono, Fairfield, and Skowhegan) have populations exceeding 5,000. Millinocket, with almost 7,600 people, is the largest town near the Penobscot's branches. Its population has increased 30% since 1950.

Between 1960 and 1970, the study area's population declined slightly. But the Bureau of Census population figures for July 1973 indicate an increase in population of almost three percent in the three-county study area. Most of the increase is estimated to have come from a greater number of births than deaths. Some of the increase, however, was due to an in-migration of people to Penobscot and Somerset Counties. Only Piscataquis County had an out-migration during the 1970-1973 period. Population projections prepared for the State Planning Office indicate the study area's residents will number 200,000 by 1980 and over 230,000 by the end of the century.

TABLE 1: POPULATION TRENDS IN 3-COUNTY STUDY AREA (THOUSANDS)

	<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1973</u>	<u>% Change</u>	
					<u>1960-70</u>	<u>1970-73</u>
Penobscot Co.	108.2	126.3	125.4	129.6	-0.8	3.4
Piscataquis Co.	18.6	17.3	16.3	16.4	-6.3	0.6
Somerset Co.	39.8	39.8	40.6	41.5	2.1	2.1
3-County Total	166.6	183.4	182.3	187.5	-0.7	2.9

Sources: U.S. Bureau of the Census
Maine State Planning Office
Maine Cooperative Extensive Service

TABLE 2: PROJECTED POPULATION FOR 3-COUNTY STUDY AREA (THOUSANDS)

	<u>1980</u>	<u>1990</u>	<u>2000</u>	<u>2020</u>	<u>% Change</u>	
					<u>1973-1980</u>	<u>1973-2000</u>
Penobscot Co.	145	162	178	207	12	37
Piscataquis Co.	15	15	14	13	-10	-15
Somerset Co.	40	41	40	40	-4	-4
3-County Total	200	218	232	260	7	24

The Local Economy

Over 66,000 people are employed in the three-county study area. The major employment opportunities in Piscataquis and Somerset Counties are found in the manufacturing sector, which accounts for 43% and 47% respectively, of all jobs. Lumber and wood and leather products are these two counties' largest industries and their economies are more heavily dependent upon such manufacturing activity than is the State as a whole.

Penobscot County's economy is more diversified, reflecting the city of Bangor's prominence as a regional center. While paper and leather manufacturing concerns employ thousands of people, there is also a substantial wholesale and retail trade sector that provides one-fifth of all jobs. There is also a notable education services component due to the presence of the University of Maine at Orono.

The State of Maine suffers chronic unemployment problems. In 1971, over 8% of the work force was unable to find employment. By March of 1975, statewide unemployment had increased to over 12%, one-third higher than the national average. This situation is even more aggravated in parts of the study area since unemployment exceeds 14% in Piscataquis County and 18% in Somerset County. The Penobscot County work force has fared somewhat better than the state as a whole. Nevertheless, unemployment there has reached almost 11%.

Maine is not a wealthy state, and the income statistics reflect that fact. In 1969, statewide median family income was \$8,200, slightly less than Penobscot County's average of \$8,300 yet substantially more than that received by the residents of Piscataquis and Somerset Counties (\$7,200 and \$7,500 respectively.) Income data from the 1970 Census indicate that approximately 10% of the study area's families subsisted on annual incomes less than the Federal government-defined poverty level. Almost one-fifth of Piscataquis' and Somerset's families lived on low level incomes (i.e., less than 125% of the poverty level). This situation has not improved in recent years, according to State Planning Office calculations. Between 1967 and 1974, the state's median income increased only \$90 in purchasing power.

The Millinocket Economic Area, which includes Millinocket, East Millinocket, and Medway, is the principal economic center near the river study corridor. The Great Northern Paper Company, which built the town of Millinocket in 1901, is the key to the area's prosperity, employing over 50% of the total work force. Great Northern's manufacturing operations here produce over 2 million tons of newsprint and special papers. As a result, in 1972 Millinocket ranked 4th among the state's 30 economic areas in manufacturing product value with \$120 million. From 1967 to 1971, the value of manufactured goods increased slightly, yet the total number of workers decreased by 10%. During the same time period, however, the area's average gross wage in the manufacturing sector rose from \$8,100 to \$10,300.

Transportation

Principal automobile access to the region is provided by Interstate 95, which passes through Bangor and continues north to the Medway-Millinocket area. Access to the Penobscot Branches, Baxter State Park and other recreation areas requires travelling over a series of secondary state roads and some private roadways. Location of major access routes is shown on the map on page iv.

State routes 11 and 159 can be used to reach various sections of the East Branch Penobscot. Access to the West Branch is more circuitous. Travelers driving north on I-95 can head for Millinocket and, after passing through the town, use a park road leading to Baxter State Park. That road connects with several private roads maintained by the Great Northern Paper Company. The most common approach to the West Branch is through the town of Greenville on State route 6-15. Here again, access to the river proper requires use of Great Northern roads. These private roads are usually open to the general public although they are sometimes closed during the winter and under special circumstances. Caution is required when driving them since they are built primarily for trucks delivering timber from the North Woods to the Millinocket pulp mills.

Canadian visitors can enter Maine south along State route 6-201, which passes the uppermost section of the Penobscot's south branch headwaters, and then drive east and south on state route 6-15 past Moosehead Lake to Greenville and beyond. An alternate entrance point in the northern-most part of Maine is near Fort Kent. State route 11 south then leads to the study region.

Air travel is the major alternative transportation mode for access to the region. Bangor International Airport, opened in 1968 on the site of the deactivated Dow Air Force Base, is the primary commercial air facility within the study area. Small airports exist near Brewer, Dexter, Dover-Foxcroft, Jackman, Old Town, Pittsfield, and Skowhegan. Several charter services provide float plane access to the region's numerous lakes. Sites of these services include Millinocket, Greenville, and Shin Pond.

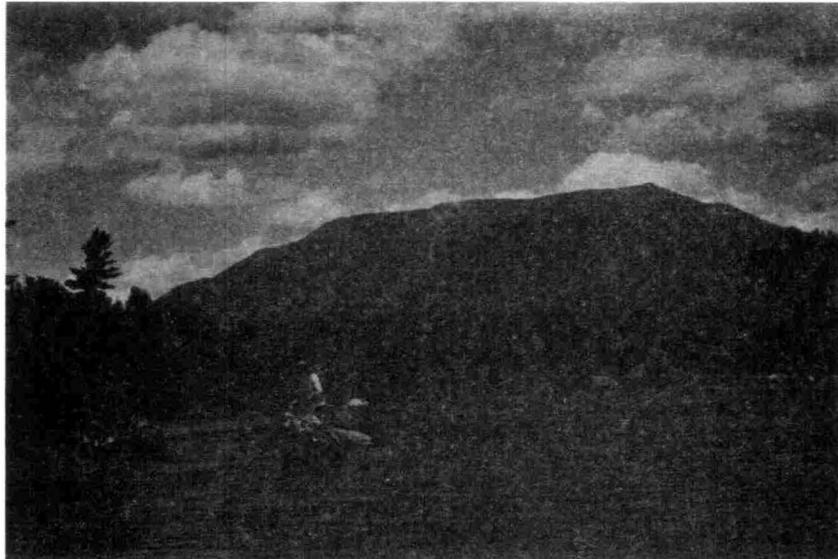
Recreation Opportunities

A. Regional

The vacationist, tourist, or leisure-seeking resident finds a variety of high quality recreation within the study area. One can canoe, fish, swim, camp, mountain climb, hike, ice fish, snowmobile, and hunt within the Penobscot watershed.

Six of the state's 20 largest lakes are located here -- Moosehead, Chesuncook, Twin Lake System (South and North Twin, Pemadumcook, and Ambajejus Lakes), Chamberlain, Churchill, and Millinocket. The combined surface area of these six lakes exceeds 226 square miles. Two of them, Chesuncook and the Twin Lake System, actually form part of the West Branch Penobscot, while Millinocket Lake feeds directly into the Penobscot.

Katahdin, the highest point in Maine, offers an interesting challenge to mountain-climbing enthusiasts. Located in Baxter State Park and visible from both the East and West Branches, Katahdin is actually a series of peaks with the most prominent ranging in height from 4,700 to 5,267 feet. It has been designated a National Natural Landmark. Traveler Mountain, visible from the East Branch, reaches 3,541 feet.



Katahdin as seen from the West Branch

Surrounded by the East and West Branches, Baxter State Park is a 200,000 acre tract designated to remain "forever wild". Deeded to the state by former Maine Governor Percival P. Baxter, the park offers wilderness camping, hiking, and nature observation opportunities. As a wildlife sanctuary, it harbors numerous species of fish, birds, and mammals, including moose, black bear, and white-tail deer. Moosehead Lake, Maine's largest, with a surface area of almost 75,000 acres, is to the west of Millinocket. It provides significant fishing, boating, and hunting. The Allagash Wilderness Waterway flows to the north of the Penobscot and offers a water passage from the West Branch to the East Branch by way of the Mud Pond Carry Trail from Umbazooksus Lake to Mud Pond and Webster Stream from Telos Lake to Grand Lake Matagamon. As the first state-administered river included in the National Wild and Scenic Rivers System, the Allagash is a popular wilderness canoeing and camping area.

Within the study area, over 225,000 acres of public recreation lands have been identified and classified in accordance with the Bureau of Outdoor Recreation's Land Classification System. Approximately 95% of these lands are Class V or "primitive areas", mostly within the boundaries of Baxter State Park. These primitive areas are in a natural and undeveloped condition and are managed with the intention of providing a wilderness experience. Most of the other public recreation lands are Class III or "natural environment" areas. While not managed strictly as primitive areas, they do offer high quality hiking, camping, picnicking, etc.

The State of Maine administers four wildlife management areas totaling 1,200 acres in Somerset County as well as Old Pond Farm, a 1,200 acre tract, in Penobscot County. Excluding the Allagash, the State also administers over 80,000 feet of lake shoreline in the three counties and approximately 3,000 feet of river shoreline. Most of the developed sites along the shore are used for camping, picnicking, hiking, and swimming. There are also 250 forest campsites in the region.

No federally administered outdoor recreation areas are located within the study area.

Very few recreation statistics are available on a regional basis. Because of state regulation, however, figures have been compiled for deer hunting and snowmobiling. In the 1966-71 period, almost 30% of the deer kills recorded in Maine occurred in Penobscot, Piscataquis and Somerset Counties. Hunting in these counties accounts for an average of 10,000 animals killed annually.

Snowmobiling has become extremely popular. In 1970, less than 8,000 vehicles were registered in the three counties. Two years later, approximately 14,000 snowmobiles were registered. The significance of these numbers becomes apparent when they are compared with population statistics. There is one snowmobile for every 10 people in Piscataquis and Somerset Counties, and one per 14 people in Penobscot County.

TABLE 3: PUBLIC RECREATION LAND ACREAGE BY BOR CLASS*

<u>Location</u>	I High Density Recreation	II General Out- door Recreation	III Natural Environ- ment	IV Interpretive & Educational	V Primitive
Penobscot Co.	602	92	2,947	108	---
Piscataquis & Somerset Co.	268	178	5,242	1,529	215,887
Total	870	270	8,189	1,637	215,887

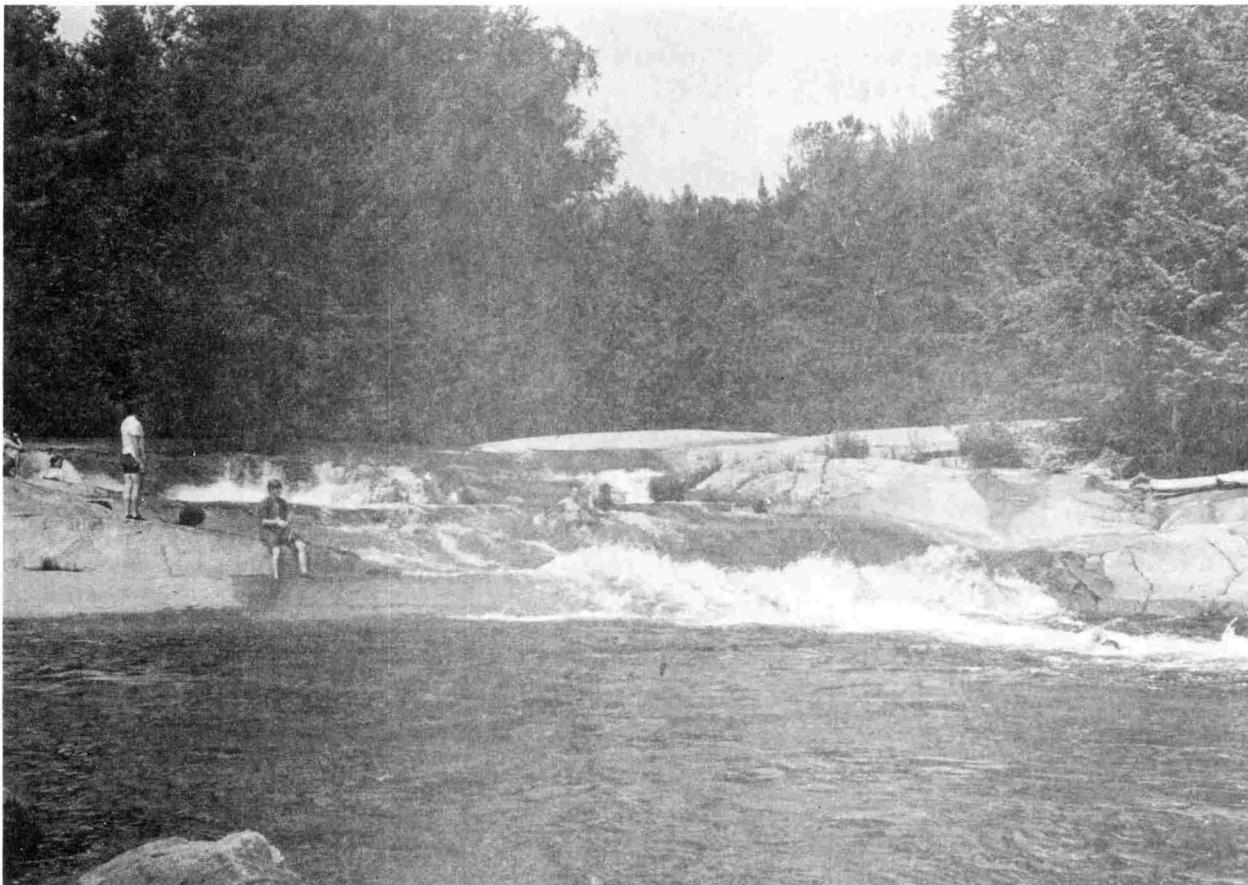
*Excluding public lots and privately administered National Historic Sites.

B. River Corridor Recreation

The East and West Branches provide ample opportunity for water and land-based recreation activity, including fishing, camping, canoeing, hiking, hunting, sightseeing, nature study, ice fishing, snowmobiling, and boating.

Recreation patterns along the West Branch can be determined from data collected at three Great Northern Paper Company checkpoints which control and monitor public access to the upper watershed. In 1974, over 37,000 persons who registered at these gates from May 20 to November 30 were travelling to West Branch locations for recreation. Vehicle registrations suggest that 60% of these visitors are Maine residents.

Eighty percent of West Branch visitors are interested primarily in sightseeing, camping, or fishing. Those using the access road northwest of Millinocket are most frequently attracted to Aboi campground and the Ripogenus Dam-Chesuncook Lake area. Persons passing the Sias Hill checkpoint also concentrate around Ripogenus-Chesuncook. Recreationists entering from the west shore of Moosehead Lake evidence a different pattern, however. Almost two-thirds of them come to fish or hunt and their most popular destinations are Seboomook and Canada Falls.



Nesowdnehunk Stream at West Branch

By 1980, an estimated 41,000 persons will travel to the West Branch for recreation. This number is likely to increase to almost 56,000 visitors by the end of the century, although no significant shift in recreation preferences is predicted. Thus, sightseeing, camping, and fishing will remain the chief attractions for 4 of every 5 recreationists.

An indication of total recreation impact can be gained from recreation day * figures. In 1974, West Branch visitors spent 114,000 recreation days in the area upstream of the lower lakes. Almost one-half of this total is attributable to campers, with much of the balance due to sightseers and fishermen. It is forecast that the river will receive 11% more use by 1980 and that annual recreation days will exceed 177,000 by 2000, an increase of 56% over present use. Camping is expected to remain the predominant activity. By the year 2000, canoeing should comprise 10% of total recreation use, thus becoming almost as popular a sport as fishing.

Recreation use of the West Branch's lower lakes -- Pemadumcook, Ambajejus, North and South Twin -- centers around the 640 cottages scattered along the shores. An estimated 224,000 recreation days of activity occur there annually. Assuming a 10% increase in the number of cottages by 2000, recreation use could rise to almost 245,000 recreation days. Combining upstream statistics with those from the lower lakes indicates that total recreation use of the entire West Branch will increase from 338,000 recreation days presently to 422,000 by the year 2000, a 25% gain.

TABLE 4: WEST BRANCH RECREATION SUMMARY**

	<u>Sightsee</u>	<u>Fish</u>	<u>Camp</u>	<u>Hunt</u>	<u>Canoe</u>	<u>Hike</u>	<u>Total</u>
1974 Total Recreation Days	24,400	16,800	54,600	10,000	6,300	1,500	113,600
1974 Recreation Day Distribution (%)	21	15	48	9	6	1	100
1980 Recreation Day Distribution (%)	22	14	48	8	6	2	100
2000 Recreation Day Distribution (%)	21	12	48	7	10	2	100

**excludes lower lakes figures

*Recreation day estimates take into consideration the average number of days a recreationist stays along the river. Thus, if the average fishing trip is 2 days, 2,000 recreation days of fishing would be attributed to every 1,000 fishermen using the river. Average length of stay information is contained in the Tourism in Maine study prepared by Northeast Markets, Inc., A.D. Little Inc., and W. R. Fothergill for Maine's Vacation Travel Analysis Committee.

No comprehensive recreation statistics for the East Branch are readily available. However, when the data which does exist is combined with estimates by persons knowledgeable about the river, a reasonable picture of recreation use emerges. Each year almost 2,900 persons use the East Branch for recreation. Only 300 more visitors are likely by 1980, but a 57% increase over current figures is possible by the year 2000 when more than 4,500 visitors may be attracted to the river.

Hunting, canoeing, and fishing are the main attractions of the East Branch. Over 90% of all recreation days are attributable to these three activities. This pattern contrasts sharply with that found on the West Branch where camping is the most significant activity and canoeing is of relatively minor importance in terms of overall recreation impact.



Fishing on the East Branch

Unlike the West Branch, the pattern of recreation activity along the East Branch should shift noticeably as total use grows to 9,100 recreation days yearly by 1980 and to 14,400 recreation days by the year 2000. Canoeing will account for one-third of all these days within the next few years. By century's end, canoeing will clearly be the dominant activity, comprising almost one-half of all recreation use. While fishing and hunting will continue to increase, the relative share of these sports in the total recreation picture will decline over the long term from 50% of all recreation days to 33%.

TABLE 5: EAST BRANCH RECREATION SUMMARY

	<u>Fish</u>	<u>Camp</u>	<u>Hunt</u>	<u>Canoe</u>	<u>Other</u>	<u>Total</u>
1974 Total Recreation Days	1,300	1,200	2,700	2,400	400	8,000
1974 Recreation Day Distribution (%)	16	15	34	30	5	100
1980 Recreation Day Distribution (%)	16	14	31	34	5	100
2000 Recreation Day Distribution (%)	12	12	22	49	5	100

TABLE 6: RECREATION USE INCREASES

	<u>% Increase: West Branch*</u>		<u>% Increase: East Branch</u>	
	<u>1974-1980</u>	<u>1974-2000</u>	<u>1974-1980</u>	<u>1974-2000</u>
Number of Visitors	10	50	11	57
Total Recreation Days	11	56	14	80

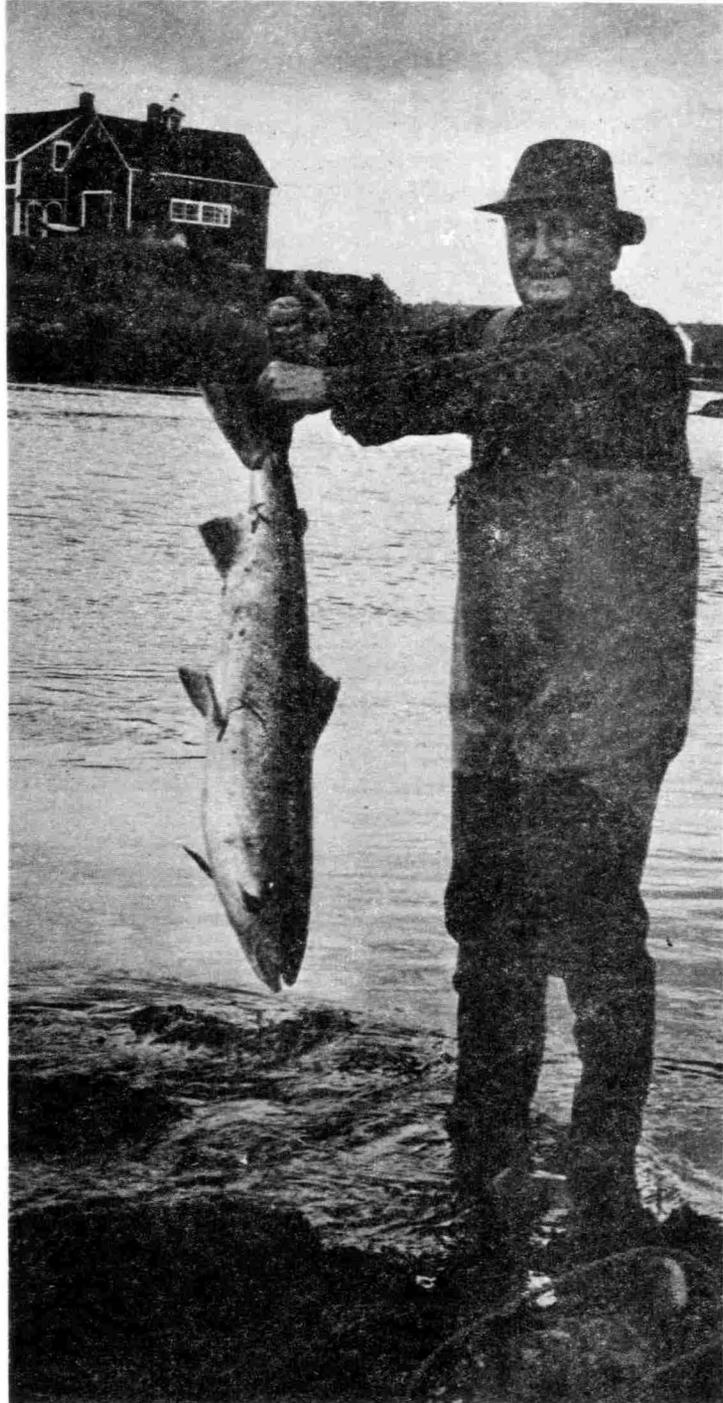
*excludes lower lakes statistics

Fishery Resources

Inhabited by 37 species of fish, the East and West Branches of the Penobscot River provide excellent cold and warm water fishing opportunities. Cold-water fishing predominates, with pressure centering on brook trout, lake trout (togue), and landlocked salmon. Major warm-water species, largely underutilized, include white perch, yellow perch, chain pickerel, and small-mouth bass.

On the East Branch, the primary landlocked salmon fishery occurs directly downstream of Grand Lake Matagamon. Togue inhabit Webster Lake and First and Second Matagamon Lakes, while brook trout are found throughout. Warm-water species, especially yellow perch and chain pickerel, are broadly distributed. Small-mouth bass extend upstream to Grand Pitch.

A concerted effort is currently underway to restore Atlantic salmon to the Penobscot River and especially to the East Branch, which was once the major spawning area for the entire Penobscot. Over 169 acres of the East Branch are suitable for spawning and nursery area and the quality of the adult resting pools has been classified "excellent". An additional 120 acres of spawning and nursery area exist within Wassataquoik Stream, although the cool water will permit only slow growth.



Goal of the salmon restoration

The West Branch is noted for its excellent landlocked salmon fishery, particularly in the section from Chesuncook Lake to the lower lakes. Two to five pound salmon are common and larger fish are taken occasionally. Togue are plentiful in the deep, colder lakes such as Lobster and the Debsconeag system.

Warm water fishing on the West Branch occurs primarily around Ambajejus, Penadumcook, and the Twin Lakes, where yellow perch and pickerel are concentrated. White perch can be found as far upstream as Seboomook Lake, while the pickerel's range is restricted to the waters below Sourdnhunk Falls. Yellow perch are also broadly distributed throughout the West Branch.

The blueback trout, a unique species, can be found in Penobscot Lake. Presently, the blueback trout is on a priority list for consideration as a threatened species by the U.S. Fish and Wildlife Service's Office of Endangered Species. No final determination of its status has yet been made.

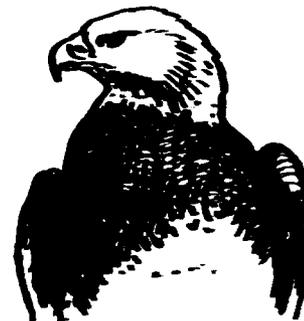
Wildlife

The study area possesses outstanding wildlife resources and offers excellent opportunities for observation, hunting, and trapping. Numerous logging roads and cut-over areas provide abundant habitat as well as access for the hunter.

Moose are abundant along the West Branch and, to a lesser extent, also appear on the East Branch. White-tailed deer, black bear, and coyote inhabit the area. The bald eagle, which was represented by only 33 active nests in Maine in 1974, nests here. Only two colonies of the Common Tern exist in the interior of Maine, and one of these is located on the West Branch.

The Northeast United States population of the bald eagle is in the most critical condition of the remaining major bald eagle populations of the United States. The status of this bald eagle population will soon be reviewed by the U.S. Fish and Wildlife Service to determine whether that population should be listed officially as Threatened or Endangered.

Fur-bearing animal species abound, including red fox, grey fox, bobcat, otter, mink, raccoon, short-tailed weasel, long-tailed weasel, fisher, pine martin beaver, and muskrat. Major small-game mammals include the snowshoe hare and gray squirrel.



Bald Eagle

Over 120 species of birds can be observed within the study area. Nesting species include the Common Loon, Great Blue Heron, American Bittern, Red-tailed Hawk, Osprey, Ruffed Grouse, Woodcock, Ruby-throated Hummingbird, Pileated Woodpecker, Blue-winged Teal and American Merganser.

Waterfowl production areas are small in number and widely scattered. The most significant of these is located at Pine Stream flowage, a broad, shallow sedge marsh unlike any in the surrounding area. Among the waterfowl which do find nesting places are the black duck, ringnecked duck, and wood duck.

Reptiles present include the wood turtle, snapping turtle, painted turtle and green snake. Bull frogs, leopard frogs, blue spotted salamanders and red spotted newts are but a few of the resident amphibians.



Moose

Vegetation

Spruce, fir, and northern hardwoods dominate the landscape along the river corridor. The spruce-fir type consists primarily of red spruce, black spruce, and balsam fir, with associated species being tamarack, northern white cedar, eastern white pine, hemlock, red maple, white birch and ash. Principal northern hardwoods are sugar maple, yellow birch and beech with associated species being red maple, northern red oak, American elm (dead or dying in many locations) white ash, black cherry and American basswood.

The occurrence of the spruce-fir type reflects the region's severe climate, its relatively coarse, poorly drained, infertile soils, and the logging history of the land. These species predominate on outwash plains where the effective soil depth may be limited by high water tables, and on bogs and poorly drained soils adjacent to lakes. They are also found on the uppermost slopes where the soil is coarse and excessively drained. The best northern hardwood sites are deep, well drained soils of glacial till with a mull humus layer.

Stands of old growth eastern white pine can be found west of Chesuncook Lake into Pine Stream flowage. These pines tower 20 to 40 feet above the spruce, fir and hardwoods and this area is the only stretch along either branch where they remain extensive.

Four plants found within the study area are among those recommended by the Smithsonian Institution to the Department of the Interior as candidates for listing as threatened or endangered species. Two of these, the Cyperaceae (a sedge) and the Alleghany Monkey Flower, are known only from Maine and are candidates for endangered status. The Tubercled Orchid and Auricled Twayblade (a member of the orchid family) are candidates for threatened status.

Black spruce bogs within the river corridor contain three species of carnivorous plants and four orchid types (White bog orchid, Grass pink, Rose pogonia, Arethusa). Cedar bog vegetation includes the orchid species Calypso.

Ground cover includes ferns, mosses, lichens, checkerberries, wintergreen, blueberries, raspberries, strawberries, wild sasparilla, Clintonia and wild onion. Shrubs include glossy buckthorn, withe-rod, alders, hobble-bush, shadbush, red-berried elder and willows.

Minerals

There are no known coal or oil reserves within the upper Penobscot basin. Mining activity is practically nonexistent along the branches, reflecting a situation common to the entire study area. In 1972, the only significant mineral activity in the three-county area was the production of a million tons of sand and gravel, with a value of \$1.4 million, in Penobscot County and the recovery of a small amount of dimension slate (used for floor tile) in Piscataquis County. No metal extraction took place within the river corridor and there are no known plans for undertaking such operations in the near future.

Air Quality

Air quality is excellent throughout the upper Penobscot region except for the industrial area of Millinocket-Medway. The two pulp and paper mills at Millinocket and East Millinocket emit sulphur dioxide, nitrous oxide, and particulates, as well as minor quantities of hydrocarbons and carbon monoxide. Currently, the mills are in compliance with State air quality implementation plans. The towns of Millinocket and East Millinocket have open burning dumps, and Millinocket has applied for a variance under Maine law so that it may continue its open burning operations. The prevailing winds, northwest during the winter and southwest during the remainder of the year, disperse these pollutants away from the study area.



West Branch

Water Quality

Water quality along almost all of the East and West Branches is "uniformly excellent". With one exception, the river segments under study are unpolluted and suitable for all water supply uses -- domestic, commercial, industrial, agricultural -- as well as for swimming.

The West Branch segment from Millinocket to Medway is a water quality problem area due principally to the waste discharges associated with local paper mill operations. Municipal uses along this stretch are a minor additional factor in the overall pollution levels.

Presently, there are no significant water quality problems related to runoff, thermal pollution, septic tank pollution or mine drainage. Log skidding and road construction cause limited erosion and sedimentation.

Maine's Department of Environmental Protection has classified the Penobscot's waters in accordance with State laws as follows:

East Branch

headwaters to outlet of Grand Lake Matagamon (including tributaries)
Class A

outlet at Grand Lake Matagamon to Medway (including tributaries)
Class B-1

West Branch

headwaters and tributaries above Seboomook Lake - Class A

Seboomook Lake to North Twin Dam (including tributaries) - Class A

Quakish and Ferguson Lakes - Class B-2

Millinocket to Medway - Class D

Class A is the highest classification. It is suitable for swimming and water supply after disinfection. Such waters have dissolved oxygen content not less than 75% saturation and contain not more than 100 coliform bacteria per 100 milliliters. Class B-1 waters are also suitable for swimming, water supply after treatment, and fish and wildlife habitat. Total coliform bacteria count cannot exceed 300 per 100 milliliters, while dissolved oxygen content is not less 75% saturation. Class B-2 waters are less stringent regarding dissolved oxygen (not less than 60% saturation) and permit up to 1,000 coliform bacteria per 100 milliliters. Class C waters are suitable for fish and wildlife but not for swimming. Dissolved oxygen levels must not be less than 5 parts per million for trout and salmon waters. Class D waters, the lowest classification, are suitable only for navigation and waste disposal. To prevent nuisance conditions, dissolved oxygen cannot be less than 2.0 parts per million.

Class D is to be phased out under the Federal Water Pollution Control Amendments of 1972. At present, the Millinocket segment is not meeting Class D standards. Once "best practicable treatment" facilities at the two pulp and paper mills are constructed and in operation, the Maine Department of Environmental Protection and the U.S. Environmental Protection Agency will evaluate this river segment to determine what steps may be feasible to meet Class D, or, if possible, to meet a Class C or B standard.

Completion of secondary treatment facilities are scheduled for the Town of Millinocket by 1977 and East Millinocket by 1980. East Millinocket has an existing primary plant. Since septic systems have proved inadequate in Medway, engineering plans have been prepared for a wastewater collection and treatment system. Future regional treatment at the programmed Millinocket Municipal plant has been proposed.

River Flow Patterns

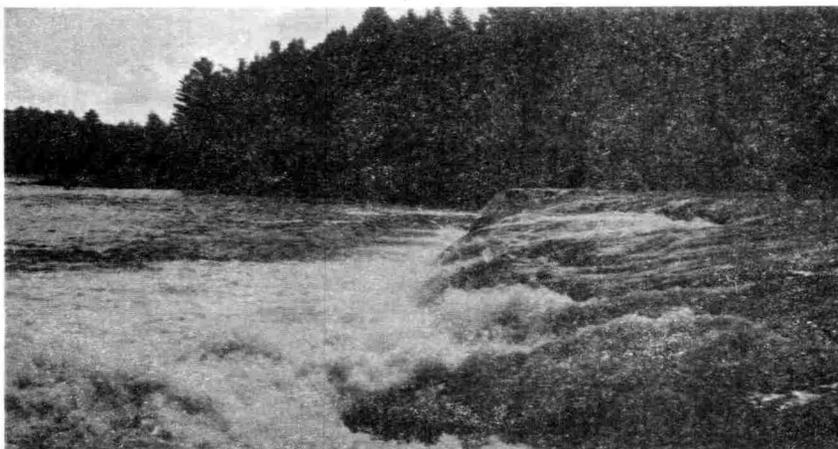
Gaging stations on the Penobscot branches have been maintained periodically at Millinocket, Medway, and Grindstone. On the West Branch, the mean flow is 3,073 cubic feet per second (CFS) at Millinocket and 3,699 cfs at Medway. The East Branch's average flow, measured at Grindstone, is 1,893 cfs. Maximum monthly flows generally occur from April through June, while minimums usually occur in the fall.

Like many of Maine's rivers, the natural flow pattern of the West Branch Penobscot has been manipulated by the logging industry. Initially, scores of small dams were constructed to transport logs downstream to the mills and to provide hydro-power for mill operations. Today, the existing system of dams is used primarily for hydroelectric power generation. The movement of logs over the water was discontinued in 1971 and will no longer be permitted by the state after 1975.

The Great Northern Paper Company currently owns and operates an extensive water storage system along the West Branch. River flow is regulated to deliver maximum hydropower, resulting in a relatively steady flow along the entire branch. Great Northern is legally required to maintain a minimum flow at Millinocket of 2,000 cubic feet per second as long as sufficient water is available in their storage system. This minimum has been maintained on all but three occasions since Ripogenus Dam was completed in 1917.

The West Branch water storage system has a capacity of 57 billion cubic feet (BCF). It is comprised of 15 dams at four major areas: Chesuncook Chain (30 BCF), Pemadumcook Chain (15 BCF), Small Ponds (10.1 BCF -- includes Seboomook, Caucongomoc and Ragged Lakes), and Millinocket Lake (1.9 BCF).

Water flow on the East Branch is affected by the Telos/Chamberlain Lakes and Grand Lake Matagamom storages. Telos/Chamberlain, with a capacity of 4.6 BCF, is part of the Allagash Waterway. Nevertheless, its waters have been dammed in such a way as to make releases possible into the East Branch. When combined with the 1.8 BCF capacity of Matagamom, this results in an effective storage capacity of 8.4 BCF along the East Branch. All of this storage is operated by the Bangor Hydro-Electric Company for the use of its generating plants below Medway on the main stem Penobscot.



Sourdnhunk
Falls

Water Resources Development

The West Branch Penobscot has been harnessed to supply hydro-electric power for the pulpmills operated by the Great Northern Paper Company at Millinocket and East Millinocket. Initial Great Northern hydro-power development occurred during the first third of this century at Millinocket, Dolby and East Millinocket. North Twin Station was added in the 1930's. Construction of the McKay Station below Ripogenus Dam was begun in 1950 and has been developed into the largest of the hydro projects, supplying more than 37% of the 101,000 kilowatt capacity now available along the West Branch. Presently Great Northern has 32 turbines operating to produce more power than any other company in the State, with the sole exception of the Central Maine Power Company.

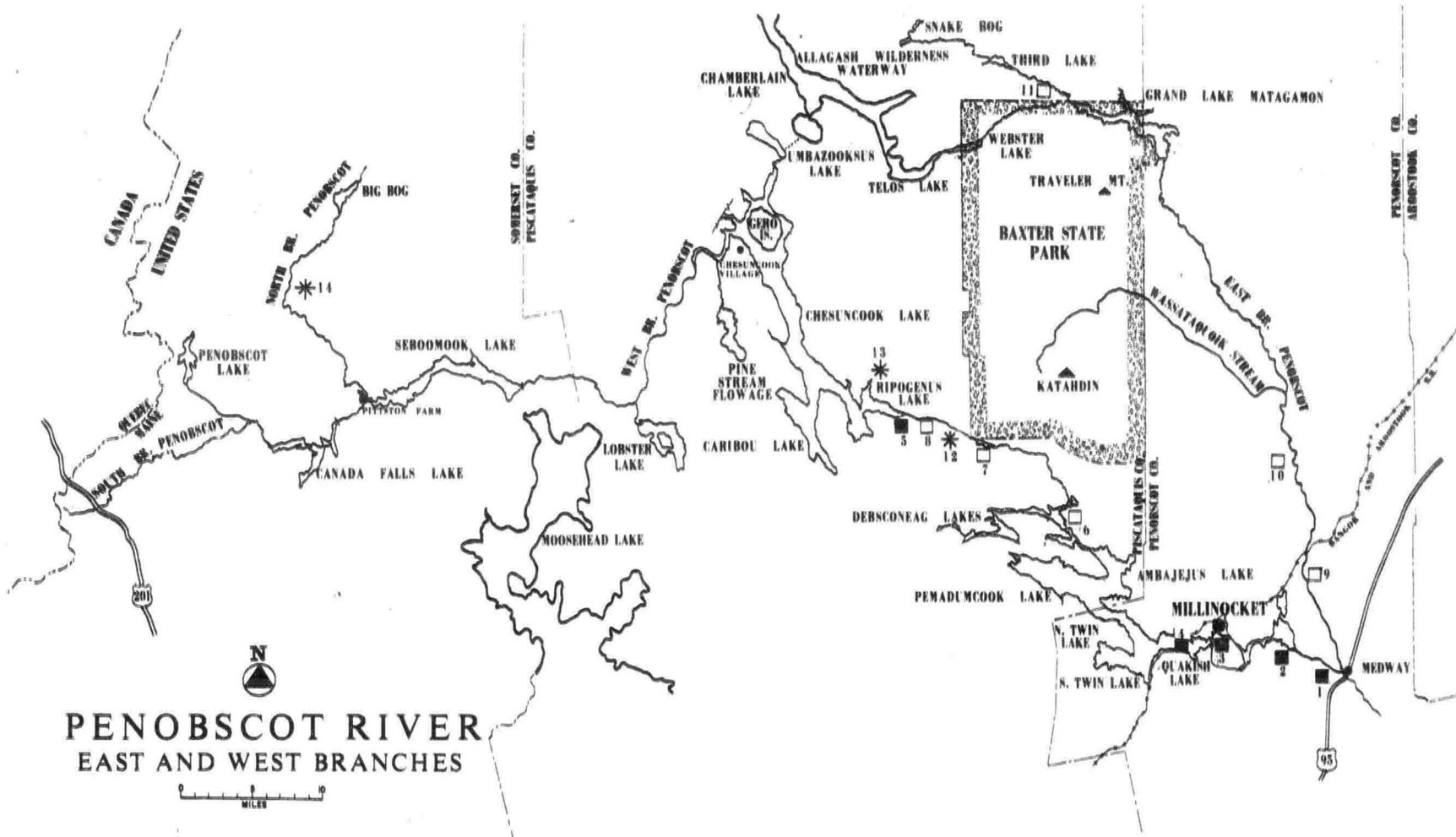
A small hydroelectric facility is maintained by the Bangor Hydro Electric Company on the West Branch above Medway. There are no existing hydropower facilities on the East Branch.

Almost 300 feet of the West Branch's head (i.e., the river's drop in elevation) has not yet been developed. Most of this lies between McKay Station and the lower lakes. Potential sites which could make use of this power resource are Debsconeag, Sourdnahunk, and the Arches (Holbrook, Ambajackmockamus). Of these Sourdnahunk is the largest, with a capacity of 24,000 kilowatts.

Great Northern is actively considering the development of additional hydropower facilities between Ripogenus Dam and Sourdnahunk Falls. If constructed, a new station would normally operate 24 hours a day to supply power to the pulp mills at Millinocket and East Millinocket. It is estimated that up to 240,000 megawatt hours could be obtained annually by using the undeveloped head. This represents a 40% increase over the amount of power now obtained by Great Northern from the West Branch. The company is not now considering installing turbines at Seboomook Dam to generate 7,000 kilowatts. This proposal would require approximately 30 miles of power lines to hook into the existing system.

Through topographic analysis, the Federal Power Commission has identified three potential pumped storage locations along the West Branch -- Harrington Lake #1 and #2 and Penobscot Lake. These sites are not considered realistically developable due to their incompatibility with New England's power use and need patterns, high cost, and associated environmental impacts.

While no hydropower projects are now located on the East Branch, three potential sites have been identified: Meadow Brook, Whetstone Falls, and Grand Pitch (on Webster Brook). Of these Whetstone Falls is by far the largest, with a 30,000 kilowatt capacity. Neither the Whetstone Falls nor the Meadow Brook site is of sufficient size to have been considered in the New England power pool's short term (i.e., to 1985) plans and no locally-oriented energy producers have shown an interest in them. Construction of the Grand Pitch site is precluded by its location within Baxter State Park.



**PENOBSCOT RIVER
EAST AND WEST BRANCHES**

HYDROELECTRIC POWER RESOURCES

DEVELOPED ■	UNDEVELOPED □	POTENTIAL PUMPED STORAGE *
1. MEDWAY	6. DEBSCONAEG	12. HARRINGTON LAKE #1
2. DOLBY	7. FOURNAHUNK	13. HARRINGTON LAKE #2
3. MILLINOCKET	8. THE ARCHES	14. PENOBSCOT LAKE
4. NORTH TWIN	9. MEADOW BROOK	
5. RIPOGENUS	10. WHETSTONE FALLS	
	11. GRAND PITCH	

SOURCE: FEDERAL POWER COMMISSION

TABLE 7 HYDROELECTRIC POWER RESOURCES

<u>Project</u>	<u>River</u>	<u>Capacity (kilowatts)</u>	<u>Annual Generation (million kilowatt hours)</u>	<u>Gross Head (ft.)</u>
<u>Developed*</u>				
Medway	West Branch	3,440	31	18
Dolby	West Branch	14,100	93	49
Millinocket	West Branch	8,000	44	110
North Twin	West Branch	6,900	43	29
Ripogenus	West Branch	<u>37,530</u>	<u>100</u>	186
	Total	69,970	311	
<u>Undeveloped</u>				
Debsconeag	West Branch	15,000	69	58
Sourdnahunk	West Branch	24,000	109	95
The Arches	West Branch	22,500	94	90
Meadow Brook	East Branch	12,000	48	50
Whetstone Falls	"	30,000	117	135
Grand Pitch	Webster Brook	<u>5,000</u>	<u>22</u>	90
	Total	108,500	459	
<u>Potential Pumped Storage</u>				
Harrington Lake #1	West Branch	4,070,000	8,480	496
Harrington Lake #2	West Branch	964,000	2,000	406
Penobscot Lake	West Branch	<u>1,780,000</u>	<u>3,710</u>	604
	Total	6,814,000	14,190	

Source: Federal Power Commission
Great Northern Paper Company

*Hydromechanical power facilities are located at the Millinocket site (capacity approximately 23,000 kilowatts) and at East Millinocket station (7,357 kilowatt capacity). Thus, the total power system of Great Northern has a 101,000 kilowatt capacity with annual generation of 588 million kilowatt hours.

In addition to generation facilities, East Millinocket Reservoir (FPC No. 2458), Seboomook Headwater Reservoir (FPC No. 2638) and Canada Falls Reservoir (FPC No. 2634) are located on the West Branch Penobscot River. Licensed project numbers for the developed sites are: Medway No. 2666, Dolby No. 2458, Millinocket No. 2458, North Twin No. 2458, Ripogenus No. 2572.

Water Rights

Water rights in Maine are based on riparian doctrine. Private right to the use of the water is dependent upon owning part of the river bed. On non-tidal streams, such as the section of the Penobscot River under study here, sale of land along a stream's bank is presumed to convey title of the river bed to the middle of the stream unless otherwise stipulated.

Starting from the concept that each riparian owner was entitled to a stream's natural flow "substantially undiminished in quantity and unimpaired in quality", Maine water law has been modified to permit "reasonable use" by all riparian owners. "Reasonableness" is not precisely defined, but is instead determined on a case-by-case basis whenever a dispute arises. A riparian owner's use is not usually restricted unless the benefits of that use are less than the costs or harm inflicted on another riparian owner.

Public rights to the use of Maine's waterways derive from the State's power to protect navigation. Public use is permitted on all streams and lakes "large enough to be usable in transporting property". The State courts have interpreted public navigation rights to include the use of pleasure craft. Thus, recreational boating and associated activity (e.g., fishing and fowling) on navigable waters by the general public appears to present no major legal difficulties. The State legislature may, however, restrict or even eliminate public rights by transferring them to private ownership. Such a transfer can be accomplished only where a definite public purpose can be demonstrated.

Public access to freshwater streams and lakes smaller than 10 acres in surface area can occur only over publicly owned property adjacent to the water or by permission of a private owner. Where a lake or pond exceeds 10 acres in surface area, public access is also available by travelling over unenclosed private land.

Maine's Great Ponds Act places certain restrictions on lakefront property owners. It requires such landowners to apply for a permit from the Department of Environmental Protection before constructing causeways, bridges, marinas, wharfs, and permanent structures or before beginning dredge and fill operations. Before granting the permit, the Department must examine the project's impact on existing recreational, navigational, scenic, and aesthetic uses, and its effects on natural water flow, water quality, fish and wildlife resources, and soil erosion. The Act applies to all natural lakes larger than 10 acres and artificial lakes larger than 30 acres if owned by more than one person.

Land Ownership

Land ownership in northern Maine is not fragmented--a small number of corporations and trusts control extensive territory. This pattern is readily apparent within the river corridor. Along the West Branch, the Great Northern Paper Company holds title to over 95% of the land. East Branch land ownership is not as highly concentrated, although the total number of landholders is still relatively small, especially upstream of Hay Brook.

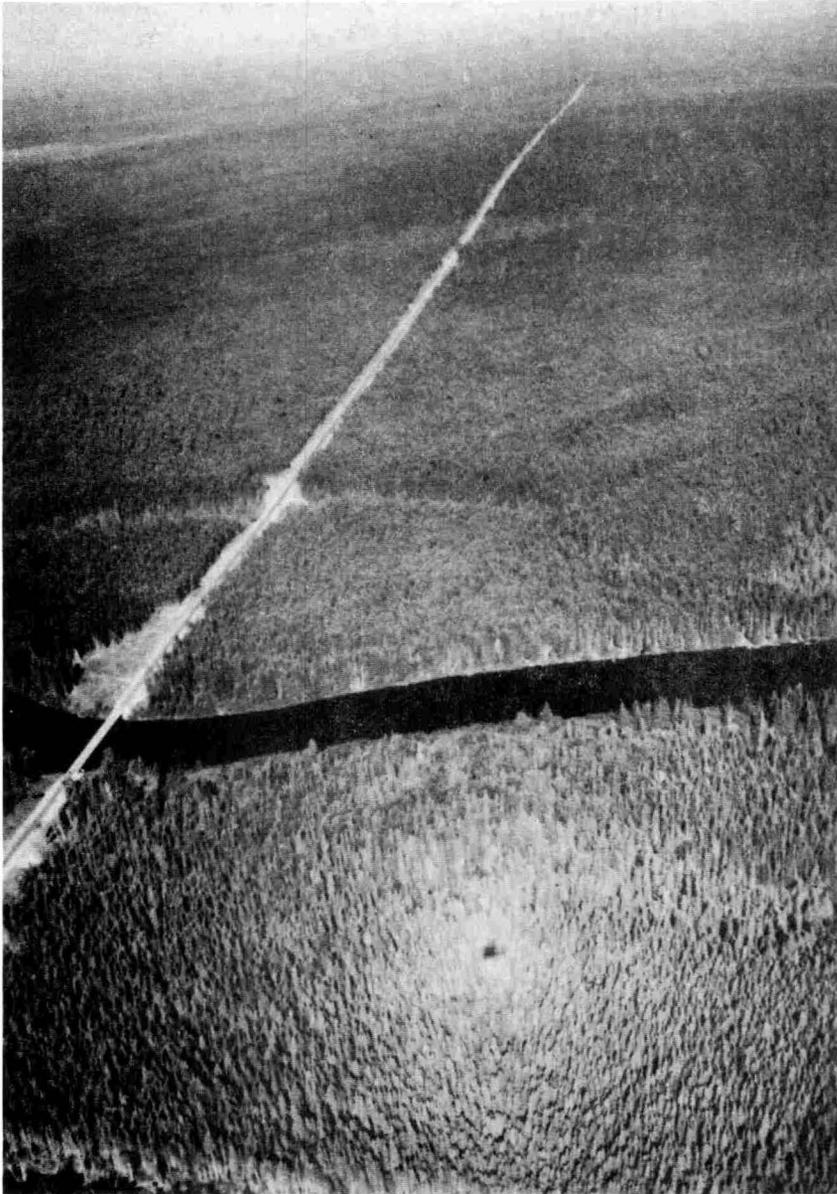
Much of the forest land in the northern part of the State is held in "common and undivided interest". Under this system, several owners of a parcel will hold an interest which is not susceptible to precise location. For example, "five owners may each own one-fifth of a parcel of land, yet no boundaries have been laid out and none of the owners can identify his portion on the ground". This system makes it difficult to determine who precisely owns some of the land along the East Branch. Aside from Great Northern's interest in the area, the most prominent landowners in unorganized townships through which the East Branch flows are the J. M. Huber Corporation (particularly above Grand Lake Matagamon), Diamond International (T7R11, T4R8), and G. Pierce Webber (T4R7, T1R7).

Public ownership along the Branches consists primarily of lands in Baxter State Park and public lots scattered throughout the corridor. Most of Webster Lake and Brook and about one-half of Massataquoik Stream are in Baxter, so that the river banks are owned by the State. When the unorganized townships were created, the State reserved a 1,000 acre tract within each township to itself. In an attempt to consolidate its holdings, the state recently entered into an agreement with the Great Northern Paper Company involving the trading of land areas. Part of that agreement resulted in the state gaining ownership to the land surrounding the portion of Webster Lake not now in Baxter Park, most of Gero Island, and Chesuncook Village.

Land Use

Almost seven million acres of the study area are forested. Ninety-three percent of this forest land is suited to commercial timber harvesting operations and a majority of the acreage is owned by the forest industry.

Growing stock volumes average 14.5 cords per acre with approximately 40% of the annual growth being harvested. Although overall growth exceeds timber removals, sawtimber removals presently exceed growth for several species, including yellow birch, sugar maple, northern red oak, beech, ash and white pine. According to estimates by the U.S. Forest Service, Maine's forests are presently producing less than their theoretical potential. It is thought that more intensive protection and management of the study area's forest lands could eventually lead to a doubling of timber yields.



"Golden Road" (Great Northern's western haul road) crossing the West Branch

Within the river corridor, over 90% of the land is suitable for commercial timber harvesting operations. The forest is used primarily for its wood production capability, although compatible recreation uses are permitted where cutting is not actually in progress. Much of the non-commercial forest is wetlands, such as the Pine Stream flowage, which provides waterfowl and other wildlife habitat.

Town development, which is less than 1% of river corridor land use, is concentrated at the downstream end of the West Branch where the Towns of Millinocket and East Millinocket are located. Industrial development is restricted to the land along the West Branch below North Twin Station. Residential development is also prominent along that stretch. Otherwise, there are only a few scattered cottages, small homes, or minor tracts within the river corridor. Agricultural activity is also of little consequence, there being but a few plots in actual production.

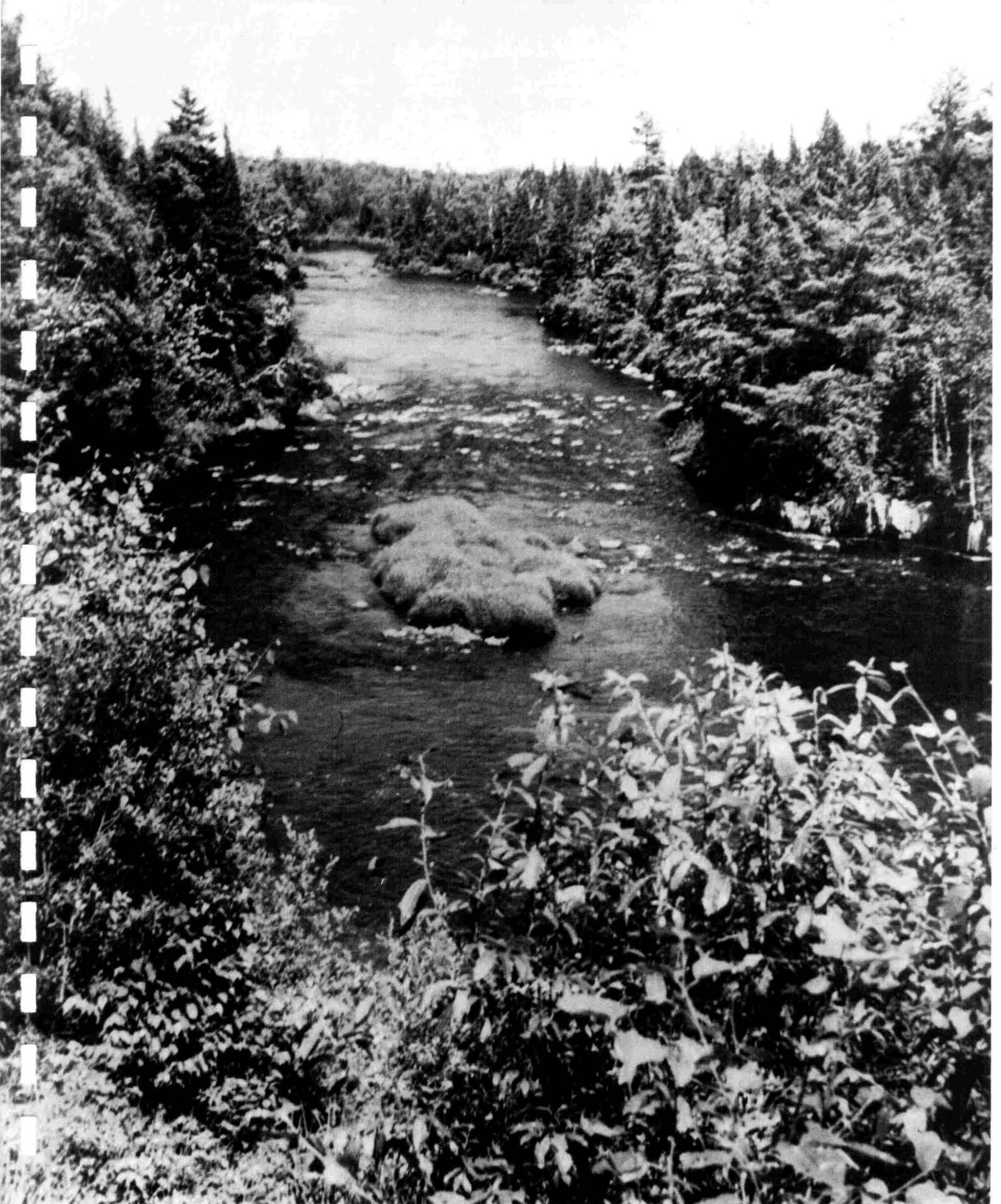
With the exception of Millinocket, East Millinocket, and Medway, the Penobscot's Branches flow through Maine's northern 'wildlands', that is, through forest lands not contained within organized municipalities. In 1972, the State Legislature created the Land Use Regulation Commission (LURC) with authority to set policy and make regulations for land use and protection within the wildlands. Thus, most of the land acreage bordering the study river is within the domain of LURC's land use regulatory powers. The Commission's mandate includes responsibility for comprehensive planning, zoning, and issuing permits for certain land use activities. As a first step in meeting this responsibility, LURC is dividing the wildlands into three types of interim land use districts -- protection, management, and development. Land along the Penobscot has been interim zoned into either "protection" districts (regulated to protect natural, recreational, and historical values) or "management" districts (primarily for timber harvesting). This zoning is to remain into effect through March, 1978. As a comprehensive plan is developed over the next several years, it is expected that these categories will be refined, some boundary adjustments will be made, and final zoning will be implemented.

TABLE 8 LAND USE ACREAGE WITHIN THE RIVER CORRIDOR (1/4 MILE)

	<u>Forest</u>		<u>Developed*</u>	<u>Agriculture</u>	<u>Total</u>
	<u>commercial</u>	<u>non-commercial</u>			
East Branch	26,073	2,341	--	86	28,500
West Branch	80,265	7,135	831	456	88,687
Total	106,338	9,476	831	542	117,187

*Consists of residential, industrial, and commercial categories.

II. PLANNING CONSIDERATIONS



Before a realistic strategy for adequate resource protection can be shaped, it is necessary to be aware of the river's major natural elements, and to understand the differing human interests, concerns, and perceptions regarding its best use. Therefore, this section focuses on the Penobscot's environmental values as they relate to wild and scenic river criteria and sketches the major issues surrounding the river's future use.

THE NATURAL ENVIRONMENT

Primary Values

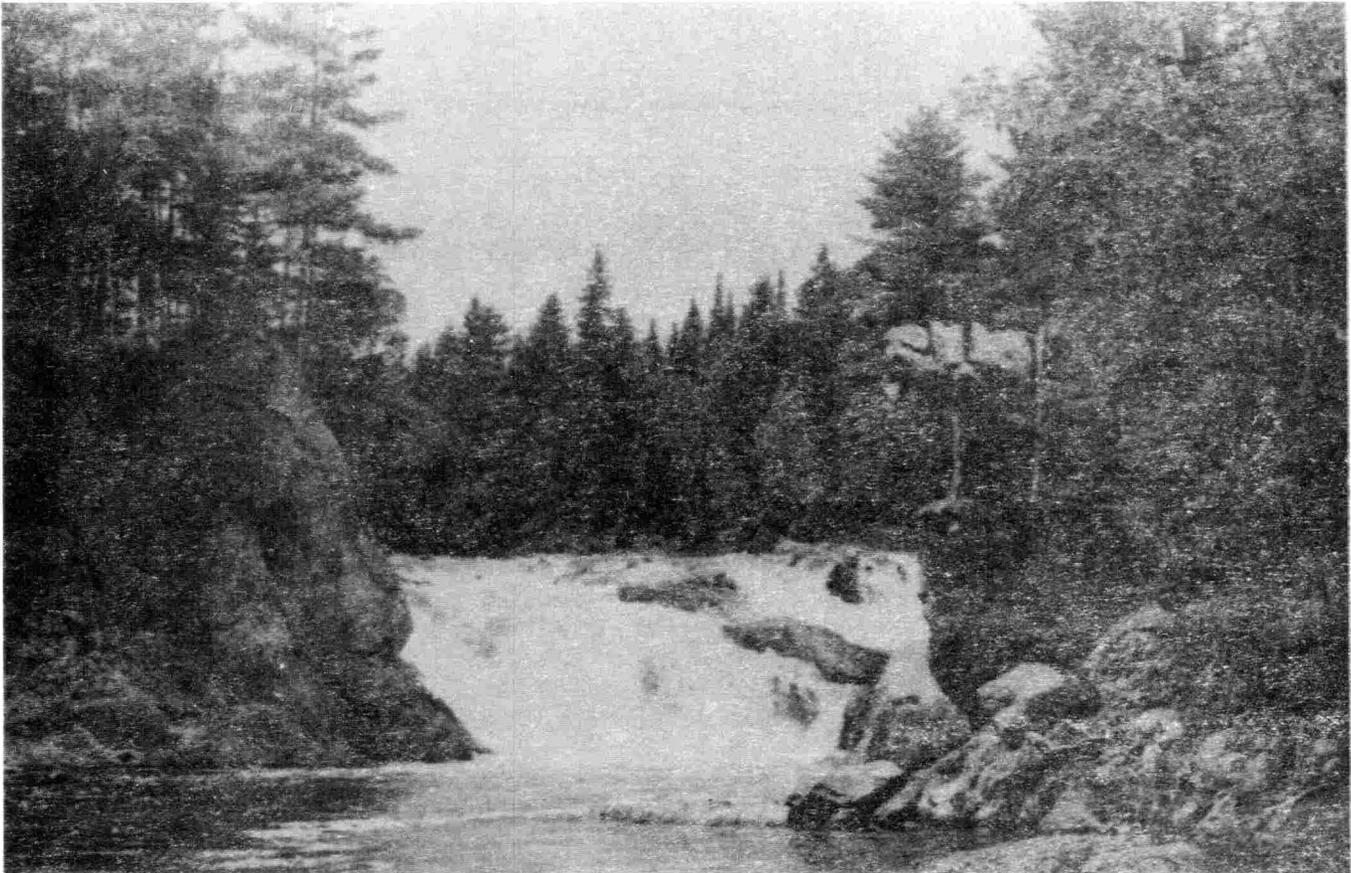
The East and West Branches of the Penobscot River, with the exception of the West Branch segment between North Twin Station and Medway, qualify for inclusion in the National Wild and Scenic Rivers System. In arriving at this conclusion, information was gathered from field inspections, published materials, and written and verbal communications with various resource specialists and private citizens. This data was then evaluated in light of criteria outlined in the Wild and Scenic Rivers Act and evaluation guidelines prepared by the Secretaries of Agriculture and Interior.

The Penobscot's primary values are its:

- * outstanding fishery resources, including landlocked salmon, brook trout, and Atlantic salmon habitat
- * outstanding wildlife resources, including bald eagle, moose, black bear, deer, and black duck
- * uniformly excellent water quality
- * clean air
- * extensive scenic resources both within the river corridor and visible from it
- * significant wilderness-oriented recreation opportunities due to the river's location in Maine's "wildlands"
- * consistently high quality environment along more than 300 waterway miles
- * high archeological potential, given the river's former importance as a major travelway of the Abenaki Indians

Additionally, the river weaves through two physiographic sections (White Mountains and New England Upland) and normally has sufficient water flow during the summer for enjoyment of outdoor recreation. The Penobscot also unifies the Northeast's largest wilderness complex by connecting with the Allagash Wilderness Waterway and surrounding and flowing through Baxter State Park.

Downstream of North Twin Station to the confluence at Medway, the West Branch has very poor water quality, industrial and other development along the shoreline, shallow water and log obstructions. It has been determined that this 15 mile segment does not qualify for national designation.



Grand Pitch on East Branch

Significant Features

The Penobscot's East and West Branches contain a variety of unique sites and areas, both natural and man-made, which should be given special attention. These can be grouped into three categories:

Natural Habitat -- Areas of special value for protection of significant habitat and/or unusual plant or animal life.

Natural Landmark -- Areas possessing unique vegetational or geologic features.

Historic Resources -- Sites which possess exceptional value or quality in illustrating or interpreting the historical heritage of the Nation or Maine.

Within the river corridor, 24 such features have been identified as follows:

Natural Habitat

1. Penobscot Lake -- prime area for native blueback trout, a unique species.
2. Big Bog -- scenic wildlife habitat, especially moose and waterfowl.
3. Moosehorn Deadwater to Chesuncook Lake -- important spawning and nursery habitat for Chesuncook Lake's wild landlocked salmon population.
4. Pine Stream Flowage -- most important nesting area for waterfowl within the upper watershed.
5. Gero Island -- excellent wildlife habitat.
6. East Branch Penobscot -- spawning and nursery habitat for Atlantic Salmon.
7. Ripogenus Dam to Pemadumcook Lake -- ideal summer habitat for a river population of landlocked salmon.

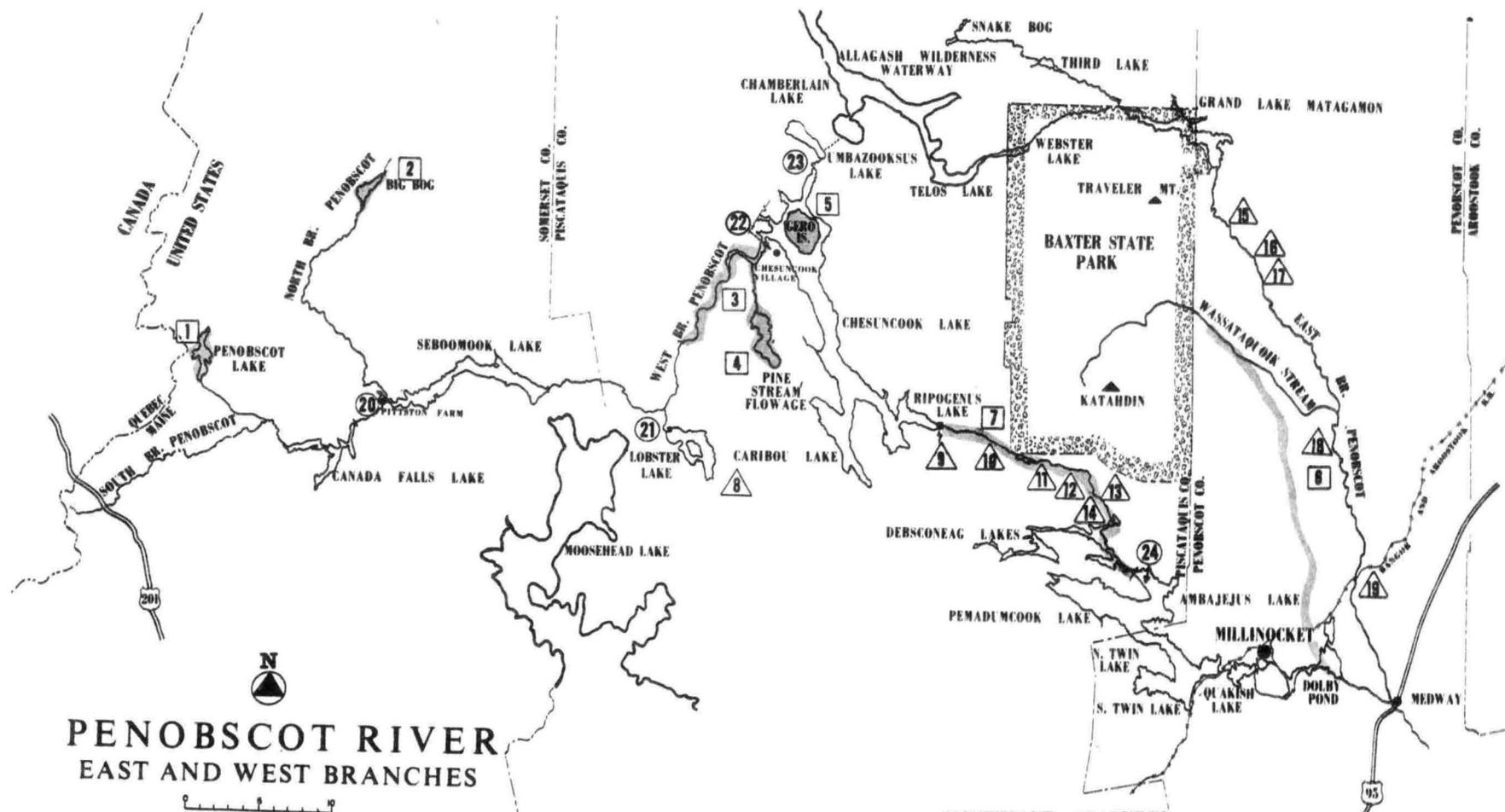
Natural Landmarks

8. Lobster Lake -- natural clear water lake with outstanding mountain views and sandy beaches.
9. Ripogenus Gorge -- rugged gorge with drop of 80 feet in 1-1/4 miles.
10. Little and Big Ambejackmockamus Falls and the Horserace -- rapids and furious cascading waters downstream of Big Eddy.
11. Sourdnahunk Falls -- dramatic falls at end of the Sourdnahunk Deadwater.
12. Abol Falls -- falls 4/5 mile below Abol stream junction.
13. Pockwockamus Falls -- falls followed by 3-1/2 miles of island studded river.
14. Debsconeag Falls -- dramatic descent at end of Pockwockamus Deadwater.
15. Stair Falls -- rough, scenic drop below Grand Lake Dam.
16. Haskell Rock Pitch -- rocky cataract one mile below Stair Falls.
17. Grand Falls -- falls consisting of four steep cataracts - Pond Pitch, Grand Pitch, Hulling Machine Pitch and Bowlin Falls.
18. Whetstone Falls -- exciting rapids followed by receding slopes with occasionally steep banks and low hills.
19. Grindstone Falls -- superb falls with 45-foot gradient.

Historic Areas

20. Pittston Farm -- old farm which provided food for surrounding logging camps.
21. Penobscot Farm -- West Branch terminus of Northeast Carry, an historic supply route for lumber operations.
22. * Chesuncook Village -- village at head of Chesuncook Lake that was focal point for loggers in the mid-1800's, and was referred to by Thoreau in his writings.
23. Umbazooksus Stream and Lake -- archeologic value as primary Indian route.
24. * Ambajejus Boom House -- site of original West Branch Boom House. Present Boom House was built about 1907 and was used by Great Northern Paper Company until 1971 when the West Branch drive was discontinued.

* On National Register of Historic Places



PENOBSCOT RIVER EAST AND WEST BRANCHES



NATURAL HABITAT

1. PENOBSCOT LAKE
2. BIG BOG
3. MOOSEHORN DEADWATER TO CHESUNCOOK LAKE
4. PINE STREAM FLOWAGE
5. GERO ISLAND
6. EAST BRANCH PENOBSCOT
7. RIPOGENUS DAM TO PEMADUNCOOK LAKE

NATURAL LANDMARKS

8. LOBSTER LAKE
9. RIPOGENUS GORGE
10. AMBEJACKMOCKAMUS FALLS AND THE HORSERACE
11. SOURDNHUNK FALLS
12. ABOL FALLS
13. POCKWOCKAMUS FALLS
14. DERSCONEAG FALLS
15. STAIR FALLS
16. HASKELL ROCK PITCH
17. GRAND FALLS
18. WHETSTONE FALLS
19. GRINDSTONE FALLS

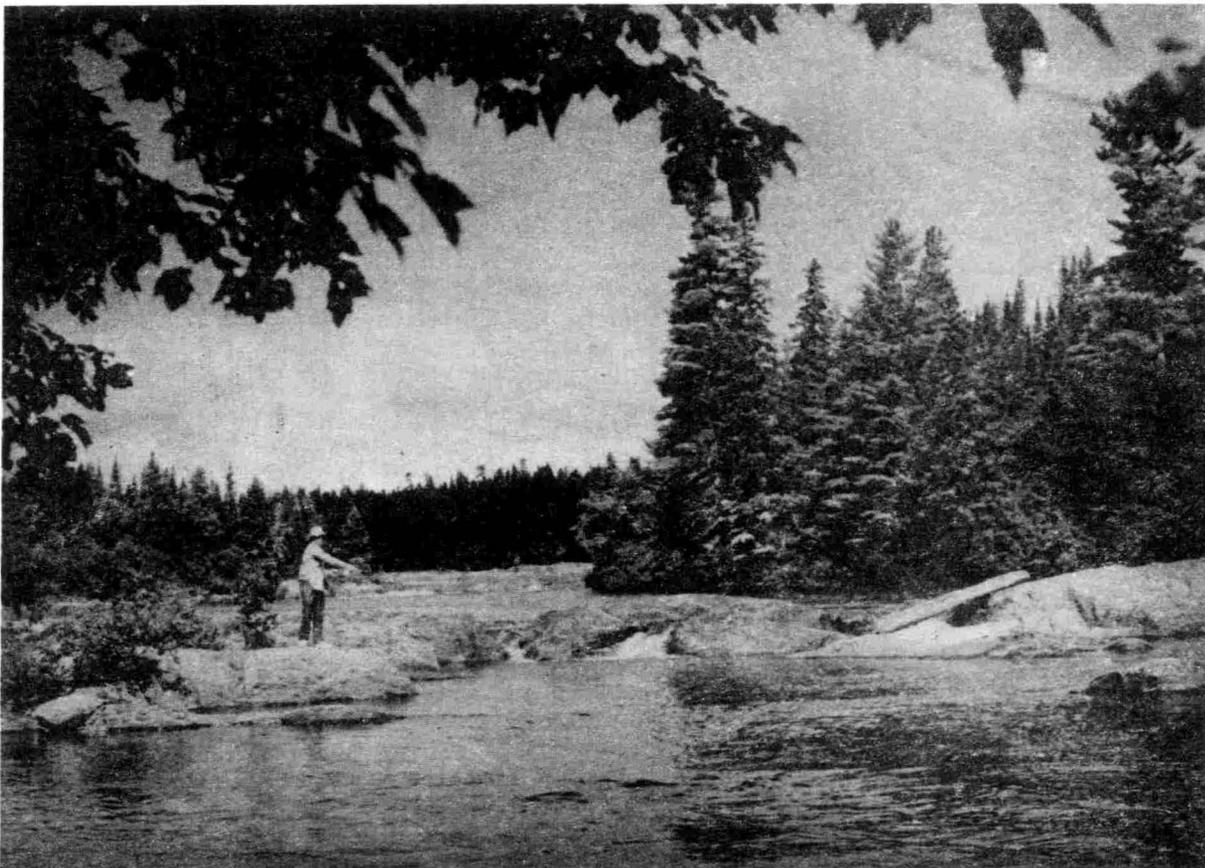
HISTORIC AREAS

20. PITTSOT FARM
21. PENOBSCOT FARM
22. CHESUNCOOK VILLAGE
23. UMBAZOOKSUS STREAM AND LAKE
24. AMBAJEJUS BOOM HOUSE

Classification

The Wild and Scenic Rivers Act stipulates that every river included in the national wild and scenic rivers system shall be classified, designated, and administered as one of the following:

1. Wild River Areas - Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and water unpolluted.
2. Scenic River Areas - Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
3. Recreational River Areas - Those rivers or sections of rivers that are readily accessible by road or railroad, that may have undergone some impoundment or diversion in the past.



Fishing at Roll Dam Campsite on West Branch

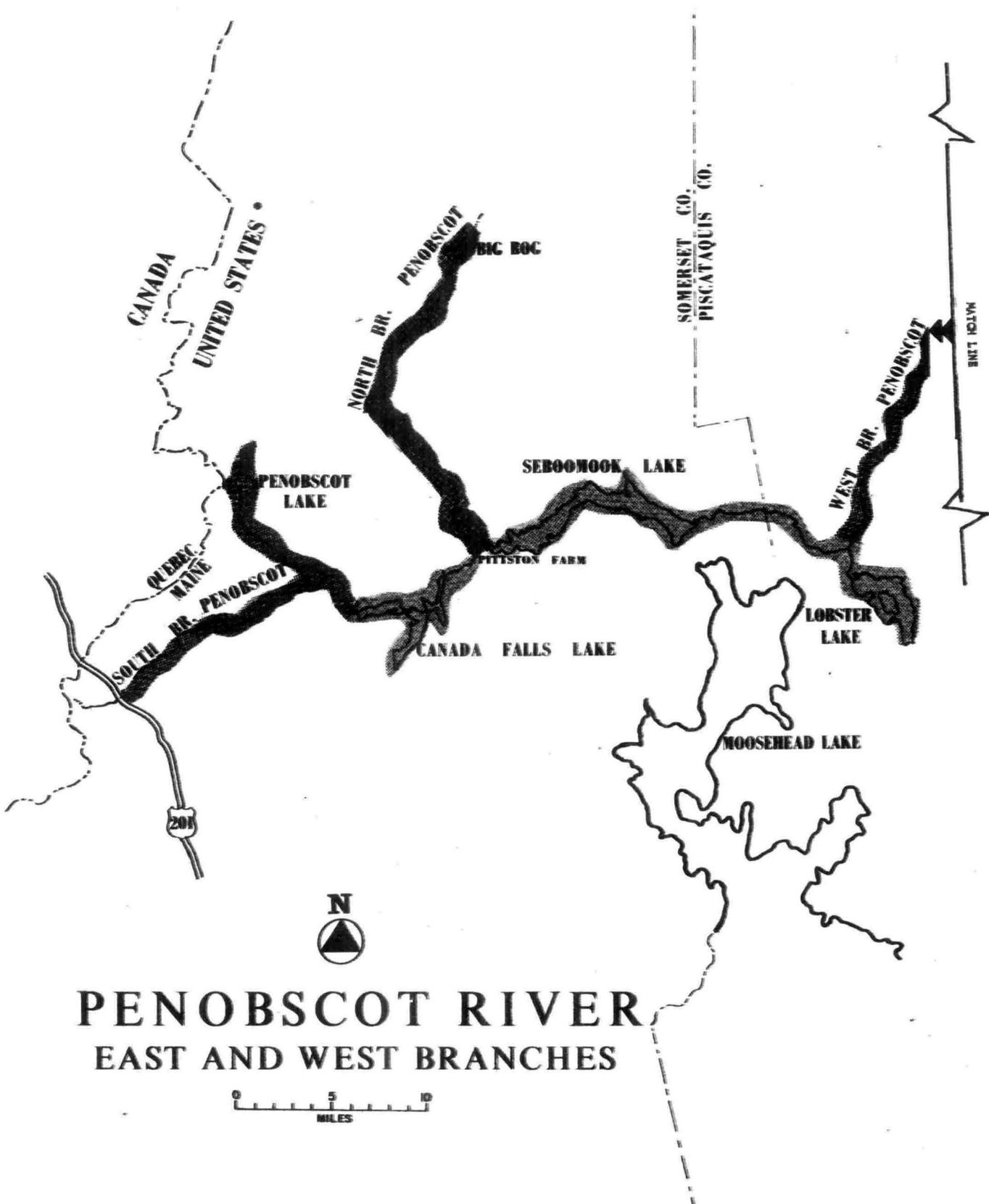
Based on their attributes, the Penobscot's East and West Branches have been divided into segments and classified as follows (see map, p. 8-9).

EAST BRANCH

Classification

Headwaters (Snake Bog) to Baxter State Park boundary through Grand Lake Matagamon, also Webster Lake and Brook (31 miles)	Wild
Grand Lake Matagamon to Bowlin Camps (12 miles)	Scenic
Bowlin Camps to Hay Brook, also Wassataquoik Stream (52 miles)	Wild
Hay Brook to bridge above Medway at State Route 157 (12 miles)	Scenic
<u>WEST BRANCH *</u>	
North Branch headwater from canal cut approximately 1-1/4 miles upstream of Big Bog to Pittston Farm (22 miles)	Wild
South Branch headwater from Hilton Farm (at Route 201) to bridge at upper end of Canada Falls Lake; also Penobscot Lake and Brook (26 miles)	Wild
Canada Falls Lake to Pittston Farm and Seboomook Lake at Pittston Farm to Golden Road Bridge (approximately 2 miles below Lobster Stream), also Lobster Lake and Stream (42 miles)	Scenic
Golden Road Bridge to Pine Stream, also Pine Stream and Pine Stream flowage (23 miles)	Wild
Pine Stream to Ripogenus Dam, including Umbazooksus Lake and Stream and Carry Trail (32 miles)	Scenic
Caribou Lake (8 miles)	Recreational
Ripogenus Dam to Ambajejus Falls (22 miles)	Scenic
Debsconeag Lake System (all 8 lakes) (13 miles)	Wild
Ambajejus, Pemadumcook, North and South Twin Lakes (17 miles)	Recreational

* Segments of the West Branch that include Seboomook Dam and Ripogenus Dam have been classified as SCENIC. While it is recognized that impounded sections are generally classified as RECREATIONAL, a SCENIC classification here reflects the outstanding wilderness character of the resource. These segments are notable for their undeveloped shorelines, excellent scenery, Class A water quality, excellent fishery (e.g., wild landlocked salmon and trout), and historical values (Chesuncook Village and Penobscot Farm).



CANADA
UNITED STATES

NORTH BR. PENOBSCOT
BIG BOG

SOMERSET CO.
PISCATAQUIS CO.

MATCH LINE

PENOBSCOT LAKE

SEBOMOOK LAKE

LITTLETON FARM

CANADA FALLS LAKE

LOBSTER LAKE

MOOSEHEAD LAKE

QUERCY MAINE
SOUTH BR. PENOBSCOT

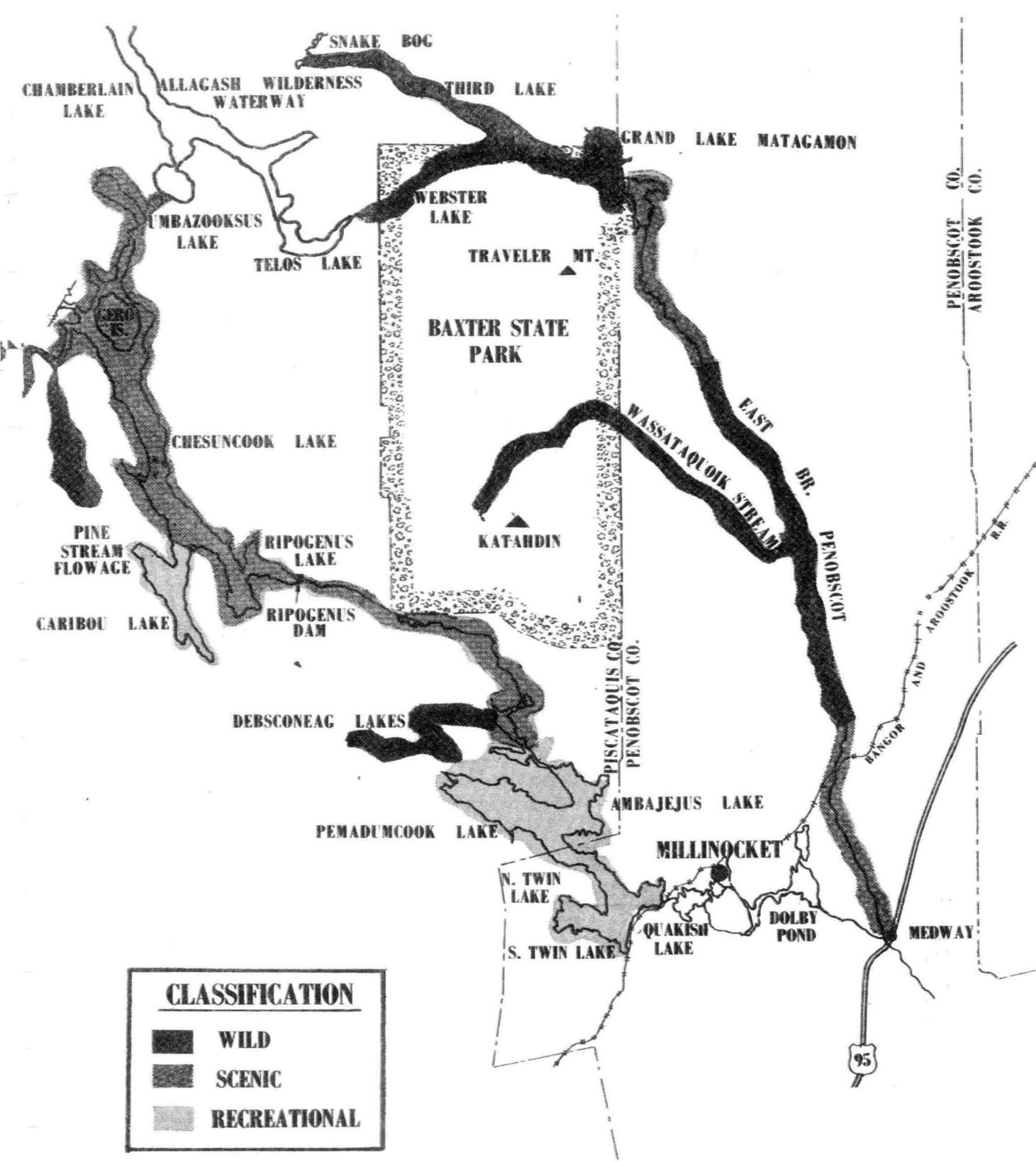
WEST BR. PENOBSCOT



PENOBSCOT RIVER

EAST AND WEST BRANCHES





SOCIAL ENVIRONMENT

The issues outlined below provide part of the framework which will shape any planning proposal for the river. These are the factors which need to be considered in developing realistic, long-term policies to guide recreation and other uses of the Penobscot.

Hydropower Development

The Penobscot's West Branch has long been used to generate power for pulp mill operations. Designation would not affect existing hydropower facilities, but the construction of future hydropower facilities would be prohibited. For example, SCENIC designation between Ripogenus Gorge and Debsconeag Falls would preclude construction of any new power facilities, such as those being actively considered by the Great Northern Paper Company. SCENIC designation could, therefore, result in foregoing up to 240,000 megawatt hours of hydroelectric power annually. On the other hand, if facilities are constructed there, the significant natural features of Ambejacknockamus Falls and the Horserace and Sourdnhunk Falls would be impaired. Six miles of summer habitat for landlocked salmon would be inundated. Also, some of the best white-water canoeing (rated from easy to difficult by W. F. Burmeister in Appalachian Waters) is located along this stretch of the river.

On the East Branch, hydroelectric projects have been proposed at Whetstone Falls and Meadow Brook. However, these projects are not under active consideration. If constructed, they would conflict with ongoing efforts to restore Atlantic salmon to the East Branch.

The Timber Economy

The Penobscot River has historically been closely associated with the sawlog and pulp and paper industry. Today, over 50% of the Millinocket Economic Area's total work force is employed by the pulp and paper industry. Thus, a realistic multiple use plan must accommodate resource protection and recreation use within the context of a "working" forest. If all eligible segments were designated, as much as 170,000 acres of land could come within the scope of wild and scenic river protection. Regulations governing harvesting procedures would have to be designed so that they do not significantly deter landowners from obtaining the value of annual timber growth, while at the same time guaranteeing that the river's scenic qualities remain outstanding.

Recreation Opportunities and Needs

Between 1967 and 1973, the number of resident and non-resident recreationists in Maine has tripled.* While this trend is not expected to continue at the same rate, additional tourism increases are expected. Given the interest many vacationers have in wilderness-oriented recreation, it is likely that some of these new visitors will travel to the upper Penobscot.

* Tourism in Maine Study

Increased recreation use of the Penobscot requires the development of management policies to conform to three sometimes conflicting goals: providing facilities and areas to accommodate increased demand, continuing local recreation use patterns, and preserving the scenic and environmental qualities of the river area. Among the factors which must be weighed in developing appropriate programs is the concern of local residents that the Penobscot's values may deteriorate due to over-use and that their freedom of access to recreation areas will be restricted by procedures for regulating visitor use (e.g., entrance fees, reservation systems, etc.). At the same time, the legitimate recreational interests of non-local Maine residents, as well as non-residents, must be considered so that they too may enjoy the Penobscot's recreational opportunities into the future.

Any recreation plan must discourage congestion, since concentrated recreational activities can endanger the environment. The Penobscot already suffers somewhat from seasonal congestion (summer) and locational congestion (lower segments of the river). In order to alleviate this situation, management policies should seek a balance between peak season and off-season visitation and also emphasize dispersal of recreationists throughout the protected waterway.

Cottages

Local residents maintain small cottages or "camps" for recreational purposes along the river on land leased from major landowners. Most of these would be unaffected by inclusion of the Penobscot in the Wild and Scenic Rivers System, because they are located within RECREATIONAL segments and are thus compatible with protection objectives. Cottages within WILD and SCENIC segments, however, are less compatible with the more primitive environment desired there. A procedure must therefore be developed for these segments which does not impose any hardship upon existing leaseholders and their families but which also eventually restores the river's bank to its natural condition.

Roads and Access

Most of the existing roads providing public access to the Penobscot are privately owned and maintained primarily for logging by the Great Northern Paper Company. Trucks have the right-of-way, which makes it necessary that the public proceed with extra caution when travelling on these roads. It is essential that safe public access be guaranteed to recreation sites along the river in a manner consistent with continued timber hauling operations.

Spruce Budworm Blight

In the last few years, Maine's northern forest has been subjected to increasing infestation by the spruce budworm. An estimated 5.4 million acres of spruce-fir were damaged in 1974, including extensive tracts in the upper Penobscot watershed. Since most trees can withstand only two or three successive years of budworm-induced defoliation, and since Maine's economy is heavily dependent on the forest industry, the current epidemic is a matter of major concern.

Aided by Federal matching funds, the State conducted a major insecticide spraying program in June, 1975. About 2.2 million acres were treated with short-lived toxins. This was followed with an even larger spray program in 1976 when 3.5 million acres were treated. The 1976 application included about 70% of the area sprayed in 1975. Much of the West Branch to as far downstream as Chesuncook Lake, and parts of the East Branch headwaters, were included in the spray area for both years. Given the likelihood of continued budworm blight, any decision to manage the Penobscot as a wild and scenic river will ultimately require formulating policies regarding appropriate responses to budworm outbreaks. Those policies must be sensitive to both the short and long-term ecological consequences of pesticide use and the economic importance to the state of maintaining a strong forest products industry.

Penobscot Indian Claim

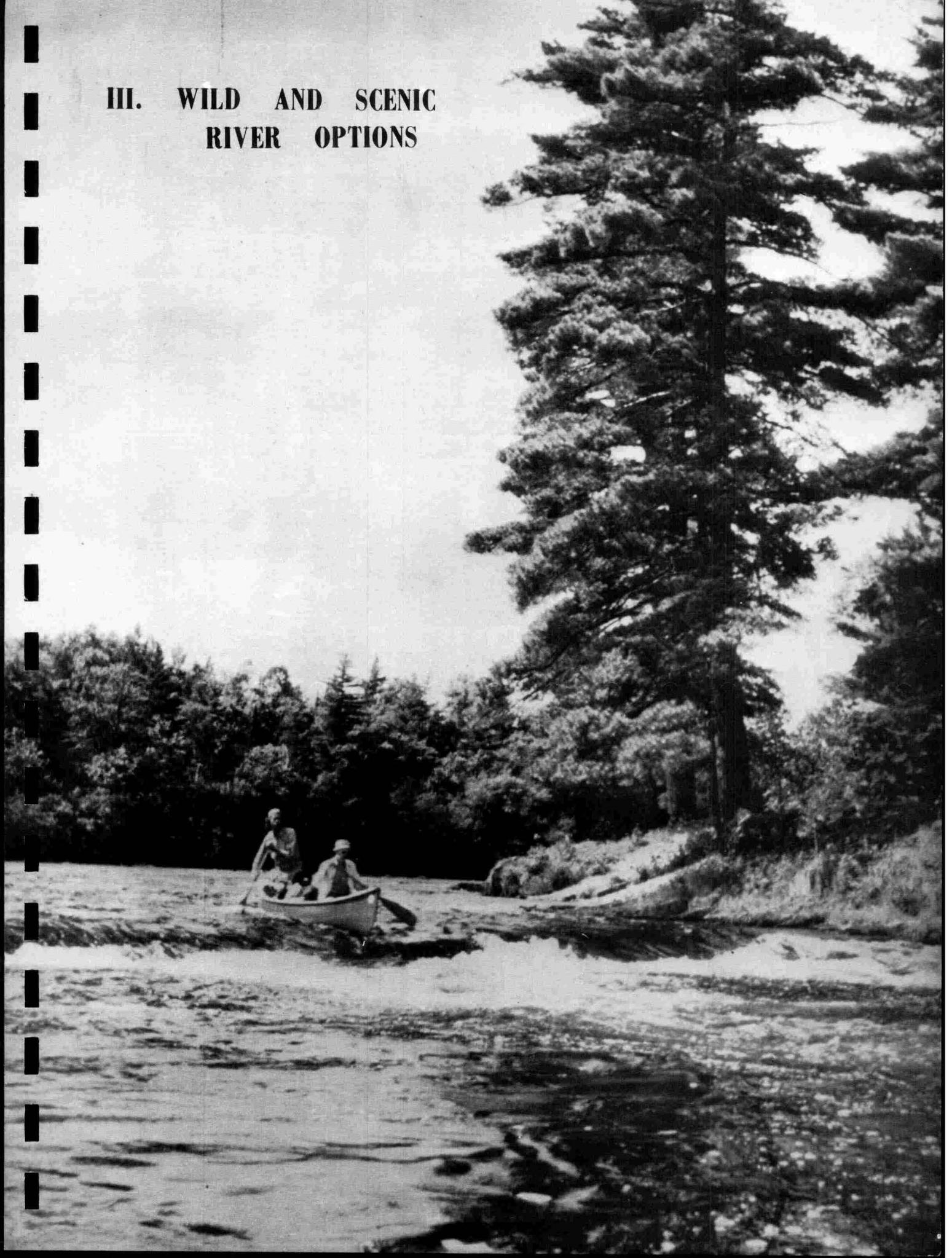
In a pending suit, U.S. v. Maine, the Penobscot Indians claim ownership of the Penobscot watershed, including more than one million acres along the West Branch and 500,000 acres along the East Branch. Resolution of their claim depended in part on the final outcome of another suit, Passamaquoddies v. Morton, which considered whether the Penobscots were entitled to protection under the Indian Nonintercourse Act of 1790. The statute provides that no transaction involving Indian land has validity unless the Federal government consents to the action. The Penobscots contended that Maine gave away their land in the 1700's and 1800's without the required federal approval. In January, 1975, a federal district court ruled that the Act is applicable to the Indians and does establish a trust relationship between the United States and the Tribe. This ruling was affirmed by the U.S. Court of Appeals (First Circuit) in December, 1975, and no further appeals were made. The federal government is now preparing for the U.S. v. Maine suit, which is likely to begin its way through the courts by December, 1976.

Long Term and Short Term Uses

A fully developed management plan must guide land and water use decisions so that short term activity within the river corridor is compatible with maintaining the resource's long term productivity. Predominant uses -- commercial timber harvesting and recreation -- should continue, with emphasis on practices and use intensities which do not seriously damage the natural setting. For example, timber harvesting should be conducted according to sound forest management practices in order to protect scenic qualities and assure long term productivity. The short term "gains" of overcutting do not outweigh the adverse consequences to the ecosystem. Similarly, recreation use, which offers economic and social benefits to both permanent residents and visitors, should be regulated so that optimal levels are not exceeded. The objective sought, of course, is to maintain the river's integrity by avoiding the undesirable consequences of over-fishing, excessive encroachment on wildlife habitat, etc.

As economic and social conditions change, the introduction of activities new to the area should be carefully examined to determine how they might best be integrated with the natural environment.

**III. WILD AND SCENIC
RIVER OPTIONS**



In the process of developing a wild and scenic river plan, careful consideration is given to appropriate size options. Also, an assessment is made of potential resource managers. This section outlines five linear options and discusses possible administrative arrangements for a Penobscot wild and scenic river. It is from these alternatives that a particular corridor length and resource manager is eventually selected for any wild and scenic river recommendation. A detailed analysis of the environmental, economic, and social impacts of each linear option is contained in Part V.



Roll Dams Downstream of Seboomook Lake

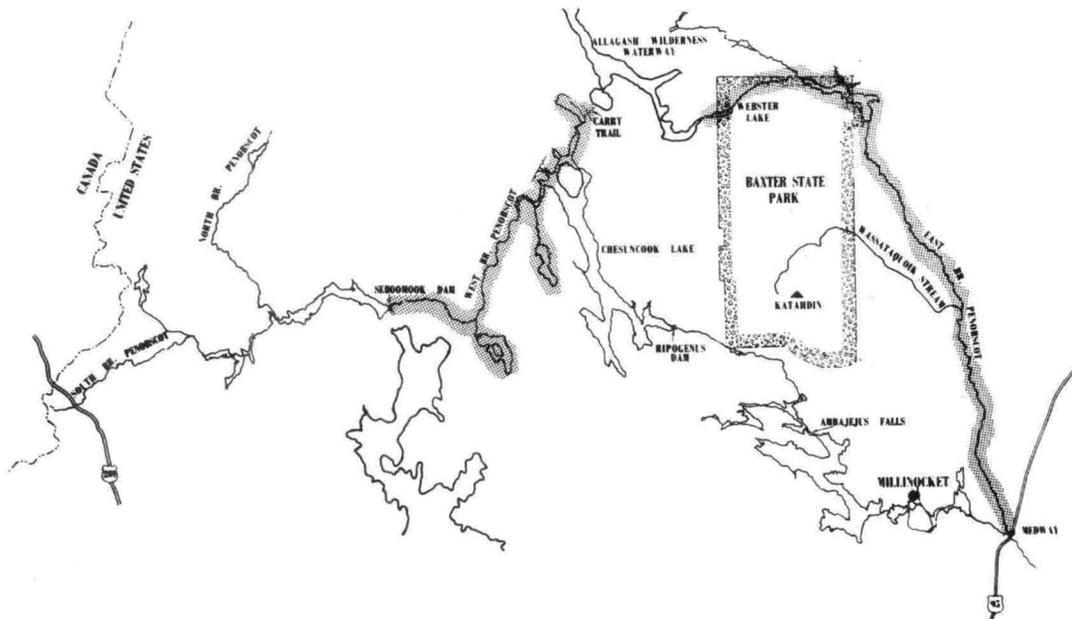
Linear Options

The extensiveness of the Penobscot's East and West Branches suggests a variety of length options. Of the many alternatives which have been examined, the following are the most feasible (WB=West Branch; EB=East Branch):

Option A

WB: Seboomook Dam to Carry Trail
EB: Webster Lake to Medway
(excluding Wassataquoik Stream)

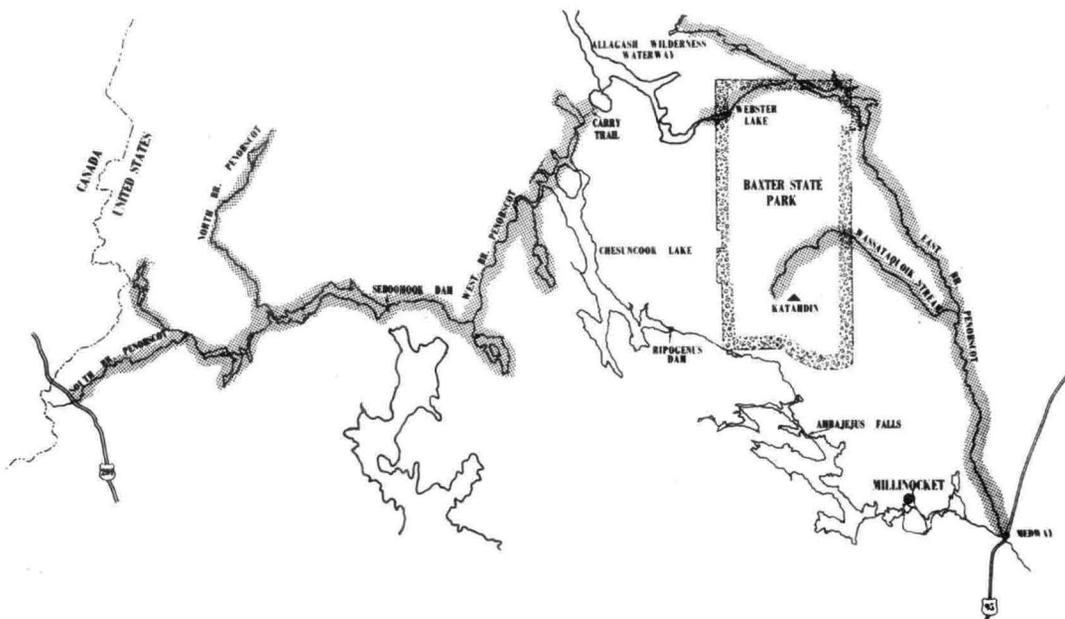
This represents the minimum length necessary to effectively manage the Penobscot as a natural resource having national significance. 124 river miles would be protected.



Option B

WB: headwaters to Carry Trail
EB: entire

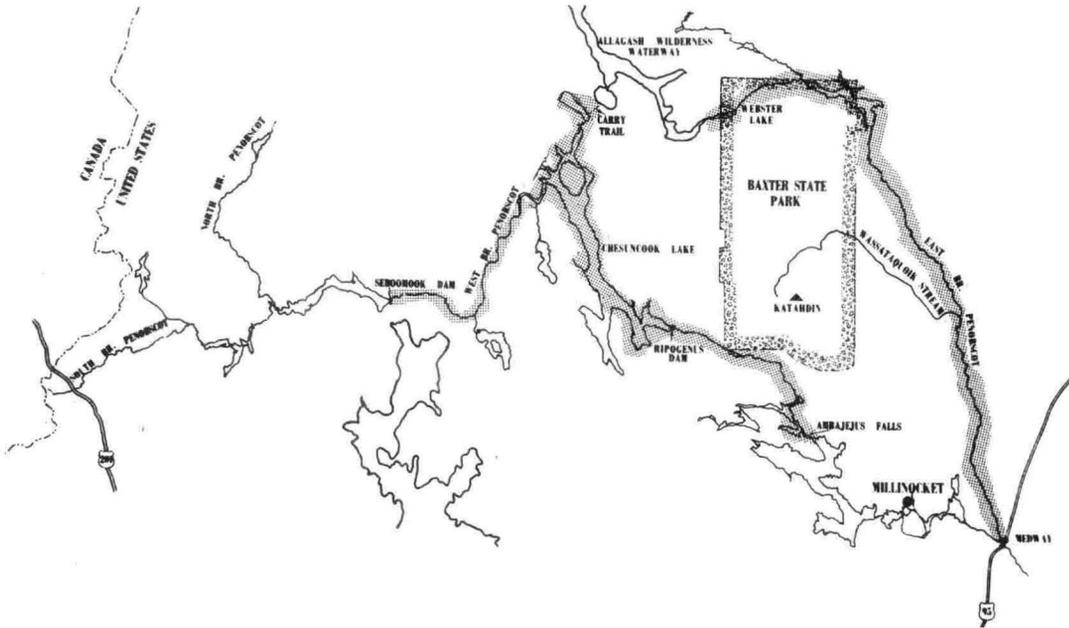
Significant wildlife and fishery habitat within a 233 mile corridor would be protected. Control of water quality is gained through inclusion of the headwaters.



Option C

- WB: main waterway from Seboomook Dam to Ambajejus Falls
- EB: main waterway from Webster Lake to Medway

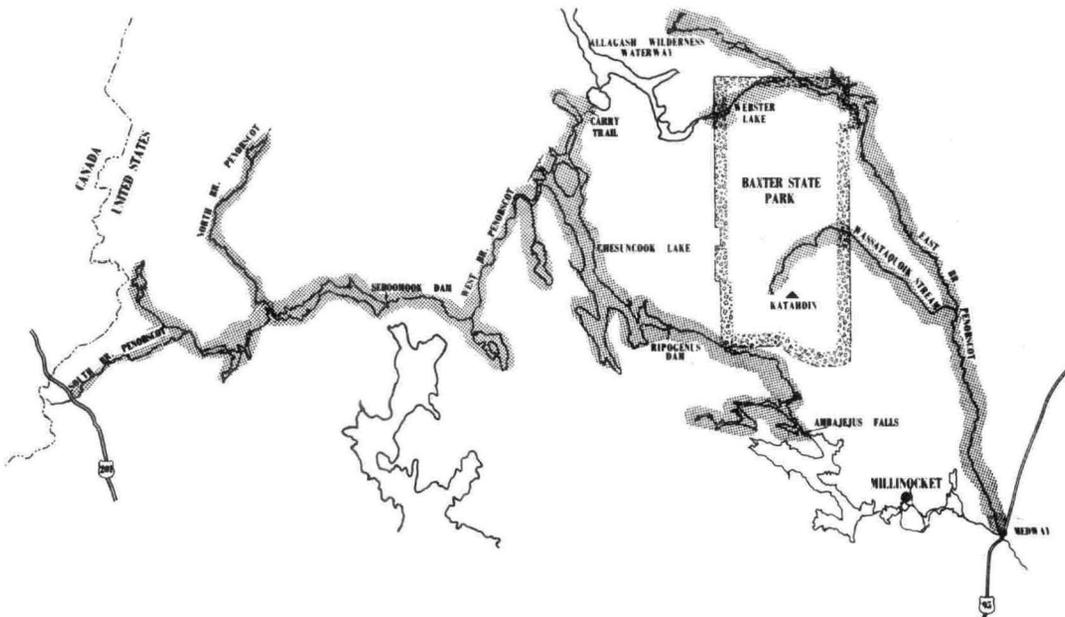
This 146 mile reach consists of each branch's principal waterway. Emphasis is on control of the prime recreation stretches and the highly scenic Ripogenus Gorge-Debsconeag Deadwater area.



Option D

- WB: headwaters to Ambajejus Falls
- EB: entire

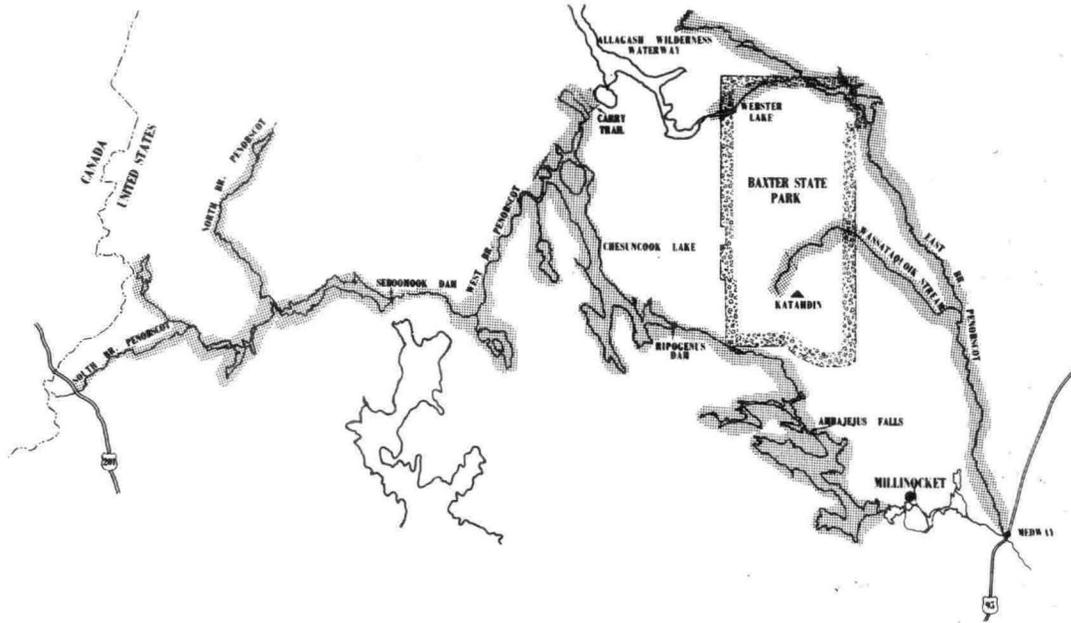
ALL WILD and SCENIC segments and Caribou Lake are within this 295 mile option. Protection is afforded to all major habitat areas and natural landmarks, as well as to the river's whitewater sections.



Option E

WB: entire
EB: entire

This 312 mile alternative involves wild and scenic river status for all qualified segments.



Management Alternatives

If a decision is reached to designate the Penobscot as a wild and scenic river, future administration of the river can be accomplished through strictly public, public-private, or strictly private management. Any of these management arrangements can be adjusted to adequately serve the objectives of any linear protection option which may be selected.

1. Public Management -- Management of land and water uses within any designated river corridor could be accomplished through State, Federal, or joint State-Federal efforts.

The State of Maine has acquired considerable experience in resource management. The Allagash Wilderness Waterway was the first state-administered river to be added to the National Wild and Scenic Rivers System, and experience gained there could serve to guide state action on the Penobscot.

If the State were to accept full responsibility for administration of the East and West Branches, day-to-day management could be delegated to agencies such as the Department of Conservation, Department of Inland Fisheries and Game, and the Baxter Park Authority (through an expansion of its powers), or to a newly-created river association or commission. Management responsibility could be handled by any one of these agencies or the tasks could be shared. For example, the Department of Inland Fisheries and Game might be given responsibility for critical wildlife habitat and significant spawning and nursery areas, while the Department of Conservation manages general land and recreation use along the river. Another approach would broaden the Baxter Park Authority's mandate by including the East Branch within the Park's boundaries while calling upon another state agency to deal with the West Branch.

The state legislature could protect the Penobscot's East and West Branches by designating the river a unique natural resource or by including it within any future state scenic rivers system. If state-administered, the Penobscot could be added to the national wild and scenic rivers system through procedures detailed in the Wild and Scenic Rivers Act. While no federal monies can be expended for such administration, federal matching funds might be available for land acquisition and recreation facility development under the Land and Water Conservation Fund.

Public management of the East and West Branches could also be accomplished through the joint efforts of State and Federal agencies. If this option is selected, Maine's participation would probably be channeled through one or more of the above mentioned agencies, while Federal participation would most likely involve Department of the Interior agencies such as the National Park Service or the U.S. Fish and Wildlife Service.

The East and West Branches could also be administered as a Federal component of the National Wild and Scenic Rivers System by the Secretary of the Interior through one or more Interior agencies. If this approach is selected, the National Park Service would probably be given primary responsibility, with the possibility existing for cooperative management with the U.S. Fish and Wildlife Service. Costs for planning, acquisition, recreation facility development, and administration would then be borne by the Federal government.

2. Private-Public Management -- Through a series of formal agreements, the Penobscot River's East and West Branches could be administered jointly by the State and the river corridor landowners. Cooperative arrangements already do exist between some of these landowners and Maine's Bureau of Forestry, whereby the Bureau of Forestry leases campsites for general public use. Together with appropriate land use controls, such leasing arrangements could form the basis for a management system which draws upon the expertise of both sectors in natural resource and recreation use management. Where compatible with river protection objectives, this approach could permit some private development of recreation facilities as well as other private activity which does not adversely affect the river's environment.

Another possible approach to private-public cooperation is the division of resource protection responsibility by river branch. Here the State of Maine might become the primary river corridor manager along the East Branch (for example, by expanding the boundaries of Baxter State Park) while the Great Northern Paper Company, which presently owns most of the land along the West Branch, manages the West Branch in a manner consistent with the objectives of a wild and scenic river.

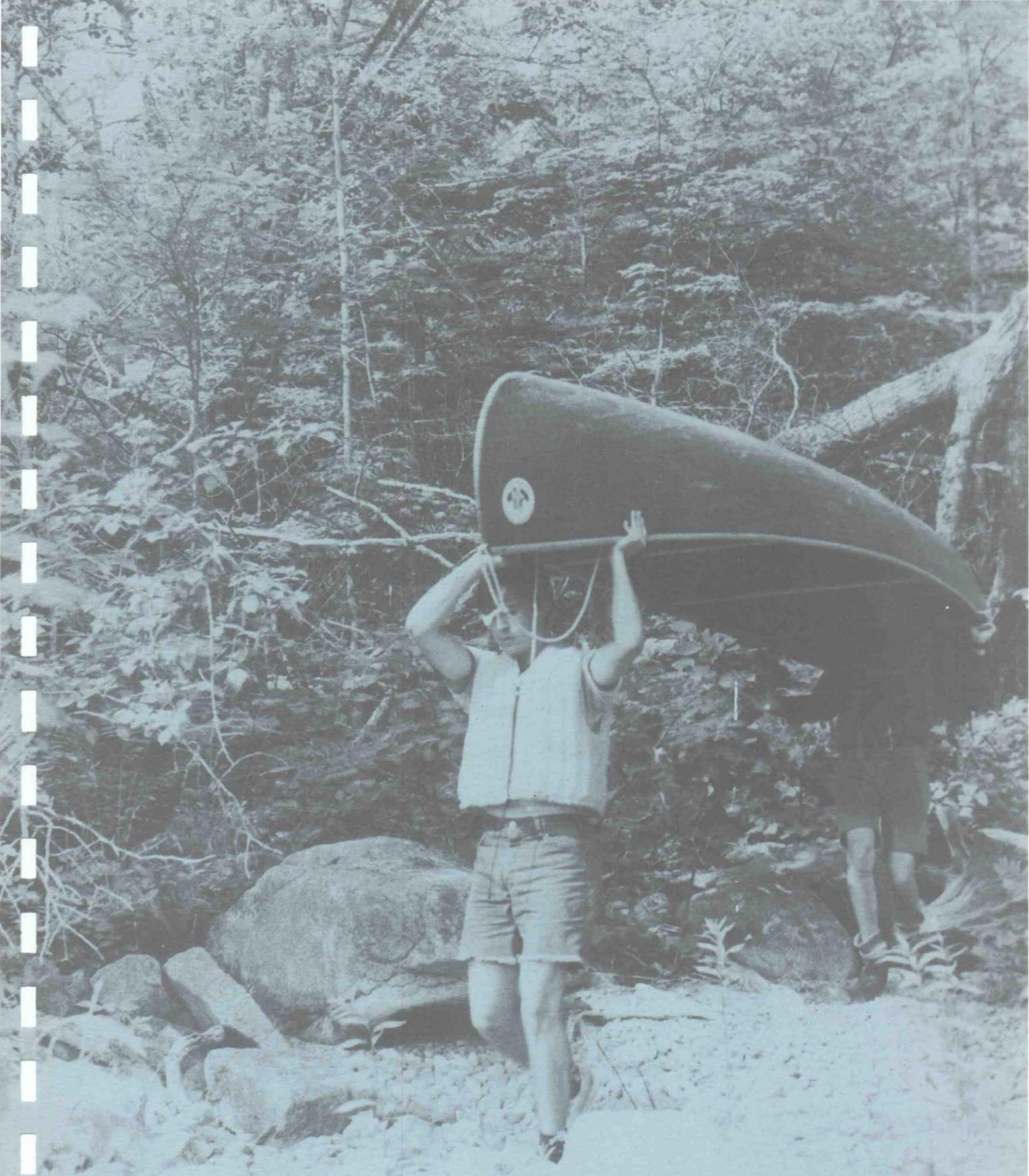
3. Private Management -- Land and water use responsibility and general recreation management of the Penobscot by the private sector is another possible approach. Private management could be accomplished through the efforts of individual landowners, a landowners association, or a land management company.

Under the individual landowner approach, each person or company would be responsible for protecting the land and water resources under his control. This is particularly feasible where extensive sections of the river corridor are now under single ownership. (e.g., the Great Northern Paper Company's holdings along the West Branch). Formation of a landowners association might encourage more uniform policies and practices along the length of the river. Such a partnership would be appropriate in those areas where ownership patterns are fragmented. Finally, a land management company could be created and given management responsibility for all protected river segments. Such an organization would function independently of existing landowners.

Public interest in long-term maintenance of the Penobscot's outstanding values could be served by transferring title of the critical areas within the river corridor to a public agency. The private sector would then assume full responsibility for regulating land and water uses within the entire protection area in accordance with objectives of a wild and scenic river.

Aside from holding title to critical areas, government involvement would be limited to: 1) initial development of performance standards regarding protection goals and overall recreation policies; and 2) monitoring actual performance of the private sector to guarantee that adequate protection and public access continues. Within the agreed upon parameters, the private sector would perform all necessary management tasks and determine the necessity for and locations of recreation facilities such as access sites, campsites, marinas, and vacation homes. Specific policies regarding visitor use, nominal fees, recreation distribution, etc., would also be a private responsibility.

Private sector management is not a totally new concept to northern Maine. A cooperative arrangement in the St. John and Allagash River Basins, known as the North Maine Woods, has provided the public with fishing boating, camping, and other recreation access to privately-held lands. Procedures have been devised to accommodate recreation demand within an area used primarily for commercial timber harvesting. Similarly, major landowners along the Penobscot Branches have found ways to open their timber lands to the public for recreation purposes. With the end of log driving on the river and resort to selective harvesting practices (including a natural "screen" along the water's edge), the river's scenic values could also be preserved by private owners.



IV. PLAN FOR A WILD AND SCENIC RIVER

Preparation of a wild and scenic river plan involves setting the management objectives to be pursued, defining the plan's boundaries, determining appropriate management arrangements, and offering guidelines for proper resource use and adequate public access. The plan which follows seeks to preserve the Penobscot River's outstanding values by permitting compatible land and water uses while regulating the intensity of those uses in conformance with the natural character and "carrying capacity" of the resource. It is designed to permit public and private use of the river corridor while discouraging overuse.

Objectives

In order to assure its preservation as a wild and scenic river, the Penobscot's East and West Branches should be managed to:

Protect the outstanding scenic values of the river corridor.

Preserve the free-flowing condition of the waters.

Maintain the existing excellent water quality.

Maintain and enhance the outstanding quality of fish and wildlife resources.

Maintain good air quality.

Permit the continuation of compatible land and water uses (especially timber harvesting and recreation).

Provide outdoor recreation that is compatible with a wild and scenic river at a level of use which does not deteriorate land and water resources.

Preserve archeological and historic values.

Boundaries

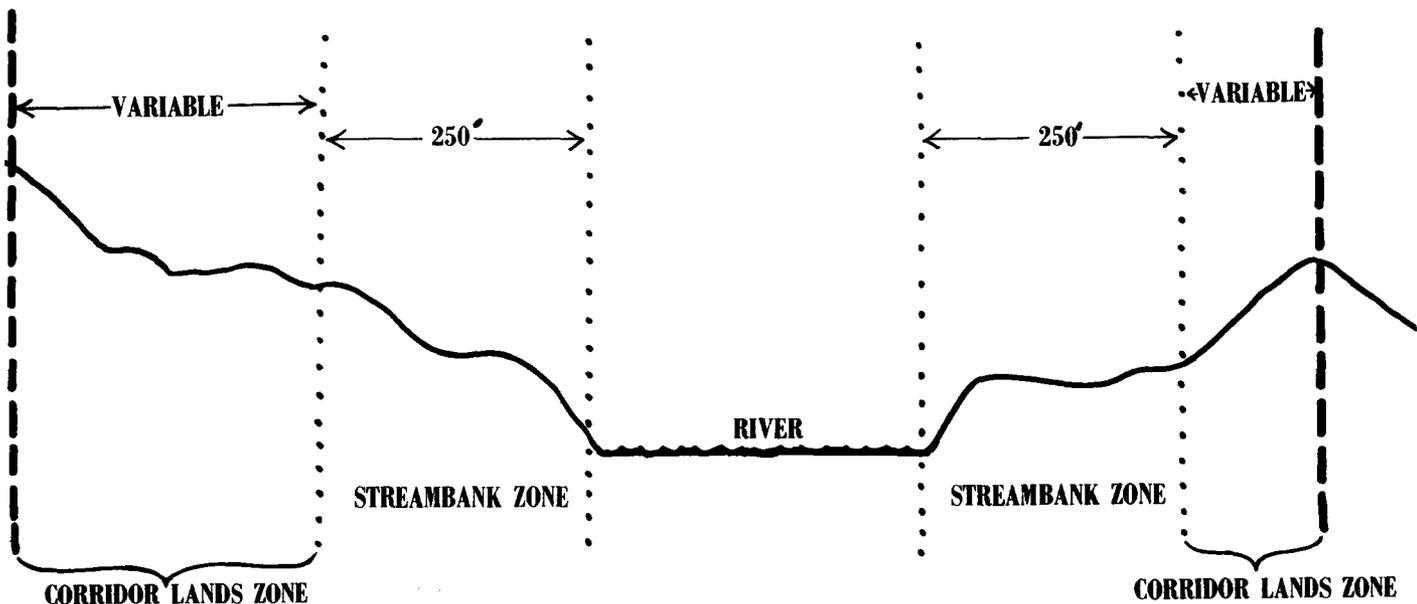
Linear Option D (see page 44) is the recommended corridor length for a Penobscot Wild and Scenic River. 295 miles of the East and West Branches would be protected, including all waterway segments classified as WILD or SCENIC and Caribou Lake. The West Branch's lower lakes would not be within the designated area, even though that 17 mile segment does qualify for national designation as a RECREATIONAL section. Instead, the lower lakes should continue to primarily serve the local recreation needs of Millinocket area residents.

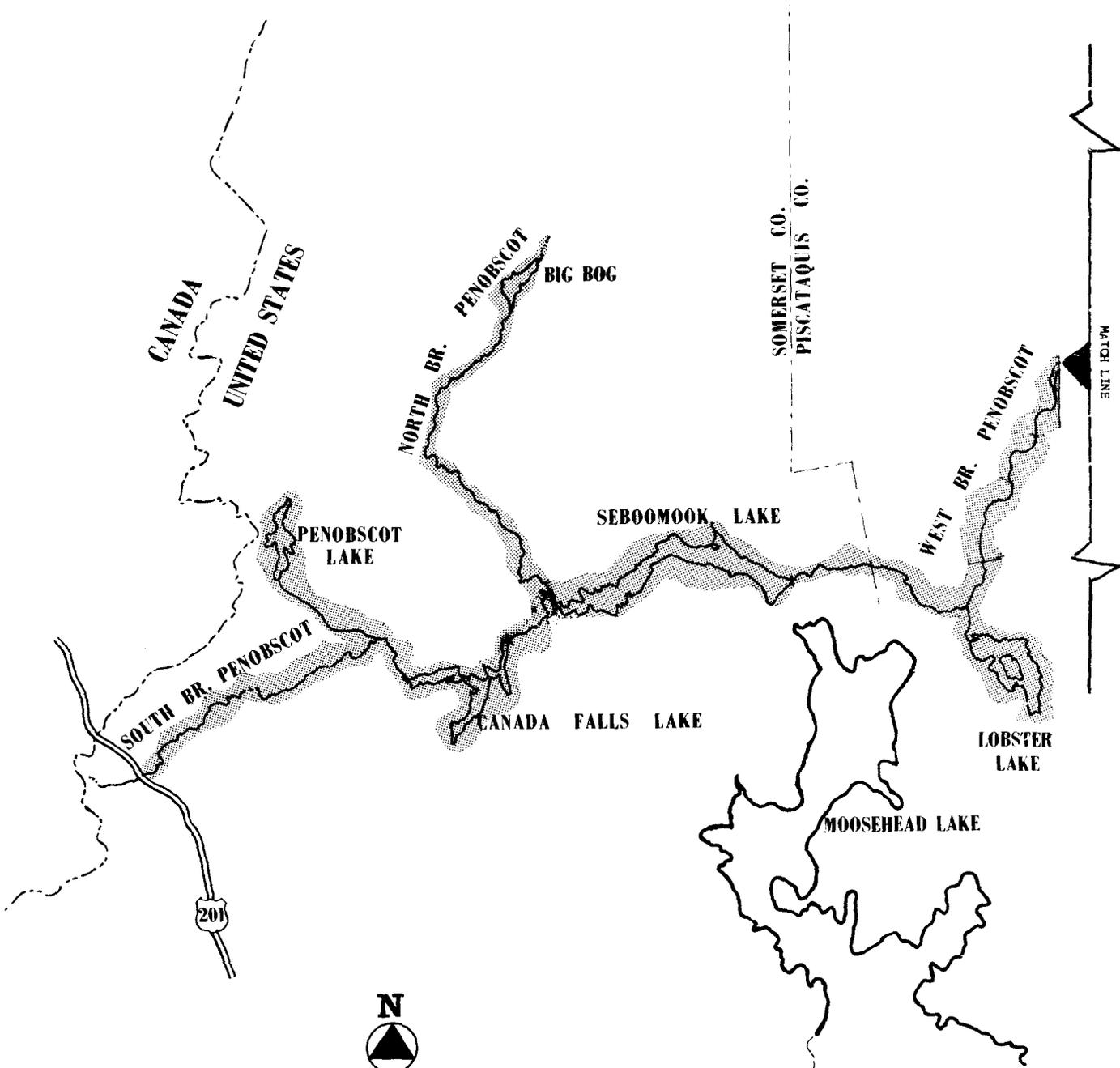
Creation of two management zones along the waterway's length, a streambank zone and a corridor lands zone, is envisioned. Approximately 164,000 land acres adjacent to the river would be encompassed by these zones. The two protection areas can be briefly described as follows:

STREAMBANK ZONE -- This zone provides primary protection for the river's values. It consists of land within 250 feet on either side of the normal high water mark as well as some additional land surrounding the significant features described on pages 31-33. This zone is to be managed for maximum maintenance and enhancement of scenic, fish, wildlife, and recreation values.

CORRIDOR LANDS ZONE -- This zone operates as a buffer between the streambank zone and land not within the scope of the wild and scenic river proposal. It consists of land outside the streambank zone and within a variable boundary drawn on the basis of view from the river and general topography. This boundary ranges from several hundred feet to one-half mile and averages one-third mile beyond the streambank zone. A variety of land and water uses, including development compatible with the natural surroundings, could occur within this zone.

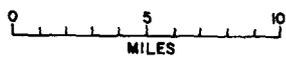
RIVER CORRIDOR ZONES

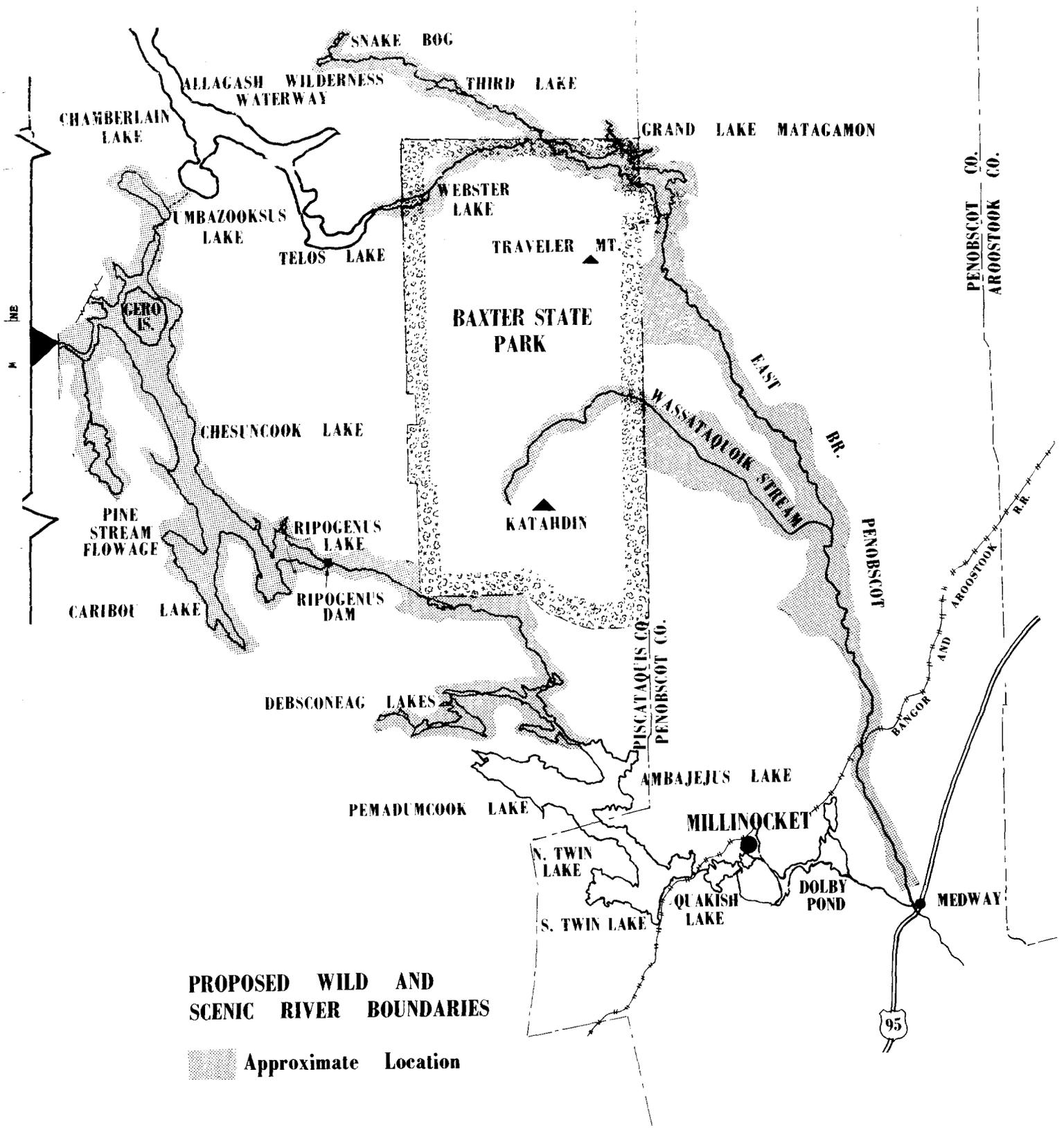




PENOBSCOT RIVER

EAST AND WEST BRANCHES





PROPOSED WILD AND SCENIC RIVER BOUNDARIES

Approximate Location

PENOBSCOT CO.
AROOSTOOK CO.

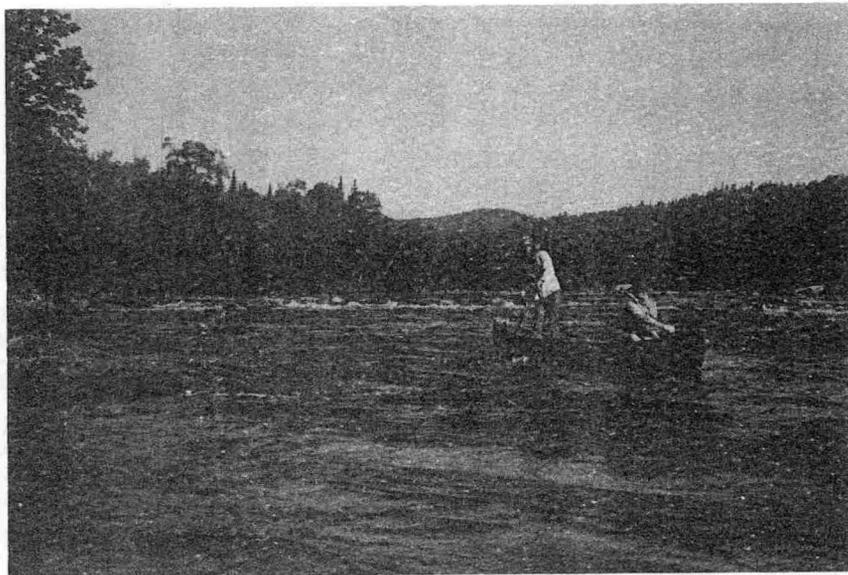
PISCATAQUIS CO.
PENOBSCOT CO.

95

River Corridor Management

The Penobscot's East and West Branches should be added to the national wild and scenic rivers system as a state-administered river upon application by the Governor of Maine. Responsibility for land and water management should generally remain with private landowners, subject to adequate State conservation zoning and environmental guidelines. Such a procedure recognizes the state's ability to effectively regulate extensive land and water areas for conservation purposes, as demonstrated by its administration of the Allagash Wilderness Waterway. It is also based on the fact that the existing landowners have, on the whole, carefully managed their land so as to preserve the environmental quality of the upper Penobscot watershed.

Most of the land within the river corridor can be adequately protected through zoning standards established by Maine's Land Use Regulation Commission. This would involve placing the streambank zone permanently in "protection districts" (where land use is regulated to protect natural, recreational, or historical values) and including all of the corridor lands zone within "management districts" (land devoted primarily to commercial timber production). The Commission should adopt permanent zoning standards within the river boundary which:



West Branch

-- prohibit development along the streambank zone (250 ft. from the highwater mark). Land use standards within this zone should be similar to the "interim shoreland protection subdistrict" (P-3) standards in effect prior to the June, 1975 amendments. (See Appendix III).

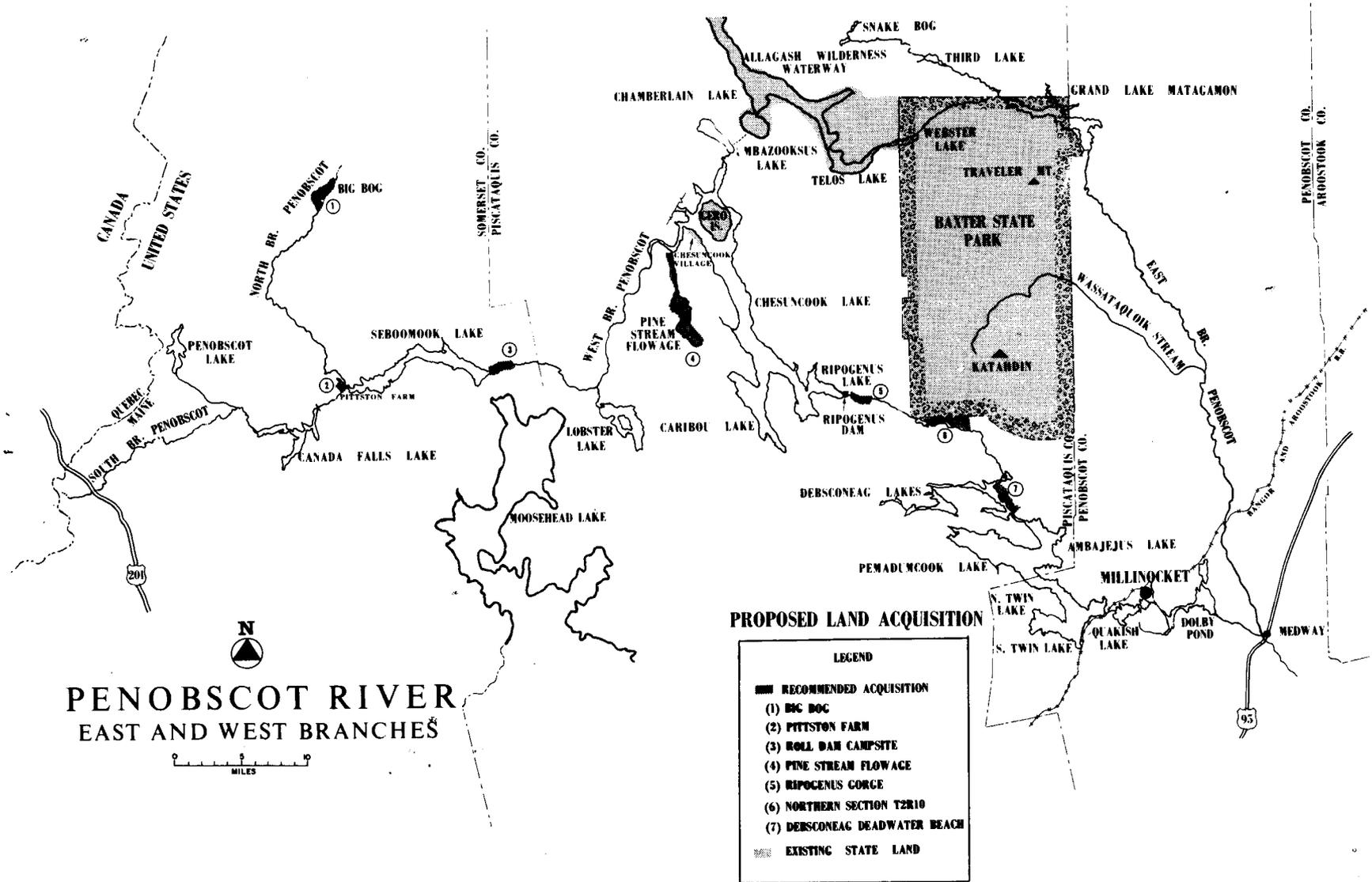
-- restrict timber harvesting along the streambank zone of WILD segments to operations necessary to maintain a healthy, vigorous stand condition.

-- require Department of Conservation review and approval of all timber cutting plans within the designated river corridor. (This procedure is now followed along the Allagash Wilderness Waterway).

While zoning can be relied upon as the major land protection technique, fee purchase by a public agency of some land parcels is highly desirable in order to assure long-term productivity and continued public availability. Seven sites along the West Branch have been identified for such purchase by the state due to their ecological, scenic, or recreational significance (see map, p. 56).

1. *Big Bog -- major wildlife habitat, especially for moose and waterfowl (1500 acres)
2. *Pittston Farm -- outstanding example of an historic farm which supported the early loggers (75 acres)
3. Roll Dam campsite area -- extends 2 miles downstream of Seboomook Dam; recreation activity center for canoeing and fishing, with control needed to protect wilderness quality (350 acres)
4. *Pine Stream Flowage -- critical waterfowl production and nesting area, especially for black ducks (5800 acres)
5. *Ripogenus Gorge -- spectacular steep walled gorge, one of only two such canyon-like areas in Maine (400 acres)
6. Northern section, T2R10 -- necessary to assure most scenic views of Katahdin available to waterway users (3500 acres)
7. Debsconeag Deadwater Beach -- potential day use swimming and picnicking area for Millinocket residents, which fills a need identified in Maine's Statewide Comprehensive Outdoor Recreation Plan (100 acres)

*Significant feature (see pages 31-33).



**PENOBSCOT RIVER
EAST AND WEST BRANCHES**

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0 1 2 3 4 5
MILES

Resource Use Policies

Three major types of management policies are appropriate within the river corridor: general, classification-related, and features-related. Each set of policies is designed to guide land and water use decisions toward achievement of the wild and scenic river objectives. General management policies apply throughout the river corridor and operate as the basic ground rules for resource protection and use. Classification-related policies offer guides for maintaining the natural character of the particular WILD, SCENIC, and RECREATIONAL segments, while features-related policies serve as tools for strictly regulating unique sites which are highly susceptible to overuse and misuse.

This complex of management policies has been designed so that the types supplement rather than displace one another. For example, the guides to proper resource management practices at Penobscot Lake (a significant feature) consist of relevant general, WILD segment, and features-related policies. Where inconsistencies arise, the more restrictive procedure would govern.

I. General Policies

General management policies emphasize maintaining the corridor's natural character while at the same time recognizing its utility as a "working" resource. Many of the benefits extracted from the corridor are renewable provided that optimum use levels are not exceeded. The management challenge is to preserve the ecosystem's integrity so that it can continue to produce significant economic benefits and still retain its high quality amenities. The following guidelines are crucial to that effort.

a. Fish and Wildlife

- permit fishing and hunting throughout the corridor with appropriate monitoring to assure that no one species or particular site receives intense pressure.
- set optimum use levels based upon natural wild populations in order to avoid the necessity for artificial propagation and stocking programs.
- provide and properly maintain fish passage facilities wherever necessary. Strong efforts should be made to promote programs downstream of the study area which remove obstacles to restoration of an Atlantic salmon fishery along the East Branch.
- guide fishing interest toward warm water species which are currently underutilized.
- permit trapping where appropriate precautions are taken so that this activity does not conflict with other uses (e.g., timber harvesting, recreation, etc.).

b. Water Quality and Flow

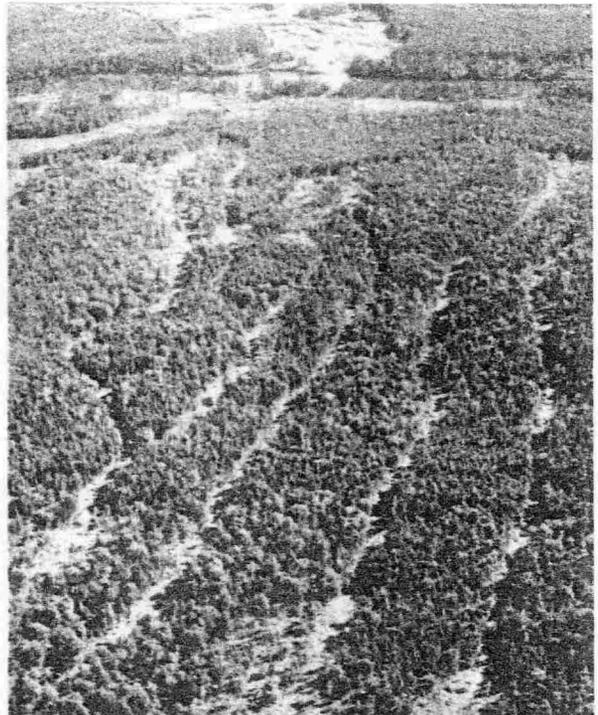
Since water quality throughout almost the entire waterway is uniformly excellent, the major effort should be to avert degradation and assure adequate flows as changes occur within the watershed.

- support water quality standards set by Maine's Department of Environmental Protection.
- continue water supply manipulations for power generating purposes in a manner similar to policies now in force. The 2,000 cfs minimum flow requirement at Millinocket should be retained.
- allow expansion of existing impoundments where in keeping with the natural environment.

c. Commercial Timber Harvesting

Historically, the Penobscot has been closely associated with the logging industry. With increasing demands being made on the nation's forest resources, it is expected that commercial timber harvesting will continue as the predominant land use within the upper basin. Efficient and ecologically sound utilization of the watershed's timber should be encouraged.

- allow small scale timber harvesting operations conducive to the maintenance and enhancement of wildlife habitat within the streambank zone in accordance with Land Use Regulation Commission (LURC) procedures and standards.
- permit forest management activities, including timber harvesting, within the corridor lands zone in accordance with procedures and standards adopted by LURC for "protection subdistricts". Whenever feasible, harvesting should occur during periods of minimum recreation use.



Logging on West Branch

- prohibit the use of relatively persistent insecticides along the river, particularly those having a tendency to accumulate in food chains. Insecticide application should comply with the Federal Environmental Pesticide Control Act and there should be no application directly on the water or within the streambank zone.

d. Recreation

- use existing Bureau of Forestry campsites to form the core of public recreation facilities made available.
- screen campsites and related facilities from view along the waterway.
- monitor types of recreation use and their impacts to determine optimum levels within given areas.
- regulate total visitor use and distribution throughout the corridor to avoid overcrowding and resource deterioration through overuse.
- encourage four season recreation use to discourage congestion during summer months.
- develop a waste disposal system which enhances the river environment and which strongly encourages recreationists to "carry out" any litter they have "carried in".
- permit small and moderate sized recreation activity centers, but exclude development of large-scale operations.

e. Access

- maintain existing roads so that they are unobtrusive to the natural environment and are well-screened from view along the waterway.
- limit overland public access to specifically designated routes with guaranteed public right-of-way.
- operate access control points to regulate volume of recreation-related travel. Traffic may also be reasonably regulated so that it does not unduly conflict with commercial timber hauling operations.
- maintain adequate erosion control measures along all roads, including logging roads and skid trails.
- prohibit construction of new roads within the streambank protection zone, except for skid trails and access spurs to public recreation sites.

f. Structures

- require structures visible from the river, trails, or developed recreation sites to: a) be of attractive and unobtrusive design, b) have sufficient topography or vegetative screening to make them as inconspicuous as possible, and c) be designed and constructed to minimize adverse environmental impacts.

- allow leases on existing cottages ("camps") to continue indefinitely subject to appropriate environmental and aesthetic regulations.
- prohibit powerlines and gaslines within the streambank zone except where necessary to service compatible uses along the river corridor. Where such lines are constructed, every effort should be made to harmonize them with the natural environment by means of careful siting and vegetative screening.

2. Classification-Related Policies

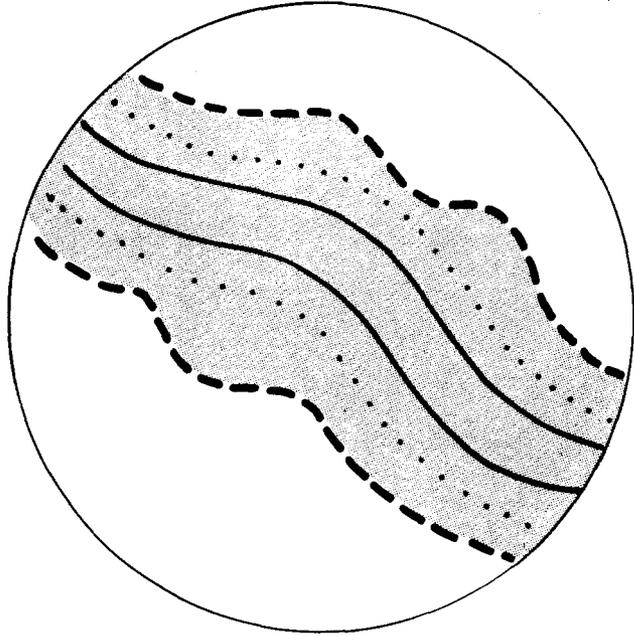
As noted previously, segments of the Penobscot's East and West Branches have been classified as WILD, SCENIC, or RECREATIONAL based upon criteria established in the Wild and Scenic Rivers Act and classification guidelines prepared jointly by the Department of the Interior and the Department of Agriculture. Each of these categories describes, in shorthand form, the relative "primitiveness" or naturalness of the river corridor's environment.

In order to preserve the Penobscot's values, it will be necessary to regulate the intensity of use along the waterway. Use patterns should be light within WILD segments, light to moderate within SCENIC segments, and moderate within RECREATIONAL segments, with some provision made for more intensive or concentrated use within RECREATIONAL segments. These broad patterns should take into account the fact that the corridor lands zone is normally better suited for more intensive activity or development than the streambank zone. Additionally, use intensities should be modified in accordance with the natural environment's ability to sustain certain levels of activity - implementation of the plan requires sensitivity to the fragile ecology of particular places. Use patterns are graphically illustrated on the next page.

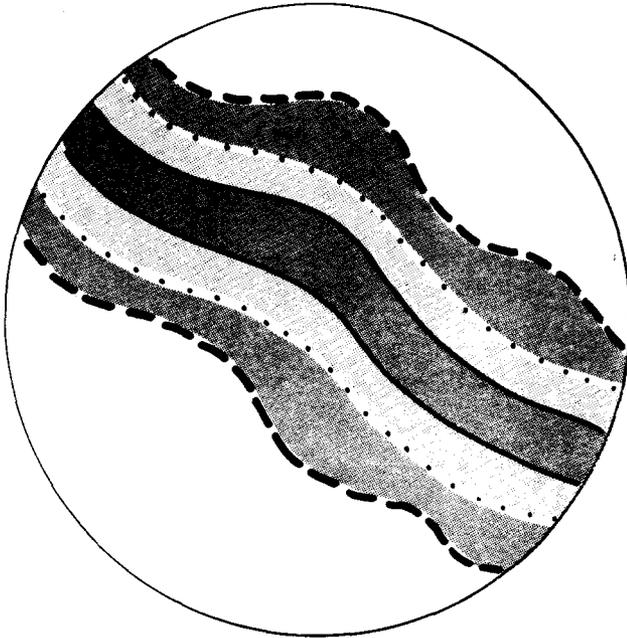
In addition to use intensity guidelines, the management policies are tailored to more precisely fit the differing requirements along the waterway's length. Regulations would be most stringent along WILD segments, since retaining a primitive character necessitates prohibition of all but minimal human encroachment. Conversely, management policies for RECREATIONAL segments should recognize the compatibility between certain types of development and preservation of the natural setting as long as the new structures are attractively and unobtrusively designed and maintained. Policies for SCENIC segments, of course, should strike a balance between the restrictive regulations for WILD segments and the allowance for potential development within RECREATIONAL segments.

USE INTENSITY BY RIVER CLASSIFICATION

WILD



SCENIC



RECREATIONAL



LEGEND

LEVEL OF USE

-  LOW
-  MODERATE
-  HIGH
-  CORRIDOR ZONE
-  STREAMBANK ZONE
-  RIVERWAY

a. Wild Segments

- prohibit new impoundments.
- permit selective timber harvesting within the corridor lands zone where such activity would not significantly detract from scenic values.
- restrict timber harvesting within the streambank zone to operations necessary to maintain a healthy, vigorous stand condition.
- permit non-intensive recreation use in keeping with the essentially primitive natural character.
- develop primitive campsites at strategic locations with distances between camps normally a minimum of one-half day's journey by canoe.
- restrict on-water travel to canoes or small boats without motors.
- prohibit new roads or bridges except for logging roads and skid trails needed to accomplish forest management objectives.
- prohibit new structures or additions except for small forest management stations within corridor lands zone.

b. Scenic Segments

- prohibit construction of new impoundments except for minor structures designed to improve fish habitat.
- permit moderate scale timber harvesting within corridor lands zone provided that a stand of well distributed trees is generally retained.
- provide campsites small to moderate in size with rustic facilities for user convenience.
- provide canoe and boat launching sites for day use.
- permit small motors on canoes and boats along the waterway and moderate size motors on Seboomook and Chesuncook Lakes.
- provide snowmobile access and use along designated trails (e.g., unused logging roads).
- prohibit construction of new bridges, although existing bridges may be expanded.
- allow construction of structures used for forest management or public recreation purposes within the corridor lands zone.

c. Recreational Segments

- permit moderate scale timber harvesting within the corridor lands zone.
- permit moderate-sized campgrounds for concentrated use with sites and picnic areas appropriately landscaped.
- design public recreation facilities such as marinas for serving waterway users.
- permit large motorized boats.
- permit additions to existing buildings and new cottages, residences, or related structures within the corridor lands zone.

3. Significant-Features Policies

The significant features found along the river corridor (and described on pp. 31-33) in large measure define the uniqueness of the Penobscot's East and West Branches. Their very "specialness" creates a dual obligation -- first, to carefully attend to their protection and second, to sensibly design procedures which offer the recreationist/visitor a full and rewarding encounter with their values. To further these ends, the plan would

- extend the streambank zone's protection around each feature to a distance which incorporates the whole of that feature.
- prohibit concentrated development or inappropriate land and water practices which might encroach upon the features.
- monitor visitor use at each of these points and regulate the volume of use to avoid resource deterioration.
- design and maintain public access routes to these areas which are natural in appearance and low volume in capacity.
- maintain only small rustic recreation facilities in proximity to these features (i.e., no large campgrounds with large expanses of parking would be permitted).
- provide appropriate interpretive programs, especially at the historic features, which increase the visitor's awareness of the area's special character and its significance to the state's or nation's heritage.

Recreation Access and Campsites

A primary value of the upper Penobscot is the variety of wilderness-oriented recreation opportunities which the river provides. In order to guarantee continued public availability and enjoyment of the waterway, access roads and sites and campsites must be secured. At the same time, the river's amenities must be protected from overuse. Also, the compatibility between recreation and timber harvesting activity must be maintained. Probably the most realistic method for achieving these results is by providing limited access to specified sites over unimproved roadways. This could be done through long-term leases and agreements with private landowners who currently maintain a network of private roads throughout the upper watershed.

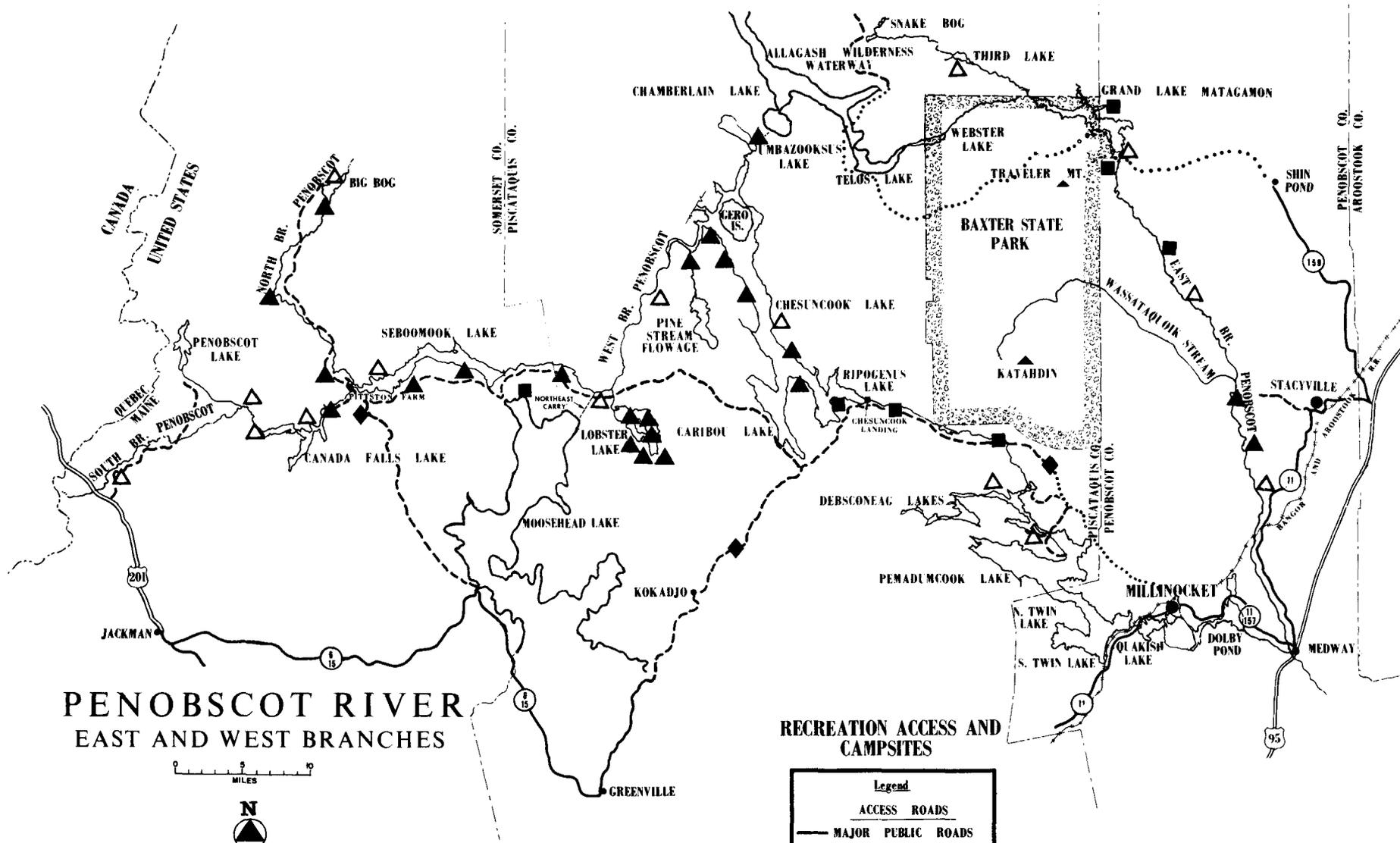
1. Road Rights-of-Way

Presently, major public access to the East Branch is provided by the road from Shin Pond into Baxter State Park and by Route 11 from Medway to Hay Brook. Access guarantees should be sought for:

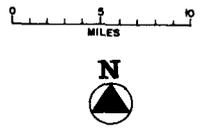
- road from Chamberlain Lake to the East Branch headwaters in T7R11
- road from Stacyville to Lunksoos and Whetstone campsites in T3R7

The major assured public access to the West Branch is over the road from Millinocket to the Baxter State Park turnoff. Entry to the south branch is possible at the river's junction with Routes 201 and 6 north of Jackman. Additional access guarantees should be sought for:

- road from Pittston Farm to Big Bog
- road from Routes 201 and 6 into T4R4 NBKP
- road from Pittston Farm to Canada Falls Dam
- Pittston Academy Road from Greenville to Pittston Farm
- Seboomook Road from Pittston Farm to its intersection with Great Northern's east-west haul road in T3R14 and the haul road from that junction to its intersection with the Kokadjo-Chesuncook Landing road
- road from Greenville through Kokadjo to Chesuncook Landing
- road from Millinocket to Chesuncook Landing
- spur road off Baxter Park Road providing access to Debsconeag Deadwater.



PENOBSCOT RIVER EAST AND WEST BRANCHES



RECREATION ACCESS AND CAMPSITES

Legend	
ACCESS ROADS	
	MAJOR PUBLIC ROADS
	PRIVATE ROADS
	PUBLIC PARK ROADS
	BUREAU OF FORESTRY CAMPSITES
	POTENTIAL CAMPSITES
	PRIVATE CAMPSITES
	CHECKPOINTS

2. Campsites

Maine's Bureau of Forestry maintains 20 campsites on the West Branch and two on the East. Two private campsites and a commercial sporting camp operate on the East Branch while three private campsites are found on the lower section of the West Branch. Also, the Seboomook Wilderness campsite on Moosehead Lake serves West Branch recreationists.



Campsite on Chesuncook Lake

Although existing recreation facilities have served visitors adequately, several new primitive-type camps should be developed to enhance recreation opportunities and to disperse recreation use. They should be capable of handling one or two parties, that is, from 12 to 24 people. Approximate locations and number of sites are as follows:

<u>Location</u>	<u>Number</u>
North Branch	1
East Branch	4
South Branch	4
Balance of West Branch	6

These new facilities should also be maintained by the state on land leased from existing landowners.

V. ANALYSIS OF ALTERNATIVES



Guided by the U.S. Water Resource Council's "Principles and Standards for Planning Water and Related Land Resources", eight plans for the upper Penobscot have been developed and analyzed. The purpose of the information displayed and evaluated in this section is to provide a basis for decisions regarding the future of the Penobscot's East and West Branches. Seven of the plans emphasize environmental quality -- the five Wild and Scenic River options, Baxter Park Expansion, and the Maximum Environmental Protection Plan. The Economic Development Plan stresses more intensive resource use to achieve economic objectives.

Each plan is compared to a "No Plan" alternative, which reflects a continuation of existing land and water use trends. They are all discussed within the framework of the four account system of the Principles and Standards, namely, Environmental Quality, National Economic Development, Regional Development, and Social Well Being. For discussion purposes, the economic and regional development accounts have been combined. Recreation costs and trends and energy impacts are discussed separately to aid decision makers in reviewing the specific recreation, conservation, and energy impacts of each alternative. These impacts are incorporated into a series of tables known as display accounts in Appendix I. Each display account compares the alternative under discussion to both the "No Plan" and the Preferred Plan.

For purposes of the regional economic development component, it is assumed that all land acquisition and development costs for the environmental quality plans would be funded through the Land and Water Conservation Fund on a 50% federal and 50% state basis.

'NO PLAN' ALTERNATIVE -- CONTINUATION OF EXISTING TRENDS

This plan involves state, local and private action. It illustrates current trends that are likely to continue if no new action is taken as a result of this study.

Environmental and Land Use Impacts

Types of land use within the river corridor are not expected to change appreciably in the foreseeable future. Timber harvesting, hydropower generation for pulp mill operations, and recreation will remain the predominant activities along the Penobscot's branches, although the intensity of these uses may increase. State supervision of these land and water uses would continue through zoning decisions of Maine's Land Use Regulation Commission, state policies regarding public lands management, and future legislative action.

The most significant environmental impacts of the "no plan" alternative, at least for the short term, are the consequences of hydropower development along the Ripogenus Gorge - Sourdnaunk Falls section of the West Branch. These are discussed under Energy impacts.

The long-term environmental integrity of the upper Penobscot basin is directly tied to the economic circumstances of the paper-producing industry. Since commercial timber harvesting is expected to remain the principal land use, it can be expected that most landowners' land use decisions would reflect their desire to maintain and enhance the area's timber harvesting potential. Short-term competitive pressures can, however, work at cross-purposes with such a long-term objective. Thus cutting practices may be used which do not adequately consider soil erosion hazards.

Decisions regarding pest control pose a potential threat to fish and wildlife resources. Maine's timber industry is now experiencing a spruce budworm epidemic and insecticide spraying of large land areas has occurred. The impact that a spray program may have on the fish and wildlife resources of the river corridor is not yet fully determinable, but significant ecological consequences can be expected if resort is made to relatively persistent chemicals such as DDT or other organochlorine compounds. Application of insecticides to reduce spruce budworm populations has become routine, with many areas now receiving treatment in successive years. Continuation of this pattern could adversely affect the food base of species such as brook trout, landlocked salmon, and other salmonids, since aquatic insects upon which they feed are also killed by the insecticides used. Long-term consequences on fish and wildlife of continued spraying with organophosphates and carbamates are not fully understood, even though these are now the pesticides most frequently applied.

The overall effect of "No Action" will be to seriously impair the fish and wildlife values discussed above of the Penobscot's Branches.

Landowners are currently leasing 855 sites along the river corridor for cottages. As the pressure for vacation and second home sites becomes greater throughout the study region, it is likely that the number of leases along the Penobscot will increase. New development on the West Branch will probably center around the lower lakes and Caribou Lake, with scattered cottages being built on SCENIC segments. On the East Branch, new cottages may appear on both WILD and SCENIC segments, especially in the stretch from Bowlin Camps to Medway. If second home development is actively promoted by the state, as recommended by the 1974 Tourism in Maine study (commissioned by the state legislature-created Vacation Travel Analysis Committee), it is possible that present land ownership patterns will fragment as waterfront areas are partitioned and sold for development.

Conservation/Recreation Costs and Trends

If existing trends continue, land along the upper Penobscot will remain in private ownership, and no additional public recreation facilities will be constructed. Thus, the only direct recreation costs would be the \$16,000 incurred for annual operation and maintenance of 22 campsites now in place.

Recreation use should remain stable at 346,000 recreation days annually through 1980 as natural increases are offset by declines in fishing, canoeing, and sightseeing due to hydropower development in the Ripogenus Gorge-Debsconeag Deadwater area. About two-thirds of the total use will occur along the West Branch's lower lakes where most of the cottages and seasonal homes are concentrated. Between 1980 and 2000, recreation use of both the East and West Branches will increase, although the ease of public access and the extent of recreation development will depend upon the policies and decisions of the paper companies and other private landowners. Assuming a 10% increase in the number of cottage leases on the lower lakes and continued recreation pressure comparable to statewide trends, annual recreation days could reach 413,000 by the end of the century, a 19% increase over the current level.

Since Interstate 95 is now almost complete as far as Millinocket and no new major access roads are planned into the study area, no significant part of the additional recreation use is directly related to an upgrading of the transportation network.

Energy Impacts

The Great Northern Paper Company is currently exploring the economic and technical feasibility of developing the West Branch's remaining hydropower potential. If the results of that evaluation are positive, it is likely that the company will construct a facility between Ripogenus Gorge and Sourdnhunk Falls. The new station would operate 24 hours a day and generate up to 240 million kilowatt hours of electricity annually. This energy would apparently be used to replace some of the power now provided by fossil fuel plants, rather than to expand pulp mill operations. As such, its primary benefit would be to reduce oil dependency by approximately 400,000 barrels yearly.

Consideration of further hydropower development has evidently been brought on by the recent dramatic rise in oil prices. Per barrel costs have escalated from \$2 in 1969 to \$11 to \$13 in mid-1975. As a result, the Federal Power Commission now estimates that the total annual cost of electricity in northern Maine on a cents per kilowatt hour basis is roughly comparable between a newly constructed hydro plant and a new oil-fired steam plant. For purposes of the "No Plan" discussion, therefore, it will be assumed that Great Northern will eventually build a new hydro-power facility as "insurance" against further oil price increases.

If constructed, the West Branch hydropower complex would inundate 6 miles of free-flowing river, including some of the best white-water canoeing in the study area. Natural landmarks of significance which would be impaired are Ambejackmockamus Falls and the Horserace, and Sourdnahunk Falls. Up to 800 acres of land now available for commercial timber harvesting would also be utilized by the project.

Adverse effects on fishery resources would be significant if the remaining West Branch hydropower potential were developed. The free-flowing segment downstream of Ripogenus Gorge serves as summer habitat for landlocked salmon found in the river and the lower lakes. The U.S. Fish and Wildlife Service notes that construction would virtually eliminate the wild salmon in the 6 mile segment from the Gorge through Sourdnahunk Falls. Construction would also adversely effect about 240 acres of permanent and potential deer wintering area either through inundation or by degrading habitat quality as deer are forced into nearby yards which are now at or near carrying capacity.

Under "No Plan" conditions, it is unlikely that further hydropower development will occur on the East Branch. Construction of the Grand Pitch site on Webster Brook is precluded by its location within Baxter State Park. Neither of the other two sites -- Meadow Brook and Whetstone Falls -- is of sufficient size to have been considered in the New England power pool's short-term (i.e., to 1985) plans, nor have any locally-oriented energy producers shown an interest in them. Development would, of course, seriously affect the Atlantic salmon restoration program by eliminating 289 acres of nursery and spawning habitat. Such a habitat loss would reduce the potential commercial and sport fish catch for the entire basin by at least 25%.

Pumped storage projects will probably not be built within the river corridor. The Harrington and Penobscot Lake sites are physically capable of holding large amounts of water. Their identification, however, was based solely on topographic analysis. Due to their incompatibility with New England's power use and need patterns, high cost, and associated environmental problems, they are not realistically developable.

No coal, oil, or uranium resources are known to exist in the upper Penobscot basin and thus no other energy development is contemplated there.

Economic and Regional Development Impacts

Under current trends, commercial timber harvesting will continue as the primary economic activity for the Millinocket Economic Area. Harvesting in the upper Penobscot watershed will contribute a portion of the basic resource needed to maintain the area's more than \$100 million manufacturing products value.

Total expenditures through 1980 by persons using the Penobscot for recreational purposes should remain at \$2,854,000 and generate 2,429 man months of employment each year. Almost \$475,000 of this amount is contributed to the Maine economy by out-of-state visitors. By the year 2000, recreation-related expenditures should reach \$3,460,000 with 19% of this amount coming from out-of-state visitor spending. 2,964 man months of employment would then be attributed to recreation use of the Penobscot.

Approximately 800 acres of prime timber land would be inundated as the West Branch's remaining hydropower potential is developed. The present value of future timber yields foregone is estimated at \$61,000 with a consequent annual loss of \$1,100 in state tree growth tax revenues. (The tree growth tax is imposed in the unorganized townships instead of a traditional property tax). Once in operation, the hydropower facilities should result in a fossil fuel saving of 400,000 barrels of oil each year. Construction of a hydropower facility could require 550 to 600 man years of effort (i.e., 140 persons working for 4 years). This would be new employment for the area. However, permanent employment would be less, since a hydroproject of these dimensions would require 5 operators while a comparable steam turbine facility would employ 20 to 30 persons.

Social Impacts

A continuation of existing trends is likely to have significant social consequences for recreation in the study area. Both the variety and quality of outdoor recreation will probably be diminished. Hydropower development on the West Branch will impair river-oriented coldwater fishing opportunities by eliminating the landlocked salmon fishery from Ripogenus Gorge to Sourdnhunk Falls. Two popular fishing areas -- Big Eddy and Sourdnhunk Deadwater -- will be inundated. Additionally, hydropower construction may increase the range of warmwater species -- an undesirable occurrence given existing fishing preferences throughout the area. Exciting whitewater canoeing would be eliminated on the West Branch except for the roll dam area downstream of Seboomook Lake.

The high quality of outdoor recreation experiences associated with the Penobscot may deteriorate under "No Plan" conditions. This could result from logging practices which increase siltation or require prolonged pesticide spraying which might reduce the natural abundance of fish and wildlife. Also, scenic values will probably be impaired by new road and bridge construction within view of the river along WILD segments. Scattered cottage development along both WILD and SCENIC segments would also affect scenic values, especially along the East Branch.

WILD AND SCENIC RIVER PLANS

Long-term preservation of the Penobscot River's outstanding values can be accomplished by designating the East and West Branches as a wild and scenic river. The waterway's great length permits consideration of a variety of linear protection options depending upon the extent of environmental preservation desired and the degree of accommodation with incompatible resource uses found necessary. Five feasible options are, therefore, evaluated here ranging from designation of 124 waterway miles to designation of all 312 miles which qualify for wild and scenic river status. Pages 43-45 contain illustrations of each of these options.

WILD AND SCENIC RIVER OPTION A

Under this option, 124 miles of river classified as WILD and SCENIC would be protected. Beginning immediately downstream of Seboomook Dam, the waterway would consist of the West Branch segment through Umbazooksus Lake and Stream and Carry Trail, and the East Branch from Webster Lake to Medway. Lobster Lake and Pine Stream flowage would be included within the West Branch segment, but none of the waterway south of Gero Island would be protected. The East Branch's Snake Bog headwaters and Wassataquoik Stream are not contained within this option.

As with all the wild and scenic river proposals being considered, land protection would be achieved primarily through "protection district" and "management district" zoning by Maine's Land Use Regulation Commission. About 61,000 acres would be zoned in that manner, while slightly more than 6,000 acres would be acquired in fee. Most of the land acquisition would be designed to assure the integrity of Pine Stream flowage, one of the most crucial waterfowl production areas in northern Maine. The balance of land purchases would be concentrated in the section immediately downstream of Seboomook Dam for purposes of scenic preservation, fishery management, and recreation access. When streambank lands now under state ownership are considered, a total of 71,000 land acres are included within this option.

Environmental and Land Use Impacts

This alternative offers significant protection of the Penobscot's East Branch while maintaining the scenic quality of an important West Branch segment. The continuing availability of East Branch waters for Atlantic salmon spawning and nursery habitat would be guaranteed since 169 acres of habitat would be included within the designated area. Additionally, all the cataracts and rapids which contribute to the East Branch's beauty and interest would be protected from encroachment by camp or cottage development.

In the short term, this approach offers reasonable protection to the West Branch segment involved. Pine Stream flowage, the critical wildfowl habitat which serves as a nesting area for black ducks and teal, could be managed for optimum productivity without the restrictions which may be placed in leasing agreements or the risk of incompatible land uses. Several other significant features -- Lobster Lake, Moosehorn Deadwater to Chesuncook Lake, and Penobscot Farm -- would also be protected, as would be the as yet unexplored archeological values of the Umbazooksus passage. Maintenance of the existing cold water fishery between Seboomook Dam and Pine Stream would be enhanced.

Long term adequacy of this option is less certain, since water quality within this segment is largely a function of events in the headwaters which are outside the proposal's boundaries. If current upstream conditions do not change, no problems should arise. However, major development or siltation from improperly conducted logging operations could result in water quality deterioration with consequent adverse impacts on fishery resources.

Selection of this alternative would not have a positive impact on endangered species, since both the bald eagle and blueback trout habitats are outside its boundaries.

Restrictions on aerial pesticide application would be in effect along the primary fish habitats of the East and West Branches. This offers moderate benefits to fish and wildlife resources by reducing the river area susceptible to the environmental consequences of continued pesticide use. However, this option would not protect the West Branch headwaters, including blueback trout habitat, from pesticide abuse.

Placing 61,000 acres of land into protection district zones would have little impact on existing land use patterns. Currently, the river corridor described in this option is managed almost exclusively for commercial timber harvesting. Logging would continue under this plan, with small scale operations occurring within 250 feet of the normal high water mark (stream-bank zone) and moderate scale operations permitted within the balance of the boundary (corridor lands zone). All such activities would, of course, be required to comply with standards and procedures adopted by the Land Use Regulation Commission.

Since all the segments in this plan are classified as WILD or SCENIC, no further cottage development would be permitted within the authorized boundaries. This does not alter the existing situation throughout most of the river corridor, since cottages are not a major feature. However, scattered development of this type has occurred along the East Branch especially between Hay Brook and Medway. Additional cottage development there would be precluded, and the existing 103 structures along the designated waterway would eventually be removed as current leasees and their direct descendents permitted their leases to lapse.

Conservation/Recreation Costs and Trends

6,300 acres of land would be transferred from private to public ownership as part of the overall conservation plan at an estimated cost of \$756,000. Public recreation facilities would consist of 12 existing wilderness-type camps as well as 5 new campsites of similar character. Assuming that each new site would accommodate 24 people, development would require \$6,000 and total operation and maintenance expenses would amount to \$29,000 yearly. No relocation costs would be incurred, since the 3 existing private camps would continue to operate as they do now.

Under existing circumstances, an estimated 28,000 recreation days will occur within the plan's boundaries by 1980. The interest and publicity which normally attends wild and scenic river designation would probably lead to greater visitation within the short-term. Thus, as many as 34,000 recreation days may occur by 1980 if this plan was adopted. Most of the increment would consist of increased canoeing and wilderness-type camping activity with some slight rise in fishing also possible. No significant overcrowding is expected. Recreation use of Lobster Lake during the spring may have to be monitored, however, since fishing-canoeing visits there are very popular. By the year 2000, annual recreation days should approach 41,000 with designation impacts levelling off.

Energy Impacts

Energy impacts of this plan would be similar to those under the "No Plan" option. Development of West Branch hydropower potential in the Ripogenus Gorge - Sourdnehunk Falls section would probably occur, while no projects would be constructed along the East Branch. National designation would, of course, prohibit any additional water resources projects along the East Branch even if they became economically and technologically feasible at some future date.

Economic and Regional Development Impacts

Inclusion of the Penobscot's East and West Branches in the National Wild and Scenic Rivers System would result in foregoing some timber harvesting benefits. Logging along the streambank zone of WILD segments would be restricted to operations necessary to maintain a healthy, vigorous stand condition. The present value of timber foregone as a result is \$163,000.

Streambank lands classified as SCENIC as well as acreage within the corridor lands zone would continue to be available for moderate scale harvesting operations. Assuming that harvesting volumes would generally not exceed the amounts permitted under the Land Use Regulation Commission's interim standards for protection subdistricts, loggers would still be permitted to remove amounts in excess of annual growth volume. Review of cutting plans to assure sound forestry practices may add some expense to logging operations, although it has not been possible to determine the

amount of such increase. The continued harvesting along the Allagash Wilderness Waterway, where such a procedure is followed, indicates that such review would not adversely affect overall profitability. Moreover, regulation of cutting practices in order to minimize soil erosion would assure long-term productivity of the land.

This option would permit the development of hydroelectric potential along the West Branch. If the maximum feasible facilities were constructed, approximately 400,000 barrels of oil presently consumed annually would no longer be necessary to provide power for existing pulp mill operations.

In developing the West Branch's hydropower potential, 800 acres of forest land would be taken out of production. This would require foregoing \$61,000 in timber value. Thus the present value of all timber foregone under this plan is \$224,000. Since Maine's forest lands are not being harvested at anywhere near their productive potential, this plan's timber output restrictions should not have any measurable impact on the region's forest based economy.

Maine is expected to gradually increase the tax rate on timber growing value until it equals the weighted average rate for organized towns (recently 33 mills). Under this plan, the state would lose \$3,500 in tree growth tax revenues annually. 70% of this is attributable to harvesting restrictions associated with designation, while the remaining 30% results from hydropower development.

Expenditures by recreationists under this proposal should reach \$288,000 annually by 1980 and increase to \$339,000 by the end of the century. About 50% of these amounts will be contributed by out-of-state visitors. Such spending levels should generate 263 man months of employment throughout the state by 1980 and 312 man months by 2000.

The small cottages or "camps" maintained along the river on lands leased from the major landowners would remain so long as the leases were renewed with the current occupants or their direct descendants. Under this procedure, it is unlikely that very many cottages would be phased out within the initial 10 to 15 years of this plan. Thus no significant economic impact should occur, since it can be assumed that the leases will generally not expire until after any structure has been fully depreciated.

Social Impacts

The quality and variety of outdoor recreation experiences available along the East Branch would be maintained if this plan was selected. The excellent coldwater fishing on the West Branch from Seboomook Dam to Pine Stream would also be protected for enjoyment by both local residents and long-distance travelers. However, by not incorporating the Ripogenus Gorge - Sourdnahunk Falls section, this alternative would result in the loss of two prime landlocked salmon fishing areas -- Big Eddy and Sourdnahunk Falls. As regards overall social well-being for local and non-residents visitors to the West Branch, then, it is only marginally preferable to "No Plan".

WILD AND SCENIC RIVER OPTION B

This alternative builds upon the preceding one by adding the West Branch headwaters (North and South Branches, Penobscot Lake and Stream) through Seboomook Lake, the East Branch headwaters, and Wassataquoik Stream. Its 233 waterway miles are classified as either WILD or SCENIC.

Conservation zoning for 112,000 acres of the river corridor is contemplated. Fee acquisition totalling almost 8,000 acres would consist of Big Bog, Pine Stream flowage, land immediately downstream of Seboomook Dam, and Pittston Farm. About 5,000 acres of streambank land within this plan's boundary are currently held by the state, mostly within Baxter State Park. Thus a total of 125,000 land acres is encompassed within this option.

Environmental and Land Use Impacts

Effective preservation of the upper West Branch watershed and of all eligible East Branch segments is the major benefit associated with this alternative. With the addition of Wassataquoik Stream, the total Atlantic salmon spawning and nursery habitat protected is increased to 289 acres. This includes a significant summer pool area for adult salmon. Additionally, long-term water quality control should be slightly enhanced with the inclusion of the Snake Bog headwaters.

Designation of the West Branch's headwaters should preclude any substantial possibility of long-term deterioration in water quality. By prohibiting major incompatible development and insisting upon forestry practices which minimize erosion hazards, this plan would maintain the river's excellent water quality and thus benefit fishery and wildlife resources. Penobscot Lake, a prime area for the unique native blueback trout, would be protected, as would be the moose and other wildlife habitat provided by Big Bog. Pittston Farm, an outstanding example of the "wilderness" farm associated with early logging operations, is also within this plan's boundaries.

As with the preceding alternative, this plan would not significantly affect existing land use patterns. Commercial timber harvesting would continue to predominate, subject to environmental safeguards designed to guarantee the land's long-term productivity. Impacts on existing camp and cottage leases would be the same as with Option A.

Conservation/Recreation Costs and Trends

Transfer of 7,800 acres from private to public ownership under this option would cost an estimated \$936,000. Thirty wilderness-type campsites would be provided, 12 more than are now available. New site development would cost \$14,000 and annual operation and maintenance expenditures would approximate \$39,000. As with Option A, no relocation expenses would be incurred, since no current landowners or leasees would be displaced.

If trends continue, 39,000 recreation days can be expected along the river corridor by 1980. Implementation of this option could result in short-term added recreation interest due to the publicity associated with designation, so that 48,000 visitor days by 1980 are possible. Much of the designation-related increase would probably occur in canoeing and wilderness-type camping, particularly along the East Branch. By 2000, 56,000 days of recreation use may occur. This represents a 41% increase over 1974 use.

Energy Impacts

Energy impacts of this plan are the same as discussed under Option A.

Economic and Regional Development Impacts

This option differs from the previous one by adding the West Branch headwaters and the other eligible East Branch segments. Since much of the added waterway is classified WILD, timber harvesting restrictions along the streambank would increase the timber value foregone by \$317,000. Thus, present value of timber yields foregone would reach \$541,000 of which almost 90% would be attributable to wild and scenic river designation and 10% to hydropower development.

By 1980, an estimated \$404,000 annually will be expended by persons using the river corridor for recreation. This amount should increase gradually, until it reaches \$469,000 in the year 2000. These outlays will have a relatively small employment impact on Maine's economy, generating 368 man months of work annually by 1980 and 430 man months 25 years from now.

Social Impacts

Social impacts of this wild and scenic river option are more striking than those offered by the preceding one, at least as regards the West Branch. By including the West Branch headwaters, this plan more than doubles the waterway miles classified as WILD. Since extensive areas of primitive natural beauty are at a premium in the heavily populated northeastern United States, preservation of 154 miles of wilderness river creates considerable aesthetic and psychological benefits for outdoor-oriented persons.

A better understanding and appreciation of Maine's logging heritage and the social patterns of the state's original inhabitants are added advantages of this plan. By preserving and interpreting the two logging farms and the archeological potential of the West Branch, this plan could heighten awareness of past human interaction with the northern wildland's natural resources. Similarly, the opportunity for nature study of such relatively uncommon creatures as the moose and blueback trout has positive educational value.

WILD AND SCENIC RIVER OPTION C

This option consists of the West Branch's main watercourse from Seboomook Dam to Ambajesus Falls (excluding Caribou Lake), and the East Branch from Webster Brook to Medway. Umbazooksus Lake and Stream and Carry Trail are included in order to protect the passage which makes it possible to travel by water from the West Branch to the East Branch. Historically, this connection functioned as a primary Indian route to the far north. It has the added advantage of linking the Penobscot directly with the Allagash Wilderness Waterway which was the first state-administered river to be added to the National Wild and Scenic Rivers System. Altogether, 146 miles of waterway, all of which has been classified as WILD or SCENIC, would be protected by this plan.

Land protection would be achieved through zoning of 89,000 acres and full title purchase of 4,300 acres. Acquisition would be concentrated at the Roll Dam campsite area, Ripogenus Gorge, the northern section of T2R10, and Debsconeag Deadwater. Ripogenus Gorge is a unique scenic area in Maine, there being but one other canyon-like area of comparable length and depth within the state. The northern section of T2R10 provides the foreground of a very scenic view of Katahdin for West Branch waterway users between Sourdnaunk Deadwater and Abol Bridge.

Acquisition of beach property on Debsconeag Deadwater would provide day use swimming and picnicking opportunities for local residents in accordance with Maine's Statewide Comprehensive Outdoor Recreation Plan. When land currently under state control is considered, this alternative contains 97,000 land acres within its boundaries.

Environmental and Land Use Impacts

Resource protection for the East Branch would be identical to that offered by Option A. All significant features, including 169 acres of Atlantic salmon habitat, would be preserved.

On the West Branch, this plan focuses on protecting the natural landmarks clustered in the Ripogenus Gorge - Debsconeag Deadwater area. Extensive whitewater, gorge vistas, and dramatic scenic views of Katahdin are but the highlights of the diverse experiences available along this 20 mile section. Landlocked salmon and brook trout are the principal sport species, and preservation of this segment's free-flowing character is necessary to protect salmon spawning habitat.

The core waterway plan offers added protection to 3 of the 5 historic areas found in the study area -- Chesuncook Village, Penobscot Farm, and the Umbazooksus passage. Of these, Chesuncook Village, a focal point for loggers in the mid 1800's, is the most significant and has been placed on the National Register of Historic Places. It is not located within the boundaries of the preceding two options.

The most obvious drawback of this plan is its exclusion of Lobster Lake, Pine Stream flowage, and the West Branch headwaters. Continued waterfowl productivity in the flowage area would depend upon long-term amenability of private landowners to preservation of this resource in cooperation

with the state's Department of Inland Fisheries and Game. Similarly, the wildlife habitat provided by Big Bog would not be guaranteed indefinitely. Penobscot Lake, habitat for the blueback trout, is also not included within this option's boundaries.

Land and water uses within the core waterway would be regulated to maintain a high quality environment. In the short term at least this should provide sufficient assurance that the river's outstanding scenic and recreational values are retained. Long-term adequacy of this approach depends upon the character and extent of changes in land use along the headwaters and major tributaries of the East and West Branches. If existing conditions are not altered over time, this alternative offers reasonable protection. However, significant development along "feeder" streams could lead to a deterioration in water quality on either or both branches with consequent adverse impacts on fish and wildlife resources. An unregulated expansion of recreation activity near tributaries or on adjacent lakes could have negative spillover effects on the designated corridor, for example by generating overuse of the ecosystem's fishery or by "crowding out" such valuable wildlife species as the moose and bald eagle.

Impacts on land use patterns would not differ significantly among any of the wild and scenic river alternatives -- commercial timber harvesting will remain the primary land use. As with Option A and B, new cottage development would be prohibited, although the existing 134 structures would remain until their leases expired. Complete control over the impacts of cottage development is not accomplished, however, since Caribou Lake is not a part of this plan. While exclusion of that lake should not have any adverse scenic impacts, it is possible that unplanned development there may have some secondary impacts, for example, by increasing the eventual number of high-powered motorboats using Chesuncook Lake or the number of seasonal residents using Chesuncook for fishing.

Conservation/Recreation Costs and Trends

Land acquisition along the core waterway would involve 2,000 to 3,500 fewer acres and \$230,000 to \$420,000 less than either of the first two wild and scenic river options. Most of the \$516,000 estimated purchase price would be spent on land not included within the designated area of Option A or B. Campsite development costs of \$9,000 would be comparable, however, as 8 new wilderness-type sites are envisioned. When the 9 existing publicly available camps are considered, total operation and maintenance should approximate \$43,000 annually.

1980 projected recreation use under existing conditions is 126,000 recreation days. Designation may increase this by 22%. By 2000, this could further increase to 179,000 recreation days annually.

Energy Impacts

As with all the plans being evaluated, the core waterway option will have no energy impacts with respect to the East Branch, since hydropower potential there is unlikely to be developed in any event. Nor are there any determinable constraints on fossil fuel extraction as no such resources are known to exist in the upper basin.

Unlike Option A and B, the core waterway plan would affect potential hydropower development along the West Branch. The Wild and Scenic Rivers Act prohibits construction of new water resources projects within WILD and SCENIC segments. Since the Ripogenus Gorge - Debsconeag Deadwater area has been classified SCENIC, national designation would preclude hydropower development there, even if the Great Northern Paper Company determined at some future date that new facilities within that stretch would be technologically and economically desirable.

Economic and Regional Development Impacts

This plan contains fewer miles of WILD waterway than the preceding options. Thus designation-related impacts on timber harvesting would be less, amounting to only \$163,000 in terms of present value foregone. Since new hydropower construction would be precluded under this alternative, no timber would be foregone due to inundation. The total state tax revenue loss would be only \$2,400 per year.

Recreation activity within this plan's boundary is much greater than that of options A or B, primarily because of the use concentration in the Chesuncook-Ripogenus area. Thus, 154,000 recreation days are expected by 1980, with a total expenditures impact of \$1,479,000 and an employment impact of 1,359 man months. Twenty years later, expenditures will have increased by 17% to \$1,737,000, one-half of which will result from spending by out-of-state visitors. Man months of employment should reach 1,609 by then.

Social Impacts

Adoption of this proposal offers significant social well-being advantages over the "No Plan" situation. Perhaps the most obvious is the maintenance of diverse recreation opportunities along the West Branch. The many coldwater fishing enthusiasts who travel to the river each year would be assured of a continued landlocked salmon fishery. Whitewater canoeists would be guaranteed the thrill of running rapids in the "shadow" of Katahdin. These possibilities would remain open due to the prohibition on new water resources projects for nationally designated rivers. Additionally, understanding of Maine's early logging history would be enhanced through a program of historic interpretation which centered around Pittston and Penobscot Farms and Chesuncook Village.

WILD AND SCENIC RIVER OPTION D (PREFERRED PLAN)

Under this plan, all WILD and SCENIC segments and Caribou Lake would be designated. A total of 295 waterway miles and 164,000 acres would thus be protected.

All sites within the study area which have been identified for maximum protection would be acquired in fee. The acquisition program would consist of Big Bog, Pittston Farm, Roll Dam campsite area, Pine Stream Flowage, Ripogenus Gorge, the northern section of T2 R10 and the beach at Debsconeag Deadwater. In addition to these 11,800 acres, almost 5,000 acres are now in State ownership. The remaining 148,000 acres would be protected through zoning by the Land Use Regulation Commission.

Environmental and Land Use Impacts

This alternative affords significant resource protection to both branches of the Penobscot. All eligible segments of the East Branch would receive wild and scenic river status. Thus 289 acres of Atlantic salmon spawning and nursery habitat would be preserved, the river's pristine water quality would be maintained over the long term, and encroachment upon the natural landmarks -- Stair Falls, Haskell Rock Pitch, Grand Falls, Whetstone Falls, and Grindstone Falls -- would be precluded.

Environmental benefits to the West Branch would also be substantial. Bald eagle, moose, and other wildlife habitat would be protected, as would be the waters essential to the productivity of such fish as landlocked salmon, brook trout, and the blueback trout. Pine Stream Flowage, perhaps the most significant waterfowl production area in northern Maine, would be transferred to public ownership, assuring its long-term management for waterfowl purposes.

All the West Branch's significant natural features -- including Lobster Lake and its Stream which occasionally reverses direction, Ripogenus Gorge, and the series of falls between the Gorge and Ambajejus Falls -- are included within this option's boundaries. Additionally, four of the identified historic areas would be within the designated corridor.

Long-term water quality of the West Branch should be easily maintained under this option. Land use regulation that precludes large-scale development and insists upon environmentally sound forestry management practices within the boundaries should minimize any degradation due to pollution or siltation.

Placing 148,000 land acres into "protection" and modified "management" zoning districts as defined by Maine's Land Use Regulation Commission should not lead to changes in land use patterns. Commercial timber

harvesting would continue as the dominant land use. Review and approval of cutting plans by the state in advance of harvesting within the designated area would encourage the adoption of environmentally sound harvesting practices. Such a procedure, which is now in use along the Allagash Wilderness Waterway, is unlikely to impede use of the corridor for timber. Emphasis would be on mitigating adverse impacts due to inappropriate cutting practices rather than on restricting the amount of wood which can be taken.

The proposal would also enhance fish and wildlife resources along both branches by restricting insecticide use on the river and within the streambank zone (250 feet from the river). This should minimize the potential for fishery reductions associated with the toxic effects of insecticides on aquatic insects that form the food base for many fish species.

Further cottage development within WILD and SCENIC segments would, of course, be precluded. Continuation of existing leases on Caribou Lake or increases in the number of leases there would be at the discretion of the landowners. New construction on the lake shore would, however, be subject to general regulations established by the state legislature with regard to setbacks, sewage disposal, etc. Current use of the lake for seasonal home and recreational purposes is moderate and not expected to increase substantially. If this pattern changes, however, and major development does take place, some long-term environmental degradation might occur. This could include deterioration of scenic values as well as water and noise pollution from motorboat use.

Conservation/Recreation Costs and Trends

Land acquisition costs would approach \$1,416,000 as 11,800 acres of land are transferred from private to public ownership. Thirty-seven wilderness-type camps would be available to recreationists. This would necessitate development of 15 more sites at a cost of \$17,000. Total operation and maintenance expenses would amount to \$68,000 annually. As with all the wild and scenic river options, no relocation costs would be incurred.

If current trends continue, an estimated 137,000 recreation days will be devoted to leisure activities along the river corridor by 1980. Wild and scenic river designation may increase this figure by as much as 22% in the short term. Most of the designation-related increase is likely to consist of persons travelling to the Penobscot for canoeing and wilderness-type camping experiences. No significant overcrowding is projected, although some stress may be placed on the coldwater fishery of the West Branch. Monitoring of recreation use at selected sites during particular periods may also become necessary to avoid any noticeable environmental deterioration or perceived loss of "wilderness feeling" brought on by overuse. By the year 2000, designation-related impacts should be minor, with natural increases in recreation activity resulting in an annual recreation day count of 193,000.

Energy Impacts

Selection of this option would extend the Wild and Scenic Rivers Act's prohibition on water resources development to all free-flowing river segments. The most immediate effect would be to preclude hydropower development in the Ripogenus Gorge - Debsconeag Deadwater area regardless of economic feasibility or desirability. SCENIC designation of that stretch could thus result in foregoing up to 240 million kilowatt-hours of electricity annually. As a result, the Great Northern Paper Company would not be able to phase-out fossil fuel operations now consuming almost 400,000 barrels of oil each year.

No other immediate or short-term (i.e., through 1985) energy impacts are likely, since no other energy development is contemplated in the upper Penobscot basin. Long-term (post-1985) energy consequences are not predictable at this time. It should be noted, however, that if it is determined at some future time that a substantially different use of the Penobscot is in the national interest, river management objectives associated with national designation could be modified or reversed.

Economic and Regional Development Impacts

As with all the wild and scenic river options, this alternative would preclude significant timber harvesting within the streambank zone (land within 250 feet of the highwater mark) along WILD segments. Not all of this land is available for commercial logging, of course, since it includes wetlands and bog areas. Nevertheless, some timber would, for all practical purposes, be taken out of production. The present value of timber yields foregone is \$535,000 with the associated tree growth tax value foregone being \$8,600 annually. (The State of Maine imposes a tree growth tax in the unorganized townships rather than a property tax). No timber values would be lost in the balance of this proposal's boundaries since moderate scale logging operations would be permitted to continue subject to environmental safeguards.

Persons travelling to the Penobscot for outdoor activity should expend \$1,595,000 within the state by 1980. Their spending should have an employment effect of 1,464 man months. By 2000, recreation expenditures should reach \$1,866,000 and employment 1,727 man months.

Forty percent of all current visitors are out-of-state residents. Under national wild and scenic river designation, it is probable that the "out-of-state share" of total recreationists will increase gradually to 50%. Thus, approximately \$800,000 of 1980 recreation-related expenditures and \$930,000 of year 2000 expenditures may be attributable to spending within Maine by non-Maine residents. Some of this no doubt would be money "new" to the state, in the sense that persons would have vacationed in some other part of the country if they had not traveled to the Penobscot. On the other hand, a portion of this sum may merely represent expenditures which would have been made in Maine anyway; for example, by vacationing on the Allagash Waterway. It has not been possible to determine the extent to which these expenditures are real additions to the Maine economy versus mere shifts in recreation destinations within the state.

Social Impacts

Designation of 295 waterway miles would essentially protect all the significant amenities and social benefits associated with the Penobscot -- diverse and high quality recreation, the educational value of historic interpretation and nature observation, and the scenic splendor of an extensive forested landscape.

Solitude is also a valued attribute of the upper Penobscot River watershed. Human sounds are confined to the occasional noise of motorboats on some larger lakes, snowmobiles, logging trucks, and float planes. Solitude is becoming an increasingly scarce yet increasingly sought resource, especially in the northeast. Accordingly, preservation of solitude would be a major benefit of wild and scenic river designation and management.



West Branch

Some minor disadvantages may result from designation. Fish management surveys indicate that landlocked salmon fishing downstream of Ripogonus Gorge already exceeds optimum levels. If the publicity attendant to designation even slightly encourages greater fishing pressure, users will be inconvenienced either through less spectacular "catches" or greater restrictions on access, catch limits, etc. This added inconvenience would be particularly felt by local residents who view the Penobscot as "their" river and who are accustomed to using it more or less at will.

WILD AND SCENIC RIVER OPTION E

This option involves designation of all segments which qualify for wild and scenic river status, i.e., the entire East and West Branches, with the exception of the West Branch segment between North Twin Station and Medway. 312 miles of waterway and 173,000 acres of land would be protected.

Environmental and Land Use Impacts

Environmental and land use impacts of this alternative are essentially the same as discussed under Option D, the sole difference being the inclusion of the West Branch's lower lakes. This would incorporate Ambajejus Boom House, a registered national historic landmark, within the designated area.

The most noticeable land use feature associated with the lower lakes is cottage development. About 640 structures are scattered along the lakes' shores. Since those waters have been classified RECREATIONAL, cottage leasing could continue at the landowner's discretion, subject to the state's environmental quality regulations. No major additional environmental benefits would be gained.

Conservation/Recreation Costs and Trends

Costs of this option are essentially the same as those associated with the Preferred Plan. Thus land acquisition expenses would be \$1,416,000. Campsite development costs are \$3,000 greater than Option D due to suggested placement of two additional campsites on the lower lakes.

Recreation use upstream of Ambajejus Lake on the West Branch and on the East Branch would be the same as under Option D. However, inclusion of the West Branch's lower lakes in this plan adds considerably to the total recreation activity which would occur within the boundaries of a Penobscot wild and scenic river. Recreation days would exceed 391,000 in 1980 and would reach 438,000 by the year 2000. This plan thus accommodates over twice as much recreation activity within its boundaries as the Preferred Plan.

Energy Impacts

Energy impacts of this alternative are the same as those discussed under Option D.

Economic and Regional Development Impacts

This plan's economic consequences are similar to those discussed under Option D. Recreation benefits are greater, however, due to inclusion of the lower lakes. Total 1980 expenditures should reach \$3,262,000 by 1980 and increase another 13% between then and 2000. Employment should grow to 2,799 man months by 1980 and 3,183 man months by 2000.



Seboomook Dam on West Branch

Social Impacts

This option differs from Option D only in that it includes the Pemadumcook chain of lakes on the West Branch. Its social well-being impacts are very similar to that option. One distinction between the two should be noted, however. At public meetings conducted as an integral part of this study, Millinocket residents expressed opposition to any designation of the river. Their concern appeared to stem in large part from uncertainty as to the long-term influence such action might have on their ability to acquire and retain cottage leases on the lower lakes. Many of the townspeople feared that designation would eventually result in decisions to phase out cottages surrounding the lakes and ultimately make access to those waters more difficult and perhaps even more expensive (through imposition of a reservation fee system, for example). In terms of local social well-being, therefore, inclusion of the lower lakes in a wild and scenic river plan would be perceived as a negative influence on recreation opportunities.

BAXTER PARK EXPANSION

This plan does not involve wild and scenic river status. However, it does afford protection to 53 miles of East Branch waters by extending Baxter State Park's eastern boundary to include the balance of Grand Lake Matagamon and the riverway from Grand Lake to Hay Brook. This requires fee acquisition of 65,000 acres.

Environmental and Land Use Impacts

Expansion of Baxter Park in this manner would increase the land area under the Park Authority's control by 30%. As with the present park, this option would require management which preserves the land as "forever wild". Thus, maximum environmental protection would occur within the boundaries. This approach would rationalize resource management by bringing the balance of Grand Lake Matagamon and Wassataquoik Stream under Park Authority control. Water quality would remain excellent and all but one natural landmark on the East Branch would receive protection. The East Branch's Atlantic salmon habitat would be incorporated within the option's boundary. 22 cottages now located along the river would be removed.

As regards the East Branch, this plan's principal drawbacks are its failure to protect the WILD headwaters and the 12 mile SCENIC segment from Hay Brook to Medway. Some slight water quality deterioration in the lake area is possible if incompatible use occurs in the unprotected Snake Bog headwaters.

Environmental impacts on the West Branch would be the same as those described under the "No Plan" alternative.

Recreation/Conservation Costs and Trends

Land acquisition costs for Baxter Park expansion are much greater than under the wild and scenic river options. An estimated \$7,800,000 would be required. Public recreation facilities expenses would be minimal, however, since emphasis would be on maintaining a primitive character. At most, 3 new sites would be developed at a cost of \$3,000 while annual operation and maintenance expenses would be \$25,000.

Recreation use would probably increase to 9,000 recreation days by 1980. There would not be any designation-related component within this figure since it does not involve wild and scenic river status. Whether recreation day totals would increase beyond that level would depend upon park management policies. It is possible that an attempt would be made to stabilize use at that point or to permit only minor growth through the year 2000.

Energy Impacts

Energy impacts would be the same as discussed under the No Plan option.

Economic and Regional Development Impacts

Except for the maximum environmental quality plan, this option has the greatest impact on the timber economy. 65,000 acres would be taken out of production. Not all of this is prime timber land, due to areas of rugged terrain. Nevertheless, an estimated \$4,500,000 in timber growth value would be foregone, with a consequent tree growth tax loss of \$58,000 annually. This is more than 8 times the impact associated with the most extensive wild and scenic river option.

Total expenditures by persons using the East Branch area protected by this plan should reach \$64,000 by 1980 with corresponding employment benefits of 59 man months. This value would remain relatively constant if the Baxter Park Authority established a policy of stabilizing total recreation use. If natural increases in visitation are permitted to continue, expenditures could increase to \$100,000 by century's end.

Since Baxter Park is managed as "forever wild", this plan would require removal of 22 cottages now located within its bounds. Currently, those buildings have an estimated value of \$25,000. Removal or relocation costs are not, therefore, economically significant.

Social Impacts

This option substantially increases the amount of land within the state which would be managed as "forever wild". It thus would assure the future availability of wilderness-oriented outdoor recreation and provide a place of solitude. These social well-being advantages are, however, limited to a river stretch of 53 miles. The balance of the East Branch and the entire West Branch would continue to be affected by the trends outlined under the "No Plan" situation. The adverse social impacts noted in the "No Plan" discussion would, therefore, equally apply to the area outside this option's boundaries.

MAXIMUM ENVIRONMENTAL PROTECTION PLAN

This plan calls for maximum environmental protection of the Penobscot's East and West Branches. Although its implementation is unlikely, it is presented for comparison purposes.

Under this option, 312 waterway miles and 173,000 land acres would be preserved in a natural state. This comprises all river segments which qualify for national designation. Since all but 5,000 land acres are now in private ownership, the maximum protection option requires public purchase of 168,000 acres.

Environmental and Land Use Impacts

A decision to provide the Penobscot with maximum environmental protection would result in a major land use shift. Management emphasis within the river corridor would change from commercial timber harvesting to resource preservation. Logging operations would be precluded, although hydro-electric and water storage projects now in operation would continue. Actual impacts on the natural resource base -- fish and wildlife resources, natural and historic landmarks, and related values -- would not be significantly more beneficial than those discussed in the two most extensive wild and scenic river options, since timber cutting properly done is not a resource depleting activity.

Conservation/Recreation Costs and Trends

Land acquisition costs of over \$20 million exceed the most expensive wild and scenic river option by more than 13 times. Recreation expenses would be moderate, since no new facilities would be developed nor would existing campsites be expanded.

Visitation on all but the lower lakes would be stabilized at the current level of 122,000 recreation days per year by discouraging increases in recreation use. This would probably require implementation of a reservation system or other means to limit visitor access. On the lower lakes, recreation use would decline from 224,000 recreation days now to 75,000 by the year 2000 as cottages are removed. Total recreation use by the end of the century would be comparable to that of the preferred plan although this maximum protection alternative would disperse that activity over 9,000 more land acres and 18,000 additional lake surface acres.

Energy Impacts

This plan would prohibit further hydropower development on the upper Penobscot although it would not require a phasing-out of existing facilities.

Economic and Regional Development Impacts

An estimated 158,000 acres of commercially harvestable timber is contained within this plan's boundaries. By precluding logging operations on that land, substantial forest product value would be foregone. The present value of future yields affected by this strategy is \$12,700,000. Annual tax revenues foregone would exceed \$200,000.

The Great Northern Paper Company would undergo economic losses of undetermined, but no doubt considerable, amount. These losses would result from the necessity for removing their major road network to a location outside the project boundaries and from the dislocation of their harvesting operations to lands not readily accessible to the Millinocket and East Millinocket mills.

Under the maximum protection plan, all 850 cottages along the river would be removed over a relatively short period of time. These buildings have a combined assessed value greater than \$1.5 million and, at a mill rate of 33, pay approximately \$50,000 annually in property taxes. Land on which the cottages are built is leased from timber companies at an average yearly rental of \$60 per lease, thus providing them with about \$51,000 in income. Since these leasing agreements include provisions for the removal of buildings at the leasee's expense, public relocation costs would be minimal at most. However, considerable private expense would be encountered, both in removing these cottages and rebuilding at some new site. If it is assumed that three-fourths of affected leasees would eventually find new places within the state, Maine's \$50,000 yearly property tax loss might eventually decrease to \$13,000 annually. Lease income would not be lost to the state economy, but would probably accrue to landowners other than those now receiving that income as leasees look to other parts of the state for their cottage sites.

Annual recreation-related expenditures would decline by 39% from \$2,857,000 in 1974 to \$1,739,000 in 2000. Employment would slip from 2,441 man months to 1,552 man months by 2000.

Social Impacts

For those travelling to the Penobscot for recreation, perceptions of being in the wilderness should be heightened since commercial logging operations would not be visible from the river and their audible character would be greatly diminished. Also, limits on visitor use would lessen the frequency of contacts with other recreationists, further enhancing the feeling of solitude.

Returning the river to its natural condition would also have adverse social consequences. Recreationists would find that unrestricted access would no longer be possible. Instead, a reservation system would be necessary to assure that yearly recreation use stabilized at 200,000 recreation days. Local residents would be particularly inconvenienced, since casual use of the river during the summer months would probably no longer be possible. Required removal of all 855 cottages within a short time period would also foreclose recreation opportunities for cottage owners, their guests and persons contemplating cottage leasing.

ECONOMIC DEVELOPMENT PLAN

Realistically, there is very little that the state or federal governments can do to promote rapid development within the study area. The local economy is forest products-based and is likely to remain so, even under stimulated economic conditions. Thus, the distinction between the Economic Development Plan and "No Plan" is one of degree rather than kind. This option outlines the likely impacts of a systematic program of maximum resource exploitation. It is presented for comparison purposes.

Environmental and Land Use Impacts

Under this option, almost the entire river corridor would be managed for a single purpose, namely, timber production. Land use controls would be relaxed to permit cutting in whichever manner was determined to be most economical by private companies. No effort would be made to minimize siltation problems and it could be expected that water quality would deteriorate, with a resulting negative impact on fishery resources. Scenic quality would also probably deteriorate due to cutting practices and road and bridge placement.

Perhaps the most significant long-term impact, however, would result from sustained pesticide spraying to maintain timber crops. Under this option, scarce attention would be paid to the fish and wildlife impacts of chemicals used or the possibilities of mitigation through carefully planned application schedules. Management for maximum timber production would necessarily imply a decision to eliminate institutional constraints, such as Environmental Protection Agency regulations and state laws, on types of pesticides which could be used. Thus, whenever a major spruce budworm infestation occurred, exemptions from pesticide regulations would follow, permitting use of high toxicity chemicals such as DDT.

The environmental trade-offs associated with new hydropower development on the West Branch would be similar to those considered in the "No Plan" option.

Cottage and second home development would probably be encouraged along the lower lakes. The primary objective would be to maximize development profits through relatively high density use.

Conservation/Recreation Costs and Trends

Recreation use on all but the lower lakes would decline to 108,000 recreation days through 1980, as natural increases are discouraged and declines in fishing, canoeing, and sightseeing occur due to hydropower development. Thereafter, it is likely that recreation activity would be further discouraged where it conflicts with timber cutting and hauling activity. By 2000, as few as 96,000 recreation days may occur along the river corridor, a 21% decrease over current use.

The general decline in recreation opportunities may be partially offset by concentrated cottage and second home development in the lower lakes section of the West Branch. That area has easy access to state highways and is not as crucial for timber harvesting operations. If such development did occur, it would probably begin after 1980 and could result in at least a doubling of the number of cottages. Thus by the end of the century 1,300 cottages could be clustered around the lakes and annual recreation days there could reach 454,000.

Energy Impacts

Energy impacts would be similar to those discussed under the "No Plan" option.

Economic and Regional Development Impacts

Benefits derived from more intensive harvesting, or cutting by the least expensive method, are speculative and therefore have not been quantified. Recreation expenditures under this option would be \$550,000 less by 1980 than if the entire river were given wild and scenic river status. This situation would gradually be reversed as second home development took place. By 2000, recreation expenditures under this plan would be \$657,000 greater than those of the most extensive wild and scenic river alternative.

Social Impacts

Under the Economic Development Plan, the quality and variety of river-oriented recreation for local residents would be seriously impaired and the upper Penobscot would no longer serve as a prime recreation resource for either Maine residents or out-of-state visitors. Adverse impacts on leisure opportunities and recreation quality would be more severe than those noted under "No Plan", with the most significant losses occurring in the areas of cold water fishing, whitewater canoeing, and scenic and wildlife observation. Additionally, the total number of persons gaining access to the river would decrease over time as timber hauling roads are gradually closed off to public traffic.

Some economic gains would be associated with this option, thus increasing the employment opportunities of northern Maine residents. Most of the newly-generated jobs would be in the forest products sector, with some increases also likely in the services sector.

SUMMARY OF IMPACTS OF ALTERNATIVES

#	MEASUREMENT	'NO PLAN'	WILD AND SCENIC RIVER OPTIONS *					BAXTER PARK EXPANSION	MAXIMUM ENVIRONMENTAL PROTECTION	ECONOMIC DEVELOPMENT
			A	B	C	D **	E			
WATERWAY PROTECTED										
1.	Total Miles	29	124	233	146	295	312	53	312	29
2.	WILD	29	67	154	56	167	167	41	167	29
3.	SCENIC	0	57	79	90	120	120	12	120	0
4.	RECREATIONAL	0	0	0	0	8	25	0	25	0
5.	Miles of Free-Flowing River	23	94	177	109	212	212	51	212	23
6.	currently state protected	23	12	23	12	23	23	0	23	23
7.	newly protected	0	82	154	97	189	189	51	189	0
8.	Lake Surface Acreage	2,600	10,600	22,000	33,200	50,700	69,000	2,100	69,000	2,600
LAND AREA PROTECTED										
9.	Total Acreage	5,100	71,000	125,000	97,000	164,000	173,000	65,000	173,000	5,100
10.	fee acquisition	0	6,300	7,800	4,300	11,800	11,800	65,000	167,900	0
11.	currently state owned	5,100	4,300	4,800	4,600	5,100	5,100	0	5,100	5,100
12.	conservation zoning	0	60,400	112,400	88,100	147,100	156,100	0	0	0
CONSERVATION/RECREATION COSTS										
13.	Capital Expenditures (1975 \$)	0	762,000	950,000	525,000	1,433,000	1,436,000	7,803,000	20,148,000	0
14.	land acquisition	0	756,000	936,000	516,000	1,416,000	1,416,000	7,800,000	20,148,000	0
15.	recreation development	0	6,000	14,000	9,000	17,000	20,000	3,000	0	0
16.	Annual Operation & Maintenance	16,000	29,000	39,000	43,000	68,000	68,000	25,000	68,000	16,000
RECREATION ANALYSIS										
17.	Annual Recreation Days by Year 1980 ^{1/}	346,000	34,000	48,000	154,000	167,000	391,000	9,000	346,000	332,000
18.	Annual Recreation Days by Year 2000 ^{1/}	413,000	41,000	56,000	179,000	193,000	438,000	14,000	198,000	550,000
19.	1974-1980 Recreation Days Increase (%)	0	31	33	38	37	13	12	0	- 4
20.	1974-2000 Recreation Days Increase (%)	19	58	56	60	58	27	75	- 43	59
21.	Year 1980 Recreation-Related Expenditures (1975 \$)	2,854,000	288,000	404,000	1,479,000	1,595,000	3,262,000	64,000	2,857,000	2,712,000
22.	Year 2000 Recreation-Related Expenditures (1975 \$)	3,460,000	339,000	469,000	1,737,000	1,866,000	3,687,000	100,000	1,739,000	4,344,000
23.	Year 1980 Recreation-Related Employment (man-months)	2,429	263	368	1,359	1,464	2,799	59	2,441	2,299
24.	Year 2000 Recreation-Related Employment (man-months)	2,964	312	430	1,609	1,727	3,183	93	1,552	3,588
25.	Campsites Available (existing + new)	22 + 0	12 + 5	18 + 12	9 + 8	22 + 15	22 + 17	2 + 3	22 + 0	22 + 0
FISH AND WILDLIFE IMPACTS										
East Branch										
26.	Productivity of Fishery	NE	MP	HP	MP	HP	HP	HP	HP	MA
27.	Atlantic Salmon Habitat Protected (acres)	0	169	289	169	289	289	277	289	0
28.	Productivity of Wildlife	NE	MP	HP	MP	HP	HP	HP	HP	MA
West Branch										
29.	Productivity of Fishery	HA	HA	MA	MP	HP	HP	HA	HP	HA
30.	Productivity of Wildlife	MA	MP	MP	MP	HP	HP	MA	HP	HA
31.	Protection of Threatened Species	MA	NE	MP	NE	MP	MP	MA	HP	HA
HYDROPOWER ANALYSIS										
32.	Hydropower Potential Foregone (million kilowatt-hours)	0	0	0	240	240	240	0	240	0
33.	Miles of Free-Flowing River Inundated	6	6	6	0	0	0	6	0	6
34.	Scenic Acreage Inundated	800	800	800	0	0	0	800	0	800
35.	Natural Landmarks Impaired (number)	2	2	2	0	0	0	2	0	2
TIMBER ANALYSIS										
36.	Present Value of Future Timber Yields Foregone (1975 \$)	61,000	224,000	541,000	163,000	535,000	535,000	4,500,000	12,700,000	61,000
37.	Annual Tree Growth Taxes Foregone (1975 \$)	1,100	3,500	8,700	2,400	8,600	8,600	58,000	206,000	1,100
IMPACTS ON CULTURAL VALUES										
38.	Diversity of Recreation Opportunities	MA	MA	MA	MP	HP	HP	MA	HP	MA
39.	Impact on Historic Sites	NE	MP	HP	MP	HP	HP	NE	HP	MA
40.	Impact on Scenic Values	MA	NE	MP	MP	HP	HP	MA	HP	HA

Degree of Impact

HP = Highly Protective
 MP = Moderately Protective
 NE = No Significant Effect
 MA = Moderately Adverse
 HA = Highly Adverse

^{1/} Recreation Use Within Each Plan's Boundaries Only

* Description of Options (EB = East Branch; WB = West Branch)

A: Webster Lake to Medway (64% of EB); Seboomook to Carry Trail (25% of WB)
 B: Entire EB; headwaters to Carry Trail (57% of WB)
 C: Webster Lake to Medway (64% of EB); main stem from Seboomook to Ambajesus Falls (35% of WB)
 D: Entire EB; headwaters to Ambajesus Falls (85% of WB)
 E: Entire EB; headwaters to North Twin Station (93% of WB)

** PREFERRED PLAN

COMPARISON OF PREFERRED PLAN WITH ALTERNATIVE PLANS

#	MEASUREMENT	WILD AND SCENIC RIVER OPTIONS *					BAXTER PARK EXPANSION	MAXIMUM ENVIRONMENTAL PROTECTION	ECONOMIC DEVELOPMENT	
		PREFERRED PLAN **	"NO PLAN"	A	B	C				E
WATERWAY PROTECTED										
1.	Total Miles	295	- 266	- 171	- 62	- 149	+ 17	- 242	+ 17	- 266
2.	WILD	167	- 138	- 100	- 13	- 111	N	- 126	N	- 138
3.	SCENIC	120	- 120	- 63	- 41	- 30	N	- 108	N	- 120
4.	RECREATIONAL	8	- 8	- 8	- 8	- 8	+ 17	- 8	+ 17	- 8
5.	Miles of Free-Flowing River	212	- 189	- 118	- 35	- 103	N	- 161	N	- 189
6.	currently state protected	23	N	- 11	N	- 11	N	- 23	N	N
7.	newly protected	189	- 189	- 107	- 35	- 92	N	- 138	N	- 189
8.	Lake Surface Acreage	50,700	- 48,100	- 40,100	- 28,700	- 17,500	+ 18,300	- 48,600	+ 18,300	- 48,100
LAND AREA PROTECTED										
9.	Total Acreage	164,000	- 158,900	- 93,000	- 39,000	- 67,000	+ 9,000	- 99,000	+ 9,000	- 158,900
10.	fee acquisition	11,800	- 11,800	- 5,500	- 4,000	- 7,500	N	+ 53,200	+ 156,100	- 11,800
11.	currently state owned	5,100	N	- 800	- 300	- 500	N	- 5,100	N	N
12.	conservation zoning	147,100	- 147,100	- 86,700	- 34,700	- 59,000	+ 9,000	- 147,100	- 147,100	- 147,100
CONSERVATION/RECREATION COSTS										
13.	Capital Expenditures (1975 \$)	1,433,000	- 1,433,000	- 671,000	- 483,000	- 908,000	+ 3,000	+ 6,370,000	+ 18,715,000	- 1,433,000
14.	land acquisition	1,416,000	- 1,416,000	- 660,000	- 480,000	- 900,000	N	+ 6,384,000	+ 18,732,000	- 1,416,000
15.	recreation development	17,000	- 17,000	- 11,000	- 3,000	- 8,000	+ 3,000	- 14,000	- 17,000	- 17,000
16.	Annual Operation & Maintenance	68,000	- 52,000	- 39,000	- 29,000	- 25,000	N	- 43,000	N	- 52,000
RECREATION ANALYSIS										
17.	Annual Recreation Days by Year 1980 ^{1/}	167,000	+ 179,000	- 133,000	- 119,000	- 13,000	+ 224,000	- 158,000	+ 179,000	+ 165,000
18.	Annual Recreation Days by Year 2000 ^{1/}	193,000	+ 220,000	- 152,000	- 137,000	- 14,000	+ 245,000	- 179,000	+ 5,000	+ 357,000
19.	1974-1980 Recreation Days Increase (%)	37	- 37	- 6	- 4	+ 1	- 24	- 25	- 37	- 41
20.	1974-2000 Recreation Days Increase (%)	58	- 39	N	- 2	+ 2	- 31	+ 17	- 101	+ 1
21.	Year 1980 Recreation-Related Expenditures (1975 \$)	1,595,000	+ 1,259,000	- 1,307,000	- 1,191,000	- 116,000	+ 1,667,000	- 1,531,000	+ 1,262,000	+ 1,117,000
22.	Year 2000 Recreation-Related Expenditures (1975 \$)	1,866,000	+ 1,594,000	- 1,527,000	- 1,397,000	- 129,000	+ 1,821,000	- 1,766,000	- 127,000	+ 2,478,000
23.	Year 1980 Recreation-Related Employment (man-months)	1,464	+ 965	- 1,201	- 1,096	- 105	+ 1,335	- 1,405	+ 977	+ 835
24.	Year 2000 Recreation-Related Employment (man-months)	1,727	+ 1,237	- 1,415	- 1,297	- 118	+ 1,456	- 1,634	- 175	+ 1,861
25.	Campsites Available (existing and new)	37	- 15	- 20	- 7	- 20	+ 2	- 32	- 15	- 15
FISH AND WILDLIFE IMPACTS										
East Branch										
26.	Productivity of Fishery	HP	Unfavorable	Unfavorable	N	Unfavorable	N	Unfavorable	N	Very Unfavorable
27.	Atlantic Salmon Habitat Protected (acres)	289	- 289	- 120	N	- 120	N	- 12	N	- 289
28.	Productivity of Wildlife	HP	Unfavorable	Unfavorable	N	Unfavorable	N	N	N	Very Unfavorable
West Branch										
29.	Productivity of Fishery	HP	Very Unfavorable	Very Unfavorable	Very Unfavorable	Unfavorable	N	Very Unfavorable	N	Very Unfavorable
30.	Productivity of Wildlife	HP	Very Unfavorable	Unfavorable	Unfavorable	Unfavorable	N	Very Unfavorable	N	Very Unfavorable
31.	Protection of Threatened Species	MP	Unfavorable	Unfavorable	N	Unfavorable	N	Unfavorable	Favorable	Very Unfavorable
HYDROPOWER ANALYSIS										
32.	Hydropower Potential Foregone (million kilowatt-hours)	240	- 240	- 240	- 240	N	N	- 240	N	- 240
33.	Miles of Free-Flowing River Inundated	0	+ 6	+ 6	+ 6	N	N	+ 6	N	+ 6
34.	Scenic Acreage Inundated	0	+ 800	+ 800	+ 800	N	N	+ 800	N	+ 800
35.	Natural Landmarks Impaired (number)	0	+ 2	+ 2	+ 2	N	N	+ 2	N	+ 2
TIMBER ANALYSIS										
36.	Present Value of Future Timber Yields Foregone (1975 \$)	535,000	- 474,000	- 311,000	+ 6,000	- 372,000	N	+ 3,965,000	+ 12,165,000	- 474,000
37.	Annual Tree Growth Taxes Foregone (1975 \$)	8,600	- 7,500	- 5,100	+ 100	- 6,200	N	+ 49,400	+ 197,400	- 7,500
IMPACTS ON CULTURAL VALUES										
38.	Diversity of Recreation Opportunities	HP	Very Unfavorable	Very Unfavorable	Very Unfavorable	Unfavorable	N	Very Unfavorable	N	Very Unfavorable
39.	Impact on Historic Sites	HP	Unfavorable	Unfavorable	Unfavorable	Unfavorable	N	Unfavorable	N	Very Unfavorable
40.	Impact on Scenic Values	HP	Very Unfavorable	Unfavorable	Unfavorable	Unfavorable	N	Very Unfavorable	N	Very Unfavorable

Interpretation

A positive number indicates the amount by which the alternative exceeds the Preferred Plan. A negative number shows that the alternative has a value less than that of the Preferred Plan.

N = No Significant Difference

^{1/} Recreation Use Within Each Plan's Boundaries Only

Degree of Impact

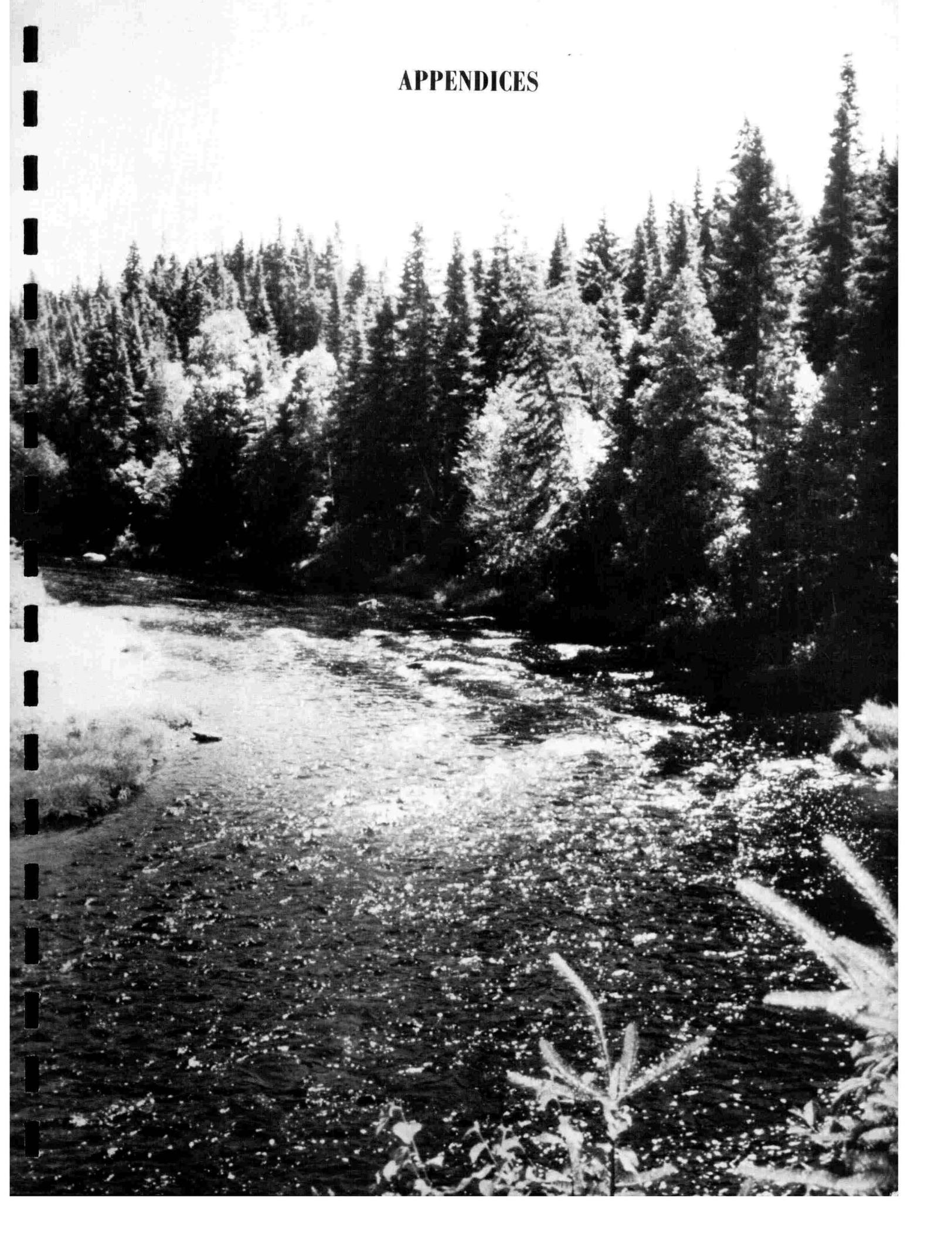
HP = Highly Protective
 MP = Moderately Protective
 NE = No Significant Effect
 MA = Moderately Adverse
 HA = Highly Adverse

*** Description of Options (EB = East Branch; WB = West Branch)**

A: Webster Lake to Medway (64% of EB); Seboomook to Carry Trail (25% of WB)
 B: Entire EB; headwaters to Carry Trail (57% of WB)
 C: Webster Lake to Medway (64% of EB); main stem from Seboomook to Ambajejus Falls (35% of WB)
 D: Entire EB; headwaters to Ambajejus Falls (85% of WB)
 E: Entire EB; headwaters to North Twin Station (93% of WB)

** WILD AND SCENIC RIVER OPTION D

APPENDICES



APPENDIX I

PRINCIPLES AND STANDARDS DISPLAY ACCOUNTS

The following nine tables are provided in accord with the informational requirements of the U. S. Water Resource Council's Principles and Standards for Water and Related Land Planning.

As an example, the display account for Wild and Scenic River Option A may be interpreted as follows:

	<u>GROSS EFFECT</u>	<u>NET EFFECT "NO PLAN"</u>	<u>NET EFFECT PREFERRED PLAN</u>
Miles of Waterway Protected	124	- 95	+ 171

This indicates that the net effect of the "No Plan" (i.e., continuation of existing trends) alternative is to protect 95 fewer waterway miles than Option A. The Preferred Plan protects 171 more miles.

Several of the measurements are qualitative rather than quantitative. These have been rated according to the degree of impact, ranging from "highly adverse" (HA) to "highly protective" (HP). For example:

	<u>GROSS EFFECT</u>	<u>NET EFFECT "NO PLAN"</u>	<u>NET EFFECT PREFERRED PLAN</u>
Impact on Historic Sites	MP	Unfavorable	Favorable

MP shows that Wild and Scenic River Option A has a moderately protective effect on historic sites. In comparison, the "No Plan" alternative has a less favorable effect on historic sites while the Preferred Plan is more protective than Option A.

Likewise, another column reads:

	<u>GROSS EFFECT</u>	<u>NET EFFECT "NO PLAN"</u>	<u>NET EFFECT PREFERRED PLAN</u>
Productivity of West Branch Fishery	HA	N	Very Favorable

In this instance, Option A has a highly adverse effect. The N in the "No Plan" column indicates that there is no significant difference between its effect and that of Option A. In contrast, the Preferred Plan has a considerably better effect on the fishery's productivity than does Wild and Scenic River Option A.

Display Account: "NO PLAN"

MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
ENVIRONMENTAL QUALITY			
WATERWAY IMPACTS			
Miles of Waterway Protected	29		+ 266
WILD	29		+ 138
SCENIC	0		+ 120
RECREATIONAL	0		+ 8
Miles of Free-Flowing River Protected	23		+ 189
currently state protected	23		N
newly protected	0		+ 189
Miles of Free-Flowing River Inundated	6		- 6
Lake Surface Acreage Protected	2,600		+ 48,100
LAND AREA PROTECTED			
Total Acreage	5,100		+ 158,900
fee acquisition	0		+ 11,800
currently state owned	5,100		N
conservation zoning	0		+ 147,100
FISH AND WILDLIFE IMPACTS			
East Branch			
Productivity of Fishery Atlantic Salmon Habitat Protected (acres)	NE		Favorable
Productivity of Wildlife	0		+ 289
Productivity of Wildlife	NE		Favorable
West Branch			
Productivity of Fishery	HA		Very Favorable
Productivity of Wildlife	MA		Very Favorable
Protection of Threatened Species	MA		Favorable
NATURAL LANDMARKS (total = 12)			
Number Protected	0		+ 12
Number Impaired	2		- 2

Interpretation

A positive number in the Net Effect column indicates the amount by which the "No Plan" or Preferred Plan exceeds the displayed alternative. A negative number shows that the Plan has a value less than that of the displayed alternative.

N = No Significant Difference

Degree of Impact

HP = Highly Protective
 MP = Moderately Protective
 NE = No Significant Effect
 MA = Moderately Adverse
 HA = Highly Adverse

MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
NATIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	0		+ 1,433,000
land acquisition	0		+ 1,416,000
recreation development	0		+ 17,000
Annual Operation & Maintenance	16,000		+ 52,000
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	0		+ 240
Present Value of Future Timber Yields Foregone (1975 \$)	61,000		+ 474,000
Year 1980 Recreation-Related Expenditures (1975 \$)	2,854,000		- 1,259,000
Year 2000 Recreation-Related Expenditures (1975 \$)	3,460,000		- 1,594,000
Year 1980 Recreation-Related Employment (man-months)	2,429		- 965
Year 2000 Recreation-Related Employment (man-months)	2,964		- 1,237

REGIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	0		+ 717,000
land acquisition	0		+ 708,000
recreation development	0		+ 9,000
Annual Operation & Maintenance	16,000		+ 52,000
Annual Tree Growth Taxes Foregone	1,100		+ 7,500
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	0		+ 240
Year 1980 Expenditures by Out-of-State Visitors (1975 \$)	475,000		+ 323,000
Year 2000 Expenditures by Out-of-State Visitors (1975 \$)	656,000		+ 277,000
Year 1980 Recreation Employment from Out-of-State Visitor Spending (man-months)	438		+ 294
Year 2000 Recreation Employment from Out-of-State Visitor Spending (man-months)	603		+ 261

SOCIAL WELL BEING			
Annual Recreation Days by Year 1980	346,000		- 179,000
Annual Recreation Days by Year 2000	413,000		- 220,000
Campsites Available	22		+ 15
Diversity of Recreation Opportunities	NA		Very Favorable
Impact on Historic Sites	NE		Favorable
Impact on Scenic Values	NA		Very Favorable

MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
ENVIRONMENTAL QUALITY			
WATERWAY IMPACTS			
Miles of Waterway Protected	124	- 95	+ 171
WILD	67	- 38	+ 100
SCENIC	57	- 57	+ 63
RECREATIONAL	0	N	+ 8
Miles of Free-Flowing River Protected	94	- 71	+ 118
currently state protected	12	+ 11	+ 11
newly protected	82	- 82	+ 107
Miles of Free-Flowing River Inundated	6	N	- 6
Lake Surface Acreage Protected	10,600	- 8,000	+ 40,100
LAND AREA PROTECTED			
Total Acreage	71,000	- 65,900	+ 93,000
fee acquisition	6,300	- 6,300	+ 5,500
currently state owned	4,300	+ 800	+ 800
conservation zoning	60,400	- 60,400	+ 86,700
FISH AND WILDLIFE IMPACTS			
East Branch			
Productivity of Fishery Atlantic Salmon Habitat Protected (acres)	MP	Unfavorable	Favorable
	169	- 169	+ 120
Productivity of Wildlife	MP	Unfavorable	Favorable
West Branch			
Productivity of Fishery	HA	N	Very Favorable
Productivity of Wildlife	MB	Unfavorable	Favorable
Protection of Threatened Species	NE	Unfavorable	Favorable
NATURAL LANDMARKS (total = 12)			
Number Protected	6	- 6	+ 6
Number Impaired	2	N	- 2

Interpretation

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Degree of Impact

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MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
NATIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	762,000	- 762,000	+ 671,000
<u>land acquisition</u>	756,000	- 756,000	+ 660,000
<u>recreation development</u>	6,000	- 6,000	+ 11,000
Annual Operation & Maintenance	29,000	- 13,000	+ 39,000
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	0	N	+ 240
Present Value of Future Timber Yields Foregone (1975 \$)	224,000	- 163,000	+ 311,000
Year 1980 Recreation-Related Expenditures (1975 \$)	288,000	+ 2,566,000	+ 1,307,000
Year 2000 Recreation-Related Expenditures (1975 \$)	339,000	+ 3,121,000	+ 1,527,000
Year 1980 Recreation-Related Employment (man-months)	263	+ 2,166	+ 1,201
Year 2000 Recreation-Related Employment (man-months)	312	+ 2,652	+ 1,415

REGIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	381,000	- 381,000	+ 336,000
<u>land acquisition</u>	378,000	- 378,000	+ 330,000
<u>recreation development</u>	3,000	- 3,000	+ 6,000
Annual Operation & Maintenance	29,000	- 13,000	+ 39,000
Annual Tree Growth Taxes Foregone	3,500	- 2,400	+ 5,100
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	0	N	+ 240
Year 1980 Expenditures by Out-of-State Visitors (1975 \$)	144,000	+ 331,000	+ 654,000
Year 2000 Expenditures by Out-of-State Visitors (1975 \$)	170,000	+ 486,000	+ 763,000
Year 1980 Recreation Employment from Out-of-State Visitor Spending (man-months)	132	+ 306	+ 600
Year 2000 Recreation Employment from Out-of-State Visitor Spending (man-months)	156	+ 447	+ 708

SOCIAL WELL BEING			
Annual Recreation Days by Year 1980	34,000	+ 312,000	+ 133,000
Annual Recreation Days by Year 2000	41,000	+ 372,000	+ 152,000
Campsites Available	17	+ 5	+ 20
Diversity of Recreation Opportunities	MA	N	Very Favorable
Impact on Historic Sites	MP	Unfavorable	Favorable
Impact on Scenic Values	NE	Unfavorable	Favorable

MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
ENVIRONMENTAL QUALITY			
WATERWAY IMPACTS			
Miles of Waterway Protected	233	- 204	+ 62
WILD	154	- 125	+ 13
SCENIC	79	- 79	+ 41
RECREATIONAL	0	N	+ 8
Miles of Free-Flowing River Protected	177	- 154	+ 35
currently state protected	23	N	N
newly protected	154	- 154	+ 35
Miles of Free-Flowing River Inundated	6	N	- 6
Lake Surface Acreage Protected	22,000	- 19,400	+ 28,700
LAND AREA PROTECTED			
Total Acreage	125,000	- 119,900	+ 39,000
fee acquisition	7,800	- 7,800	+ 4,000
currently state owned	4,800	+ 300	+ 300
conservation zoning	112,400	- 112,400	+ 34,700
FISH AND WILDLIFE IMPACTS			
East Branch			
Productivity of Fishery Atlantic Salmon Habitat Protected (acres)	HP 289	Unfavorable - 289	N N
Productivity of Wildlife	HP	Unfavorable	N
West Branch			
Productivity of Fishery	MA	Unfavorable	Very Favorable
Productivity of Wildlife	MP	Unfavorable	Favorable
Protection of Threatened Species	MP	Unfavorable	N
NATURAL LANDMARKS (total = 12)			
Number Protected	6	- 6	+ 6
Number Impaired	2	N	- 2

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MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
NATIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	950,000	- 950,000	+ 483,000
land acquisition	936,000	- 936,000	+ 480,000
recreation development	14,000	- 14,000	+ 3,000
Annual Operation & Maintenance	39,000	- 23,000	+ 29,000
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	0	N	+ 240
Present Value of Future Timber Yields Foregone (1975 \$)	541,000	- 480,000	- 6,000
Year 1980 Recreation-Related Expenditures (1975 \$)	404,000	+ 2,450,000	+ 1,191,000
Year 2000 Recreation-Related Expenditures (1975 \$)	469,000	+ 2,991,000	+ 1,397,000
Year 1980 Recreation-Related Employment (man-months)	368	+ 2,061	+ 1,096
Year 2000 Recreation-Related Employment (man-months)	430	+ 2,534	+ 1,297

REGIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	475,000	- 475,000	+ 242,000
land acquisition	468,000	- 468,000	+ 240,000
recreation development	7,000	- 7,000	+ 2,000
Annual Operation & Maintenance	39,000	- 23,000	+ 29,000
Annual Tree Growth Taxes Foregone	8,700	- 7,600	- 100
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	0	N	+ 240
Year 1980 Expenditures by Out-of-State Visitors (1975 \$)	202,000	+ 273,000	+ 596,000
Year 2000 Expenditures by Out-of-State Visitors (1975 \$)	235,000	+ 421,000	+ 698,000
Year 1980 Recreation Employment from Out-of-State Visitor Spending (man-months)	184	+ 254	+ 548
Year 2000 Recreation Employment from Out-of-State Visitor Spending (man-months)	215	+ 388	+ 649

SOCIAL WELL BEING			
Annual Recreation Days by Year 1980	48,000	+ 298,000	+ 119,000
Annual Recreation Days by Year 2000	56,000	+ 357,000	+ 137,000
Campsites Available	30	- 8	+ 7
Diversity of Recreation Opportunities	MA	Unfavorable	Very Favorable
Impact on Historic Sites	MP	Unfavorable	Favorable
Impact on Scenic Values	MP	Unfavorable	Favorable

MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
ENVIRONMENTAL QUALITY			
WATERWAY IMPACTS			
Miles of Waterway Protected	146	- 117	+ 149
WILD	56	- 27	+ 111
SCENIC	90	- 90	+ 30
RECREATIONAL	0	N	+ 8
Miles of Free-Flowing River Protected	109	- 86	+ 103
currently state protected	12	+ 11	+ 11
newly protected	97	- 97	+ 92
Miles of Free-Flowing River Inundated	0	+ 6	N
Lake Surface Acreage Protected	33,200	- 30,600	+ 17,500
LAND AREA PROTECTED			
Total Acreage	97,000	- 91,900	+ 67,000
fee acquisition	4,300	- 4,300	+ 7,500
currently state owned	4,600	+ 500	+ 500
conservation zoning	88,100	- 88,100	+ 59,000
FISH AND WILDLIFE IMPACTS			
East Branch			
Productivity of Fishery Atlantic Salmon Habitat Protected (acres)	MP	Unfavorable	Favorable
Productivity of Wildlife	169	- 169	+ 120
West Branch			
Productivity of Fishery	MP	Very Unfavorable	Favorable
Productivity of Wildlife	MP	Unfavorable	Favorable
Protection of Threatened Species	NE	Unfavorable	Favorable
NATURAL LANDMARKS (total = 12)			
Number Protected	11	- 11	+ 1
Number Impaired	0	+ 2	N

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MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
NATIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	525,000	- 525,000	+ 908,000
land acquisition	516,000	- 516,000	+ 900,000
recreation development	9,000	- 9,000	+ 8,000
Annual Operation & Maintenance	43,000	- 27,000	+ 25,000
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	240	- 240	N
Present Value of Future Timber Yields Foregone (1975 \$)	163,000	- 102,000	+ 372,000
Year 1980 Recreation-Related Expenditures (1975 \$)	1,479,000	+ 1,375,000	+ 116,000
Year 2000 Recreation-Related Expenditures (1975 \$)	1,737,000	+ 1,723,000	+ 129,000
Year 1980 Recreation-Related Employment (man-months)	1,359	+ 1,070	+ 105
Year 2000 Recreation-Related Employment (man-months)	1,609	+ 1,355	+ 118

REGIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	263,000	- 263,000	+ 454,000
land acquisition	258,000	- 258,000	+ 450,000
recreation development	5,000	- 5,000	+ 4,000
Annual Operation & Maintenance	43,000	- 27,000	+ 25,000
Annual Tree Growth Taxes Foregone	2,400	- 1,300	+ 6,200
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	240	- 240	N
Year 1980 Expenditures by Out-of-State Visitors (1975 \$)	740,000	- 265,000	+ 58,000
Year 2000 Expenditures by Out-of-State Visitors (1975 \$)	868,000	- 212,000	+ 65,000
Year 1980 Recreation Employment from Out-of-State Visitor Spending (man-months)	680	- 242	+ 52
Year 2000 Recreation Employment from Out-of-State Visitor Spending (man-months)	804	- 201	+ 60

SOCIAL WELL BEING			
Annual Recreation Days by Year 1980	154,000	+ 192,000	+ 13,000
Annual Recreation Days by Year 2000	179,000	+ 234,000	+ 14,000
Campsites Available	17	+ 5	+ 20
Diversity of Recreation Opportunities	MP	Very Unfavorable	Favorable
Impact on Historic Sites	MP	Unfavorable	Favorable
Impact on Scenic Values	MP	Unfavorable	Favorable

MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
ENVIRONMENTAL QUALITY			
WATERWAY IMPACTS			
Miles of Waterway Protected	295	- 266	
WILD	167	- 138	
SCENIC	120	- 120	
RECREATIONAL	8	- 8	
Miles of Free-Flowing River Protected	212	- 189	
currently state protected	23	N	
newly protected	189	- 189	
Miles of Free-Flowing River Inundated	0	+ 6	
Lake Surface Acreage Protected	50,700	- 48,100	
LAND AREA PROTECTED			
Total Acreage	164,000	- 158,900	
fee acquisition	11,800	- 11,800	
currently state owned	5,100	N	
conservation zoning	147,100	- 147,100	
FISH AND WILDLIFE IMPACTS			
East Branch			
Productivity of Fishery Atlantic Salmon Habitat Protected (acres)	HP	Unfavorable	
	289	- 289	
Productivity of Wildlife	HP	Unfavorable	
West Branch			
Productivity of Fishery	HP	Very Unfavorable	
Productivity of Wildlife	-HP	Very Unfavorable	
Protection of Threatened Species	MP	Unfavorable	
NATURAL LANDMARKS (total = 12)			
Number Protected	12	- 12	
Number Impaired	0	+ 2	

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MEASUREMENT	GROSS EFFECT	NET EFFECT 'NO PLAN'	NET EFFECT PREFERRED PLAN
NATIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	1,433,000	- 1,433,000	
land acquisition	1,416,000	- 1,416,000	
recreation development	17,000	- 17,000	
Annual Operation & Maintenance	68,000	- 52,000	
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	240	- 240	
Present Value of Future Timber Yields Foregone (1975 \$)	535,000	- 474,000	
Year 1980 Recreation-Related Expenditures (1975 \$)	1,595,000	+ 1,259,000	
Year 2000 Recreation-Related Expenditures (1975 \$)	1,866,000	+ 1,594,000	
Year 1980 Recreation-Related Employment (man-months)	1,464	+ 965	
Year 2000 Recreation-Related Employment (man-months)	1,727	+ 1,237	

REGIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	717,000	- 717,000	
land acquisition	708,000	- 708,000	
recreation development	9,000	- 9,000	
Annual Operation & Maintenance	68,000	- 52,000	
Annual Tree Growth Taxes Foregone	8,600	- 7,500	
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	240	- 240	
Year 1980 Expenditures by Out-of-State Visitors (1975 \$)	798,000	- 323,000	
Year 2000 Expenditures by Out-of-State Visitors (1975 \$)	933,000	- 277,000	
Year 1980 Recreation Employment from Out- of-State Visitor Spending (man-months)	732	- 294	
Year 2000 Recreation Employment from Out- of State Visitor Spending (man-months)	864	- 261	

SOCIAL WELL BEING			
Annual Recreation Days by Year 1980	167,000	+ 179,000	
Annual Recreation Days by Year 2000	193,000	+ 220,000	
Campsites Available	37	- 15	
Diversity of Recreation Opportunities	HP	Very Unfavorable	
Impact on Historic Sites	HP	Unfavorable	
Impact on Scenic Values	HP	Very Unfavorable	

MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
ENVIRONMENTAL QUALITY			
WATERWAY IMPACTS			
Miles of Waterway Protected	312	- 283	- 17
WILD	167	- 138	N
SCENIC	120	- 120	N
RECREATIONAL	25	- 25	- 17
Miles of Free-Flowing River Protected	212	- 189	N
currently state protected	23	N	N
newly protected	189	- 189	N
Miles of Free-Flowing River Inundated	0	+ 6	N
Lake Surface Acreage Protected	69,000	- 66,400	- 18,300
LAND AREA PROTECTED			
Total Acreage	173,000	- 167,900	- 9,000
fee acquisition	11,800	- 11,800	N
currently state owned	5,100	N	N
conservation zoning	156,100	- 156,100	- 9,000
FISH AND WILDLIFE IMPACTS			
East Branch			
Productivity of Fishery Atlantic Salmon Habitat Protected (acres)	HP	Unfavorable	N
Productivity of Wildlife	289	- 289	N
Productivity of Wildlife	HP	Unfavorable	N
West Branch			
Productivity of Fishery	HP	Very Unfavorable	N
Productivity of Wildlife	HP	Very Unfavorable	N
Protection of Threatened Species	MP	Unfavorable	N
NATURAL LANDMARKS (total = 12)			
Number Protected	12	- 12	N
Number Impaired	0	+ 2	N

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MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
NATIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	1,436,000	- 1,436,000	- 3,000
land acquisition	1,416,000	- 1,416,000	N
recreation development	20,000	- 20,000	- 3,000
Annual Operation & Maintenance	68,000	- 52,000	N
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	240	- 240	N
Present Value of Future Timber Yields Foregone (1975 \$)	535,000	- 474,000	N
Year 1980 Recreation-Related Expenditures (1975 \$)	3,262,000	- 408,000	- 1,667,000
Year 2000 Recreation-Related Expenditures (1975 \$)	3,687,000	- 227,000	- 1,821,000
Year 1980 Recreation-Related Employment (man-months)	2,799	- 370	- 1,335
Year 2000 Recreation-Related Employment (man-months)	3,183	- 219	- 1,456

REGIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	718,000	- 718,000	- 1,000
land acquisition	708,000	- 708,000	N
recreation development	10,000	- 10,000	- 1,000
Annual Operation & Maintenance	68,000	- 52,000	N
Annual Tree Growth Taxes Foregone	8,600	- 7,500	N
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	240	- 240	N
Year 1980 Expenditures by Out-of-State Visitors (1975 \$)	798,000	- 323,000	N
Year 2000 Expenditures by Out-of-State Visitors (1975 \$)	933,000	- 277,000	N
Year 1980 Recreation Employment from Out-of-State Visitor Spending (man-months)	732	- 294	N
Year 2000 Recreation Employment from Out-of-State Visitor Spending (man-months)	864	- 261	N

SOCIAL WELL BEING			
Annual Recreation Days by Year 1980	391,000	- 45,000	- 224,000
Annual Recreation Days by Year 2000	438,000	- 25,000	- 245,000
Campsites Available	39	- 17	- 2
Diversity of Recreation Opportunities	HP	Very Unfavorable	N
Impact on Historic Sites	HP	Unfavorable	N
Impact on Scenic Values	HP	Very Unfavorable	N

MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
ENVIRONMENTAL QUALITY			
WATERWAY IMPACTS			
Miles of Waterway Protected	53	- 24	+ 242
WILD	41	- 12	+ 126
SCENIC	12	- 12	+ 108
RECREATIONAL	0	N	+ 8
Miles of Free-Flowing River Protected	51	- 28	+ 161
currently state protected	0	+ 23	+ 23
newly protected	51	- 51	+ 138
Miles of Free-Flowing River Inundated	6	N	- 6
Lake Surface Acreage Protected	2,100	+ 500	+ 48,600
LAND AREA PROTECTED			
Total Acreage	65,000	- 59,900	+ 99,000
fee acquisition	65,000	- 65,000	- 53,200
currently state owned	0	+ 5,100	+ 5,100
conservation zoning	0	N	+ 147,100
FISH AND WILDLIFE IMPACTS			
East Branch			
Productivity of Fishery Atlantic Salmon Habitat Protected (acres)	MP	Unfavorable	Favorable
	277	- 277	+ 12
Productivity of Wildlife	HP	Unfavorable	N
West Branch			
Productivity of Fishery	HA	N	Very Favorable
Productivity of Wildlife	MA	N	Very Favorable
Protection of Threatened Species	MA	N	Favorable
NATURAL LANDMARKS (total = 12)			
Number Protected	4	- 4	+ 8
Number Impaired	2	N	- 2

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MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
NATIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	7,803,000	- 7,803,000	- 6,370,000
land acquisition	7,800,000	- 7,800,000	- 6,384,000
recreation development	3,000	- 3,000	+ 14,000
Annual Operation & Maintenance	25,000	- 9,000	+ 43,000
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	0	N	+ 240
Present Value of Future Timber Yields Foregone (1975 \$)	4,500,000	- 4,439,000	- 3,965,000
Year 1980 Recreation-Related Expenditures (1975 \$)	64,000	+ 2,790,000	+ 1,531,000
Year 2000 Recreation-Related Expenditures (1975 \$)	100,000	+ 3,360,000	+ 1,766,000
Year 1980 Recreation-Related Employment (man-months)	59	+ 2,370	+ 1,405
Year 2000 Recreation-Related Employment (man-months)	93	+ 2,871	+ 1,634

REGIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	3,902,000	- 3,902,000	- 3,185,000
land acquisition	3,900,000	- 3,900,000	- 3,192,000
recreation development	2,000	- 2,000	+ 7,000
Annual Operation & Maintenance	5,000	+ 15,000	+ 28,000
Annual Tree Growth Taxes Foregone	58,000	- 56,900	- 49,400
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	0	N	+ 240
Year 1980 Expenditures by Out-of-State Visitors (1975 \$)	26,000	+ 449,000	+ 772,000
Year 2000 Expenditures by Out-of-State Visitors (1975 \$)	40,000	+ 616,000	+ 893,000
Year 1980 Recreation Employment from Out-of-State Visitor Spending (man-months)	24	+ 414	+ 708
Year 2000 Recreation Employment from Out-of-State Visitor Spending (man-months)	37	+ 566	+ 827

SOCIAL WELL BEING			
Annual Recreation Days by Year 1980	9,000	+ 337,000	+ 158,000
Annual Recreation Days by Year 2000	14,000	+ 399,000	+ 179,000
Campsites Available	5	+ 17	+ 32
Diversity of Recreation Opportunities	MA	N	Very Favorable
Impact on Historic Sites	NE	N	Favorable
Impact on Scenic Values	MA	N	Very Favorable

MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
ENVIRONMENTAL QUALITY			
WATERWAY IMPACTS			
Miles of Waterway Protected	312	- 283	- 17
WILD	167	- 138	N
SCENIC	120	- 120	N
RECREATIONAL	25	- 25	- 17
Miles of Free-Flowing River Protected	212	- 189	N
currently state protected	23	N	N
newly protected	189	- 189	N
Miles of Free-Flowing River Inundated	0	+ 6	N
Lake Surface Acreage Protected	69,000	- 66,400	- 18,300
LAND AREA PROTECTED			
Total Acreage	173,000	- 167,900	- 9,000
fee acquisition	167,900	- 167,900	- 156,100
currently state owned	5,100	N	N
conservation zoning	0	N	+ 147,100
FISH AND WILDLIFE IMPACTS			
East Branch			
Productivity of Fishery Atlantic Salmon Habitat Protected (acres)	HP	Unfavorable	N
Productivity of Wildlife	289	- 289	N
West Branch			
Productivity of Fishery	HP	Very Unfavorable	N
Productivity of Wildlife	-HP	Very Unfavorable	N
Protection of Threatened Species	HP	Very Unfavorable	Unfavorable
NATURAL LANDMARKS (total = 12)			
Number Protected	12	- 12	N
Number Impaired	0	+ 2	N

Interpretation

A positive number in the Net Effect column indicates the amount by which the "No Plan" or Preferred Plan exceeds the displayed alternative. A negative number shows that the Plan has a value less than that of the displayed alternative.

Degree of Impact

HP = Highly Protective
 MP = Moderately Protective
 NE = No Significant Effect
 MA = Moderately Adverse
 HA = Highly Adverse

N = No Significant Difference

MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
NATIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	20,148,000	- 20,148,000	- 18,715,000
land acquisition	20,148,000	- 20,148,000	- 18,732,000
recreation development	0	N	+ 17,000
Annual Operation & Maintenance	68,000	- 52,000	N
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	240	- 240	N
Present Value of Future Timber Yields Foregone (1975 \$)	12,700,000	- 12,639,000	- 12,165,000
Year 1980 Recreation-Related Expenditures (1975 \$)	2,857,000	- 3,000	- 1,262,000
Year 2000 Recreation-Related Expenditures (1975 \$)	1,739,000	+ 1,721,000	+ 127,000
Year 1980 Recreation-Related Employment (man-months)	2,441	- 12	- 977
Year 2000 Recreation-Related Employment (man-months)	1,552	+ 1,412	+ 175

REGIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	10,074,000	- 10,074,000	- 9,357,000
land acquisition	10,074,000	- 10,074,000	- 9,366,000
recreation development	0	N	+ 9,000
Annual Operation & Maintenance	68,000	- 52,000	N
Annual Tree Growth Taxes Foregone	206,000	- 204,900	- 197,400
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	240	- 240	N
Year 1980 Expenditures by Out-of-State Visitors (1975 \$)	595,000	- 120,000	+ 203,000
Year 2000 Expenditures by Out-of-State Visitors (1975 \$)	595,000	+ 61,000	+ 338,000
Year 1980 Recreation Employment from Out-of-State Visitor Spending (man-months)	553	- 115	+ 179
Year 2000 Recreation Employment from Out-of-State Visitor Spending (man-months)	553	+ 50	+ 311

SOCIAL WELL BEING			
Annual Recreation Days by Year 1980	346,000	N	- 179,000
Annual Recreation Days by Year 2000	198,000	+ 215,000	- 5,000
Campsites Available	22	N	+ 15
Diversity of Recreation Opportunities	HP	Very Unfavorable	N
Impact on Historic Sites	HP	Unfavorable	N
Impact on Scenic Values	HP	Very Unfavorable	N

MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
ENVIRONMENTAL QUALITY			
WATERWAY IMPACTS			
Miles of Waterway Protected	29	N	+ 266
WILD	29	N	+ 138
SCENIC	0	N	+ 120
RECREATIONAL	0	N	+ 8
Miles of Free-Flowing River Protected	23	N	+ 189
currently state protected	23	N	N
newly protected	0	N	+ 189
Miles of Free-Flowing River Inundated	6	N	- 6
Lake Surface Acreage Protected	2,600	N	+ 48,100
LAND AREA PROTECTED			
Total Acreage	5,100	N	+ 158,900
fee acquisition	0	N	+ 11,800
currently state owned	5,100	N	N
conservation zoning	0	N	+ 147,100
FISH AND WILDLIFE IMPACTS			
East Branch			
Productivity of Fishery Atlantic Salmon Habitat Protected (acres)	MA	Favorable	Very Favorable
Productivity of Wildlife	0	N	+ 289
West Branch			
Productivity of Fishery	HA	N	Very Favorable
Productivity of Wildlife	HA	Favorable	Very Favorable
Protection of Threatened Species	HA	Favorable	Very Favorable
NATURAL LANDMARKS (total = 12)			
Number Protected	0	N	+ 12
Number Impaired	2	N	- 2

Interpretation

A positive number in the Net Effect column indicates the amount by which the "No Plan" or Preferred Plan exceeds the displayed alternative. A negative number shows that the Plan has a value less than that of the displayed alternative.

Degree of Impact

HP = Highly Protective
 MP = Moderately Protective
 NE = No Significant Effect
 MA = Moderately Adverse
 HA = Highly Adverse

N = No Significant Difference

MEASUREMENT	GROSS EFFECT	NET EFFECT "NO PLAN"	NET EFFECT PREFERRED PLAN
NATIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	0	N	+ 1,433,000
land acquisition	0	N	+ 1,416,000
recreation development	0	N	+ 17,000
Annual Operation & Maintenance	16,000	N	+ 52,000
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	0	N	+ 240
Present Value of Future Timber Yields Foregone (1975 \$)	61,000	N	+ 474,000
Year 1980 Recreation-Related Expenditures (1975 \$)	2,712,000	+ 142,000	- 1,117,000
Year 2000 Recreation-Related Expenditures (1975 \$)	4,344,000	- 884,000	- 2,478,000
Year 1980 Recreation-Related Employment (man-months)	2,299	+ 130	- 835
Year 2000 Recreation-Related Employment (man-months)	3,588	- 624	- 1,861

REGIONAL ECONOMIC DEVELOPMENT			
CONSERVATION/RECREATION COSTS			
Capital Expenditures (1975 \$)	0	N	+ 717,000
land acquisition	0	N	+ 708,000
recreation development	0	N	+ 9,000
Annual Operation & Maintenance	61,000	N	+ 474,000
Annual Tree Growth Taxes Foregone	1,100	N	+ 7,500
RESOURCE USE IMPACTS			
Hydropower Potential Foregone (million kilowatt-hours)	0	N	+ 240
Year 1980 Expenditures by Out-of-State Visitors (1975 \$)	418,000	+ 57,000	+ 380,000
Year 2000 Expenditures by Out-of-State Visitors (1975 \$)	385,000	+ 271,000	+ 548,000
Year 1980 Recreation Employment from Out-of-State Visitor Spending (man-months)	386	+ 52	+ 346
Year 2000 Recreation Employment from Out-of-State Visitor Spending (man-months)	355	+ 248	+ 509

SOCIAL WELL BEING			
Annual Recreation Days by Year 1980	332,000	+ 14,000	- 165,000
Annual Recreation Days by Year 2000	550,000	- 137,000	- 357,000
Campsites Available	22	N	+ 15
Diversity of Recreation Opportunities	MA	N	Very Favorable
Impact on Historic Sites	MA	Favorable	Very Favorable
Impact on Scenic Values	HA	Favorable	Very Favorable

APPENDIX II

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APPENDIX III

MAINE LAND USE REGULATION COMMISSION: INTERIM SHORELAND PROTECTION SUBDISTRICT STANDARDS*

SUBCHAPTER II

INTERIM DISTRICT BOUNDARY AND LAND USE STANDARDS SECTION 221. INTERIM (P) PROTECTION DISTRICT BOUNDARY AND LAND USE STANDARDS

The following Interim (P) Protection Subdistricts and
Land Use Standards are established:...

III. Interim (P-3) Protection Subdistricts and Land Use Standards

A. Areas To Be Included Within Interim (P-3) Protection Subdistricts

Areas within two hundred and fifty feet of the normal high water mark, measured as a horizontal distance landward from such high water mark, of sizeable non-tidal bodies of standing water (lakes and ponds), sizeable non-tidal flowing waters (rivers and streams), and tidal waters - all terms as defined in Section 220.

B. Land Use Standards Applicable To Interim (P-3) Protection Subdistricts

1. Uses Permitted Without Review and Approval Within Interim (P-3) Protection Subdistricts:

The following shall be permitted without review and approval within Interim (P-3) Protection Subdistricts, to the

*Source: Standards for Interim Land Use District Boundaries and Permitted Uses, originally adopted on October 10, 1972 and revised on August 10, 1973.

extent they are compatible with the resources or values protected:

- a. Primitive recreational uses, including, fishing, hiking, hunting, wildlife study and photography, wild crop harvesting, trapping, horseback riding, tent and shelter camping, canoe portaging, cross country skiing, and snowshoeing;
- b. Motorized vehicular traffic on roads and trails, and snowmobiling;
- c. Fire prevention activities, wildlife management practices, and soil and water conservation practices;
- d. Mineral exploration to determine the nature and extent of mineral resources provided such exploration is accomplished by hand sampling, test boring, or other methods which create minimal disturbance;
- e. Surveying and other resource analysis;
- f. Emergency operations conducted for the public health, safety or general welfare, such as resource protection, law enforcement, and search and rescue operations;
- g. Agriculture when in conformance with the standards listed below:
 - (1) All spreading or disposal of manure shall be accomplished in conformance with the "Maine Guidelines for Manure and Manure Sludge Disposal on Land" published by the University of Maine and Maine Soil and Water Conservation Commission, on July 1972 or subsequent revisions thereof.
 - (2) No more than a 1/2 acre area of soil is tilled in any year.
 - (3) Agricultural practices shall be conducted in such manner to prevent soil erosion, sedimentation, and contamination or nutrient enrichment of surface waters.
- h. Forest management activities including timber harvesting when in conformance with the standards listed below:
 - (1) Written notice of all timber harvesting operations shall be given to the Commission prior to the commencement of on the ground operations. Such notice shall state the location, nature, and time period of harvesting operations; and may be combined with the notice required by other sections of this chapter.
 - (2) Harvesting operations shall be conducted in such a manner that a well-distributed stand of trees is retained.
 - (3) Harvesting activities shall not create single openings greater than seven thousand five hundred (7,500) square feet in the forest canopy.
 - (4) In any stand, harvesting shall remove not more than forty (40) percent of the volume of trees six (6) inches in diameter and larger measured at four and one-half (4-1/2) feet above ground level, in any ten (10) year period. Removal of trees less than six (6) inches in

diameter, measured as above is permitted in conformance with provisions (2), (3), (5), (6) and (7) of this subsection. For the purpose of these standards, a stand means a contiguous group of trees, sufficiently uniform in species, arrangement of age classes, and condition, to be identifiable as a homogeneous and distinguishable unit.

(5) No substantial accumulation of slash shall be left within fifty (50) feet of the normal high water mark of surface water areas protected by these districts. At distances greater than fifty (50) feet from the normal high water mark of such waters and extending to the limits of the Interim (P-3) Protection Subdistricts, all slash shall be disposed of in such a manner that it lies on the ground and no part thereof extends more than four feet above the ground.

(6) Skid trails, log yards, and other sites where the operation of logging machinery results in the exposure of substantial areas of mineral soil should be located such that an unscarified filter strip is retained between the exposed mineral soil and the normal high water mark of the surface water areas protected by these districts. The width of this strip should vary according to the average slope of the land as follows:

Average Slope of Land Between Exposed Mineral Soil and Normal High Water Mark (Percent)	Width of Strip Between Exposed Mineral Soil and Normal High Water Mark (Feet along Surface of the Ground)
0	25
10	45
20	65
30	85
40	105
50	125
60	145
70	165

(7) Harvesting operations shall be conducted in such a manner and at such a time that minimal soil disturbance results. Adequate provision shall be made to prevent soil erosion and sedimentation of surface waters. Construction of land management roads and minor land management road crossings of watercourses as defined in Section 220 when in conformance with the standards listed below:

(1) Written notice of all land management road con-

struction projects shall be given to the Commission prior to the commencement of on the ground operation. Such notice shall state the location, nature, and time period of such projects; and may be combined with the notice required by other sections of this chapter.

(2) Land management roads shall be located, constructed, and maintained in such a manner that minimal erosion hazard results. Adequate provision shall be made to prevent soil erosion and sedimentation of surface waters. All land management roads shall be located, constructed and maintained in conformance with the erosion preventative provisions of "Permanent Logging Roads for Better Woodlot Management" published by the Division of State and Private Forestry, Forest Service Northeastern Area, U.S. Department of Agriculture in 1960 or subsequent revisions thereof.

(3) Additionally, all land management roads constructed shall conform with the following standards:

- (a) Land Management road crossings of watercourses shall be kept to the minimum number necessary;
- (b) Bridges or culverts of adequate size and design shall be provided for all land management road crossings of watercourses which are to be used when surface waters are unfrozen;
- (c) Bottoms of culverts shall be installed at streambed elevation; and
- (d) All cut or fill banks and areas of exposed mineral soil in the immediate vicinity of watercourses shall be revegetated or otherwise stabilized.

(4) Whenever practicable land management road crossings of watercourses should be constructed during periods of low flow, normally July and August. It is especially important that construction of land management road crossings of watercourses be avoided between October 1 and November 30 on trout and salmon waters or their tributaries.

2. Uses Permitted Upon Review And Approval Within Interim (P-3) Protection Subdistricts

The following uses shall be permitted upon review and approval within Interim (P-3) Protection Subdistricts, pursuant to Title 12, M.R.S.A., Section 685-B:

- a. Principal and accessory structures or buildings and essential services as may be necessary for the exercise of uses listed in Section 221, III, B, 1;
- b. Agricultural practices which exceed the limits of the standards for such use listed in Section 221, III, B, 1, including the tilling of an area of soil in excess of one half acre in any year in conformance with a soil conservation plan;
- c. Timber harvesting activities which exceed the limits of

the standards for such use listed in Section 221, 111, B, 1; and

- d. Land management road construction activities which exceed the limits of the standards for such use listed in Section 221, 111, B, 1, and major land management road crossings of watercourses as defined in Section 220 and other land management road crossings of watercourses, which exceed the limits of the standards for such use listed in Section 221, 111, B, 1.**

APPENDIX IV

PHOTOGRAPHY CREDITS

Atlantic Sea Run Salmon Commission: 15

Bureau of Outdoor Recreation: viii, 3 (top), 5 (top), 13, 29, 34, 41, 49, 58, 66, 87

Maine Department of Conservation: 1, 11, 27, 85, Appendices

Maine Department of Inland Fisheries and Game: 17

U. S. Forest Service: 31, 42

Great Northern Paper Company: 67

William Stearns: Cover, vi, 3 (bottom), 5 (bottom) 9, 19, 21, 54

Sketch on page 16 by Bob Hines, U. S. Fish and Wildlife Service

Description of Chapter Pictures:

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1	Ripogenus Gorge on West Branch
29	South Branch near Pittston Farm
41	East Branch
49	Portaging on West Branch
67	Logging in Northern Maine
Appendices	North Branch

LETTERS OF COMMENT

STATE OF MAINE
OFFICE OF THE GOVERNOR
AUGUSTA, MAINE
04333

JAMES B. LONGLEY
GOVERNOR

December 30, 1975

Mr. Curtis Bohlen
Acting Assistant Secretary
of the Interior
U. S. Department of the Interior
Washington, D. C. 20240

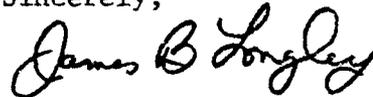
Dear Mr. Bohlen:

Thank you for your letter of December 10 and the copies of the Department's report on the Penobscot River.

I have asked Richard Barringer, Commissioner of the Maine Department of Conservation, to comment on the report in our behalf, and you may expect to hear from him in this regard in mid-January.

Like the Department of the Interior, the people of Maine are most anxious to conserve and protect the Penobscot; and I shall look forward to your assistance in developing a protection plan that is satisfying to the needs of the people of this State.

Sincerely,



James B. Longley
Governor

JBL/gph

cc: Richard Barringer, Commissioner
Department of Conservation



DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20250

APR 11 1976

APR 11 1976

Honorable Thomas S. Kleppe
Secretary of the Interior

FOR
cc. fw

Dear Mr. Secretary:

This is in reply to Assistant Secretary Reed's December 3 letter requesting our views on your Department's proposed report on the Penobscot Wild and Scenic River Study.

The information contained in the report about the natural values of the area favorably supports a wild and scenic designation for the river. We were pleased to see the costs and the overall net effects of implementing the proposal displayed as they are in the report. The information shown will provide the decisionmakers a picture of the trade-offs between optimizing economic development, and the proposal for the river. We believe this is important especially in view of the potential for hydropower development on the Penobscot River.

We would have no objection to the report recommendation that the river segments studied should be made a part of the National Wild and Scenic Rivers System as a State-administered component. If the proposal is implemented, there are no apparent conflicts with the programs administered by this Department.

We appreciate the opportunity to review the report and present our views.

Sincerely,


Paul H. Jones
Assistant Secretary



DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
WASHINGTON, D.C. 20310

Bein-

FOR

11 FEB 1976

Honorable Thomas S. Kleppe
Secretary of the Interior
Washington, D. C. 20240

Dear Mr. Secretary:

This letter is in response to a request (D4219-Penobscot River) from Assistant Secretary Reed for views of the Department of the Army on your proposed report recommending inclusion of portions of the Penobscot River, Maine, in the national wild and scenic rivers system.

Affirmative action by the Congress on your proposed recommendation would not adversely affect water resource programs or projects of the Corps of Engineers, or other elements of this Department.

We appreciate the opportunity afforded us to review and comment on your proposed report and hope that these comments will be of assistance.

Sincerely,

Charles R. Ford
Deputy Assistant Secretary of the Army
(Civil Works)



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

WASHINGTON, D.C. 20410

DEC 16 1975

OFFICE OF THE ASSISTANT SECRETARY
FOR COMMUNITY PLANNING AND DEVELOPMENT

IN REPLY REFER TO:

Mr. Nathaniel Reed
Assistant Secretary of
the Interior
Office of the Secretary
Washington, D. C. 20240

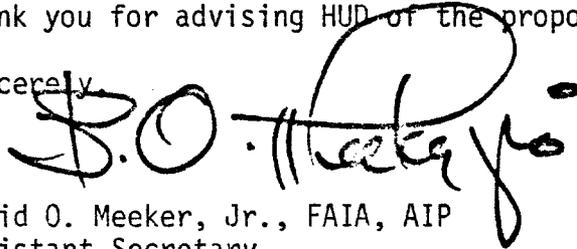
Dear Mr. Reed:

This is in response to your letter of December 3, 1975, to Secretary Hills requesting review and comment on your proposed report on the Penobscot River, Maine in accordance with the provisions of the Wild and Scenic Rivers Act of 1968. Your request is being furnished to our Boston Regional Office for review and response as needed.

The Regional Administrator, Mr. Maurice E. Frye, Jr., Room 800, John F. Kennedy Federal Building, Boston, Massachusetts 02203 is cognizant of the program activities in this area and can respond on behalf of the Department.

Thank you for advising HUD of the proposed report.

Sincerely,



David O. Meeker, Jr., FAIA, AIP
Assistant Secretary



OFFICE OF THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

MAR 8 1976

Mr. Nathaniel Reed
Assistant Secretary
Department of the Interior
Washington, D.C. 20240

Dear Mr. Reed:

This is in response to your December 3, 1975 letter to Secretary Coleman, enclosing for review the Department of the Interior's proposed report on the Penobscot River, Maine.

The Department of Transportation does not have any comments concerning the report.

Sincerely,

A handwritten signature in cursive script, appearing to read 'M. Convisser', is written above the typed name.

Martin Convisser, Director
Office of Environmental Affairs
Office of Environment, Safety,
and Consumer Affairs



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I

J.F. KENNEDY FEDERAL BUILDING, BOSTON, MASSACHUSETTS 02203

February 27, 1976

Mr. Robert Eastman, Chairman
Interagency Study Group on Wild and Scenic Rivers
Bureau of Outdoor Recreation
U.S. Department of the Interior
Washington, D.C. 20240

Dear Mr. Eastman:

EPA has reviewed the Penobscot Wild and Scenic River Study Report and accompanying Draft Environmental Impact Statement. We concur with the analyses and findings. The unique pristine environmental and scenic values qualify the upper Penobscot River for inclusion in the Wild and Scenic River System. We commend using the National Wild and Scenic Rivers legislation, in this case with major State and private responsibilities, as a tool to preserve the area's outstanding environmental values of near-pristine water and air quality, solitude, choice ecosystems, and scenic quality.

Our major concern is that the State legislation and administrative arrangements developed to implement the proposal for State administration contain safeguards to assure that the outstanding environmental values be maintained in perpetuity in the face of any unforeseen development or State administrative pressures. The legislation and administrative regulations, proposed to be implemented primarily through the Maine Land Use Regulation Commission, should specify the criteria to preserve for future generations the river corridor and natural setting in the face of any future development, in accordance with Wild and Scenic River designation or use pressures.

We offer the following specific comments for use by the State when it develops management guidelines and a master plan for implementing the proposal. The Report and EIS should briefly reference conformity to environmental standards.

(1) Criteria and site plans should meet the water quality requirements set forth in the Statewide (or any subsequent areawide) water quality management plan which the Maine Dept. of Environmental Protection (DEP) is developing to meet the requirements of Section 208 as well as the other provisions of the Federal Water Pollution Control Act of 1972 (FWPCA).

(2) Under the preferred plan (Wild and Scenic River Option D), 15 new primitive recreational sites will be developed. General information should be included as to their location, the type and amount of use for which they will be designed, and the type of waste and sanitary facilities that will be provided there, to insure that the requirements of FWPCA, are met.

(3) Provisions should be made to assure a sufficient supply of safe drinking water, where needed, in conformity with the Safe Drinking Water Act of 1974.

Since Maine DEP and EPA will be evaluating the possibility of upgrading the Millinocket-Medway segment to a Class C or B standard in the future, an explanation of Class C (to go with the explanation of the other classes in the Report (page 20) and E.I.S. (page 46)) would help the reader:

"Class C waters are suitable for fish and wildlife, but not for water contact recreation. Dissolved oxygen levels must not be less than 5 parts per million for trout and salmon waters."

In accordance with our National Rating System (copy enclosed), we rated the Draft impact statement as LO-1.

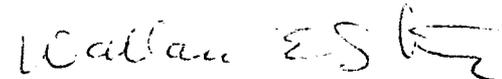
These comments reflect EPA's representation on the Interagency Study Group on Wild and Scenic Rivers, Region I's participation on the Regional Study Team, and the Region I Environmental Impact Statement Office. We find the Report and Draft E.I.S. reflect our suggestions during the study and comments (April 29) on the Preliminary Draft Report.

It has been our pleasure to serve on the Penobscot Wild and Scenic River Study Team. We wish to commend the Northeast Region of BOR for its leadership of the study and especially for the thoughtful exploration and evaluation of alternatives and development of a sound recommendation.

Sincerely yours,



Bart Hague, Chief
Environmental Studies



Wallace Stickney, Director
Environmental Impact Office

Enclosure

cc: Maurice D. Arnold, Regional Director
Northeast Regional Office, BOR

EXPLANATION OF EPA RATING

Environmental Impact of the Action

LO -- Lack of Objections

EPA has no objections to the proposed action as described in the draft environmental impact statement; or suggests only minor changes in the proposed action.

ER -- Environmental Reservations

EPA has reservations concerning the environmental effects of certain aspects of the proposed action. EPA believes that further study of suggested alternatives or modifications is required and has asked the originating federal agency to reassess these aspects.

EU -- Environmentally Unsatisfactory

EPA believes that the proposed action is unsatisfactory because of its potentially harmful effect on the environment. Furthermore, the Agency believes that the potential safeguards which might be utilized may not adequately protect the environment from hazards arising from this action. The Agency recommends that alternatives to the action be analyzed further (including the possibility of no action at all).

Adequacy of the Impact Statement

Category 1 -- Adequate

The draft environmental impact statement sets forth the environmental impact of the proposed project or action as well as alternatives reasonably available to the project or action.

Category 2 -- Insufficient Information

EPA believes that the draft environmental impact statement does not contain sufficient information to assess fully, the environmental impact of the proposed project or action. However, from the information submitted, the Agency is able to make a preliminary determination of the impact on the environment. EPA has requested that the originator provide the information that was not included in the draft environmental impact statement.

Category 3 -- Inadequate

EPA believes that the draft environmental impact statement does not adequately assess the environmental impact of the proposed project or action, or that the statement inadequately analyzes reasonably available alternatives. The Agency has requested more information and analysis concerning the potential environmental hazards and has asked that substantial revision be made to the impact statement.

If a draft environmental impact statement is assigned a Category 3, no rating will be made of the project or action; since a basis does not generally exist on which to make such a determination.



FEDERAL ENERGY ADMINISTRATION
WASHINGTON, D.C. 20461

MAR 4 1976

OFFICE OF THE ADMINISTRATOR

Honorable Nathaniel P. Reed
Assistant Secretary of the Interior
Washington, D. C. 20240

Dear Mr. Reed:

Thank you for your letter of December 3, 1975 requesting Federal Energy Administration review of the Penobscot Wild and Scenic River Study (D4219-Penobscot).

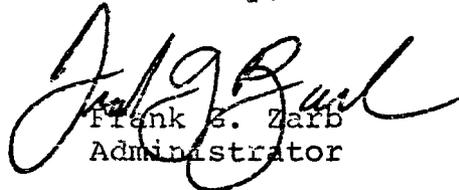
The study illustrates that the Penobscot River is outstanding for its free flowing beauty and natural resources. We concur that portions of the river meet the criteria for wild and scenic designation.

The study presented five options, two of which would allow for hydroelectric development. More analysis is clearly needed on these options. The analysis should include the need for and benefits of the development as well as an integrated assessment of environmental impact of the development on the free flowing river.

We recommend that such analysis take place before a decision is made as to what portions of the river should be designated as wild and scenic.

We appreciate this opportunity to comment on the study.

Sincerely,


Frank S. Zarb
Administrator

FEDERAL POWER COMMISSION
WASHINGTON, D.C. 20426

IN REPLY REFER TO:

7-1-76

Honorable Thomas S. Kleppe
Secretary of the Interior
Washington, D.C. 20240

Reference: D4219 - Penobscot River

Dear Mr. Secretary:

This is in reply to Assistant Secretary Reed's letter of December 3, 1975, transmitting for the Commission's comments, pursuant to the provisions of the Wild and Scenic Rivers Act (P.L. 90-542), your Department's proposed report on the Penobscot River, Maine. It is also in response to the letter of January 21, 1976, from the Regional Director, Bureau of Outdoor Recreation, Philadelphia, Pennsylvania, inviting comments on the draft environmental statement for the proposed wild and scenic river.

The cited documents cover a review of the wild, scenic, and recreational qualities of the entire 327 miles of the East and West Branches of the Penobscot River above Medway. They recommend that the entire 107 miles of the East Branch and the upper 188 miles of the West Branch, for a total of 295 miles, be designated as a State-administered National Wild and Scenic River. Excluded from designation would be the West Branch's 17-mile lower lakes segment, which qualifies for recreational designation, and the lower 15-mile segment which does not qualify for designation.

The Federal Power Commission staff has reviewed the material furnished to determine the effects of the proposal on matters affecting the Commission's responsibilities. Such responsibilities relate to the development of hydroelectric power and assurance of the reliability and adequacy of electric service under the Federal Power Act, and the construction and operation of natural gas pipelines under the Natural Gas Act.

1377



As shown in your proposed report, there are a number of existing and potential hydroelectric developments located within the 327-mile segments studied for possible inclusion in the National Wild and Scenic Rivers System. There are four existing hydroelectric power plants -- the 8,200-kilowatt North Twin, 8,000-kilowatt Millinocket, 14,100-kilowatt Dolby, and 3,440-kilowatt Medway projects -- located within the 15-mile segment of the lower West Branch which was not found suitable for wild, scenic, or recreational designation. The first three plants are licensed by the Federal Power Commission (FPC Project No. 2458) and the latter plant has an application for license pending (FPC Project No. 2666). The lower lakes segment of the West Branch, which was found to qualify for recreational designation but is not recommended for inclusion in the national system, is a part of FPC Project No. 2458. Reservoir storage in this lower lakes segment regulates stream-flow for power purposes at downstream power plants.

There is one hydroelectric plant, the licensed 37,530-kilowatt Ripogenus development (FPC Project No. 2572) located on a segment of the West Branch proposed for scenic classification. Also, the licensed Seboomook and Canada Falls reservoirs, FPC Project Nos. 2638 and 2634, respectively, are located on upstream segments of the West Branch proposed for scenic classification. These reservoirs are operated to provide regulation of flows at hydroelectric generating plants downstream. According to the report, inclusion of the West Branch segments in the national system, as recommended, would not affect the continued operation of the Ripogenus development and the Seboomook and Canada Falls reservoirs.

The current inventory of undeveloped hydroelectric power sites maintained by the Commission staff indicates that there are five potential conventional hydroelectric projects in the river segments proposed for inclusion in the National Wild and Scenic Rivers System. The following table shows these five potential projects:

	<u>River</u>	<u>Installed Capacity (kW)</u>
Debsconeag	West Branch	15,000
Sourdnahunk	West Branch	24,000
The Arches	West Branch	22,500
Meadow Brook	East Branch	12,000
Grand Pitch	Webster Brook	5,000
		<u>78,500</u>

The three potential conventional hydroelectric projects listed above on the West Branch would be capable of generating an average of approximately 270 million kilowatt-hours annually. The two potential projects within the East Branch drainage would be capable of generating an average of about 70 million kilowatt-hours annually.

According to the report, the Great Northern Paper Company is considering the development of hydroelectric power at the undeveloped West Branch sites and at the existing Seboomook Dam. The staff is not aware of the extent of these considerations.

The staff notes that there are three undeveloped pumped storage sites on the segments of the West Branch proposed for inclusion in the national system. These sites, Harrington Lake No. 1, Harrington Lake No. 2, and Penobscot Lake, have been identified by the staff from reconnaissance-type investigations and could provide a total of about 6,800 megawatts of capacity. There are no known plans for the development of these sites.

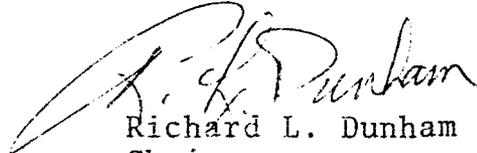
The staff review shows that the Penobscot River basin is located in an area served by electric utilities which are members of the Northeast Power Coordinating Council (NPCC). In its April 1975 report to the Commission, the NPCC projected its winter peak loads to increase from 44,540 megawatts in 1974-75 to 82,472 megawatts in 1984-85. A small portion of the additional generating capacity needed to meet the increased loads would be provided by conventional or pumped storage hydroelectric projects. Beyond 1985 through 1994, the NPCC forecasted that 10 percent of the increased generating capacity requirements would be provided by some form of hydroelectric developments. Consequently, it would appear that the hydroelectric power that could be economically developed in the Penobscot River basin could ultimately find a place in meeting the loads of the region.

Based on its consideration of the proposed report of your Department, the draft environmental statement, and the studies of its own staff, the Commission concludes that the proposed wild, scenic, and recreational designation of 295 miles of the East and West Branches of the Penobscot River would conflict

Honorable Thomas S. Kleppe -4-

with the possible future development of conventional and pumped storage hydroelectric power. It believes that the possible power benefits foregone should be thoroughly considered in deciding whether or not to include the rivers in the National Wild and Scenic Rivers System.

Sincerely yours,



Richard L. Dunham
Chairman

NEW ENGLAND RIVER BASINS COMMISSION

NERBC

55 COURT STREET • BOSTON, MASSACHUSETTS 02108
PHONE (617) 223-6244

February 26, 1976

Mr. Nathaniel Reed, Assistant Secretary
U. S. Department of the Interior
Office of the Secretary
Washington, D. C. 20240

Re: D4219 - Penobscot River

Dear Mr. Reed:

We are pleased to forward to you our review and comment on the Penobscot (Maine) Wild and Scenic River Study. Of note particularly is the parallel goal of this river study and the New England River Basins Commission Guide Plan Program in Maine. I feel that our overall river basin efforts are mutually supportive. We appreciated the opportunity to have our staff participate on the Penobscot River Study Task Force. At this time, I see no items of conflict in your October, 1975, report. Offered for your perusal, however, are the following comments.

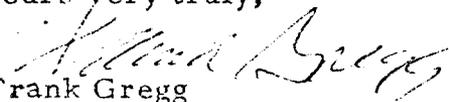
To our knowledge, this represents the first report to be channeled through Maine for review which has conscientiously applied to "Principles and Standards for Planning Water and Related Land Resources", promulgated by the U. S. Water Resources Council. We note the positive results of following these guidelines. Despite the Department's recommendation of Option D as the "preferred" plan, all of the alternatives are viable, allow for various potential trade-offs, and are clearly portrayed. With alternative power generation systems becoming increasingly sensitive issues, there is merit in having formulated several strategies which would allow for hydropower development of the resource.

I believe that the Penobscot study represents one of the first major river systems to be studied under the Wild and Scenic Rivers Act wherein the major adjacent land is in private ownership -- and in this unique situation, by a single corporation. Again, a full range of management options (public, public-private cooperative, and private) is appropriate. There remains the potential within any of these for possible mutual modifications as events unfold.

As the report notes, one specific area which will have to be updated before final release of the study is the status of two suits relating to the Penobscot Indian claim of land ownership in the Penobscot basin.

We have no further comments of substance and appreciate this review privilege.

Yours very truly,



Frank Gregg

Chairman

cc: Maurice D. Arnold



UNITED STATES WATER RESOURCES COUNCIL

SUITE 800 • 2120 L STREET, N.W. WASHINGTON, D.C. 20037

APR 22 1976

Honorable Nathaniel Reed
Assistant Secretary of the Interior
Washington, D. C. 20240

Dear Mr. Reed:

This will respond to your letter of December 3, 1975, requesting Water Resources Council comments on the Penobscot Wild and Scenic River study report.

The Water Resources Council has reviewed the report and has determined: (1) that the proposal does not conflict with any other planning being conducted for the Penobscot River Basin pursuant to the Water Resources Planning Act, P.L. 89-80, and (2) that the report adheres to the Principles and Standards for planning water and related land resources that were established by the Water Resources Council, including depicting potential benefits foregone. Accordingly, the Water Resources Council has no objections to the Penobscot Wild and Scenic River study report. However, it should be noted that implementation of the study's proposal is dependent in part on the resolution of the two suits relating to the Penobscot Indian Tribe's claim of land ownership in the Basin.

Sincerely,

Warren D. Fairchild
Director

MEMBERS: SECRETARIES OF INTERIOR, AGRICULTURE, ARMY, COMMERCE, HOUSING AND URBAN DEVELOPMENT, TRANSPORTATION; ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY; CHAIRMAN, FEDERAL POWER COMMISSION - OBSERVERS: ATTORNEY GENERAL; DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET; CHAIRMEN, COUNCIL ON ENVIRONMENTAL QUALITY, TENNESSEE VALLEY AUTHORITY, RIVER BASIN COMMISSIONS, BASIN INTERAGENCY COMMITTEES.

