UPPER MERRIMACK WILD AND SCENIC RIVER STUDY

DRAFT REPORT

JANUARY 1999

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Special thanks to the members of the *Upper Merrimack River Local Advisory Committee*

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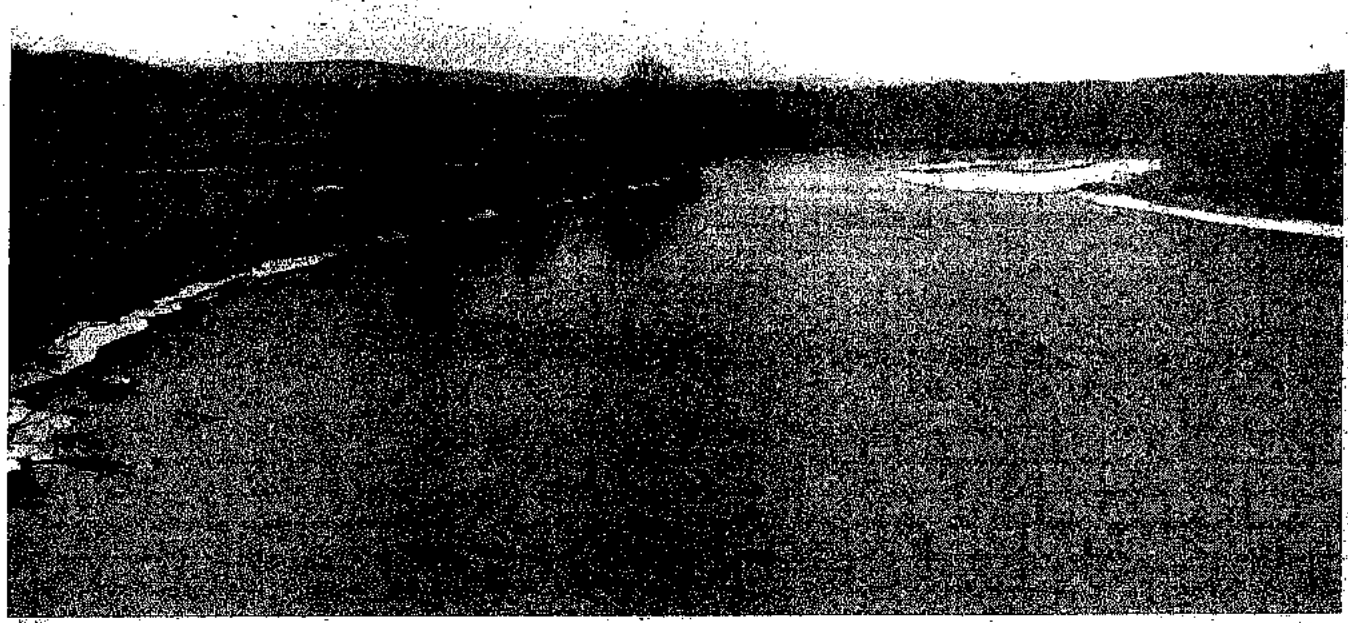


A scenic view of agricultural floodplain lands along the Merrimack in Boscawen.

SUMMARY

SUMMARY OF FINDINGS

Eligibility

The Wild and Scenic River Study for the Upper Merrimack River found that 26 miles of the river are eligible for inclusion in the National Wild and Scenic Rivers System based on free-flowing character and the presence of outstanding resource values in the following areas: recreation; fish and aquatic values; wildlife; cultural; and geologic and natural features. The eligible portion comprises the 26-mile section of river between its origin in Franklin and the Manchester St. Bridge in Concord.

Classification

The Wild and Scenic Rivers Act provides for three possible classifications of eligible river segments: wild; scenic; and recreational. The criteria distinguishing these classifications are based on the degree of human modification of the river and its adjacent shorelands. The most appropriate classifications for the eligible portion of the upper Merrimack are: "scenic" for the segment between Franklin and Sewall's Island; and "recreational" for the segment between Sewall's Island and the Manchester St. Bridge.

Suitability

No portion of the eligible river area of the upper Merrimack is found to meet all of the requisite criteria of suitability for designation as a national wild and scenic river. Principal factors considered in determining suitability are discussed later in this report and relate to a river's potential to be managed and protected effectively as a component of the National System. Although the eligible segments of the upper Merrimack meet most of the criteria of suitability, the adjacent riparian communities failed to show sufficient support for the designation to be found suitable at this time.

Recommendation

Four alternatives are considered, three involving full or partial designation, and the fourth involving no designation. Based upon the lack of support for designation by the affected riverfront communities, no designation is recommended at this time.

CHAPTER 1

BACKGROUND

This chapter provides an introduction to the Wild and Scenic Rivers Act and the upper Merrimack River Study. It includes a review of the project's history, the study strategy and process, the principal participants, and the major study products and accomplishments.

1.1 BACKGROUND ON THE WILD AND SCENIC RIVERS PROGRAM

Enacted in 1968, the National Wild and Scenic Rivers Act (P.L. 90-542, as amended) was created to balance long-standing federal policies promoting construction of dams, levees, and other river development projects with one that would permanently preserve selected rivers, or river segments, in their free-flowing condition. Section 1(b) of the Act states:

> It is hereby declared 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 original Act designated eight rivers into the National Wild and Scenic Rivers System, and specified processes by which other rivers could be added.

Currently, one hundred fifty four rivers or river segments totaling 10,815 miles have been included in the national system. Of the designated segments, only five are located in New England: the Farmington in Connecticut; the Allagash in Maine; the Wildcat and Lamprey in New Hampshire; and the Westfield in Massachusetts.

Each river designated into the national system receives permanent protection from federally licensed or assisted dams, diversions, channelizations and other water resource projects that would have a direct and adverse effect on its free-flowing condition and special values. The Wild and Scenic Rivers Act explicitly prohibits any new dam or other project licensed by the Federal Energy Regulatory Commission (FERC) on or directly affecting a designated river segment, and requires that all other proposed federally assisted water projects in the area be evaluated for their potential impacts on the river's values. Any project that would result in adverse effects to the designated segment is precluded under the Act.

This same protection is provided on a temporary basis for rivers that are under legislatively authorized study for potential addition to the national system. The interim protection remains in place from the date of study authorization until Congress makes a decision on whether or not to designate the river into the national system, or until three years after a final study report is transmitted to Congress by the President, whichever comes first.

1.2 UPPER MERRIMACK RIVER STUDY BACKGROUND

The Merrimack in Franklin.

At the request of seven communities along the upper Merrimack River, Congress authorized the Merrimack Wild and Scenic River Study on August 10, 1990 (see Appendix A), and directed the Department of the Interior through

the National Park Service to conduct the study. The purpose of the study is to determine whether any or all of the segment should be designated as a component of the National Wild and Scenic Rivers System, and if so, how the designated portion should be managed.

The study segment extends from the confluence of the Pemigewasset and Winnipesaukee Rivers in Franklin, NH to the backwater impoundment of the Hooksett Dam, excluding the Garvin's Falls impoundment. The seven communities bordering this segment participated in the study include: the cities of Franklin and Concord, and the towns of Northfield, Boscawen, Canterbury, Bow and Pembroke. Each of these communities selected at least two representatives to sit on a Local Advisory Committee that was established under the State's Rivers Management and Protection Program to make recommendations concerning management of this river segment. This committee was the central partner with the National Park Service throughout the conduct of the study.

The National Park Service also conducted the study in close cooperation with the NH Department of Environmental Services, the Office of State Planning, and the Central New Hampshire Regional Planning Commission. Of particular significance was the Upper Merrimack River Corridor Plan completed in 1991 by the Office of State Planning. This two volume resource provided much of the background information needed for the Wild and Scenic Study, and formed the backbone of resource information about the river. The presence of this recently completed and thoroughly researched document alleviated the need to conduct a new or independent Resource Assessment as a part of the Study.

1.2-A PARTNERSHIP STUDY APPROACH

Two additional points were established at the outset in recognition of local desires and expectations, expectations of congressional sponsors, and established National Park Service (NPS) policy:

1) that the river management plan would emphasize private, local and state conservation measures as alternatives to federal land acquisition and management;

2) that federal designation of the study segment would only be recommended if there were strong local support expressed by vote of town meeting or town council.

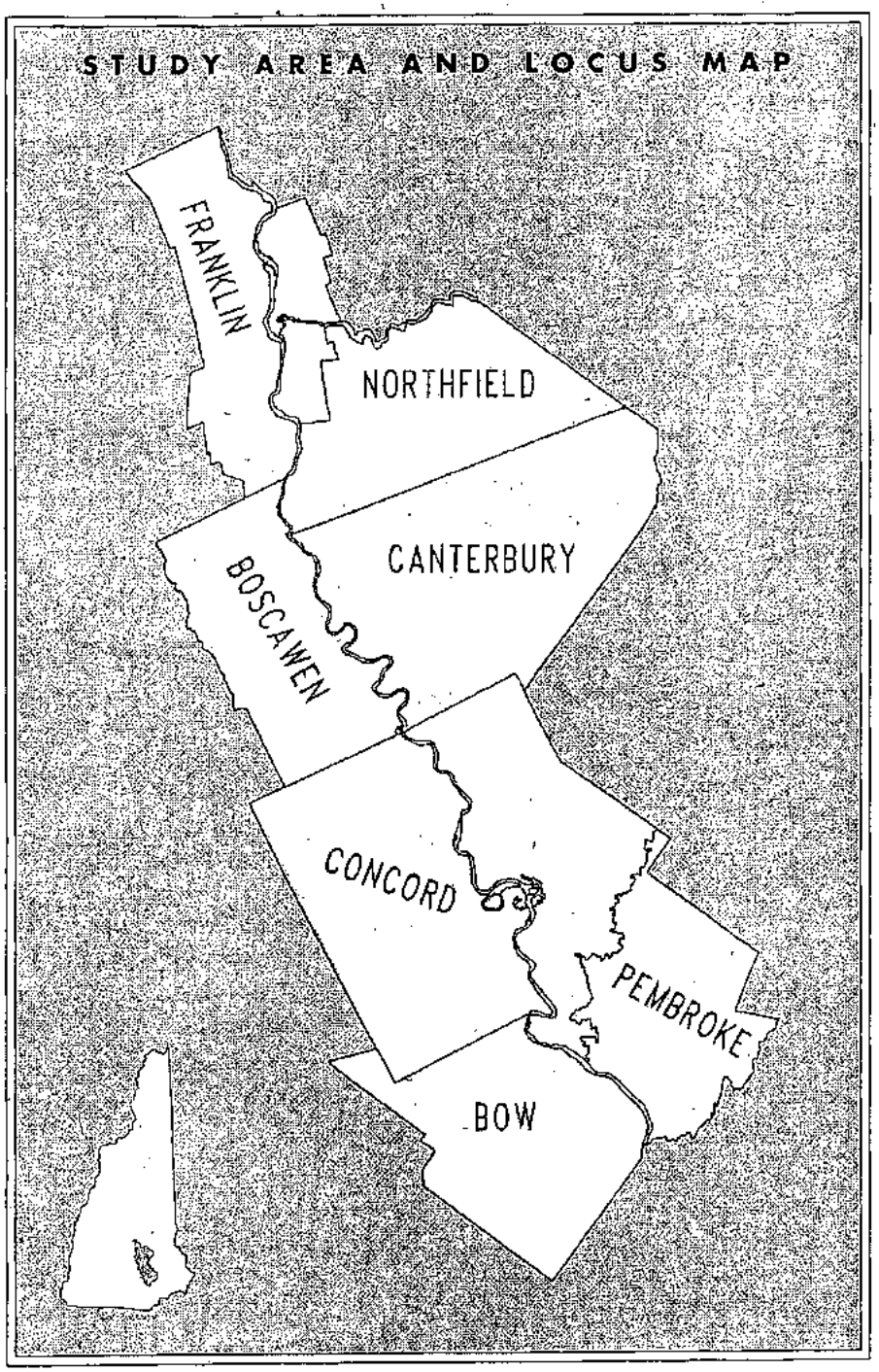
From this starting point the NPS and Study partners developed a study strategy and work plan.

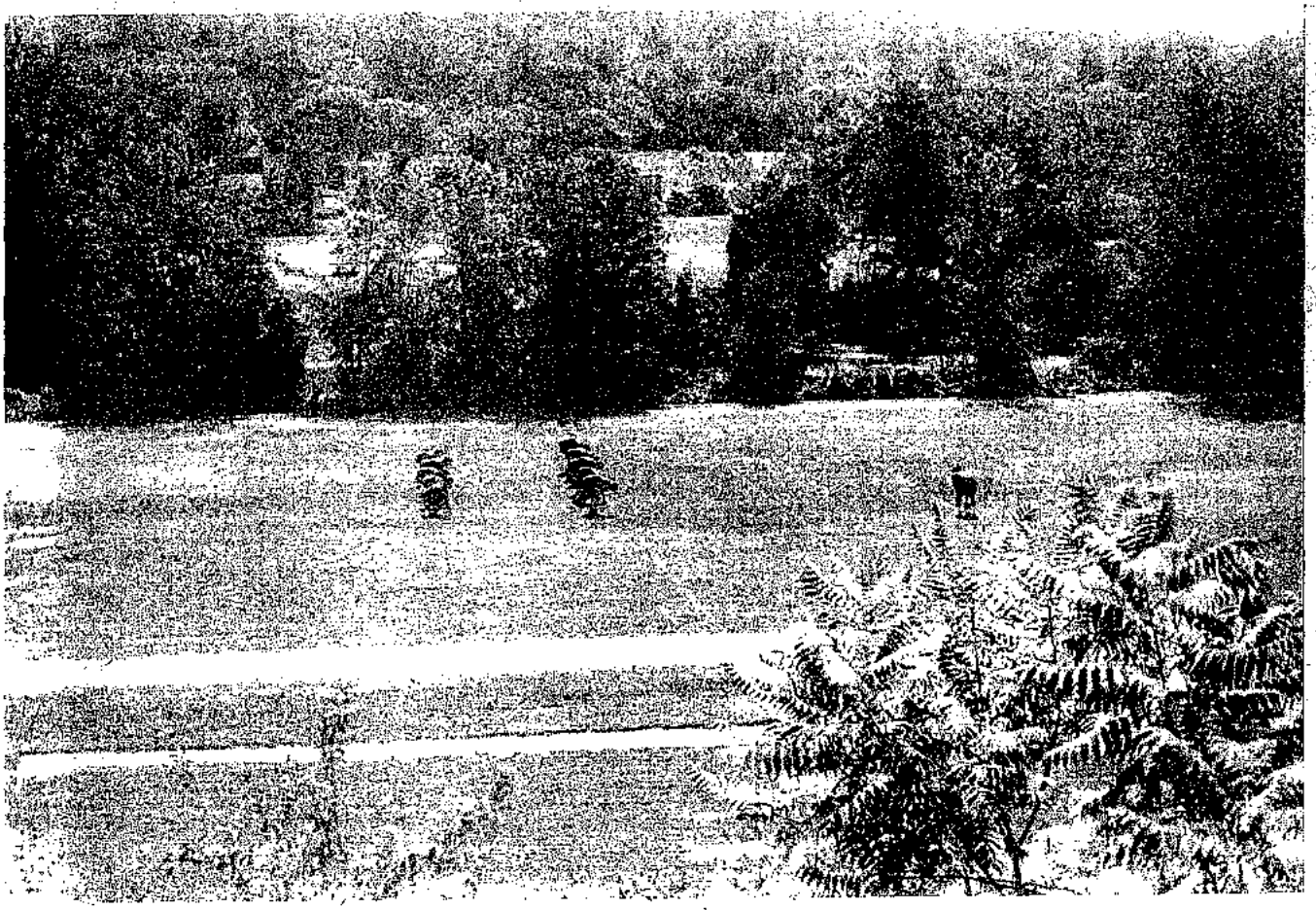
1.2-B PUBLIC INVOLVEMENT

One of the most important elements of the study strategy was to involve the interested public to the greatest extent possible. The Upper Merrimack River Local Advisory Committee (UMRLAC), whose members are nominated by the towns to represent diverse interests, was the focal point for public involvement. Some highlights of the Study's public involvement include:

- Monthly meetings of the UMRLAC open to the public;
- A survey of all riverfront landowners regarding river management and protection issues (see Appendix B);
- Town-by-town public forums held at various points to discuss river issues, the draft River Management and Implementation Plan (Draft Plan), and riverfront landowner survey results;
- Wide distribution of the Draft Plan;
- Draft Plan review by town planning boards and conservation commissions through regular publicly noticed meetings;

Booths at town fairs, articles in local and regional publications, numerous talks with citizens' groups, and similar outreach efforts supplemented the above activities.


STUDY AREA AND LOCUS MAP
FRANKLIN
NORTHFIELD
CANTERBURY
BOSCAWEN
CONCORD
PEMBROKE
BOW



CHAPTER 2

REGIONAL SETTING AND RESOURCE ASSESSMENT SUMMARY

This Chapter summarizes the physical characteristics of the upper Merrimack River, as well as its human community context. This information is taken primarily from the NH Office of State Planning's Corridor Plan, Volume I: Background Information.

2.1 REGIONAL SETTING

The Merrimack River watershed includes approximately 5,010 square miles in New Hampshire and Massachusetts. It is the fourth largest watershed in New England, and the largest in New Hampshire, covering approximately 3,800 square miles of the Granite State. The headwater stream of the Merrimack is the Pemigewasset River which originates in Franconia Notch State Park in the White Mountains of north-central New Hampshire.

The upper Merrimack River study segment extends for a total of about 32 miles from the confluence of the Pemigewasset and Winnipesaukee Rivers in Franklin to the Suncook River confluence at the southern Pembroke town line. This segment is located in central New Hampshire, and includes parts of seven communities—Franklin, Northfield, Boscawen, Canterbury, Concord, Pembroke, and Bow.

2.2 GEOLOGY AND PHYSIOGRAPHY

The surface features of the study area are defined by the erosive activity of the Merrimack River as it re-established its course to the sea following the retreat of the last glaciation approximately 14,000 years ago. Immediately following the retreat of the glacial ice, the Merrimack Valley consisted of a series of large glacial lakes. In New Hampshire glacial lakes Merrimack (south) and Hooksett (north) covered most or all of the study area, and deposited up to 200 feet of deltaic sediments in the valley.

It is believed that these lakes existed for no more than 3,000-4,000 years before terrain uplifting to the north and breaching of glacial debris dams released the river to once again carve its way southward. For the past 10,000 years, the river has been cutting down through these sediments, reaching metamorphic bedrock at areas such as Sewall's Falls and Garvin's Falls.

These bedrock areas greatly slow the downward cutting of the river by stabilizing flow and gradient patterns; however, the river's erosive energy still finds an outlet through lateral erosion and movement. This lateral erosivity is responsible for the sinuous, meandering character of the river as found above both Garvin's Falls and Sewall's Falls. And the river is still hydrologically active today, eroding land on the outside of river bends and depositing sediments on the insides.

The combination of downward cutting and lateral erosion is responsible for the character of the river area as witnessed today. The area is characterized by a resultant floodplain/terrace topography, sinuous river channel, and scattered oxbow ponds caused by the shifting course of the river.

The soils of the river area are dominated by sandy and gravelly glacial outwash soils of the Windsor-Hinckley-Sudbury association and by floodplain soils of the Ondawa-Suncook-Podunk association.

2.3 HYDROLOGIC CHARACTERISTICS

2.3-A GRADIENT

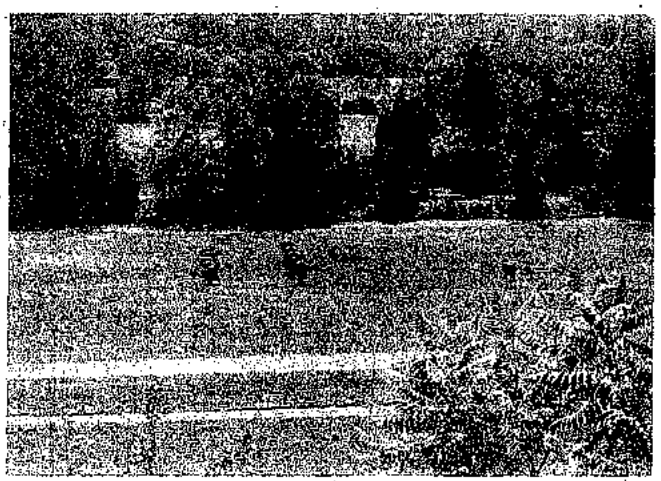
The upper Merrimack exhibits a generally gentle gradient throughout the study area. Beginning in Franklin there are several miles of gentle riffles punctuated by pools of varying sizes. Through Boscawen the river's gradient becomes gentler with generally flat water and some quickwater conditions. Upon entering Concord the river picks up speed as it approaches Sewall's Falls. There are about two miles of fast water and light rapids in the vicinity of the breached Sewall's Falls Dam, with a slightly steeper pitch at the point of the breached dam itself. The average gradient for this 20 miles of river is approximately 1.6 feet per mile, falling from 260 ft. in Franklin to 228 ft. at the base of Sewall's Falls.

Past the dam, the river once again flattens at Sewall's Island and meanders into the center of Concord and beyond to the Garvin's Falls Dam in Bow. The average bed gradient between Sewall's Falls and tailwaters of Garvin's Falls (elevation 200 ft.) is approximately 3 feet per mile. Below the Garvin's Dam the river is flat once again through the remainder of the study segment and beyond to the Hooksett Dam.

The Sewall's Falls, Garvin's Falls, and Hooksett Dam sites are all three natural falls areas that attracted dam construction. The natural pattern of flow through the entire study area would be characterized as relatively flat water punctuated by sudden drops at naturally occurring bedrock outcrops. This pattern is now revealed in its natural state through Sewall's Falls since the breaching of the timber crib dam at that site in 1984.

2.3-B FLOW

As noted earlier, the Merrimack drains roughly 3,800 square miles of watershed area, and is the largest river basin in the State. This watershed area generates an average flow of 7,300 cubic feet per second (cfs) of flow in Lowell, MA. The study segment begins in Franklin where the Pemigewasset's average 2,000 cfs join with the Winnipesaukee's average 700 cfs to produce an initial average flow of 2,700 cfs. At Sewall's Falls in Concord, average discharge equals 4,000 cfs with the addition of the Contoocook's 1,250 cfs and several small brooks. Below Garvin's Falls, the Soucook River adds 113 cfs for an estimated average annual discharge at the bottom of the study area equal to 4,113 cfs.



The Winnipesaukee River in Franklin, just above the confluence. The ball field in the foreground is an appropriate open space use of floodplain lands.

Because of the large drainage area, the Merrimack generally retains reasonable flow levels in summer months. Average summer low flows in Concord are estimated to be 1,000 cfs, with 600 cfs exceeded 99% of the time. Spring run-off high flows are somewhat regulated by the presence of the Army Corps of Engineers' Franklin Falls flood control structure which is managed to release a maximum of 29,000 cfs. The only dam on the study segment is Garvin's Falls Dam south of Concord. The Garvin's Falls Dam is a hydroelectric generating station (FERC #1893 NH) owned and operated by Public Service Company of New Hampshire. It operates in a generally run-of-the-river fashion, but does cause some fluctuations in upstream water levels. The dam is 20 feet high at its highest point, and produces an annual average of 42,100 MWH.

The Federal Energy Regulatory Commission's project boundary for the Garvin's Falls project extends upstream to a point just north of Sewall's Island in Concord. PSNH is required to maintain a minimum release of 709 cfs below the dam (or inflow if less than 709).

The impoundment created by the Hooksett Dam (also FERC# 1893 NH) to the south of the study segment impacts the flow of the river nearly to the base of the Garvin's Falls Dam (the extent of the project boundary). This dam is also owned and operated by Public Service Company of New Hampshire. It operates as a run-of-the-river facility, and also serves to maintain water levels for cooling intakes at the Merrimack Station coal fired generating station in Bow. The minimum flow requirement for the Hooksett Dam is 819 cfs.

2.3-C WATER QUALITY

For decades the Merrimack River, including the study segment, existed as one of the most polluted rivers in America. Untreated industrial and municipal waste discharges throughout the watershed rendered the river essentially life-

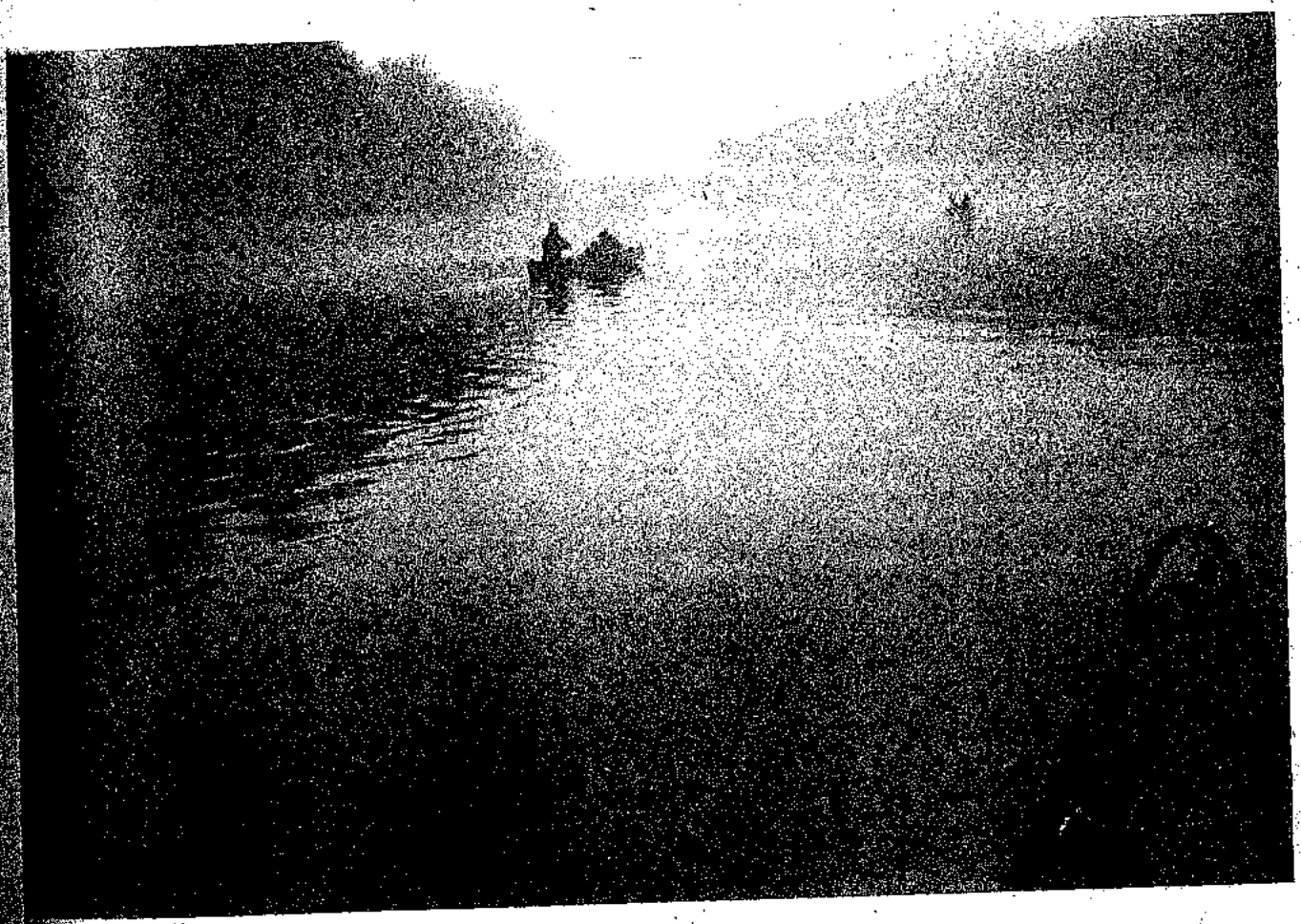
less—a blight on the landscape that was to be avoided at all costs. Changing economic trends together with the passage of the Federal Water Pollution Control Act of 1972 have led to a dramatic recovery for the Merrimack River. Since 1972 nearly 500 million dollars of federal funds have been allocated toward the construction of municipal treatment facilities in the Merrimack watershed. Local communities have spent nearly as much on collection systems.

In the study area, the Merrimack River is legislatively classified as a Class B river—suitable for fishing, swimming, irrigation, and, after adequate treatment, for drinking water supply. According to the US Fish and Wildlife Service, water quality no longer constitutes an impediment to anadromous fish restoration in the Merrimack River. This is despite the fact that the entire Merrimack, including the study segment, remains very much a working river, with substantial demands upon its water resources. The Office of State Planning Report documents 71 municipal waste treatment plants which discharge into the Merrimack basin, and 141 industrial users that use the river for waste assimilation or process water. Discharges into the river must meet secondary treatment standards that are determined by the physical and biological characteristics of the receiving waters.

Within the study area, the NH Department of Environmental Services' Water Resources Division documents 11 registered withdrawals and discharges into the Merrimack River (users must register with the DES if they use more than 20,000 gallons of water per day). Of these 11, eight are wholly or primarily non-consumptive (water is returned to the river) and three are consumptive; all three consumptive uses are for agricultural irrigation. Of the eight non-consumptive uses, three are municipal waste water treatment facilities, three industrial processing, one institutional, and one hydroelectric generation.

Today's threats to water quality on the Merrimack include: sometimes toxic discharges from permitted facilities; nonpoint source water pollution threats from agricultural, residential, urban run-off, road salts, etc.; site specific problems such as combined sewer overflows (Penacook) and landfill leacheats. Two wastewater treatment plants in Concord have a toxic discharge of total residual chlorine. This means that the amount of chlorine used to treat bacteria is high enough to create a toxic discharge into the river. When new permits are issued for these facilities a limit on the amount of chlorine will be included in the permit guidelines.

The Pemigewasset River in Franklin, just above the confluence to form the Merrimack. Trout fishing is popular in this stretch.



CHAPTER 3

ELIGIBILITY AND CLASSIFICATION FINDINGS

The purpose of this chapter is to document National Park Service findings relative to: 1) the "outstandingly remarkable" natural and cultural resource values associated with the Upper Merrimack River study segments; 2) the "free-flowing character" of study segments; and 3) proposed "classifications" under which eligible river segments could be included in the National Wild and Scenic Rivers System. These findings were presented in draft form as a part of the study process.

3.1 ELIGIBILITY AND CLASSIFICATION CRITERIA

The subsections below describe the relevant eligibility and classification criteria as set forth in the Wild and Scenic Rivers Act and in the USDA/USDI Interagency Guidelines for Eligibility, Classification, and Management of River Areas as published in the Federal Register on September 7, 1982.

3.1-A OUTSTANDINGLY REMARKABLE VALUES

To be considered eligible for inclusion in the National Wild and Scenic Rivers System a river segment, together with its adjacent lands, must support one or more "outstandingly remarkable" natural, cultural, or recreational resource values. Such resource values must be directly related to, or dependant upon, the river. The "outstandingly remarkable" threshold within the Act is designed to be interpreted through the professional judgement of the study team.

The descriptions below provide examples to help interpret this "outstandingly remarkable" eligibility requirement.

Nationally Significant Resource Values

Resource values which are nationally significant clearly meet the "outstandingly remarkable" threshold. A nationally significant resource would be rare or exemplary at a national scale. For example, a recreational boating experience which draws visitors from all over the nation would qualify as a nationally significant recreational resource.

Regionally Significant Resource Values

Based upon the desirability of protecting a regional diversity of rivers through the national system, a river segment may qualify based on regionally rare or exemplary resource values. For example, a river segment which supports wildlife populations rare or endangered within a given region (New England or New Hampshire in this case) can qualify even if that population may not have clear "national" significance.

Resource Values Significant in Aggregate

A river may qualify for a given resource value based upon an aggregate of important values, no one of which would confer eligibility standing alone. For example, a series of unusual and distinctive river-related geologic features may together qualify a segment as exhibiting an "outstandingly remarkable geologic resource value" even though no one element meets the criteria alone.

3.1-B FREE-FLOWING

The Wild and Scenic Rivers System is designed to protect only "free-flowing" rivers and streams that support qualifying resource value(s). The Act's definition of "free-flowing" varies somewhat depending upon the potential classification of the river area under consideration. Potential "Wild" and "Scenic" river segments must exhibit essentially natural stream channels and may not be dammed or impounded. "Recreational" river segments may be more impacted by channel alterations and may include "some existing impoundments, diversions, and other modifications of the waterway," as long as the river remains "generally natural and riverine in appearance."

3.1-C CLASSIFICATION CRITERIA

The Wild and Scenic Rivers Act requires that all eligible or designated river segments be classified as Wild, Scenic, or Recreational. These classifications are based solely on the amount of human impact present at the time of classification. The Act defines them as follows.

- 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 waters unpolluted. These represent vestiges of primitive America.

- 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.

- Recreational river areas—Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

3.2 OUTSTANDINGLY REMARKABLE RESOURCES

This subsection describes the outstanding natural and cultural values supported by the Upper Merrimack River through the study area. Not all river reaches in the study area support all noted outstanding values, but there is no stretch of river which does not contribute to the viability of the whole.

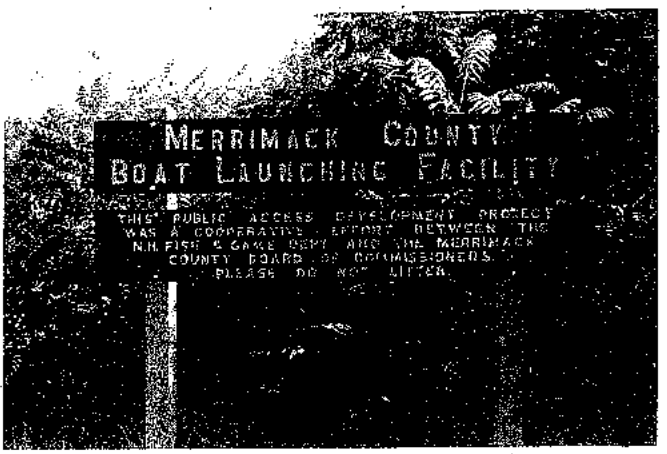
3.2-A RECREATION

The upper Merrimack River offers outstanding opportunities for fishing, swimming, boating and other water oriented recreation. It has excellent access and an extremely long recreational use season. The New Hampshire Heritage Trail is under development along its banks by the state and local communities. These and other attributes qualify the river as a regionally unique and exemplary recreational resource.

Scenery

The Upper Merrimack River is characterized by a remarkable diversity of scenery including expansive agricultural lands, dense upland forest cover, floodplain forests, high and low sand bluffs, exposed bedrock, and historic structures. Each of these contributes to the overall scenic value and appealing scenic diversity of the river. Overall, the river is remarkably undeveloped and "natural" in feel and appearance. In travelling on the river between Franklin and center Concord, one encounters only a handful of visible residences. The only other man-made intrusions are three bridge crossings, the remnants of the Sewall's Falls Dam and its appurtenant structures, agricultural activities, and the towering steeple of the First Congregational Church in Boscawen.

Through the center of Concord itself, the river remains remarkably natural in appearance. A wide and scenic floodplain forest buffers the west side of the river between the I-93 crossing and the Louden Rd. bridge, while the east side of the river is occupied by high bluffs and the protected lands of the Merrimack River Outdoor Education and Conservation Area.



The presence of substantial institutional and public lands along the Merrimack is important to the river's protection and public access.

As one approaches the Louden Rd. bridge the wooded buffers thin and views of the City are opened up on the west. This opening is brief before one returns to agricultural fields on the east and wooded open space to the west. Just before reaching the end of the upper portion of the study segment at the Manchester Street bridge, the fields on the east give way to a high bluff followed by Terrill Park which extends to the bridge.

Below the Garvin's Falls Dam the study segment picks up again with wooded and undeveloped conditions again prevailing. There are only a couple of primitive cabins and residences near the river in this area. These conditions prevail throughout the rest of the study segment (Suncook River confluence) on the eastern shore of the river in Pembroke. To the west (Bow), this character is broken near the end of the study segment by the substantial presence of the coal fired Merrimack Station electrical generating plant operated by Public Service Company of New Hampshire.

A survey of river recreationists done in 1988 found that scenic beauty, undeveloped character, and the enjoyment of nature and the outdoors were the most important attributes to people using the river.

Instream Recreation

The Upper Merrimack exhibits outstanding instream recreational values and characteristics. The river has high water quality, numerous public and private access sites, and a variety of deep pools and riffle areas. The river's lack of treacherous rapids make it ideal for family oriented outdoor appreciation. These characteristics combine with outstanding scenery and an undeveloped character to create an ideal environment for fishing, boating, and swimming. The river's size and flow characteristics make it suitable for these activities through all seasons—the river is boatable, swimmable, and fishable even in August low flow conditions. This is an unusual and very important aspect of the river's instream recreational value. When other rivers and streams of the region have long since been unboatable and unfishable due to low flows, the Merrimack is still supporting these activities.

The OSP report lists nineteen publicly used boat accesses between Franklin and Garvin's Falls Dam, and there are three more in Pembroke and Bow below this point. These accesses range from publicly owned and maintained concrete ramp facilities to mere paths to the riverbank suitable only for canoe or kayak launches by the sure-footed. This mix of facilities provides excellent access at an appropriate scale to accommodate present demand.

There is one canoe livery and rental service on the study segment. This operation has become steadily more popular since its opening in 1986. Trips range from several hours to overnight, two day excursions. Camping is popular along beaches and islands through Canterbury, Boscawen, and Concord, and to some extent in Bow. There are numerous deep holes for swimming, and pleasant beaches and banks for picnicking, and sunning. The popularity of non-motorized boating on the segment above Sewall's Falls will undoubtedly continue to increase. This upper stretch has too many shallow areas to be well suited for motorized recreation, though some does occur in higher water and in isolated stretches. The quality, length and long season of this boating segment makes it one of the best family-oriented river recreation opportunities in New England.

These values are reflected in the results of a comparative analysis performed to determine the relative significance of the non-motorized boating opportunity on the upper Merrimack. Twenty-five well known boating river segments in New Hampshire, Vermont, and Maine were reviewed by a team of experts, and were rated in the following categories: length of season; flow; character; scenery; access; level of use; associated opportunities; and camping opportunities. The Merrimack between Franklin and Concord rated fifth over all behind two segments of the Androscoggin, and one segment each of the Pemigewasset, Saco, and White (VT). The study segment between Concord and Hooksett rated fifteenth, reflecting the higher use of this area for motorized recreation. The complete results and methods for the comparative analysis are contained in Appendix C.

Motorized boating is popular below the Sewall's Falls area, and continues to be so through the remainder of the study area. Boat ramps suitable for the launching of powerboats occur in Concord at the NH Technical Institute and in Bow at PSNH's recreation facility. The Merrimack County boat launch in Boscawen is also suitable, though the water conditions in this area are generally unsuited to motorized use.

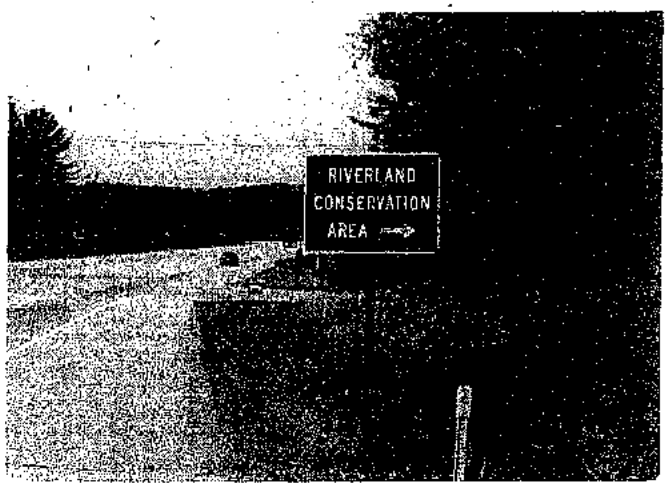
The river is regionally noted as both a bass and trout fishery. The area around Sewall's Falls is noted for producing large trout throughout the summer season. The river's large size and flow in this area, together with the steeper, riffly gradient, serves to maintain adequate flows and oxygenation, and, at the same time, places plenty of habitat near the center of the river out of the reach of shore anglers—thereby assuring that trout will have safe holding habitat.

The existing fishery has the potential to be greatly enhanced through the Atlantic salmon restoration program. The New Hampshire Fish and Game Department has identified seven priority areas along the mainstem Merrimack where angling opportunity and success will be maximized—four of the seven are located along the Upper Merrimack study segment. Current plans call for stocking of excess adult salmon into the Merrimack River in these prime areas beginning in 1993, providing anglers a glimpse of what the future may hold.

Smallmouth Bass fishing is the most popular non-salmonid fishery in the upper Merrimack, though the oxbow ponds and some areas of the mainstem are also noted for largemouth bass and pickerel. The most concentrated use appears to occur in Concord below Sewall's Falls, but nearly the entire segment is utilized.

Shorebank Recreation

The scenic and recreational assets of the Merrimack have been well recognized by the communities along the river, as well as the State. Each of the seven communities has at least one riverfront park area, as well as river access of some type. Examples include municipal riverfront parks in Canterbury, Boscawen, Concord, and Pembroke. In Franklin, a series of riverfront trails follow the river's west bank along



One of numerous local conservation and recreation areas along the upper Merrimack. This area is in Canterbury.

public land. In Bow, PSNH maintains an access site and recreational area for that town's residents.

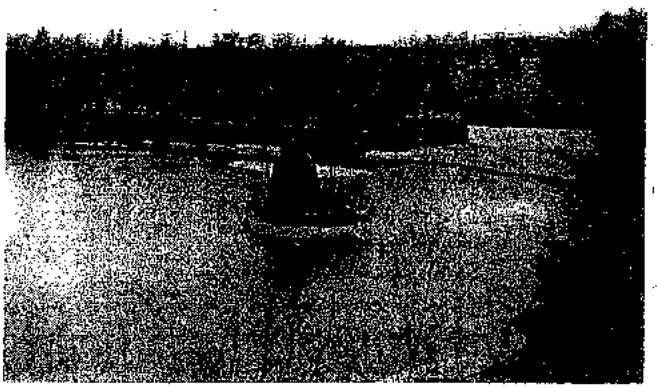
The State of New Hampshire, in partnership with local and federal organizations, is currently developing the Sewall's Falls Multiple Use Recreation Area on a large tract of riverfront land surrounding the Sewall's Falls Dam site. This area will be a regionally significant recreational attraction, including full facilities for handicapped enjoyment.

Also at the state level, the Upper Merrimack has been chosen by the State Legislature as the pathway for the New Hampshire Heritage Trail - a 230 mile trail designed to "tell the continuing story of the State's history, natural resources, culture, and economy." This effort is dependant upon the Merrimack River corridor for success, and is clearly a recreational project of State and regional significance.

Another regionally significant feature of the Upper Merrimack River is the presence of the Merrimack River Outdoor Education and Conservation Area in Concord. Owned and operated by the Society for the Protection of New Hampshire Forests, this center is regionally significant for recreation and outdoor education.

Geographic Location

The outstanding recreational attributes of the Upper Merrimack



Remains of early rail and mill development at the junction with the Contoocook River.

are all the more noteworthy given its geographic location. The segment flows right through the middle of the State's capitol city, Concord. Also on the study segment is another regional population center, Franklin. The State's largest City, Manchester, is less than twenty minutes away by car, and Boston is roughly 90 minutes. This segment of the Merrimack has potential to be an extremely significant recreational asset to all of these population centers, and already is for some.

3.2-B WILDLIFE

The upper Merrimack River provides significant bald eagle wintering habitat and may offer important nesting habitat as the regional eagle population recovers. The river provides highly significant habitat for migrating and breeding waterfowl, bank nesting avians, and for other resident and migrant species.

Bald Eagles

The Merrimack River is one of five recognized bald eagle (Haliaeetus leucocephalus) wintering habitat areas in the state of New Hampshire, and ranks as the state's second most utilized eagle wintering habitat after Great Bay. While the greater proportion of eagle activity on the Merrimack occurs downriver from the study area, significant activity occurs at the head of the river in Franklin, in the Canterbury/Boscawen/Concord area near the mouth of the Contoocook River, from Sewall's Falls to Bow Mills, and from the Garvin's Falls Dam to the backwaters of the Hooksett impoundment.

New Hampshire's eagle wintering areas provide critical habitat for eagles from Maine, Canada, and other parts of the northeast region. Suitable wintering habitat areas are deemed to be a critical limiting factor in the recovery of the regional population. The undeveloped shorelines of the upper Merrimack may also one day prove a suitable nesting grounds for New Hampshire's eagle population. In 1989 a single nesting pair of bald eagles returned to Lake Umbagog in New Hampshire after a forty year absence. Since 1989, this pair has remained NH's only nesting pair of bald eagles.

The bald eagle is listed as an endangered species by both the federal government and the State of New Hampshire.

Waterfowl

The upper Merrimack's undeveloped shorelines and oxbow ponds provide excellent habitat for migrating and breeding waterfowl. Canada Goose, Snow Goose, American Black Duck, Mallard, Blue-winged Teal, Wood Duck, Ring-neck Duck, Common Golden-eye, Hooded Merganser, and Common Merganser are the most commonly encountered migrants. Breeding species include American Black Duck, Mallard, Wood Duck, and Hooded Mergansers. River sections which remain open during the winter months support wintering populations of Canada Geese, American Black Ducks, Mallards, Common Golden-eyes, and Hooded and Common mergansers.

Bank Nesting Avians

A noteworthy feature of the upper Merrimack is its excellent habitat for Bank and Northern Rough-winged swallows and the Belted Kingfisher, which excavate nesting burrows in the vertical faces of sand banks along the river. Bank Swallow nesting cavities are a conspicuous feature of the river.

Deer Wintering Areas

The NH Fish and Game Department has mapped three deer wintering areas adjacent to the study segment. These

areas provide critical sheltering habitat during periods of high biological stress in winter, and are important for the health of the regional deer population.

Neotropical Migrants The Merrimack River valley is a major travel corridor for neotropical migrant birds, many of which are undergoing significant population declines. More than 50 species of neotropical migrants use the river as a travel corridor in Spring and Fall, feeding and resting in a variety of habitats. The abundance of insects associated with aquatic habitats and the diversity of fruit and berry producing plants on rich, moist bottomland soils provide critical resources to sustain small birds on long distance migrations.

Other Threatened or Endangered Wildlife Species

There are 12 state or federally listed threatened or endangered wildlife species of known or potential occurrence in the upper Merrimack corridor. In addition to the Bald Eagle, three regularly use the river and its oxbows during migration. Migrating Ospreys use the Merrimack as a major travel corridor, and individuals frequently spend several days resting and fishing on various stretches within the study area en route to and from more northern breeding grounds. Pied-billed Grebes use slow stretches of the river and deeper backwaters during migration, and may occasionally nest on associated wetlands supporting open water and extensive emergent vegetation. Common Nighthawks follow the river corridor during migration, feeding on the flying adults of various aquatic insects. Individuals from nesting populations in Franklin, Penacook, and Concord also forage on the river during the breeding season.

3.2-C FISH AND AQUATIC RESOURCES

The upper Merrimack provides critical habitat for the Merrimack River Anadromous Fish Restoration Program. Resident fish values rank tops in the state for overall habitat quality and diversity, species diversity, and recreational significance. In addition, the study segment supports a regionally significant diversity and quantity of freshwater mussel species.

Anadromous Fish

Modern anadromous fish restoration efforts formally began on the Merrimack River in 1969 following passage of the Anadromous Fish Conservation Act of 1965 which made restoration of anadromous fish stocks a national priority. The Merrimack is one of three river basins in New England in which anadromous fish restoration has been embarked upon as a full scale federal-state cooperative with private and public partnerships. Together, three federal agencies (the US Fish and Wildlife Service, National Marine Fisheries Service, US Forest Service) and the states of Massachusetts and New Hampshire have spent over 13 million dollars on the effort through 1992. This figure has been at least matched by the private sector, principally through the construction of fish passage facilities on mainstem dams.

Anadromous fish species under restoration include the river herring, American shad, and Atlantic salmon. Impassable dams, pollution, and overfishing all contributed to a drastic reduction (elimination, in the case of salmon) in fish runs during the last century. Today, annual counts of returning fish at fish passage facilities on the Merrimack River, such as the Essex Dam in Lawrence Massachusetts, are marking the return of these sea-run fish.

The marquis species under restoration is the Atlantic salmon. The program's overall goal for Atlantic salmon is:

> To restore the Atlantic salmon resource to a level of optimal utilization of the existing habitat in the Merrimack River basin for public benefit (Merrimack River Policy and Technical Committee, 1990).

The upper Merrimack is critical to the success of this restoration since fish must pass through this area to reach the Pemigewasset River and its pristine spawning habitat areas. The NH Fish and Game Department has identified seven priority habitat reaches on the Merrimack where fish will be expected to congregate on the way toward their ancestral spawning grounds. These are critical holding and resting areas which will also be prime fishing areas. Four of these areas are located on the upper Merrimack study seg-

record, and the most critical habitat area is located in the Sewall's Falls area.

The historic Sewall's Falls breached dam on the Merrimack River in Concord. A proposal to build a larger dam downstream of this site threatened Anadromous fish plans, agriculture, historic and archealogic sites.

Restoration efforts depend upon providing fish passage through the seven major dams which impound the Merrimack River. To date, facilities have been installed at the three most downstream dams—the Essex and Pawtucket dams in Lawrence and Lowell, Massachusetts, and the Amoskeag dam in Manchester, New Hampshire—enabling returning salmon to get part way upriver. Construction of fish passage at the four remaining upstream dams will be triggered by increasing returns of fish at downstream locations. Hooksett and Garvin's Falls dams will have passage facilities constructed based upon a threshold of returning American Shad.

The table below details the return rate of Atlantic Salmon and American Shad to the Merrimack River basin. The fish were captured and counted at the Essex Dam in Lawrence, Massachusetts. In 1991, a record 332 adult salmon were captured at the Essex Dam during the fish passage season. Although this number is less than the number of fish tallied on the Penobscot and Connecticut Rivers during the same year, it represents significant progress over the 23 returning fish captured on the Merrimack in 1982.

Prospects for the success of the restoration program have received a boost from a recently enacted moratorium on commercial salmon harvesting in Newfoundland and a government-sponsored fisherman buyout program being implemented in Labrador. Greenland, also noting serious declines in salmon populations, is reportedly considering protective measures as well. In addition, ongoing fish cultural research relative to hatchery rearing techniques, diet, disease prevention, and genetics, holds out the promise of improved salmon stock.

Ultimately, the goal of the Merrimack River Anadromous Fish Restoration Program is to have some 3,000 adult Atlantic salmon returning to the Merrimack River basin each year to complete their life cycle in the waters of the Pemigewasset River and its tributaries. Stocked fish would augment this number and, south of Ayers Island dam, provide sport to a public eager for the return of this prized gamefish.

Year	No. of Salmon	No. of Shad	Year	No. of Salmon	No. of Shad
1982	23		1990	248	6,013
1983	114	5,629	1991	331	16,098
1984	115	5,597	1992	199	20,796
1985	213	12,793	1993	61	8,399
1986	103	18,173	1994	21	4,349
1987	139	16,909	1995	34	13,857
1988	65	12,356	1996	76	11,322
1989	84	7,875	1997	71	22,586

Resident Fish

The Upper Merrimack River is a regionally recognized sport fishery for both Smallmouth Bass and Rainbow, and Brown Trout. The Sewall's Falls area is particularly noted trout habitat. In addition, the cut-off river meanders are very popular and productive fisheries for Smallmouth Bass, Largemouth Bass, Pickerel, and Bullhead. The excellent access available on the Upper Merrimack combines with the quality and diversity of the fishery to produce a heavily used recreational fishery. This fishery is enjoyed by shorebank anglers, canoers, and power boat (below Sewall's Falls) fishermen alike. In addition, the extremely diverse habitat of the Upper Merrimack combines with its high, class B water quality to support a reported 27 species of resident fish. In order to ascertain the regional significance of these and other attributes of the upper Merrimack's resident fish resource, a comparative study was conducted. Fifty-three New Hampshire rivers or river segments rated as "highly significant" for inland fisheries by a 1983 New Hampshire Rivers Center Study were used for the comparative analysis. Explicit criteria used to evaluate the resource included structural habitat quality, diversity and value of species, populations of species, natural reproduction, size and vigor of fish, quality of aesthetic experience, level of use, and access. Each river segment was rated for each criterion on a scale from 1 to 4, with 1 indicating that the value in question was largely insignificant in the context of the region and 4 indicating that the particular value was present to an outstanding degree. The survey team that completed the questionnaires was comprised of experts from the U.S. Fish & Wildlife Service, New Hampshire Department of Fish & Game, New Hampshire Wildlife Federation, Trout Unlimited, and the Pemigewasset Fish & Game Club.

The results of the comparative analysis (see Appendix C) rank the upper Merrimack as the number one resident fish resource of New Hampshire, ranking at or near the top in all categories.

A quiet morning on the River.

Aquatic Resources

During the summer of 1992, the US Fish and Wildlife Service and NH Fish and Game Department conducted a limited field survey of the portion of the upper Merrimack in Boscawen/Canterbury and Concord. The purpose of the survey was to look for freshwater mussel species, in particular the Brook Floater (*Alasmidonta varicosa*)—a State Endangered Species and federal candidate for endangered listing.

The survey revealed highly significant mussel beds throughout the area. These beds support at least six species of freshwater mussel, including the Brook Floater. Currently, more extensive field surveys are being planned for the '93 field season to further document the quality, diversity, and distribution of the mussel habitat.

Mussel Species of Known Occurrence in the Upper Merrimack River

Common Name	Latin Name
Common elliptio	*Elliptio complanata*
Eastern lampmussel	*Lampsilis radiata*
Triangle floater	*Alasmidonta undulata*
Squawfoot	*Strophitus undulatus*
Eastern floater	*Anodonta cateracta*
Brook floater	*Alasmidonta varicosa*

(source: New Hampshire Natural Heritage Inventory)

1 / D CULTURAL RESOURCES

The historic and archaeologic information summarized in this section is based on reports prepared by the NH Division of Historical Resources for the National Park Service and NH Office of State Planning.

The historic and archaeologic resources of the upper Merrimack River are abundant, diverse, and well preserved. They are capable of conveying the history of 10,000 years of human settlement in central New Hampshire. These attributes contribute to the river's regionally unique and exemplary cultural resources.

The upper Merrimack River has been a focal point for settlement and habitation for at least 10,000 years. The river corridor contains a vast and diverse historical record which spans at least three prehistoric periods (Archaic, Woodland, and Contact) and nearly 400 years of modern historical development. The relatively undeveloped nature of the corridor, combined with the nature of the development which has occurred, has preserved this rich historic and pre-historic archaeologic record to an unusual degree.

The discussion below hits only a few highlights of this rich history.

Pre-Historic Archaeologic

Several archaeological sites of known importance have been investigated and documented along the upper Merrimack, but, according to the New Hampshire Division of Historical Resources, these have only scratched the surface of what is believed to exist. According to statements of the Division's Director, these archaeological resources could be the finest in New England.

The earliest Native American habitants of the upper Merrimack were drawn to the area principally by its anadromous fishery and its natural status as a transportation and communications corridor. Sites along the upper Merrimack from this era date back almost 10,000 years to the early Archaic period, and are concentrated at river falls areas (Sewall's Falls, Turkey River Falls, Garvin's Falls), and at confluence points of major tributaries (origin in Franklin, Contoocook River, Soucook River, and Suncook River). These areas represent heavily and repeatedly used sites for encampments and seasonal outposts for the region's migratory Indian population.

Later, during the Woodland Period (3,000 - 400 years before present), as Native American populations formed more permanent settlements, the upper Merrimack continued to be a focal point. Its fisheries remained important, but were complemented by its rich bottomland soils ideal for emerging subsistence cultivation patterns. The broad floodplain areas of present-day Concord, Boscawen, and Canterbury, in particular, provided a basis for the development of permanent Indian settlements in the region. The archaeologic record from this period is extensive along the Merrimack. Several rich sites have been discovered and investigated, including the Beaver Meadow site and the New Hampshire Technical Institute site. The vast majority of this record, however, remains unexplored.

During the Contact Period (contact with European colonial settlers) in the early 1600's, colonial traders and, later, settlers encountered well established American Indian tribal settlements. These settlements were principally components of the Penacook Confederacy headed by Chief Passaconaway whose principal village and three forts were located in Concord. The name "Penacook" means "the crooked place," and reflects the dependence of the Indian inhabitants upon the broad intervales of the Merrimack River. This is a rich period in the history of the region, but one with comparatively few known surviving archaeologic remains due to the brevity of the Period and the swiftness with which colonial settlements overtook the region.

Historic

The OSP report contains a partial listing of known historical sites between Franklin and Garvin's Falls, including numerous colonial farmsteads (including Daniel Webster's experimental farm), two historic dams, canal works, an indian fort, three historic residential districts, three historic

bridges, two factory/ manufacturing areas, and a railroad. This is only a partial listing of better documented sites taken from the more extensive materials supplied by the Division of Historical Resources. Below Garvin's Falls, the Division of Historical Resources has documented noted brickyards, the Bow canal, the Suncook Branch of the Concord and Montreal Railroad, early farmsteads, the Londonderry and Chester Turnpikes, and the many sites in the village of Suncook. These specific sites are remnants of a rich history which surrounded the development of the Merrimack River as a backbone for the State of New Hampshire.

Colonial settlers and traders were attracted to the region of the upper Merrimack for the same reasons that Native American settlements thrived—as a trading and agricultural center, and for its anadromous fisheries. Between 1630 and roughly 1680, colonial influence grew to the point that the Penacook Indians were permanently driven from the valley. By the early 1700's, the remaining conflicts with the Indians had been completed, and the desirability of the area for permanent settlement lead both New Hampshire and Massachusetts to claim the area as their own. This dual claim lasted until 1740 by which time the established settlements of the Scotch-Irish, including a 1725 fort in present-day Concord, had secured the area for New Hampshire.

The colonial settlements along the river in Concord, Boscawen, and Canterbury gained quick prominence as some of the most productive farming communities in the state due to the rich agricultural lands associated with the fertile floodplain. To reflect this, Concord and Boscawen developed along similar lines, with villages established on high ground overlooking the agricultural floodplain and river, a pattern still clearly visible today in the historic districts of both communities.

By the time of the American Revolution Concord was well established as a trading center as well, with regular ferry service established at key points along the river. At this point, the river also served to transport logs from as far north as the White Mountains to the mills at Lowell. This use of the river was augmented by the construction of the Middlesex Canal completed in 1814 to connect Concord to Boston. This canal system solidified Concord's importance as a center of commerce for the entire region, and fostered the construction of private turnpikes connecting to Portsmouth, the Connecticut River valley and Vermont, and southern New Hampshire and Massachusetts.

In the mid-1800's, the railroad began to replace the canal as the principal route for transportation and commerce. By 1846, the Northern Railroad had reached all the way to Franklin, causing that city to blossom as a manufacturing center whose mills were powered by the waters of the Winnepesaukee and Pemigewasset Rivers just above their confluence. During the mid and late 1800's, Franklin became one of the region's most important manufacturing centers, known for the manufacture of knitting machines, hosiery, woolens, and paper. Similarly, the village of Penacook thrived as a manufacturing center from the combination of rail service and water power at the mouth of its tributary to the Merrimack—the Contoocook River.

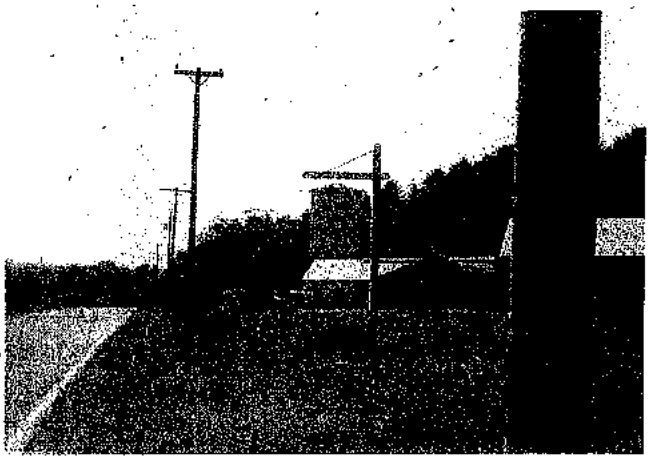
Concord itself never supported this sort of riverfront manufacture, though more than one attempt was made at Sewall's Falls. In 1893 the Concord Land and Water Power Company built the world's largest timber-crib dam at Sewall's Falls on the Merrimack River. The dam was to be the centerpiece for a grand complex of development that would have created another distinct village within Concord. These plans never materialized, but the dam did provide much of the power for Concord's future development, including electric trolley and street lights, and domestic electric service.

Agriculture

The agricultural resources of the upper Merrimack River's floodplain and bottomland areas have been the heart of the region's identity for thousands of years. Today, agriculture remains the most important land use along the river, and continues, in large part, to define the region's cultural and economic identity. This preserved agricultural heritage is an important aspect of the river's value as a regionally unique and exemplary cultural resource.

The agricultural resources of the upper Merrimack River valley have been a major defining characteristic of the region's culture and economy for thousands of years, dating to the Native American settlements of the Woodland Period. It was this productive bottomland agriculture which enabled the Penacook Indians to thrive in stable communities, cultivating such traditional foods as corn (maize), squash and pumpkins.

It was this agricultural land which attracted European settlers and defined the development, productivity, and reputation of the region during colonial times. Many of the most important historic and cultural sites along the river reflect this agricultural heritage. In Concord and Boscawen historic districts overlook the agricultural floodplain as a reminder of this heritage. Concord's Horseshoe Pond agricultural area has been continuously cultivated since that era, and has been protected through easement to remain a permanent tribute to this heritage. In Franklin, the home and experimental farm of one of New Hampshire's most famous statesman, Daniel Webster, is located along the river, and is still in cultivation today. This site is a National Historic Landmark.



The agricultural lands along the Merrimack are closely tied to the regions history and culture.

And today, agriculture along the Merrimack River continues to be a major and defining characteristic of the region's culture and economy. The Merrimack River Valley is one of four recognized agricultural centers in the state. Over 1,500 acres of nationally designated "prime" agricultural soils are currently under cultivation along the study segment. Another 600 plus acres are recognized as being of statewide agricultural importance. The soils which form the basis of these productive lands were deposited by the river over geologic time, and most are found within the river's present-day floodplain. The retention of such productive farmlands has been recognized as a national, state, and local priority for cultural, economic, and open space reasons.

The open space value of these lands, and the scenic diversity they afford are likewise a critical element of the character of the river and the communities through which it flows. In several places roads and bridge crossings afford splendid views of the corridor. Open farmlands often create these views, and provide important visual diversity and cultural distinction to these vistas.

3.2-E GEOLOGIC AND NATURAL FEATURES

The upper Merrimack River supports several unique geologic and natural features, including exposed varved glacial deposits, high sand dunes, oxbow lakes, remnant floodplain forests, and several rare plant communities. These attributes qualify as a regionally unique and exemplary geologic and natural feature.

The surficial geology of the present day upper Merrimack River is the result of thousands of years of dynamic fluvial processes that have shaped the valley since the retreat of the last glacial period approximately 14,000 years ago. Following the retreat of the glacier, the study area would have been submerged beneath glacial lake Hooksett for several thousands of years, during which vast sediments accumulated in seasonal layers at lake's bottom. Over the ten thousand years since the disappearance of the glacial lakes, the Merrimack has cut its way through the accumulated sediments in a shifting and meandering process which has produced the river bluff and river terrace characteristics of the present day upper Merrimack.

These bluffs, terraces, and floodplains support a number of geologic and natural features unique to New Hampshire and

exemplary within the New England region. These are features associated with and limited to dynamic fluvial landforms.

New England Dry Sandy Riverbluff Opening Community (G3S1)

Characterized by gray and white birch, wand bush clover, little blue stem, and occurrences of rare wild lupine, this community is found on high, steep, sandy riverbluffs subjected to erosion and undercutting. The occurrences along the upper Merrimack are the only stable communities in New Hampshire.

New England Inland Dune Community (G2S1)

Blue stem, fall witchgrass, jointweed, gray birch and rare burgrass characterize this community found on shifting and recently stabilized sand dunes. The Canterbury occurrence of this community is the only one in New Hampshire, and may be the only occurrence in New England.

Floodplain Forest

These are bottomland communities found on alluvial soils of large rivers. Flood tolerant silver maples, box elders, and ostrich ferns characterize this community found in numerous substantial stands along the study corridor. This is a regionally rare forest community type known to exist in large tracts along only one other river in New Hampshire—the Connecticut.

Important remnant floodplain forest areas are scattered along the river.

Oxbow Ponds

The recent surficial geology of the upper Merrimack has produced several notable occurrences of this regionally rare riverine feature. The fact that such a large river has remained in natural enough condition to allow for the continued observance of this dynamic fluvial process is a unique and important feature of the study corridor. The oxbow ponds provide distinct ecological habitat, and are large enough to represent significant recreational, wildlife, and fish resources.

Exposed Varved Glacial Deposits

These represent the undisturbed record of sediment deposition at the bottom of glacial lake Hooksett thousands of years ago. Exposed occurrences of this glacial record are extremely rare, and offer an invaluable research and educational opportunity. The occurrences along the upper Merrimack in Boscawen, Canterbury, and Concord may be the best such record in the state.

In addition to the features noted above, at least three additional communities deserve some mention. The largest and best occurrence in New Hampshire (probably New England as well) of *New England Pitch Pine/ Scrub Oak Barrens (G2G3S1)* is located between the Soucook and Merrimack Rivers in Concord. This community, known as the Concord Pine Barrens is highly significant, but its relationship to the river is less direct than those listed above. In addition, occurrences of rare *Acidic Riverside Seep Community* may occur along the river in a significant way, but this has not been adequately documented. Occurrences of the relatively common Mesic Riverbluff Forest Community are also important along the river for their wildlife habitat value.

3.3 FREE-FLOWING DETERMINATION

This subsection describes the free-flowing condition of portions of the study segment. Only portions found to be free-flowing according to the act's definition can be found eligible for Wild and Scenic designation.

Segment	Character
Origin to Manchester St.:	FREE-FLOWING
Manchester St. to Garvin's Falls Dam:	NOT FREE-FLOWING
Garvin's Falls to Suncook River:	NOT FREE-FLOWING

There are no dams between the upper Merrimack's origin at the confluence of the Pemigewasset and Winnipesaukee Rivers in Franklin and the Garvin's Fall's Dam in Bow. The only channel modifications which exist in this sections are remnant wooden pylons left over from railroad construction, the remains of the Sewall's Falls Dam, and isolated stretches of some rip-rap below Sewall's falls in Concord (near the state prison lands, the Department of Transportation overlook, I-93, and near Terrill Park). In addition, there are the abutments of past and present highway and railroad bridges.

Approximately the lower eight miles of this segment fall within the project boundary for the Garvin's Falls Hydroelectric Project (FERC #1893 NH), extending from the dam upstream to a point just north of Sewall's Island. This is a low head hydroelectric dam operated in a predominantly run of the river fashion, with a very limited ability to hold water for peaking operation. The influence of this dam is minimal to the character of the river. The river flows with obvious current, and remains riverine in appearance for the majority of the eight miles. As one nears the Garvin's Falls Dam the impact of the structure begins to become evident, with some moderate water level fluctuations and some evidence of impoundment.

In determining the influence of the Garvin's Falls project on the "free-flowing" character of the river, it is necessary to return to the language and intent of the Wild and Scenic Rivers Act. Under the "recreational" classification in the Wild and Scenic Rivers Act an eligible river segment "... may have undergone some impoundment or diversion in the past." This language was interpreted in the Final Revised Guidelines for Eligibility, Classification and Management of River Areas issued in the Federal Register on September 7, 1982 to mean:

> There may be some existing impoundments, diversions, and other modifications of the waterway having an impact on the river area. Existing low dams, diversion works, rip-rap and other minor structures will not bar recreational classification, provided the waterway remains generally natural and riverine in appearance.

Based upon this direction, the river is deemed "free-flowing" from its origin down to the Manchester Street bridge. The remaining three miles of river above the Garvin's Falls Dam are considered not free-flowing based upon the heavier influence of the Dam and impoundment.

Below Garvin's Falls Dam, the river almost immediately enters the project boundary of the Hooksett Dam (also FERC #1893 NH), though under normal conditions it flows with discernable current for about 1.5 miles (to the vicinity of White Sands Beach in Pembroke). Downstream from this point the river demonstrates little current and appears quite impounded by the Hooksett Dam. The short and isolated nature of the "riverine" portion of this segment is deemed insufficient for the purposes of the Act. Therefore, the segment between Garvin's Falls Dam and the southern terminus of the study segment (Suncook River) does not meet the free-flowing requirement for inclusion in the Wild and Scenic Rivers System.

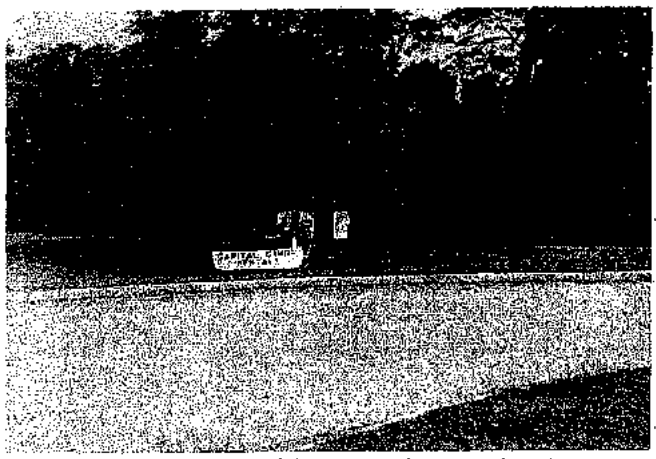
3.4 PROPOSED CLASSIFICATION

This subsection describes the proposed classification for segments found to meet the free-flowing and outstanding value criteria of eligibility.

Segment	Classification
Origin to Sewall's Island:	SCENIC
Sewall's Island to Manchester Street:	RECREATIONAL

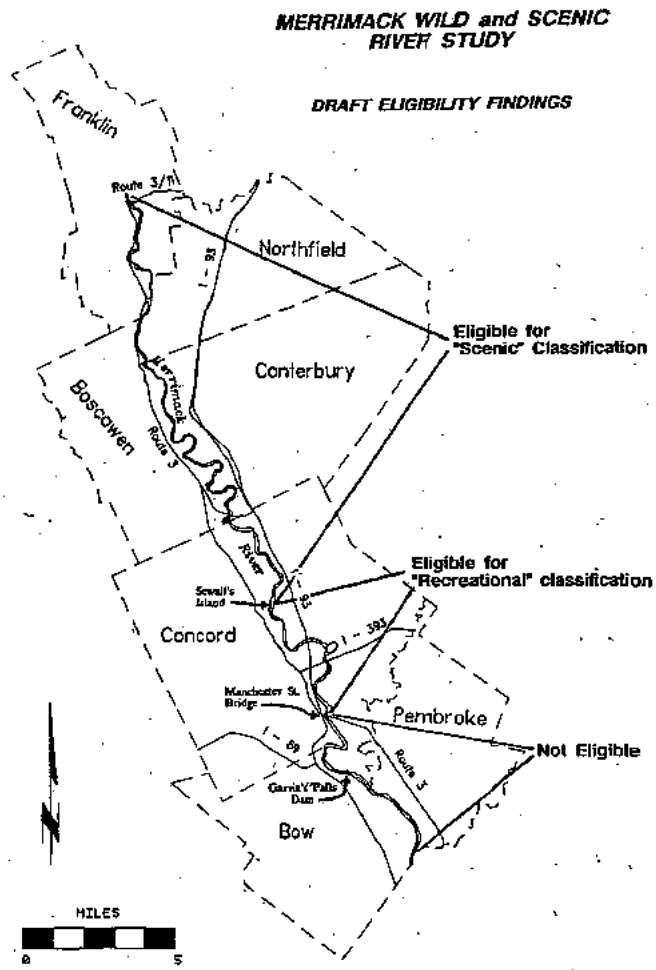
There are approximately 26 river miles between the Merrimack's origin in Franklin and the Manchester Street bridge. In the 21 Miles from Franklin to Sewall's Island, there are only three bridge crossings (two active). The only significant channel modifications relate to two river oxbows that were cut off from the rest of the river by the construction of the railroad in the 19th century. Wooden pylons are visible remnants of this work at Goodwin's Point in Concord, and at several other spots. In addition, the remains of the historic Sewall's Falls Dam and its diversion works can be found in Concord.

This 21 mile segment remains virtually wild in appearance, with very little structural intrusion. I-93 remains quite distant for almost all of this length, and does not represent an intrusion to the remote river experience. The recommended classification for this eligible river segment is Scenic.



A livery takes advantage of the river in the capital city's downtown.

From Sewall's Island south, several factors influence the proposed classification. There are four bridge crossings in the five miles between here and the Manchester Street bridge. There are several strerches of relatively modern, conspicuous rip-rap. The area is within the project boundaries of the Garvin's Falls Dam. The river area within the floodplain exhibits a more developed and urban character. And, in general, the influence of nearby downtown Concord is perceived, both visually, and in the "feel" of the River. The recommended classification for this eligible river segment is Recreational.



CHAPTER 4

SUITABILITY FINDINGS

This chapter states the study's findings relative to Section 4(a) of the Wild and Scenic Rivers Act that requires the study report to detail the river's suitability or non-suitability for national designation.

4.1 PRINCIPAL FACTORS OF SUITABILITY

For rivers such as the Upper Merrimack that flow through predominantly private lands the National Park Service has identified several factors upon which the suitability decision should be made:

1) the adequacy of existing protection measures to conserve the river's outstanding resources without the need for federal land acquisition or federal land management;
2) whether there is an existing or proposed management framework that will bring the key river interests together to work toward the ongoing protection of the river;
3) the strength of local support for river protection and national designation; and
4) the effects of designation on uses of the land, water base, and resources associated with the river, the neighboring communities, etc.

4.2 EXISTING PROTECTION

4.2.A REGULATORY PROTECTIONS

New Hampshire Rivers Management and Protection Program

In 1991 that portion of the Upper Merrimack found eligible for Wild and Scenic designation was designated by act of the state legislature as a protected river under the New Hampshire Rivers Management and Protection Program (RMPP). The NH RMPP was established in 1988 to address the problems of conflicting demands on significant river resources. River segments are designated into the RMPP upon completion of a locally driven nomination process.

The RMPP is administered by the NH Department of Environmental Services, and the protection it provides complements and reinforces existing state and federal water quality laws, establishes a protected flow for each river in the program, and creates state recognition for local river management advisory committees established under the act to review and comment on any federal, state, or local government proceedings affecting state-designated rivers. Both the NH DES through a State Rivers Coordinator and the local advisory committees have heightened standing before state agencies such as the State Wetlands Bureau to ensure that the special values of designated rivers receive adequate consideration in weighing the merits of proposed development activities.

The seclusion of the Merrimack through downtown Concord is remarkable in most areas.

NH Rivers Management and Protection Program protects:

+flow
+water quality

and limits or prohibits:

+changes to banks, dams
+interbasin transfers

It also creates:

+a local advisory committee

Designation also provides specific instream protection measures based on a river's classification. The Upper Merrimack River is classified a "rural" river, which establishes a state policy against the construction of new dams and the reconstruction of breached dams after six years. Interbasin transfers are also precluded. No channel alterations that would interfere with or alter the river's natural flow characteristics are permitted on a rural river except under special conditions. By definition, rural rivers

> shall be maintained and protected from significant discharges, unless the petitioner can prove to the Division [of Water Supply and Pollution Control], in accordance with the state's antidegradation implementation policy, that allowing limited water quality degradation is necessary to accommodate important economic and social development in the area in which the receiving water is located. In allowing limited degradation or lower water quality, the applicant shall provide adequate scientifically valid documentation to the Division that existing uses and water quality standards shall be fully protected.

The RMPP also contains limited provisions regarding adjacent land uses, specifically precluding new landfills within the 500 year floodplain, new hazardous waste facilities within 1/4 mile of the river, and other new solid waste facilities within 250 feet of the river. The only fertilizers permitted within 250 feet of the shore are manure, lime, and wood ash. The law does not otherwise interfere with local zoning, the rights of riparian landowners, or otherwise preempt local authority.

An important part of the RMPP's protection is locally supplied through the creation of a citizens advisory committee. The Upper Merrimack River Local Advisory Committee (UMRLAC), which served as a primary partner in the conduct of the Wild and Scenic River Study, is that citizen's committee for the Upper Merrimack. Under state law the UMRLAC guides river management through development of a coordinated plan, and through review and comment on development, permitting, and other issues affecting the river. The next subsection of this chapter (Management Framework) returns to the UMRLAC and its functions.

Wetland and Streambank Protection

Dredge or fill activity in wetlands is subject to review by the State Wetlands Bureau and must be authorized before work proceeds. Permits are generally conditioned upon adherence to Best Management Practices, and environmental impacts must be minimized. Under the RMPP both the UMRLAC and the State Rivers Coordinator are authorized, and expected to comment on projects on designated rivers. The Federal 404 program complements State wetlands law.

Larger rivers in the state and all lakes and ponds of 10 acres or more are governed by the NH Shoreland Protection Act, RSA 483-B, which became effective in July 1994. The law establishes minimum standards for timber harvesting, clearing, and development of land within 250' of the water's edge aimed at preventing water pollution, protecting buildings and lands from flooding and accelerated erosion, and other public purposes. In 1998, a legislative exemption which had excluded the upper Merrimack (and several other rivers) from this regulation was removed, and the entire eligible river area is now subject to the 250' state shoreland protection standard.

Additional State and Federal Programs

Other state laws directly relevant to river protection include:

- water protection planning assistance (RSA 4-C:19-23);
- excavation requirements, specifically the prohibition against excavation within 75' of any navigable river or great pond and 25' of any perennial stream (RSA 155-E:4 II-a);
- timber harvesting law, specifically limiting basal area cut within 150' of a river to <50% unless for development and prohibiting slash (RSA 224:44);
- pesticide application requirements, specifically the regulation of pesticides near any stream or other surface waters per rules adopted under RSA 541-A (RSA 430:46)
- enforcement of legislated water quality classifications (RSA 485-A:12);
- terrain alteration requirements for 50,000 and 100,000 ft2, see above (RSA 485-A:17);
- septic setbacks (RSA 485-A:29, A:32, Env.-Ws 1008.03, and RSA 483-B:9 V(b));

- dredge and fill laws, specifically no activity in a river or riverbank without a permit (RSA 482-A:3);
- motor boat operating restrictions, particularly, speeds no greater than headway speed within 150' of the shoreline (RSA 489 and RSA 270:12); and
- endangered wildlife and plant protection (RSA 212-A and RSA 217-A, respectively).

Local Regulations

All seven municipalities involved in the study have established zoning ordinances which serve as the primary tool for regulating land uses of upland areas adjacent to the Upper Merrimack (see Appendix D: Selected Aspects of Zoning and Regulations). Of the five communities bordering the segment found eligible for designation, all have regulations governing development of steep slopes, wetlands, floodplains. The vast majority of the lands adjacent to the segment are zoned for low intensity residential or agricultural uses. The communities of Concord, Northfield and Canterbury have also adopted specific building setbacks to protect the river.

4.2-B. PHYSICAL LIMITATIONS TO DEVELOPMENT

Wetlands, floodplains, steep slopes, and soil conditions (depth to bedrock, surficial stone cover, permeability, and shrink-swell potential) substantially limit the potential for development of the riparian zone and much of the river corridor (see map next page entitled "Development Constraints.") In particular, the often very wide floodplain areas have served to deter development of a great deal of open space along the river.

4.2-C CONSERVATION OWNERSHIP

A substantial percentage of the river corridor area is permanently protected through conservation ownership and easements. As the "Protected Lands" map (next page) indicates, a wide variety of protective ownership constraints are present along the segment, including institutional lands, agricultural restrictions, and dedicated conservation lands.

4.2-D MANAGEMENT FRAMEWORK

The NH Rivers Management and Protection Program and the UMRLAC created through its auspices provide the nucleus of a strong management framework which can be easily adapted for the purposes of national designation, as has been done on the Lamprey River through Wild and Scenic designation in 1996. The study was specifically designed for this purpose through the close partnership with the NH DES and UMRLAC.

Upper Merrimack River Local Advisory Committee

The UMRLAC is established as a permanent advisory body by the RMPP. Its members are nominated by the local communities and appointed by the Commissioner of the DES. In keeping with the state program's original intent of balancing competing claims on a river, the UMRLAC represents a variety of interests, including riparian ownership, business, conservation, recreation, agriculture, and local government. Members serve three year terms, and are eligible for re-appointment.

Department of Environmental Services

The NH DES is responsible for administrative oversight of the RMPP. A State Rivers Coordinator from within the DES staffs the RMPP, providing among other duties modest technical support to each of the local river advisory committees. The Rivers Coordinator also serves as the focal point for ensuring proper communication among state agencies and between the local advisory committees and the state agencies. A state River Management Advisory Committee composed of many river interests (business, conservation, recreation, municipal government, history, fisheries, public water supply, hydroelectric development) advises the DES on program implementation.

The Upper Merrimack River Management and Implementation Plan

The Upper Merrimack River Management and Implementation Plan (Appendix E) was developed as an integral part of the study process, and was adopted by Committee vote on February 22, 1994. The Plan was developed through consensus by the UMRLAC with staff support from the

DES and NPS. It currently serves as the management plan for the state designation, and was designed to serve as the comprehensive management plan for the federal designation as well. The UMRLAC has articulated the purpose of the Plan as follows:

In developing this management and implementation plan, the Committee recognized the following statement of purpose:

To develop and assist in the adoption of a river management plan that will manage the special resources of the upper Merrimack River while recognizing the following areas of concern:

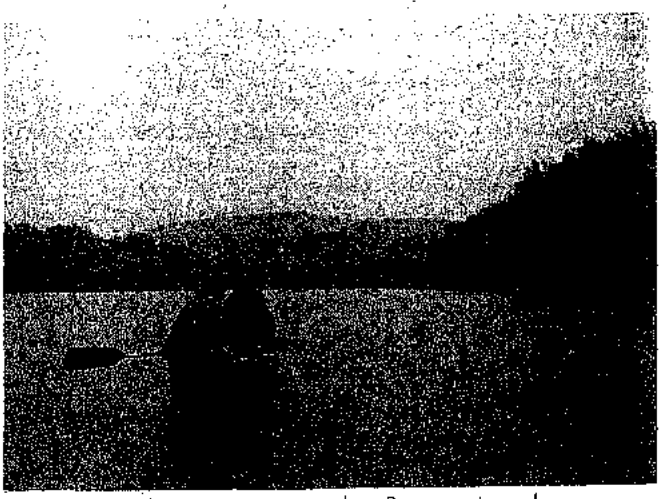
- To manage, maintain and enhance the water quality and natural, scenic, cultural, and recreational values of the river;
- To maintain local control;
- To focus on public involvement and education;
- To respect the rights of private landowners;
- To recognize the need for balanced use;
- To recognize present and future generations use of the river.

4.3 SUPPORT FOR RIVER PROTECTION AND NATIONAL DESIGNATION

4.3-A. SUPPORT FOR RIVER PROTECTION

In 1992, the UMRLAC conducted a survey of landowners located within the study corridor area. Of approximately 1,000 surveys mailed, 226 were returned, including approximately 50 percent of riverfront landowners. An overwhelming majority of responding riverfront landowners (80%) and corridor landowners (90%) expressed a desire to see their communities take steps to actively manage and protect river values, including water quality, scenic character, fisheries, wildlife, river flow, floodplains, rare species, wetlands, agriculture, and historic values. *(See Appendix B, pages 64-65 for Results to Questions 15 and 16.)*

No other formal measures of public attitudes regarding river protection were taken, however, there was clearly strong anecdotal evidence that these communities feel very strongly about protecting the river for future generations.



Canoeists on the upper Merrimack in Boscawen and Canterbury. The steeple of Boscawen's First Congregational Church rises in the background.

4.3-B SUPPORT FOR NATIONAL DESIGNATION

The principal mechanism employed during the study to assess the communities' feelings regarding the potential designation as a national Wild and Scenic River was formal votes by the governing bodies of eligible river communities.

The debate over the pros and cons of designation was an often emotional one, pitting conservation organizations like Trout Unlimited and the New Hampshire Rivers Council against opposition organized by the New Hampshire Landowners Alliance. The UMRLAC attempted to provide a neutral forum for factual debate and dissemination of information. The UMRLAC did not take a position for or against designation, but opted rather to issue a set of findings regarding the proposed designation (2/22/94) that was made available to all interested parties. These Findings are reprinted here:

FINDINGS

(adopted by Committee vote, 2/22/94)

The Upper Merrimack River Local Advisory Committee (Committee) has worked with the National Park Service and NH Department of Environmental Services for more than two years under both the state and federal river programs. The Committee members were nominated by our communities to represent a wide range of interests. In this capacity, the Committee makes the following findings regarding the proposal to designate the upper Merrimack River as a Scenic and Recreational River under the federal Wild and Scenic Rivers Act.

These findings do not represent a position for or against federal designation. Rather, it is the Committee's hope that these findings will help to dispel rumors and misinformation regarding the proposed federal designation, and will help citizens and community officials make informed decisions.

THE UPPER MERRIMACK RIVER LOCAL ADVISORY COMMITTEE FINDS THAT:

The upper Merrimack River is an outstanding natural, cultural, recreational, and agricultural resource worthy of careful management and protection.

A substantial majority of riverfront (84%) and near-river (93%) landowners from Franklin through Concord responding to a Committee survey believe that their communities should take action to manage and protect important river values. (45 riverfront landowners responded, 115 near-river landowners responded).

The State of New Hampshire and affected riparian communities have already taken substantial measures to protect the upper Merrimack River through the NH Rivers Management and Protection Program, local zoning, and similar measures.

The intent of the federal designation is to establish federal policies toward the river which complement and reinforce state and local river management and protection policies.

The federal designation is the only way to permanently preclude any additional damming or hydroelectric development of the upper Merrimack River, though the threat of such development has been substantially reduced due to the State designation, the Fish & Game access area at Sewall's Falls and a lack of additional dam sites.

The National Park Service, in consultation with the riparian communities and the Committee, would have substantial review authority to ensure that all federal agency actions comply with the Standards and Objectives of the Committee's Management and Implementation Plan.

The National Park Service's review authority over federal agency actions would extend to water resource projects upstream and downstream of the designated upper Merrimack segment, and can prohibit federal licensing, assistance, or construction of water resource development projects that would unreasonably jeopardize the upper Merrimack segment.

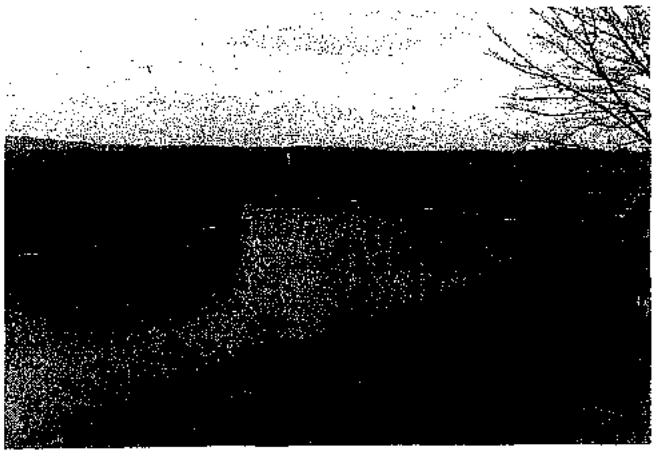
The federal designation would provide access to previously unavailable funds to enhance river management, protection, and recreation on the upper Merrimack. The National Park Service already makes limited grants on a statewide basis for recreation and conservation through the Land and Water Conservation Fund.

The content of a draft Congressional designation Bill for the upper Merrimack has been reviewed by the Committee. The Bill would not grant the National Park Service or any other federal agency the power to zone or otherwise restrict the use of non-federal lands adjacent to the river, nor would it take away any existing local government authorities. The Bill would specifically prohibit federal condemnation of lands.

The Upper Merrimack River Local Advisory Committee would continue in its advisory responsibilities under the federal designation, and would continue to have responsibility for the content of the river Management and Implementation Plan.

The towns of Northfield, Boscawen, and Canterbury voted on the issue of designation at town meeting votes in the Spring of 1994. Each of these communities voted against seeking federal designation by substantial margins. In the City of Franklin, the City Council also voted against seeking designation in the Spring of 1994.

The final community to take up the issue of designation was the City of Concord. As described in the "Alternatives" section below, the City of Concord spent considerable time and effort considering the possibility of pursuing a designation through its portion of the river alone. Eventually, in 1995, the City Council tabled discussions on the matter in favor of resolutions to pursue local initiatives on the river.



The river north of downtown Concord.

4.4 EFFECTS OF DESIGNATION

This subsection describes the anticipated effects of designating the eligible segment of the Upper Merrimack River as a component of the Wild and Scenic Rivers System.

4.4-A GENERAL

In a general sense, the effect of national designation would be to bring the policies of the federal government, in dealing with water resource management and development decisions, into line with existing state and local policies established through the state-level designation and protection of the river under the NH Rivers Management and Protection Program. The similarities of the state and national programs would be enhanced by utilization of a single advisory committee (Upper Merrimack River Local Advisory Committee) to guide ongoing management, and through utilization of a single management plan for both programs (Upper Merrimack River Management and Implementation Plan). Specific effects of national designation are further discussed below.

4.4-B DAMS AND HYDROELECTRIC DEVELOPMENT

No new dams would be allowed, and no new hydroelectric development would be allowed on the designated segment. This would include hydroelectric dams as well as other hydroelectric diversions not requiring dams. For example, the proposed Rattlesnake Hill pumped-storage hydro project in Concord would be prohibited. Any future re-construction of the Sewall's Falls hydroelectric facility would be prohibited.

4.4-C STREAM CHANNEL ALTERATIONS

Proposed alterations of the stream channel itself would receive careful scrutiny as to: project need; ecological and aesthetic impacts; alternatives to the proposed action. Projects resulting in "direct and adverse" impacts to the river or its natural, cultural, or recreational values would need to be re-designed, or they would not be permitted.

4.4-D WATER QUALITY

New permits for discharges under the Clean Water Act are considered federal actions, and would need to be compatible with the Water Quality Standard of the Management and Implementation Plan. In the long-term a designated river may receive more attention re: enforcement of existing programs; implementation of pilot programs for pollution reduction/prevention; funding for advanced treatment, non-point pollution initiatives, or other innovative programs.

4.4-E WATER QUANTITY

The construction of major new discharge or withdrawal structures would be regulated by the Act since they would require a permit from the Army Corps of Engineers. The NPS would review proposals during the Army Corps' permitting process to ensure compatibility with the Water Quantity (flow) objectives of the Management and Implementation Plan.

4.4-F. OUTSTANDING RESOURCES

National designation would enhance the protection of identified outstanding natural and cultural resources associated with the studied portion of the Upper Merrimack River. Designation would provide federal level consistency with the NH Rivers Management and Protection Program, and would focus federal agency decisionmaking on the protection of identified outstanding resources. Potential technical assistance and funding under the designation would directly benefit the conservation of outstanding resources, and support the implementation of the Upper Merrimack River Management and Implementation Plan. Designation would effectively create a local-state-federal partnership based around the same set of resource protection goals.

4.4-G UPSTREAM AND DOWNSTREAM IMPACTS

Designation would entail little in the way of upstream and downstream impacts. Present management regimes for upstream and downstream impoundments are consistent with the designation, including plans for the restoration of anadromous fish over time. The designation would have the effect of prohibiting the expansion of the Garvin's Fall Impoundment, however, there are no plans for such expansion, nor would it likely be feasible in the absence of designation due to a variety of constraints.

4.4-H COSTS

Land Acquisition

There are no anticipated land acquisition costs associated with designation.

Administration

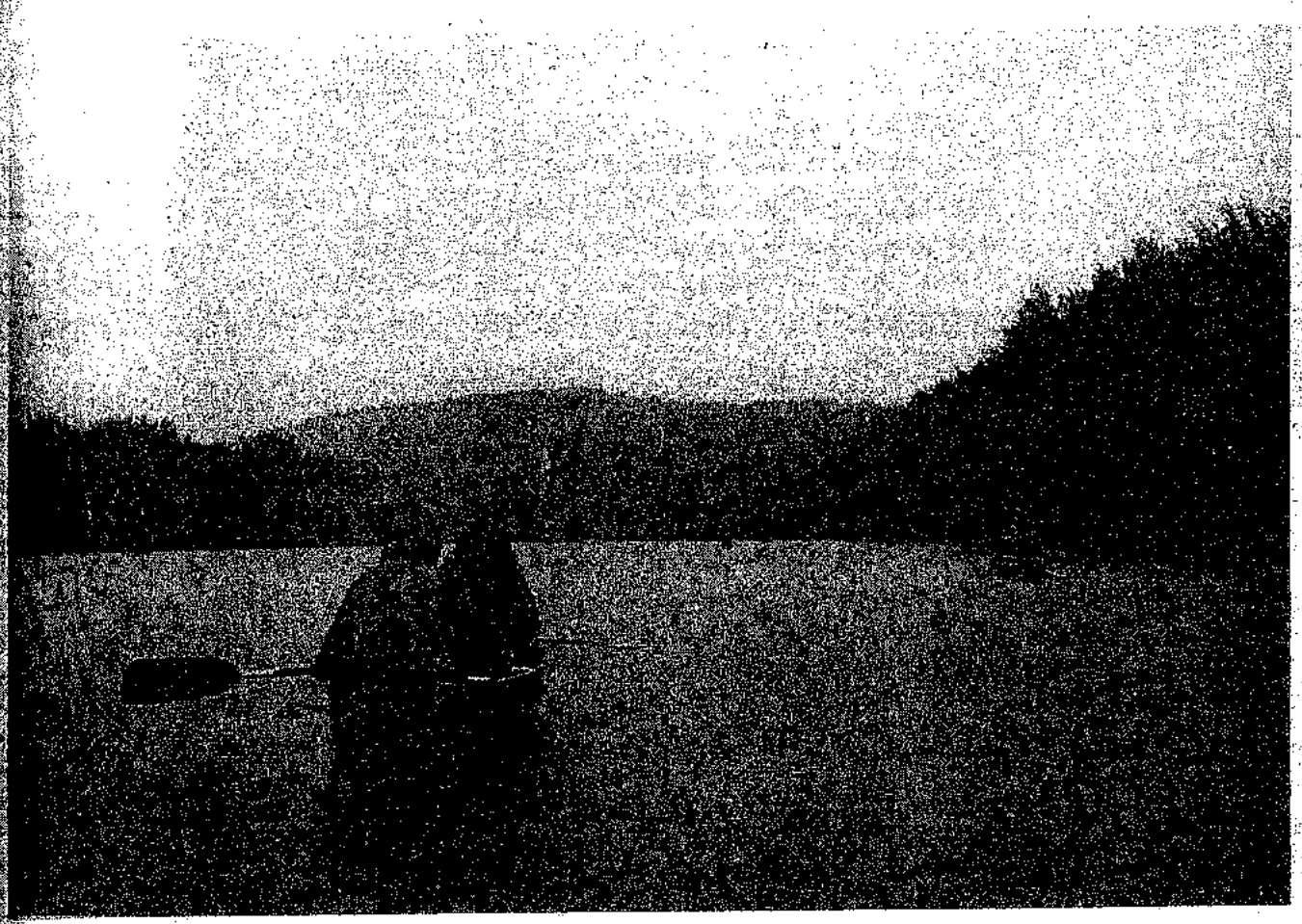
The costs of administering the designation would be minimal due to the limited role anticipated for the National Park Service, and the existing contributions already being made through ongoing responsibilities of local governments, the state, and non-profit organizations. The federal share of administrative costs is not expected to exceed $20,000 annually.

Technical Assistance and Cooperative Agreements

It is anticipated that designation would include provisions for technical assistance and small amounts of seed money and matching funds for Cooperative Agreements through the National Park Service. Such limited technical and financial assistance would be matched by other state and local cooperators as a cost-effective means of attaining the goals of the Upper Merrimack River Management and Implementation Plan. The federal share of these costs is estimated at between $50,000 and $100,000 annually, and likely less as the designation becomes established.

4.5 CONCLUSIONS

Based upon the foregoing analysis of the principal factors of suitability, the National Park Service finds that no segment of the eligible portion of the Upper Merrimack River meets all of the criteria established for suitability for national designation. Specifically, the eligible segment from Franklin to Manchester Street in Concord meets all of the criteria of suitability except the requirement that there be local support for such a designation. In the absence of this express local support, the National Park Service cannot find the segment suitable for designation at this time.



CHAPTER 5

CONSIDERATION OF ALTERNATIVES

This chapter considers several possible alternative actions resulting from the findings of the Upper Merrimack Wild and Scenic River Study, and selects a recommended alternative.

5.1 ALTERNATIVES CONSIDERED

ALTERNATIVE A. NO ACTION

This alternative would maintain existing state and local controls for resource protection on the Upper Merrimack without additional NPS involvement or support for local river protection efforts. The temporary protections of Section 7 in place during the study period will expire three years after the President sends a report to congress with his recommendation.

ALTERNATIVE B

Congressional designation of the 26 mile eligible segment from the confluence with the Winnepesaukee in Franklin to the Manchester Street bridge in Concord.

ALTERNATIVE C

Designation of the 26 mile eligible segment from the confluence with the Winnepesaukee in Franklin to the Manchester Street bridge in Concord as a state-managed component of the Wild and Scenic Rivers System pursuant to Section 2(a)(ii) of the Act.

ALTERNATIVE D

Congressional designation of the 10 mile eligible segment of the Merrimack located within the corporate limits of the City of Concord. This alternative was studied extensively by a City council appointed commission subsequent to votes in opposition to designation in other communities. After more than a year of consideration, the City Council voted to table consideration of this alternative in favor of pursuing local initiatives related to protection and enhancement of the river.

5.2 EVALUATION OF ALTERNATIVES

Alternative C, 2(a)(ii) designation, was considered by the Upper Merrimack River Local Advisory Committee, but rejected as an alternative during the study process based upon an analysis of the benefits, and upon the expectations of the congressionally sponsored study process. Specifically, the Advisory Committee felt that 2(a)(ii) designation would unfavorably restrict the ability to seek funding for management plan implementation, and would be inconsistent with the tenor of the lengthy public debate which had centered on congressional action.

Alternative B, congressional designation of the entire eligible segment, is rejected because of a lack of local community support.

Alternative D, congressional designation of the eligible segment in the City of Concord, is rejected due to a lack of local community support.

Alternative A, no action, is selected as the recommended alternative based upon the lack of local support for any alternative involving designation.

5.3 CONCLUSIONS

Based upon the lack of local support for designation expressed by Town Meeting and City Council votes, the National Park Service recommends against any designation at this time. This conclusion would be revisited if local sentiments regarding designation change. The eligible portions of the Upper Merrimack are an outstanding example of higher order, free flowing river resources in the New England region. With the exception of the local support issue, the Upper Merrimack is an excellent candidate for designation, supporting significant natural, cultural, and recreational resources which have been recognized and largely protected through local and state action.

Should local support for designation change, designation by act of congress, or through state initiative (Section 2(a)(ii)) should be carefully reconsidered. Designation through the state initiative route would require an application from the Governor of New Hampshire to the Secretary of the Interior. The UMRLAC will be in an excellent position to re-evaluate these issues and act on them as they see fit.