

**NH Rivers Management and Protection Program
Nomination**

submitted by the
Isinglass River Protection Project
June 2001

New Hampshire Rivers Management and Protection Program

River Nomination Form

Instructions: Before beginning any work on a river nomination, Sponsors should contact the State Rivers Coordinator at the NH Department of Environmental Services (DES). The Rivers Coordinator can provide initial guidance by identifying local and regional contacts and other sources of information and can give advice throughout the preparation of a river nomination. Refer to the publication, *A Guide to River Nominations*, for a step-by-step explanation of the nomination process and a directory of federal, state, regional, and private sources of information and technical assistance. The River Coordinator's address and telephone number is DES Rivers Coordinator, PO Box 95, 6 Hazen Drive, Concord, NH 03302-0095, (603) 271-1152.

I. NOMINATION INFORMATION

1. Name of River: **Isinglass River**

2. River/River Segment Location (and start/end points) and Length (miles):

The Isinglass River flows out of Bow Lake in the Town of Strafford and continues for 17.93 miles through Strafford, Barrington, and Rochester until it joins the Cocheco River.

3. (a) Sponsoring Organization or Individual: **Isinglass River Protection Project (IRPP)**

(b) Contact Person: **Ann Schulz**

(c) Address: **158 Scruton Pond Rd, Barrington, NH 03825**

(d) Daytime Telephone Number: **603.664.5361** Fax: **603.664.9594** (please call first)

(e) Email: **tropicrein@aol.com**

II. SUMMARY: RESOURCES OF STATEWIDE OR LOCAL SIGNIFICANCE

Explanation: In order to be eligible for designation to the NH Rivers Management and Protection Program, a river must contain or represent either a significant statewide or local example of a natural, managed, cultural, or recreational resource.

Instructions:

1. By checking the appropriate boxes below, indicate the resource values that you believe are present in the nominated river and its corridor and whether you believe these values are present at a level of significance that is statewide or local. If the value is not present, leave the box blank.

Significance/natural resource	Value Present/ Statewide Significance	Value Present/ Local Significance
Geologic or Hydrologic Resources		X
Wildlife Resources	X	
Vegetation/Natural Communities	X	
Fish Resources	X	
Rare Species or Habitat	X	
Water Quality		X
Open Space		X
Natural Flow Characteristics	X	

Managed Resources

Impoundments		X
Water Withdrawals/Discharges		X
Hydroelectric Resources		

Cultural Resources

Historical/Archaeological Resources	X	
Community River Resources		X

Recreational Resources

Fishery Resources	X	
Boating Resources		X
Other Recreational Resources		X
Public Access		X

Other Resources

Scenic Resources	X	
Land Use		X
Land Use Controls		X
Water Quantity		X
Riparian/Flowage Rights		X
Scientific Resources		X

2. Briefly describe the most important resource values which are present in the nominated river and why you believe these values are significant from either a statewide or local perspective. For example, if the river contains a segment of whitewater that attracts kayakers from throughout the state and is identified in a regional boaters' guide as a premier whitewater boating segment, you should identify recreational boating as a significant statewide resource and include one or two sentences in support of this statement. In addition, if you feel that a resource value is threatened, explain why.

Beauty: From a state, regional, and local perspective, the Isinglass is valued for its natural beauty. Most of the Isinglass remains in a natural state with its banks lined by natural vegetation. There are no docks, impoundments, or diversions (not including withdrawals) along its entire length. Numerous areas of rapids occur along the River—Locke's Falls is a site of singular beauty.

The beauty of the Isinglass in its present natural state is threatened by its location in one of the two most rapidly growing areas of the state. It does not have the protection afforded streams in more remote areas. The Regional Watershed map appended shows the River's proximity to the Seacoast.

History: From a state perspective, the Isinglass offers pre-European archaeological resources and sites that define the evolution of local economies from the eighteenth century through to the mid-twentieth century. The River's banks offer evidence of Native American trails and living sites in its corridor. The Squanamagonic settlement in present-day Gonic is currently being restored.

A series of mills lie along the River and its tributaries, evidenced by the remaining foundations (see Historic Sites map). The mills bear witness to production activities ranging from lumbering to agricultural products to fabric to power generation. Currently underway are efforts recognizing these mills collectively as a Historic District of value in New Hampshire's economic history. The Ayers Lake Campground, on Ayers Lake (which drains into the Isinglass via Betty's Brook), has been declared eligible at the state level for recognition as a Historic Site—an example of early tourism. The ancestors of the present owners built its cabins in the last quarter of the nineteenth century.

Science Education: In the past two years, the Isinglass has served as a laboratory for local students at the elementary, middle school, and high school levels. Several examples of their work are appended to this document. The use of a River that is local—and known to the students—has promoted a strong sense of stewardship and provided unique incentive and opportunity to engage them in projects such as water testing, examining drainage patterns, wildlife and plant identification, and investigating land use over time. In collaboration with the Cocheco River Watershed Coalition, the Isinglass communities are taking advantage of on-going opportunities to develop appropriate curricula and provide teacher training. These consequences are of both state and local value.

Water Supply and Quality: The Isinglass contributes directly to the drinking water of the City of Dover and recharges numerous wells along its length. The River supports Barrington's northern aquifer. Its high quality contributes significantly to the health of the water bodies into which it flows, most particularly the Cocheco. For example, the Isinglass contribution to the Cocheco has brought the latter into compliance in tests downstream from the Rochester treatment facility. The value of the Isinglass in this regard is of regional and local significance.

Recreation: Present-day Bow Lake is approximately twice as large as it was before a dam was erected at the outflow of the Isinglass. The expanded lake provides excellent swimming, boating, and fishing opportunities that are available to residents and visitors. Below the dam, the River is actively used for hiking, fishing, swimming, and boating (see Recreation Sites map). The Isinglass is referred to in the *AMC River Guide/New Hampshire-Vermont*¹ as having 10 miles of flatwater and quickwater of Class I and II, (navigable during high water from late March to the end of April). Permanently established access to the River exists but most is informal and could be threatened as population increases.

Wildlife Habitat and Uncommon Vegetation: The Isinglass provides habitat for many species of wildlife, such as Deer, Beaver, Mink, and Barred Owls. Significant areas of unfragmented land still exist and offer River-access to wildlife. In a number of sections, the riverbanks serve as a corridor between unfragmented parcels. Atlantic White Cedar /Red Maple Community and a Northern New England Rich

Mesic Forest are found among these parcels. Herbaceous species such as Wild Lupine and Yellow Lady Slipper have also been identified within the River corridor. Wild Lupine has been identified by the Nongame and Endangered Wildlife Program² as significant as it supports the state- and federally-endangered Karner Blue Butterfly. These attributes are described in more detail in this nomination packet.

III. COMMUNITY AND PUBLIC SUPPORT

Explanation: The level of community and other public support which is demonstrated for a river nomination will be an important factor in determining whether that river will be recommended for legislative designation. Such support may be shown by the adoption of a town resolution, a letter from selectmen, master plan excerpts, or documented support from other groups, either public or private (if private, explain the group's purpose and who is represented).

Instructions: Describe the type of community and other public support which exists for the river nomination and attach appropriate documentation. Include copies of any letters of support from local elected and appointed officials.

Letters of support for the Isinglass nomination to the NH Rivers Management and Protection Program have come from diverse groups with an interest in the welfare of the Isinglass as well as from individual landowners, local officials from the three participating communities, recreational groups, and Strafford County officials. These letters are included in the Appendix.

On May 9, 2001, the Isinglass River Protection Project invited by letter all riparian landowners, officials from the three participating towns and from the Dover Water Department, and other interested persons to a public forum held in the Turnkey Recycling & Environmental Enterprises (Turnkey) classroom on Rochester Neck Road. The purpose of the meeting was to inform attendees about the Rivers Management and Protection Program and to hear any concerns regarding the program. The meeting evidenced enthusiasm for "keeping the Isinglass as it is." No opposition to the nomination or the program was expressed at the meeting. Copies of the letters of invitation are included in the Appendix.

Additionally, the Cities of Rochester and Dover have an interest in the quality and the flow of the Isinglass and its tributaries. Both cities draw from the River and its tributaries for their public drinking water supplies. Other evidence of official support for the protection of the River is included in the section "Community Resource" below.

IV. OTHER SUPPORTING INFORMATION

Explanation: In addition to the information provided on this nomination form, Sponsors are encouraged to submit any other information which they believe will support the nomination of the river. This information may include a visual presentation (for example, a slide program or a map showing the location of significant resources) or studies and reports on the river.

Instructions: List what, if any, additional supporting information has been submitted with this river nomination.

A visual presentation will be made following the submission of this document. Attached to this document are studies and reports on the River and its corridor completed by local school children, undergraduate and graduate students at the University of New Hampshire, and three resource specialists. Descriptions and texts of these projects are included in the Appendix. Also included are:

- letters of support
- a list individuals and organizations that have contributed to the process of completing the nomination document;
- IRPP activities, outreach, and media clippings;
- additional information on aquatic invertebrates; and
- student studies, invertebrate information, and water quality data.

V. RIVER CLASSIFICATIONS

Explanation: Each river or river segment that is designated by the state legislature will be placed into a river classification system. This classification system consists of four categories: Natural, Rural, Rural-Community, and Community Rivers. Refer to Appendices A and B in the Guide to River Nominations, for a complete description and explanation of the river classification system and the instream protection measures which have been adopted by the state legislature for each classification. In this part of the nomination form, DES and the State Rivers Management Advisory Committee are interested in learning which river classification(s) you believe is most appropriate for your river.

Instructions:

1. For each classification criteria listed below (a-d), check the one box which most accurately describes the nominated river or segment.

Segment 1: In Strafford, from the outflow of Bow Lake Dam to immediately downstream of Route 202A bridge, a distance of 0.54 miles

(a) General Description

<input type="checkbox"/>	The river or segment is free-flowing and characterized by high quality natural and scenic resources. The river shoreline is in primarily natural vegetation and the river corridor is generally undeveloped and development, if any, is limited to forest management and scattered housing. (Natural Rivers)
<input checked="" type="checkbox"/>	The river or segment is adjacent to lands which are partially or predominantly used for agriculture, forest management, and dispersed or clustered residential development. Some instream structures may exist, including low dams, diversion works, and other minor modifications. (Rural Rivers)
<input type="checkbox"/>	The river or segment which flows through developed or populated areas of the state and which possesses existing or potential community resource values such as those defined in official municipal plans or land use controls. Such a river has mixed land uses in the corridor reflecting some combination of open space, agricultural, residential, commercial and industrial land uses. It is readily accessible by road or railroad and may include impoundments or diversions. (Rural-Community Rivers)
<input type="checkbox"/>	The river or segment flows through populated areas of the state and possesses actual or potential resource values, with some residential or other building development near the shoreline. The river or river segment is readily accessible by road or railroad, and may include some impoundments or diversions. (Community Rivers)

(b) Length

<input type="checkbox"/>	The river or segment is at least 5 miles long. (Natural Rivers)
<input type="checkbox"/>	The river or segment is at least 3 miles long. (Rural and Rural-Community Rivers)
<input type="checkbox"/>	The river or segment is at least 1 mile long. (Community Rivers)

(c) Water Quality

<input type="checkbox"/>	The actual water quality of the river or segment meet Class A standards under the state's water quality standards. (Natural Rivers)
<input checked="" type="checkbox"/>	The actual water quality of the river or segment meets Class B standards under the state's water quality standards. (Rural, Rural-Community and Community Rivers)

(d) Distance to Roads

	The minimum distance from the river shoreline to a paved road open to the public for motor vehicle use is at least 250 feet, except where a vegetative or other natural barrier exists which effectively screens the sight and sound of motor vehicles for a majority of the length of the river. (Natural Rivers)
x	There is no minimum distance from the river shoreline to an existing road. Roads may parallel the river shoreline with regular bridge crossings and public access sites. (Rural, Rural-Community and Community Rivers)

Segment 2: Immediately downstream of bridge at Route 202A in Strafford to immediately upstream of Route 126 bridge in Barrington, a distance of 5.75 miles

(a) General Description

x	The river or segment is free-flowing and characterized by high quality natural and scenic resources. The river shoreline is in primarily natural vegetation and the river corridor is generally undeveloped and development, if any, is limited to forest management and scattered housing. (Natural Rivers)
	The river or segment is adjacent to lands which are partially or predominantly used for agriculture, forest management, and dispersed or clustered residential development. Some instream structures may exist, including low dams, diversion works, and other minor modifications. (Rural Rivers)
	The river or segment which flows through developed or populated areas of the state and which possesses existing or potential community resource values such as those defined in official municipal plans or land use controls. Such a river has mixed land uses in the corridor reflecting some combination of open space, agricultural, residential, commercial and industrial land uses. It is readily accessible by road or railroad and may include impoundments or diversions. (Rural-Community Rivers)
	The river or segment flows through populated areas of the state and possesses actual or potential resource values, with some residential or other building development near the shoreline. The river or river segment is readily accessible by road or railroad, and may include some impoundments or diversions. (Community Rivers)

(b) Length

x	The river or segment is at least 5 miles long. (Natural Rivers)
	The river or segment is at least 3 miles long. (Rural and Rural-Community Rivers)
	The river or segment is at least 1 mile long. (Community Rivers)

(c) Water Quality

	The actual water quality of the river or segment meet Class A standards under the state's water quality standards. (Natural Rivers)
x	The actual water quality of the river or segment meets Class B standards under the state's water quality standards. (Rural, Rural-Community and Community Rivers)

(d) Distance to Roads

x	The minimum distance from the river shoreline to a paved road open to the public for motor vehicle use is at least 250 feet, except where a vegetative or other natural barrier exists which effectively screens the sight and sound of motor vehicles for a majority of the length of the river. (Natural Rivers)
	There is no minimum distance from the river shoreline to an existing road. Roads may parallel the river shoreline with regular bridge crossings and public access sites. (Rural, Rural-Community and Community Rivers)

Segment 3: In Barrington, from immediately upstream of the Route 126 bridge to the River's confluence with the Cocheco in Rochester, a distance of 11.64 miles

(a) General Description

<input type="checkbox"/>	The river or segment is free-flowing and characterized by high quality natural and scenic resources. The river shoreline is in primarily natural vegetation and the river corridor is generally undeveloped and development, if any, is limited to forest management and scattered housing. (Natural Rivers)
<input checked="" type="checkbox"/>	The river or segment is adjacent to lands which are partially or predominantly used for agriculture, forest management, and dispersed or clustered residential development. Some instream structures may exist, including low dams, diversion works, and other minor modifications. (Rural Rivers)
<input type="checkbox"/>	The river or segment which flows through developed or populated areas of the state and which possesses existing or potential community resource values such as those defined in official municipal plans or land use controls. Such a river has mixed land uses in the corridor reflecting some combination of open space, agricultural, residential, commercial and industrial land uses. It is readily accessible by road or railroad and may include impoundments or diversions. (Rural-Community Rivers)
<input type="checkbox"/>	The river or segment flows through populated areas of the state and possesses actual or potential resource values, with some residential or other building development near the shoreline. The river or river segment is readily accessible by road or railroad, and may include some impoundments or diversions. (Community Rivers)

(b) Length

<input checked="" type="checkbox"/>	The river or segment is at least 5 miles long. (Natural Rivers)
<input type="checkbox"/>	The river or segment is at least 3 miles long. (Rural and Rural-Community Rivers)
<input type="checkbox"/>	The river or segment is at least 1 mile long. (Community Rivers)

(c) Water Quality

<input type="checkbox"/>	The actual water quality of the river or segment meet Class A standards under the state's water quality standards. (Natural Rivers)
<input checked="" type="checkbox"/>	The actual water quality of the river or segment meets Class B standards under the state's water quality standards. (Rural, Rural-Community and Community Rivers)

(d) Distance to Roads

<input type="checkbox"/>	The minimum distance from the river shoreline to a paved road open to the public for motor vehicle use is at least 250 feet, except where a vegetative or other natural barrier exists which effectively screens the sight and sound of motor vehicles for a majority of the length of the river. (Natural Rivers)
<input checked="" type="checkbox"/>	There is no minimum distance from the river shoreline to an existing road. Roads may parallel the river shoreline with regular bridge crossings and public access sites. (Rural, Rural-Community and Community Rivers)

Note: Segment 3 of the Isinglass has no diversions (other one withdrawal), modifications, or major agricultural operations along its banks. Four bridges cross the River in this segment. Residential housing is more common along this segment although significant portions of the land are undeveloped.

2. Based on the boxes checked above, and your knowledge of the river or segment, identify those segments of the river which you believe should be classified as either a Natural, Rural, Rural-Community, or Community River. Be sure to include the start and end point of each segment and the length of the

segment in miles (for example: Natural River: headwaters, Z miles, to the Town of ABC town line; Rural River: Town of ABC town line, Y miles, to the state border). Although a river or segment may be given more than one classification, the number of differently classified segments should be kept to a minimum. If your recommendation is incompatible with any of the above-listed criteria for a particular river classification, and you believe the classification is nevertheless appropriate and justified, explain why.

Natural River	From Route 202A to Route 126 [Segment 2]
Rural River	From Bow Lake to Route 202A [Segment 1] From Route 126 to the confluence with the Cocheco River [Segment 3]
Rural-Community River	N/A
Community River	N/A

VI. Maps

A map of the river must be appended to this resource assessment. This map should be taken from a US Geological Survey quadrangle (scale 1:24,000) or equivalent in accuracy and detail. GIS maps produced to show river-related resources can serve this purpose. Include an inset or locator map showing the location of the river or segment within the state.

This nomination package contains a series of 11 x 17, color maps with base features from USGS, 1:24,000-scale Digital Line Graphs as archived in NH GRANIT. These maps include:

- Base Map with Surface Water, Roads, and Highways;
- Regional Watershed [also serves as locus map]
- 100-year Flood Plain;
- Conservation Lands and Unfragmented Lands;
- Existing Land Use;
- Wetlands;
- Stratified Drift Aquifers;
- Ground Water Hazards;
- Native Ecosystems;
- Soil Properties;
- Historic Sites; and
- Recreation Sites.

VII. RESOURCE ASSESSMENT

1. Natural Resources

(a) Geologic Resources

Briefly describe the significant geologic resources of the river and its corridor, including any unique or visually interesting features such as waterfalls, unusual rock formations, and areas of rapids. If you are unable to include such features, then simply describe the bedrock geology map. Consider geologic resources on the basis of natural history, visual, and economic interest. Indicate if the state geologist or a national or state resource assessment has identified these geologic resources as significant at a national, regional (New England), state, or local level.

The two types of rock formations that converge in the Isinglass corridor are metasedimentary and igneous (metavolcanic). Beyond this commonality, a recent bedrock geology map distinguishes three geologic divisions in the Isinglass corridor³. From east to west, the divisions are the Central Maine Terrain, Fredericton Trough, and Barrington Pluton. The mica present throughout— which accounts for the Isinglass River's name—characterizes this last division. From the nineteenth century well into the

1930s, windows, lamp shades, clock faces, and other goods were made from “isinglass,” a product of mica mined near Center Barnstead (Harlan Calef, 2000).

During the last glaciation, the bedrock was covered by till in unconsolidated deposits in the upper basin of the River and on the hills of the lower basin⁴. Grain sizes in those deposits vary from clay to boulders. The lowlands were wetter and contact with the glaciers produced more stratified deposits. Terraces of sand and gravelly sand were left on the edges of the ice margins, offering contemporary landowners a valuable resource.

Interesting rock formations along the River include areas of rapids at French Mill downstream of the Route 126 bridge and at the Winkley Mill site near the River’s intersection with Green Hill Road. Below Route 125, the Isinglass flows over Locke’s Falls. The rock formations and carved sluice made by early mill owners to provide an additional power source (see Historic Sites map) are spectacular.

The River corridor’s surface geology also reveals the presence of water resources beneath. In 1988, a study was undertaken by local geologist Peter Thompson on behalf of the Town of Barrington. The purpose of the study was to evaluate an area of approximately 10.5 square miles in northeastern Barrington to identify and define deposits capable of hosting aquifers suitable for public water supply⁵. The study covered approximately one-fourth of the River’s length west of Route 125 and concluded that the contemporary Isinglass is probably a remnant of a much larger river that occupied a paleo channel as deep at 40 to 70 feet, called the Mallego Channel. Aquifers were identified within this area, primarily along Route 125 running north-south for a distance south of Route 9.

In 1992, a United States Geological Survey (USGS)⁶ was published, covering a broader area and including the Bellamy, Cocheco, and Salmon Falls River basins. Like the Thompson report, this survey identified a low transmissivity aquifer surrounding Route 125 and additional sites in several other sections of the Isinglass corridor to the west. According to the USGS study, none of these aquifers is capable of providing more than 2000 square feet/day (see the Stratified Drift Aquifers map).

A vast aquifer or series of aquifers, of which the Isinglass/125 aquifer is a part, run north-south through Barrington, Rochester, Farmington, and New Durham. Underlying the Cocheco River and within the boundaries of Rochester and Farmington, the transmissivity potential of the aquifers rises to 4000+ square feet/day and in some sections, to 8000+ square feet/day.

According to the USGS assessments, the value of the Isinglass and its corridor for significant supplies of drinking water is not significant. This is in comparison to the supply potential within the more northerly aquifer sites and in terms of its instream flow being sufficient to provide surface water on any large scale to riparian and other watershed communities.

(b) Wildlife Resources

(1) List the species of mammals and birds commonly found in the river and river corridor.

Many of the species listed below are not considered common but are found in the Isinglass River corridor and are indicated by an asterisk. Aquatic invertebrates, reptiles, and amphibians are also essential to the fauna of a river system and are indicators of its health. They are also included in the lists below.

MAMMALS

Bat, Big Brown	Fox, Red	Myotis, Little Brown (Bat)
Bat, Hoary*	Hare, Snowshoe	Myotis, Small-footed (Bat)*
Bat, Red*	Lemming, Southern Bog*	Opossum, Virginia
Bat, Silver-haired*	Mink	Otter, River
Bear, Black	Mole, Hairy-tailed	Pipistrelle, Eastern*
Beaver	Mole, Star-nosed	Porcupine
Bobcat	Moose	Raccoon
Chipmunk, Eastern	Mouse, Deer	Rat, Norway
Cottontail, Eastern*	Mouse, House	Shrew, Long-tailed*
Coyote	Mouse, Meadow Jumping	Shrew, Masked
Deer, White-tailed	Mouse White-Footed	Shrew, Short-tailed
Fisher	Muskrat	Shrew, Smoky
Fox, Gray	Myotis, Keen’s (Bat)	Shrew, Water*

Skunk, Striped
Squirrel, Gray
Squirrel, Northern Flying
Squirrel, Red

Squirrel, Southern Flying
Vole, Meadow
Vole, Southern Red, backed
Vole, Woodland

Weasel, Long-tailed
Weasel, Short-tailed (Ermine)
Woodchuck

BIRDS

Bittern, American
Blackbird, Red-winged
Bluebird, Eastern
Bobolink
Bunting, Indigo
Cardinal, Northern
Catbird, Gray
Cedar Waxwing
Chickadee, Black-capped
Cormorant, Double-crested
Cowbird, Brown-headed
Creeper, Brown
Crow, American
Cuckoo, Black-billed*
Dove, Mourning
Duck, American Black
Duck, Blue-winged Teal*
Duck, Green-winged Teal
Duck, Ring Necked
Duck, Wood
Eagle, Bald*
Finch, House
Finch, Purple
Flicker, Northern
Flycatcher, Great, crested
Flycatcher, Least
Gnatcatcher, Blue-gray
Goldfinch, American
Goose, Canada
Grackle, Common
Grebe, Pied-Billed
Grosbeak, Evening
Grosbeak, Rose-breasted
Grouse, Ruffed
Gull, Herring
Gull, Great Black-backed*
Hawk, Broad-winged
Hawk, Cooper's*
Hawk, Red-Shouldered*
Hawk, Red-tailed
Hawk, Sharp-shinned
Heron, Great Blue
Heron, Green
Hummingbird, Ruby-throated

Jay, Blue
Junco, Dark-eyed/Slate-colored
Kestrel, American
Killdeer
Kingbird, Eastern
Kingfisher, Belted
Loon, Common*
Mallard
Meadowlark, Eastern
Merganser, Hooded*
Mockingbird, Northern
Moorhen, Common*
Nighthawk, Common*
Nuthatch, Red-breasted
Nuthatch, White-breasted
Oriole, Baltimore
Osprey
Ovenbird
Owl, Barred
Owl, Great Horned
Peewee, Eastern
Pheasant, Ringed-necked
Phoebe, Eastern
Rail, Virginia
Raven, Common
Redpoll, Common
Redstart, American
Robin, American
Sandpiper, Spotted
Sapsucker, Yellow-bellied
Sparrow, American Tree
Sparrow, Chipping
Sparrow, Field
Sparrow, Fox
Sparrow, House
Sparrow, Song
Sparrow, Swamp
Sparrow, White-crowned
Sparrow, White-throated
Starling, European
Swallow, Barn
Swallow, Rough-Winged
Swallow, Tree
Swan, Mute

Swift, Chimney
Tanager, Scarlet
Thrasher, Brown
Thrush, Hermit
Thrush, Wood
Titmouse, Tufted
Towhee, Eastern/Rufous-sided
Turkey, Wild
Veery
Vireo, Blue-headed
Vireo, Red-eyed
Vireo, Solitary
Vireo, Warbling
Vulture, Turkey
Warbler, Black-and-white
Warbler, Blackpoll
Warbler, Black-throated Blue
Warbler, Black-throated Green
Warbler, Blackburnian
Warbler, Blue-winged
Warbler, Canada
Warbler, Chestnut-sided
Warbler, Golden-winged*
Warbler, Magnolia
Warbler, Nashville
Warbler, Palm
Warbler, Pine
Warbler, Prairie
Warbler, Yellow
Warbler, Yellow-rumped
Waterthrush, Louisiana
Waterthrush, Northern
Waxwing, Bohemian*
Waxwing, Cedar
Whip-poor-will*
Wood-Pewee, Eastern
Woodcock, American
Woodpecker, Downy
Woodpecker, Hairy
Woodpecker, Pileated
Wren, House
Wren, Winter
Yellowthroat, Common

REPTILES

(Snake) Black Racer
Snake, Brown
Snake, Common Garter

Snake, Milk
Snake, Northern Water
Snake, Red Belly

Snake, Ring Neck
Snake, Smooth Green
Turtle, Blandings

Turtle, Eastern Painted Turtle, Snapping	Turtle, Spotted Turtle, Wood	Turtle, Common Musk (Stinkpot)
AMPHIBIANS		
Bullfrog, Blue (rare mutation) Bullfrog, Green Frog, Gray Tree Frog, Green Frog, Leopard Frog, Pickerel	(Frog), Spring Peeper Frog, Wood Newt, Eastern Red-spotted Salamander, Dusky Salamander, Four-toed Salamander, Spotted	Salamander, Spring Salamander, Northern Two-lined Salamander, Redback Toad, American

INVERTEBRATES (other aquatic invertebrates including explanatory narrative in the Appendix)

Blue Dasher Chalk-fronted Corporal Common Whitetail Darter, Black-tipped Darter, Common Green Darter, Farn Dot-Tailed Whiteface Dragonhunter Eastern Amberwing	Eastern Pondhawk Eastern Tiger Swallowtail Four-spotted Skimmer Frosted Whiteface Lancet Clubtail Least Skipper Monarch Painted Lady Prince Baskettail	Saffron-winged Meadowhawk Silver-spotted Skipper Slaty Skimmer Spangled Skimmer Stygian Shadowdragon Twelve-spotted Skimmer Yellow-legged Meadowhawk
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(2) List any endangered or threatened animals which are supported by the river and river corridor environment. Include location, if known. Check whether these animals are endangered [E] or threatened [T] species and if they are significant at a national [N] or state [S] level.

Currently, known endangered or threatened amphibians, invertebrates, or reptiles have not been documented in the Isinglass corridor. However, a new law prohibits anyone from possessing Blandings, Spotted, and Wood Turtles. All three species occur along the Isinglass. The Wild Lupine found in the corridor supports the state- and federally-endangered Karner Blue Butterfly.

Animal Species	Location	E or T	N or S
Small-footed Myotis [bat]	General Isinglass corridor	E	S
Eagle, Bald	General Isinglass corridor	E	N
Loon, Common	General Isinglass corridor	T	S
Osprey	General Isinglass corridor	T	S
Hawk, Cooper's	General Isinglass corridor	T	S
Nighthawk, Common	General Isinglass corridor	T	S

(3) List significant wildlife habitat which is supported by the river or to which the river is integral, for game and non-game wildlife populations. Identify if the habitat has been determined to be exceptionally diverse, very diverse, or moderately diverse by the NH Department of Fish and Game or the US Fish and Wildlife Service.

Significant Habitat	Diversity Rating
River corridor upstream of Route 126	Very diverse
Downstream of Route 126 to confluence	Moderately diverse

These ratings were determined by NH Department of Fish and Game fish and wildlife biologists, based upon the potential for human encroachment on the River corridor. The upper five-mile stretch of the Isinglass from Route 202A in Strafford to Route 126 in Barrington is a relatively unspoiled and natural section of River. Because there is no established access, it is not commonly disturbed by human visitation and therefore its value as prime wildlife habitat is enhanced. In the lower section, below Route

126, human influence is more pronounced with residential housing, fishing sites, and commercial establishments at Route 125 crossing (See Existing Land Use map).

The attached Wetlands map shows numerous wetland areas within the corridor which attract birds, reptiles, and amphibians (see vegetation list below). The large forested areas in the corridor offer habitat to animals with more extensive ranges and provide cover and browsing feed for other animals through much of the year (see Unfragmented Lands map).

(4) Determine if the river corridor is important for the movement of wildlife between large habitat areas. If it is, explain why.

In a number of sections, the River serves as a corridor between unfragmented parcels (see Conservation Lands and Unfragmented Lands map). The upper five-mile natural section is particularly important as a wildlife area and for movement of wildlife between adjacent large habitat areas. The unsettled woodlands that extend north from the River corridor to the Parker Mountain area are extremely valuable. This peak is the most prominent in the Blue Hills range, a small southeastern New Hampshire highland. This expansive area supports many large mammals such as Moose, Black Bear, and White-tailed Deer.

The large undeveloped area along the northwestern bank of the Isinglass extending from the Route 126 bridge to the Route 202 bridge also connect with the extensive habitat described above. Hilly terrain, wetlands, and a terrace of inactive beaver ponds mark this section. Bobcats have been seen here in recent years as well as the Moose, Black Bear, and White-tailed Deer. These animals move along the corridor downstream of Route 202. Bear and Moose are rarely seen below the Green Hill Bridge section. Coyotes cover virtually the entire River corridor west of Route 125. Most of the wildlife travel below Route 202 takes place on the northwestern banks, which are the least developed. However, all these species cross the River regularly.

Downstream, the River corridor offers good habitat to Deer in several places. The absence of reports of Black Bear and Moose suggest that the development that has occurred on the Rochester side of the River has impacted habitat for large animals.

(c) Vegetation/Natural Communities

(1) List the plant species commonly found in the river and river corridor.

Anemone, Wood	Bulrush, spp..	Fern, Royal
Arbutus, Trailing	Bur-reed	Fern, Sensitive
Arrowhead, Broad-leaved	Buttonbush	Floating Heart
Arrow-wood	Cardinal Flower	Gale, Sweet
Asparagus, Wild	Cattail, Broad-Leaved	Ginseng
Aspen, Quaking	Checkerberry	Goldenrod, spp.
Aster, spp.	Cherry, Choke	Goldthread
Azalea, Swamp	Cherry, Pin	Grape, Riverbank
Beech, American	Climbing Hempweed	Grass, Rattlesnake
Birch, Black	Cutgrass	Groundpine
Birch, Gray	Cutgrass, Rice	Gum, Black
Birch, White	Dogwood, Alternate-leaf	Hemlock
Birch, Yellow	Dogwood, Gray	Hickory, Shagbark
Black-eyed Susan	Dogwood, Silky	Huckleberry
Bladderwort, Common	Elder, Common	Huckleberry
Bladderwort, Inflatable	Elm, American	Indian Poke
Blue Flag Iris	Elm, Slippery	Ironwood
Blueberry, High-bush	Englemann's Quillwort	Jewelweed
Blueberry, Low-bush	Fern, Bracken	Joe-Pye Weed, spp.
Blue-eyed Grass spp.	Fern, Cinnamon	Juniper, Pasture
Bluegrass, Kentucky	Fern, Interrupted	Lady Slipper
Bluets	Fern, Marsh	Lady's Slipper, Pink
Boneset, spp.	Fern, New York	Lady's Slipper, Yellow

Lake Sedge	Oats, Wild	Sedge, Three-seeded
Large Yellow	Orchid, Ladies' Tresses, spp.	Sedge, Three-way
Laurel, Sheep	Partridgeberry	Sedge, Tussock
Leather Leaf	Pickerelweed	Shadblow
Lily of The Valley (Wild)	Pine, Eastern White	Skunk Cabbage
Liverwort	Pine, Pitch	Slender Crabgrass
Lupine, Wild	Pine, Red	Slender Crab-Grass
Lycopodium, spp.	Pitcher Plant	Spatterdock
Malegrass	Pitcher Plant	Spruce, Black
Maple, Red	Plum, American	Starflower
Maple, Striped	Poison Ivy	Strawberry, spp.
Maple, Sugar	Pondweed, spp.	Sumac, Poison
Mayflower, Canada	Prostrate Tick-trefoil	Sumac, Staghorn
Meadowsweet	Queen Anne's Lace	Sweet Fern (not a fern)
Milkweed, Swamp	Raspberry, spp.	Trailing Arbutus
Nut-grass, spp.	Reed grass	Trillium, spp.
Oak, Black	River Bank Quillwort	Vervain, Blue
Oak, Pin	Rose, Swamp	Violet, spp.
Oak, Red	Rue, Tall Meadow	Winterberry
Oak, Scrub	Rush, Canada	Witch Hazel
Oak, Swamp White	Sasparilla, spp.	Woolgrass
Oak, White	Sedge, Lake	Yarrow

(2) List any endangered or threatened plant species that are supported by the River and River corridor environment. Include location, if known. Check whether these plants are endangered [E] or threatened [T] species and if they are significant at a national [N] or state [S] level.

Plant	Location	E or T	N or S
Huckleberry	Turtle Brook Sanctuary	T	S
Large Yellow Lady Slipper	Barr Farm Mount Misery	Special Concern (NHI)	S
Pitcher Plant	Scruton Pond	Special Concern (NHI)	S
Ginseng	Mt. Misery Ledges	Rare, exemplary NHI	S
Trailing Arbutus	Turtle Brook Sanctuary, Barrington	Special Concern (NHI)	S
American Plum	Not identified by NHI	Rare, exemplary NHI	S
Wild Lupine	Rochester	Rare, exemplary NHI	S
Slender Crab-Grass	Not identified by NHI	Rare, exemplary NHI	S
River Bank Quillwort	Not identified by NHI	Rare, exemplary NHI	S
Englemann's Quillwort	Isinglass	Rare, exemplary NHI	S
Climbing Hempweed	Isinglass/Route 202	Rare, exemplary NHI	S

(2) List any vegetative communities supported by the river and the river corridor environment which have been identified as "exemplary natural ecological communities" by the New Hampshire Natural Heritage Inventory. Include location, if known.

The richness of vegetation reflects the diversity of land types within the corridor. Swamps, beaver ponds, and wetlands contribute various sedges, Black Gum/Red Maple community, and species such as the Inflatable Bladderwort. Managed forests provide space for the herbaceous plants that provide food for

wildlife, such as Pin Cherry. Newly opened areas in Tree Farms which have been predominantly pine offer opportunities for trees such as Black Spruce to grow more rapidly.

Natural Community

Name/Occurrence	Rank	Precision	Survey Site	Last observed
Northern New England Rich Mesic Forest .005	A	S	Mount Misery Ledges	1999
Black Gum/Red Maple Basin Swamp .011		S	Barrington Black Gum Swamp, Hale Woods, Rollercoaster Road	1972

Plant Species

Name/occurrence	Rank	Precision	Survey Site	Last observed
Large Yellow Lady Slipper		S	Mount Misery Ledges	1999
Climbing Hempweed .008		S	Isinglass River, Route 202	1988
Ginseng .003	B	S	Mount Misery Ledges	1983
American Plum .002		M		1957
Wild Lupine .016		M	Rochester	1950
Engelmann's Quillwort .002		H, M	Isinglass River	1946
Climbing Hempweed .001		H, S	Long Pond Outlet	1943
River Bank Quillwort .012		H, M		1941
Slender Crab Grass .003		G		2001

A-D = Excellent [A] to Poor [D], S = location known to within about 300 feet, H = Historical (not observed within the last 20 years), M = Location known to within about 1.5 miles, X = Extirpated, G = Location known only to place name, about 5 miles

(d) Fish Resources

(1) List the fish species commonly found in the river.

Many of the species listed below are not considered common but are found in the Isinglass River corridor and are indicated by an asterisk.

American Eel	Blacknose Shiner*	Common Sunfish
Brook Trout	Fall Fish	Redbreast Sunfish
Brown Trout	Long Nose Dace	Bluegill
Rainbow Trout	Black Nose Dace	Smallmouth Bass
Atlantic Salmon	Common Sucker	Largemouth Bass
Eastern Chain Pickerel	Creek Chub Sucker	Yellow Perch
Bridled Shiner	Brown Bullhead	Swamp Darter
Common Shiner	Margined Madtom*	

(2) List any endangered or threatened fish species which inhabit the river. Check whether these fish are endangered [E] or threatened [T] species and if they are significant at a national [N] or state [S] level.

The Blacknose Shiner, which occurs in the Isinglass mainstem, has not yet been designated but has a very limited presence in New Hampshire. It could qualify for listing in the future.

(3) Describe the presence and location of spawning beds, feeding areas, and other significant aquatic habitat for fish populations. Determine if the habitat is exceptionally diverse, very diverse, or moderately diverse as determined by the NH Department of Fish and Game or the US Fish and Wildlife Service. The fish habitat in the Isinglass is judged to be very diverse by NH Department of Fish and Game biologists. This diversity is facilitated by the River's high water quality, an abundance of riparian vegetation, and variable flow velocity which provides a range of bottom substrates from rock/cobble to mud.

Areas of importance fit into two categories: those that receive stocked trout for anglers and those that are stocked with sac fry Atlantic Salmon as part of the NH Department of Fish and Game's effort to restore a salmon population in tidal rivers in southeastern New Hampshire. The Isinglass is a freshwater component of this program.

The area most valued for trout stocking is the River reach between Routes 126 and 202. Annually, Rainbow Trout stock number about 2500 and Brook Trout about 3000. Anglers, largely due to the excellent public access there, actively pursue fish in the area. The large number of vehicles parked along the road near Routes 126 and 202 during fish stocking season are evidence of the popularity of the area.

The stocking of sac fry Atlantic Salmon in the Isinglass also occurs along this reach as well as along Green Hill Road in Barrington. It is expected that the stocked fish will complete the early stages of their life cycle as sac fry, parr, and then as smolt when they will run to the ocean to mature. It is hoped that they will return to spawn in the Isinglass.

(4) Indicate whether the significant fisheries found in the river rely on natural reproduction or a stocking program. If fish populations rely on a stocking program, indicate whether they are partly or wholly dependent on the program.

Anadromous fish in the Isinglass system are currently restricted to one species, the Atlantic Salmon. Atlantic Salmon are present only as introduced sac fry and parr as a part of a program whose goal is establish a sustainable population for the Isinglass/Cochecho system. With favorable conditions, fish may mature to run to the ocean as smolt and later return to spawn. The Isinglass lower reach (below the Locke Mill Falls) would be accessible by adult salmon after they ran the fish ladder in Dover, passed a natural ledge obstruction, and through Watson Road lower dam (all on the Cochecho River). It is possible that an adult salmon raised in the Isinglass system could ascend that stream and seek spawning habitat. The ability of salmon to pass Locke Mill Falls is less certain. The Cochecho/Isinglass, along with another coastal system, the Lamprey, are target streams for the New Hampshire Department of Fish and Game's ten-year old federally-supported program directed at restoration of Atlantic Salmon to coastal New Hampshire waters.

Evidence of natural spawning in the mainstem of the Isinglass is speculative. However, there is documented natural spawning in some of its tributaries. NH Department of Fish and Game personnel have observed clear evidence of natural spawning Brook Trout in Nippo Brook and a small unnamed stream that enters the Isinglass near the junction of Routes 202 and 126 in Barrington. No doubt, natural spawning of Brook Trout is possible in other tributaries and may occurring in the upper reaches of the mainstem when the vegetative shading of the stream is heavy.

Based on NH Department of Fish and Game's information on natural spawning in the Isinglass, it appears that the significant trout fishery is partly dependent on stocking. The majority of anglers who frequent popular fishing sites along the highway access points are pursuing stocked trout

(5) Is the river a viable anadromous fish resource? If yes, identify any on-going or planned restoration programs.

The River is currently being used as a nursery stream for the restoration project as described above.

(e) Water Quality

(1) Check the state's water quality classification which applies to this river or segment under state law.

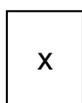
Class A

Class B

(2) According to readily available information, what is the actual water quality of this river under the state's water quality standards?



Class A



Class B

(3) If the river is not currently supporting its water quality classification, identify the existing major causes of deficient water quality (e.g., industrial or sewage pollutants, agricultural fertilizer run-off) and possible corrective measures (e.g., regulations, enforcement, local, and use controls).

For this study, the dam discharge at the southeastern end of Bow Lake marks the beginning of the Isinglass River. During the summer of 2000, volunteers of the Isinglass River Protection Project performed field sampling. Sampling included the Isinglass and two of its tributaries, the Mohawk River and Nippo Brook. Data sheets from the NH Volunteer River Assessment Program for last summer's results are included in the Appendix. Monitoring sites are depicted on the Ground Water Hazards map.

The Isinglass currently supports the Class B water quality designation at all of its monitoring locations. From a water quality perspective, the Isinglass's two chief beneficiaries are the Cocheco River and the Dover Water Works. First, the Isinglass plays a crucial role in contributing to the Cocheco River's water quality⁷. Second, the City of Dover withdraws water above the confluence of the Isinglass with the Cocheco. The Isinglass helps replenish Dover's public well water supplies.

There were monitoring sites⁸ along the Isinglass that had *E. coli* and Dissolved Oxygen (DO) samples that would border or fall outside the Class B water quality classification:

Monitoring site, 01-Mhb, along the Mohawk River above the confluence with the Isinglass River had samples that came close to the DO 5 mg/L mark for Class B water quality classification:

- On 09/09/00, 10:10 AM, station 01-Mhb recorded DO samples of 5.27 mg/L and 55.6% saturation. Observations included comments of a beaver dam with stillwater above the sampling station that may contribute to these readings.
- On 10/07/00, 1:30 PM, station 01-Mhb recorded DO samples of 7.02 mg/L and 66.3% saturation.
- On 11/05/00, 1:30 PM, station 01-Mhb recorded DO samples of 8.88 mg/L and 75.8% saturation. Observations included comments of water flowing over the beaver dam above the sampling station.

Monitoring site, 08-Isg, Isinglass River above the Route 126 bridge had samples that came close to, or exceeded, the 406 CTS/100ml *E. coli* mark for Class B water quality classification:

- On 07/07/00, station 08-Isg recorded *E. coli* 320 CTS/100ml using EPA method SM 18 9213 D.3.
- On 10/10/00, station 08-Isg recorded *E. coli* 600 CTS/100ml using EPA method SM 18 9213 D.3. No observable evidence for the cause of this high reading was documented although this site is downstream of extensive wetlands.
- With the exception of monitoring station 08-Isg, the Isinglass River at Route 126 Bridge, *E. coli* samples from all other Isinglass River monitoring stations were 120 counts per 100ml or below using EPA method SM 18 9213 D.3.

(f) Natural Flow Characteristics

Briefly describe the natural flow characteristics of the river, including natural periodic variation in flow (e.g., spring run-off and summer flow amounts) and frequency and duration of flood events. If applicable, describe purpose of and flow variations caused by impoundments, significant diversions, or channel alterations, including inter-basin transfers. Indicate which segments of the river are free-flowing.

There are no current or historic stream flow gauge sites directly on the Isinglass River. However, using other USGS stream gauges in the Piscataqua-Salmon Falls basin, namely the Lamprey River near

Newmarket (#01073500), Mohawk River near Center Strafford, NH (#01072850), Cocheco River at Dover (#01072880), and Cocheco River Near Rochester (#01072800) the IRPP has estimated monthly average and median cubic feet per second (cfs) as well as monthly median cubic feet per second per square mile of watershed. Median flow values are a much less biased estimator of monthly flows than are estimates of mean flow. The monthly flow estimates are transposed using the watershed area that contributes to each respective gauge location and the area of the Isinglass watershed, then adjusting for the period of record available for each of the gauges to produce estimates of the historical discharge for the Isinglass River.

Estimated Average Flow of the Isinglass River at the Confluence with the Cocheco River

Month	Average Discharge (cfs)	Median Discharge (cfs)	Median Discharge Area (cfsm)
January	120	86	1.14
February	134	94	1.25
March	258	195	2.61
April	291	222	2.96
May	142	109	1.46
June	75	43	0.57
July	36	21	0.28
August	25	13	0.18
September	27	12	0.16
October	53	29	0.38
November	111	72	0.95
December	143	99	1.31

The low flow statistic, 7Q10 describes the lowest seven day-average flow that is likely to be seen at a given location on an average of once every ten years. That is, in any given year there is a 1/10 chance that the 7Q10 will occur. In determining the monthly median flows for the Isinglass River, four gauges with similar underlying geology and watershed characteristics were used. However, of those gauges only the Lamprey gauge had a sufficiently long period of record to produce a reliable 7Q10 statistic. The transposed 7Q10 for the Isinglass River would be 1.97 cfs. Impoundments at Bow Lake and Ayers Pond are not likely to impact the flow estimates since the Lamprey has a similar degree of impoundment.

In 1978 and 1982, the USGS made several flow measurements in the Isinglass River. In August 1978, a low-flow event of 6.6 cfs was recorded. In April 1978, flow was recorded at 383 cfs and 298 cfs in April of 1983. By the method presented above, the April 1978 average flow was 289 cfs and 382 cfs for April 1983.

From the outlet of Bow Lake the Isinglass River flows freely to the confluence of the Cocheco River. The Isinglass River watershed is approximately 75 square miles. The major tributaries of the Isinglass River include the Mohawk River, Nippo Brook, Berrys River, Green Hill Brook, and the outlets of Hanson and Ayers Ponds. In Rochester, the Isinglass flows into the Cocheco River and then proceeds to the Piscataqua River.

(g) Open Space

Briefly describe, give the location and identify the type (e.g., floodplain, forested, etc.) and type of ownership (i.e., public or private) of significant areas of open space in the river corridor. Describe and

include the location of any protected land parcels within the river corridor (e.g., state parks and forests, national forest lands, municipal parks and conservation easements).

High-quality natural and scenic resources characterize the Isinglass River. The shore is largely forested, (primarily in natural vegetation); and the corridor largely undeveloped. Riparian land use is mostly active forest management and scattered residential housing. There are no state or federal parks or forests along the Isinglass.

Beginning at Bow Lake in Strafford, the River flows through Barrington and ends at its confluence with the Cocheco River. Various streams flow into the Isinglass including unnamed tributaries, the Mohawk and Berrys Rivers, and Ayers and Nippo Brooks. Nowhere in the River corridor is the flood plain more than 200 feet wide.

Segment 1, Strafford Corridor (IRM 17.9 - 12.1): From Bow Lake to the Barrington town line, the Isinglass corridor runs through primarily private, largely forested and undeveloped land. Immediately below the Bow Lake Dam, the River flows under the Province Road bridge, which predates the dam. Residences, two small businesses, one general store, and one craftwork studio lie on the northeasterly side of Province Road near the bridge. Beyond these structures, the River runs through deciduous forest for .3 miles until opening into a flat, forested wetland just northwest of the Route 202A bridge. Here the River separates into multiple channels which converge as the River passes under the Route 202A bridge (IRM 17.4). Extensive wetlands lie to the southeast of the bridge.

Below these wetlands, the River runs through deciduous forest along high, steep banks. There is a housing development lying on the northwesterly side of the River, accessed off Route 202A. A natural vegetated buffer on a high bank separates house lots from the River. All of the house lots are located uphill from the river channel. From this point, the River runs through privately held, undeveloped forestland. The River divides into two channels above the Foss Mills Site (see Historic Sites map) at IRM 14.3, converging some distance below the old mills. Foss Mills is sited in forested uplands and punctuated by the breached remains of the 1780s mills and old cellar holes. The Foss Mills Site is a seventeen-acre conservation area leased by the Town of Strafford from the NH Water Resources Council. Pig Lane, a closed Class VI town road, "crosses" the River at this site. There are no working bridges at this time, although local recreational groups hope to build new bicycle/snowmobile bridges over the River in the future.

Below the Foss Mills Site, the Isinglass continues to flow through privately held, undeveloped land, joined by No Name Brook. The River broadens into a wetland area at the confluence of the Isinglass with the brook descending from the Huckins Mill Pond. It then regains a defined channel with high banks. Public Service Company of NH power transmission lines cross the River about one-half mile from the Barrington town line. The River continues to run through privately held undeveloped forest land throughout this area and cannot be directly accessed from a road. Nearing the Barrington town line, the terrain flattens as the River nears its confluence with the Mohawk, opening into an extensive wetland area across the town line. Parshley Lane, off Route 126 in Strafford, extends near the River in this area, marking the site of one of the area's first homesteads. Only the Parshley family cemetery remains today. Residential development is clustered at the Route 126 end of the road, well away from the River.

Segment 2, Barrington Corridor (IRM 12.1 - 4.0): The Strafford-Barrington town line is at the confluence of the Isinglass and Mohawk Rivers. The confluence of the Isinglass with Nippo Brook at IRM 12 marks the point at which the Isinglass becomes a fourth-order stream. Extensive wetlands are found where the Isinglass crosses the Barrington town line as it flows toward Route 126. The Isinglass then flows along the northerly side of Route 126 and west of Route 202 for a little over two miles. Along this stretch, the southeastern side of the River is scattered with residential use, woods, and open wet areas. On the northwesterly side are undeveloped forest and wetlands, part of a 1000+ unfragmented land area (see Conservation Lands and Unfragmented Lands map).

Just below the Twombly's Grist Mill ruins (also called Locke Mill), the Isinglass passes under the Route 202 bridge. Moving rapidly through the mill's abandoned sluice, the water broadens into a narrow floodplain where Ayers (AKA Betty's) Brook joins the River (IRM 8.5). This area is mostly flat, forested land on the northwestern bank and residential on the southwestern.

From Route 202, the River roughly parallels Scruton Pond Road for approximately 3.5 miles. The banks are generally high with a few seasonally wet floodplain areas. In this section of the River are abutments of three pre-Revolutionary bridges. The most westerly of these led to the Barrington Town Farm and Tuttle's Fulling Mill (See Historic Sites map and *Barrington's Town Farm* in the Appendix). Presently this site is a managed woodlot of approximately 300 acres belonging to Harlan Calef. Across the River, below the old bridge abutment is a Certified Tree Farm of approximately 50 acres also owned by the Calef family.

Continuing downstream, an fifteen-acre parcel on the southeastern bank has recently been acquired by the Town of Barrington. This lot has approximately 200 feet along the River. No management plan is currently in place. At the junction of Scruton Pond and Brewster Roads, a 55-acre parcel owned by Jim and Ann Schulz is under conservation easement and is a Certified Tree Farm. A footbridge spanning the River and relying upon the historic abutment is maintained by the owners for local use.

As the River turns northeast from Scruton Pond Road, it is bounded by two small wetlands formed from the outlet of Winkley Mill Pond. The pond's containing-berms were fully breached in the mid-1980s. In all other areas, the banks are very high and steep. Below the pond, the water flows shallowly and rapidly over rocks and through rapids as it passes the abandoned Winkley Mill. Most of the northern bank here is residential housing buffered, with one exception, by natural vegetation.

Above the Green Hill Road bridge (IRM 4.7), the River broadens briefly and then moves downhill over rocky terrain for the next half-mile, it passes an inactive gravel pit well-buffered by forest. This property is owned by Robert Hussey who permits informal public access for recreational use on its 200+ acres.

Segment 3, Rochester/ Barrington Corridor (IRM 4.0 - 0.0): As the Isinglass flows northeast into Rochester near Flagg Road, it passes a clustered housing development on the northwest bounded by 11.37 acres of open space deeded to Rochester. Along the bank is a deeded Public Service of New Hampshire property of 2.34 acres as the power lines cross the River (approximately IRM 3.5).

As the River flows southeast again, it passes through the abutments of an abandoned Boston & Maine railway. A deeded easement on a 50-foot forested buffer along the Isinglass begins at the abutment where the River can be forded on horseback and used for fishing and boating access. This space also offers opportunity for rough hiking (see Recreation Sites map).

From IRM 2.0 - 0.8, the River's southern bank is within Barrington. On the northern shore of this segment, Turnkey has created a forest management area of over 100 acres within their 1200 acre site with excellent recreational and scenic opportunities (see Recreation Sites map and narrative). Although the area is in active forestry management, it is not under conservation easement and cannot be considered permanent open space.

At IRM 0.4 the River flows under the Rochester Neck Road bridge. There, the River is narrowly buffered from a former Pike Industries gravel operation. Just downstream of the bridge, the City of Dover draws water from the Isinglass for an adjacent town well. The southern bank is private land in agricultural use.

The confluence of the Isinglass and the Cocheco is at IRM 0.0. There is a conservation easement on the Gabriel Farm at the confluence.

2. Managed Resources

(a) Impoundments

List all of the dams which are present in the river, including any dams which are breached or in ruins. Identify their location, ownership, and purpose (i.e., flood control, low flow augmentation, or storage). Also indicate whether minimum flow requirements exist at any of the impoundments, if known. Include any proposals for new or reconstructed dams; indicate that this is a proposed dam by placing an asterisk (*) next to the name of the dam. Do not include existing or proposed dams which are used for hydroelectric energy production. These will be listed separately in the managed resources category.

There is one active dam (for Bow Lake) on the mainstem of the Isinglass River. The Bow Lake dam impounds 1171 acres of water, has an upstream watershed of 14.3 square miles, and is used primarily for recreational activity. Six breached dam sites have been identified from the DES database.

Past and Current Dams on the Isinglass River

Dam Code	Name	Type	Area Impounded in acres	Class	Status	Height in feet	Owner
224.01	Bow Lake	Earth/ concrete/ stone	1171	State	Active (Storage)	24	NH Water Resources Council
224.32	Foss Mill Dam I	Stone rubble, breached	0	Private	Inactive	0	NH Water Resources Council
224.33	Foss Mill Dam II	Stone rubble, breached	0	Private	Inactive	0	NH Water Resources Council
224.34	Foss Mill Dam III	Stone rubble, breached	0	Private	Inactive	0	NH Water Resources Council
015.05	Locke Mills (AKA Twombly's Grist Mill)	Timber/ Stone	0	State	Inactive	0	NH Water Resources Council
015.06	Winkley Mill Site	Stone	0	Private	Inactive	0	J. Barr and J. Bolster
015.07	Locke Mill Site	Unknown, breached	0	State	Inactive	0	M. Helfgott

Major Impoundments in the Isinglass River Watershed

Dam ID	Waterbody	Purpose	Watershed Area (Square miles)	Impoundment Area (Acres)	Minimum Release or Flow Required
224.01	Bow Lake	Recreation	14.3	1171	7cfs, 0.5 cfsm
224.21	Wildlife Pond (by Mohawk River)	Wildlife	1.09	28	N/A
083.06	Tufts Pond	Water Supply	4.19	28.0	NA
015.01	Ayers Pond	Recreation	2.7	214	N/A
015.03	Nippo Lake	Recreation	0.67	85	N/A
015.19	Stonehouse Pond	Wildlife/Recreation	2.95	14.2	NA
015.33	Scruton Pond	Wildlife/Recreation	0.81	29.4	NA

Of the four largest impoundments of the Isinglass watershed, only Bow Lake has a minimum release of 0.5 cfsm (7 cfs), equal to the US Fish and Wildlife Service's Aquatic Base Flow (ABF). Other impoundments within the Isinglass River watershed have limited areas and therefore limited impact on the Isinglass River.

(b) Water Withdrawals and Discharges

(1) List any significant water withdrawals from the river, including withdrawals for public drinking water, industry, and agriculture. Identify the purpose (e.g., irrigation) and location of the withdrawal. Indicate if

the river has been identified in a state, regional, or local study as a potential source of water supply and, if so, identify the study.

Sources, Volumes, and Use of Withdrawals by Hydrologic Unit Code

Withdrawal	Location 11-Digit HUC	Location Town/River	Purpose	Average Volume Withdrawn (Thousand Gallons per day)
Dover Water Department User ID # 20006-S09	01060003090	Rochester/ Isinglass	Recharge to Drinking Water Aquifer	1792
Rochester Water Works User ID #20011-S03	01060003090	Strafford/ Berrys River	Diversion to reservoir for drinking water	not measured

**Monthly Average Withdrawal by Dover Water Dept
(thousands of gallons per day) based upon 1994-1998 data**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Thousand Gal/Day	348.39	424.29	705.26	2014.20	2118.19	955.20	144.00	18.58	0.00	188.13	1143.60	1886.52
cfs	0.54	0.66	1.09	3.12	3.28	1.48	0.22	0.03	0.00	0.29	1.77	2.92

The City of Dover established a withdrawal from the Isinglass River in 1991 approximately one-half mile upstream of the Cocheco River confluence. The water withdrawn from the Isinglass is pumped to an old gravel pit in the "Hoppers" section of Dover (DES Registered withdrawal #20006-D02) that acts as a recharge basin. A mix of the naturally filtered Isinglass River water and groundwater is then withdrawn from the Calderwood (DES Registered withdrawal #20006-S03) and Campbell (Registered withdrawal #20006-S08) wells. The water then becomes part of Dover's water supply.

Before 1992, Pike Industries made a withdrawal of 125 thousand gallons per day for gravel washing three-quarter miles upstream of the Cocheco River. The Pike Industries withdrawal (20525-S01) is no longer active.

Rochester Water Works reports as a lump sum the quantity of treated water they produce. Consequentially, it is not possible to know how much water comes from the Berrys River (DES Registered withdrawal ID #20011-S03). Steve Smith, of the Rochester Water Works, explained that the dam on the Berrys River that diverts water into Round Pond and into the Rochester Reservoir system does not receive any manipulation of its stop-logs. The result is that when flow is high, Rochester gets water and when flow is low they do not. Under low-flow scenarios, they divert water from Tufts Pond (upper and lower valves) into the Berrys River. (Note: This facility is not within the designated corridor of the Isinglass River.)

Based on the collected information, a scenario using the Dover Water Works Withdrawal and based upon the current draft Instream Flow Rules proposed by DES in May 2001 can be created. This scenario would state:

A. The General Protected Instream Flow Standard would not be met if:

1. Stream flow were less than or equal to 0.5 cfsm and aggregate consumptive water use exceeded the *de minimis* amount of 5% of 7Q10,
2. Stream flow were between 0.5 cfsm and 1.0 cfsm and aggregate consumptive water use exceeded 0.02 cfsm,
3. Stream flow were between 1.0 cfsm and 4 cfsm and aggregate consumptive water use exceeded 0.04 cfsm, and
4. Stream flow were greater than or equal to 4 cfsm and aggregate consumptive water use exceeded 0.16 cfsm.

Estimated Median Annual Monthly Withdrawals and Discharges

Month	Median Discharge (cfs)	Median Discharge (cfsm)	Withdrawals* (In cfs)	MW** (in cfs)
January	86	1.14	0.54	3.00
February	94	1.25	0.66	3.00
March	195	2.61	1.09	3.00
April	222	2.96	3.12	3.00
May	109	1.46	3.28	3.00
June	43	0.57	1.48	1.50
July	21	0.28	0.22	0.10
August	13	0.18	0.03	0.10
September	12	0.16	0.00	0.10
October	29	0.38	0.29	0.10
November	72	0.95	1.77	1.50
December	99	1.31	2.92	3.00

*Actual watershed withdrawals may be higher when Rochester Water Works (#20011-S03) withdrawal from Berrys River is included. **MW [Maximum Withdrawal] in cfs—the maximum withdrawal, based on the May 2001 DES draft Instream Flow Rules.

The Dover Water Works withdrawal appears to pump in volumes that are related to the flow in the River. Based on the table above, their withdrawal never exceeds 3.5% of river flow. While there are some periods for which they exceed the maximum withdrawal, there are also periods well below the maximum.

(2) List all known surface water and potential discharges to the river and identify the source, type (e.g., industrial wastewater) and location of the discharge. Indicate whether the discharge has been permitted by the state (yes or no).

There are no direct discharges to the Isinglass River. Waste Management has an NPDES permit for this, as the crow flies, 2000 feet from the river but enters the Isinglass via a small brook. Subsequently, the distance from the discharge point of the confluence with the Isinglass is 4700 feet.

(c) Hydroelectric Resources

List all known existing or potential (as cited in the NH River Protection and Energy Development Project— Final Report; New England Rivers Center, 1983) sites of hydroelectric power production. Record the owner, location and whether the site is regulated or exempt from regulation by the Federal Energy Regulatory Commission (FERC).

In the *National Hydroelectric Power Resources Study Regional Assessment: New England Power Coordinating Council*⁹, the United States Army Corps of Engineers suggested that the Isinglass River Three project (Site # NHMNE8509), the old Locke Mill Site could be converted into a hydroelectric dam.

The *River Basin Management Plan for the Isinglass and Cochecho Rivers and Evaluation of Hydropower Potential at existing Dam Sites*¹⁰ estimated the annual power that could be produced by _____

rebuilding three dams, two of which were gone by 1935 according to the Water Resources Board files. As of the 1982 report, the three sites in Barrington are not under study. Therefore, no significant hydroelectric sites exist in the River corridor.

Production Capacity of Isinglass River Dams if rebuilt*

Dam ID	Name	kWh Annually
015.05	Locke Mills	560,000
015.06	Winkley Mill Site	480,000
015.07	Locke Mill Site	1,300,000

*No licenses on file

3. Cultural Resources

(a) Historical and Archaeological Resources

Describe any significant historical or archaeological resources or sites with significant potential for such resources (as determined by the state historic preservation officer) found in the River or river corridor. Identify whether the resource is listed or is eligible to be listed as a National Historic Landmark (NHL) or on the National Register of Historic Places (NRHP) or is a recognized Historic District (HD) or Multiple Use Area (MUA). If known, indicate whether these resources are significant at a national, regional (New England), state, or local level. Below this listing, note any local town histories, oral histories, or general historical knowledge about the use of the river and its corridor.

Historical/ Archaeological Resource	Listing/Eligibility	Significance
Ayers Lake Campground	Eligible at State level, HS*	Example of early tourism
Mills of the Isinglass and its tributaries	In process, HD*	Example of pre-industrial economic development
Squanamagonic Esker	Community restoration project, recreation area, potential HD	Pre-European settlement

*HS = Historic Site; HD = Historic District

One local Strafford history; *A History of Strafford, New Hampshire*¹¹ and two local Barrington histories have been published; *A History of Barrington, NH*¹² and *Barrington New Hampshire 1772-1972*¹³. Oral histories have been obtained from Harlan Calef and Mike Helfgott¹⁴.

The Isinglass was a part of the lives of both the pre-European inhabitants who lived near it and the European immigrants who took their places. The earliest human inhabitants of this area used the lakes, rivers, and streams for water, fishing, and for the wildlife that depended on the habitat. The territories of indigenous bands and community groups roughly followed watershed boundaries. The Isinglass area would likely have been part of the territory of the Cocheco band of the Piscataqua tribal group, whose presiding great sachem or sagamore at the time of the earliest European settlement was the well-known Passaconaway.

Ample evidence exists that native peoples occupied the Isinglass watershed prior to the European immigration. Artifacts have been found along the shores of Bow Lake in Strafford and along the Isinglass River below the current Bow Lake Dam. Evidence also suggests that an established Indian village at Nippo Pond, whose outflow runs into the Isinglass, was still in existence in the “contact period” when indigenous people and Europeans both lived in this region. The group at Nippo Pond may have been Penacooks.

Until sometime after 1000 AD, the people who lived in this region subsisted entirely by foraging for food. Those who depended upon these resources actively managed wild game, fisheries, and local plant populations. Typically, people came to the lakes and rivers in the spring and fall to fish and collect plants that could be stored for later use. Based upon what is known about the importance of Lake

Winnepesaukee to native economies, we can assume that the Isinglass, with what was then Bow Pond at its head, would have been key to the survival of nearby indigenous peoples.

Another indication of the significance of the Isinglass is that the pre-European inhabitants used a trail that follows the River. Province Road, that currently runs along ridges near the River, was said to have largely been laid out over these trails. Chester Price's *Map of Historic Indian Trails* shows a trail running along the Isinglass from Bow Pond to the River's confluence with the Cocheco in what is now Rochester. A number of trails met at this point.

The next chapter in the history of the Isinglass was quite different. With the growth of the colony, interest in the Isinglass watershed grew despite its rocky, swampy terrain. Pines for masts were harvested from its banks (Hale Wood). Locke's Falls on the Isinglass is demarcated on a map of the "Piscataqua Saw Mills" made for the King (circa 1700) and currently displayed at Strawberry Banke. The Cocheco River (called *Quochecha* on the 1700 map) made it possible to transport goods from the inland to the Piscataqua River and Great Bay. The Isinglass itself was too shallow and rocky to be useful for transport along most of its distance. In the winter, mast lumber was transported by land.

The Isinglass provided waterpower, a significant attraction to homesteaders. In addition to sawmills, woodsmen needed bread and the gristmills could provide flour to make it. In 1722, based in part on the availability of water power from the Isinglass, surveyors from the coast mapped boundaries and lot divisions for what became Barrington and Rochester (Strafford was part of Barrington until 1820). The lines they drew had no connection to existing land uses or land formations. As the communities grew, a few fulling mills were built to clean, shrink, and dye homespun cloth. One of these, the Tuttle Fulling Mill, built circa 1770, was washed away by a flood in 1835. No trace was left save for its records which provide many details of this step in a lumber town's development. A Barrington history offers an example with instructions "To Coller Cotten or lineon Bottle Green."

The early mills on the Isinglass and its tributaries were numerous. Their numbers, the quality and accessibility of their ruins, and their significance in the pre-Industrial economy suggest their potential as a registered historic district. Several of the mills formed the centers for village settlements, including Bow Lake, Critchett Mill (where a post office building still stands), and Locke Mill. The latter was built as a sawmill. Later a gristmill was erected opposite. A small village grew up around the mills, including a tub and firkin factory and a boarding house for employees. Later, a fire destroyed the factory and the mills were closed. In 1898, a flood washed away all evidence of this community with the exception of the mill ruins.

Historical Mills of the Isinglass*

Mill Name	Location	Date	Purpose
Foss Mills	Downstream of Bow Lake	1860	saw and grist
Montgomery Mill	Nippo Brook between Province Road and Route 126	1771	sawmill
Critchett Mill	Nippo near Province Road	1830	corn meal and cattle meal
Old French Mill	Long Pond outlet	1746	
Pearl / Felker / Berry Mills	Berrys River	1760 / 1787 / 1868	sawmill, grist, shingles, finish, planning, cider
Twombly's Mills (AKA Locke Mills)	Above Route 202	1771	grist, sawmill, shingle
Tuttle Mill	Downstream, near Route 202	1770	fulling
Winkley Mills	Near upstream, Green Hill Bridge	1780	sawmill, grist, fulling, carding, shoddy, knitting
Locke Mill	Near downstream, Route 125	1767	saw, grist, carding

*Local knowledge, state records, and other historical data show a variety of names for the mills and other geographic locations.

The most ambitious project to make use of the River for power was the construction in 1824 of the Bow Lake Dam to harness energy for the mills in Dover. The original dam was breached several years later when a larger, stronger dam in a different location immediately replaced it. The new dam, completed in 1832, raised the level of the lake by about twenty feet. However, the contours of the original pond are easily seen when looking at a map of Bow Lake.

In the mid-1830s, the Cocheco Manufacturing Company acquired water rights to the lake and to the Foss Mills in Strafford and held them until 1909 when they were sold, along with the millworks and other sites downriver, to Pacific Mills. Pacific Mills did little with most of these properties before it lost them during the Great Depression. During the 1960s, the water rights reverted to the State of New Hampshire.

Remnants of the millponds and of the dams that created them remain and can be accessed by the public. The homes built by millowners Francis and Darius Winkley still stand along the River and are in fine condition, as is a mid-nineteenth century home at Locke Mill. Unlike contemporary builders, earlier residents respected the River's potential for flooding and set their homes well back from the banks.

In the generations that followed, other activities took place in the mill sites. The property at Locke Mill later became a fruit orchard. Its produce was shipped to markets in Boston; Charleston, South Carolina; and England. Francis Winkley III invented the alemite (grease) bearing. Another Isinglass River homestead, the Swedish Farm, situated by the bridge over the historic road to Rochester, was not associated with a mill. Early in the twentieth century, it was operated as a small farm, at one point supplying Leon Calef (of Calef's Country Store) with chickens for their customers as well as for shipping to other markets from East Barrington Boston & Maine railway station.

The population of the towns along the Isinglass corridor declined with the end of the mill economy. However, two nineteenth century one-room schoolhouses along the Isinglass were still in use into the 1930s. The remnants of these and of the small houses along the River can be seen today. By 1980, the population of the three Isinglass communities began to grow at a rapid rate once again as they have become affordable "bedroom communities" for the Seacoast region.

Local Town Histories, Oral Histories or General Historical Knowledge

(b) Community Resource

Briefly describe how the river is recognized or used as a significant community resource. If the river's importance is recognized in any official town documents, such as a master plan

In Barrington, the Isinglass has been recognized in every community survey of valuable assets, most particularly in Barrington's contribution to the State's "Cornerstones Project," in the *Regional Environmental Planning Report*, and in Barrington's Natural Heritage Committee's *Special Places*. The *Town of Barrington Master Plan*¹⁵ makes specific reference to the significance of the Isinglass; its zoning regulations singled out the River by specifying a 100' setback for all buildings along the River. Barrington recently acquired a piece of land on the River to protect it from development and to provide public access.

Strafford's zoning regulations acknowledge the need to protect wetlands and surface water, including those of the Isinglass and its tributaries. The Town of Strafford has leased the land surrounding the Foss Mill site as well as the mill to ensure public access.

Rochester acquired an easement along a threatened stretch of the River and is involved in the restoration of the Squanamagonic area (see Open Space section and the Recreation Sites and Conservation Lands and Unfragmented Lands maps). Both of these areas, on the northwestern side of the Isinglass, were selected as significant resources by the Rochester representatives to a Regional Environment Planning Program conducted by the Strafford Regional Planning Commission and a number of state and regional agencies.

Details of the communities' zoning regulations as they pertain to surface water can be found below under "Land Use Controls." Other evidence of the River's broad use and recognition is found throughout this document.

4. Recreational Resources

(a) Fishery

Identify the type and location of any high quality recreational fisheries or areas with such potential which are present in the river (as determined by the NH Department of Fish and Game). Also indicate areas that have potential to be significant fisheries.

The Isinglass River is cited in the *New Hampshire Fish and Game Department Freshwater Fishing Guide*¹⁶ as a stream providing recreational fishing for Brook and Rainbow Trout. Both of these species are stocked as yearlings prior to and during the fishing season. In the past, Brown Trout were also stocked, but not with the regularity of the others. The DeLorme *New Hampshire Atlas and Gazetteer*¹⁷ represents the Isinglass as a river for fishing Brook, Brown, and Rainbow Trout. Though neither are listed in the guide books two of the Isinglass tributaries, Mohawk River and Nippo Brook, both receive stocked Brook and Rainbow Trout and provide good fishing.

In addition to trout, the angler may pursue other species. In the mid 1990s, a limited number of surplus hatchery-raised Atlantic Salmon adults were released in the Isinglass, and provided a lively fishery. It is unlikely this type of “put and take” fishery would be repeated in the future. However, if surplus salmon should become available, the Isinglass would be one of several streams that will be considered for adult salmon stocking.

The Isinglass is considered a very important trout stream and is popular with the anglers. The stocking and easy access along Routes 126 and 202 attract many anglers. Much of the fishing is done in the spring, following early-season stocking by the NH Department of Fish & Game. Other roadside fishing spots include the Route 202A area and Green Hill, Flagg, and Rochester Neck Roads.

In addition to coldwater fisheries, warmwater also provides angling opportunities. Within the slower moving, wider reaches of the Isinglass and tributaries (Mohawk and Berrys Rivers), fish species including Brown Bullhead, Pickerel, and certain *centrarchids* (Bass, Sunfish) may be found.

Beyond the easily-accessed roadside reaches of the River, there are numerous opportunities for the more adventuresome angler to bushwhack into less well-known sections of the River. Points for off-trail access include Pig Lane, the high tension (345kv) power line, Parshley Lane in Strafford, and off Scruton Pond Road in Barrington. Care must be taken to avoid trespass on private property.

For those who prefer fishing from a canoe rather than streamside, there are several opportunities. The boating section [below] details access points.

(b) Boating

Describe any significant recreational boating opportunities which are present on the river, including whether it is used for motorized boating. Indicate if the river is cited as significant for recreational boating in a publication of a national, regional or statewide recreation organization. Refer to the NH River Protection and Energy Development Project to determine the river’s significance as a recreational boating river. Also note if boaters are attracted from beyond the local area and if there are areas with potential to be significant boating resources.

The River is generally navigable from where it passes under Route 126 in Barrington to its confluence with the Cocheco River in Rochester. The first two miles can be paddled only in very high water. Waters above the Route 126 bridge can be canoed once the swift water is bypassed. Access may be gained from the new Bow Lake Road. This area is a large marshland where the Mohawk River and Nippo Brook join the Isinglass.

During high water levels, there are some fairly challenging places on the River through which to navigate such as the sluiceway just above the Route 202 bridge and through the remains of the Winkley Mills, above the Green Hill Road bridge where there is a Class II+ section of rapids. The sluiceway can only be passed in high water and should be scouted before paddling. One half-mile below the Route 125 bridge, there is a 25-foot waterfall that must be portaged.

Despite these challenging sections, the Isinglass River is generally not known for white water. A paddle in it is generally more relaxing and allows visitors to enjoy its wooded and rural banks and view the wildlife that lives along its banks.

Two of the Isinglass tributaries also provide canoeing opportunities. The Berrys River can be traveled from French Mill site upstream through a quiet reach of water with about one-half mile of marshy and wooded banks. This relatively short paddle can be very rewarding as the area is relatively untouched by humans with wildlife sightings likely. With a short portage, paddlers may access the lower, unsettled part of Long Pond where there are additional wildlife viewing and fishing opportunities.

The Mohawk River has two canoeable sections. The stillwater above Route 202A offers over one half-mile of excellent marshy habitat where Beaver, Muskrat, waterfowl, and various passerine birds can be observed. Adequate parking is available by the bridge. A canoe may be floated through the marsh that is located upstream of the Route 126 bridge. During periods of high water, an experienced canoeist can run the Mohawk from this point down through the winding stream through woodlands to the River's terminus where it joins the Isinglass in a large marsh. From this excellent natural area, visitors may next go downstream to the Route 126 bridge that is just about a half-mile from the put-in on the Mohawk River.

(c) Other Recreational Opportunities

List any other recreational areas, facilities, or opportunities or potential for such on the river or in the river corridor (e.g., hiking, camping, picnicking, etc.). Indicate ownership, if known.

Prime wildlife viewing abounds along the Isinglass River and its tributaries. There are many bird species such as Owls, Blue Herons, and Cedar Waxwings. The River is also home to Beaver, Mink, and Otter. About two and three-quarter miles below the Route 202 bridge—just past an iron footbridge—there is a small beaver dam that is passable by boat. Just above this point, the River is wide and deep and takes a sharp right hand turn. This is a good location to sight Beaver and one of the better fishing spots on the River. Other points of interest along the River are two granite bridge abutments that predate the Revolutionary War are within the two-mile section below the Route 202 bridge. In the Mohawk River marsh area, Beaver, Muskrat, Red-Winged Blackbird, Blandings Turtles, and many other birds and animals may be viewed.

There are many places along the River's banks to enjoy—from steep clay embankments that are fun to slide down—to open grassy areas and high ledges that offer fine views. The many historic sites and ruins provide interesting walks along the River. The riverbanks, marshes and historic sites are also ideal areas for picnics and quiet contemplation.

Other Recreational Opportunities*

Recreational Area	Ownership	Location
Bow Lake Town Beach	Town of Strafford	Near outlet of Bow Lake
Foss Mill Site, fishing, birding, walking	State of NH, leased to Town of Strafford	Accessed from Pig Lane
White Bridge: Fishing	Town of Barrington	Scruton Pond Road (approximately 2 miles from Route 125)
Flagg Road easement/B&M: canoe access, fishing, birdwatching	City of Rochester; Guilford Transportation	Flagg Road (approximately 1.5 miles from Route 125)
Turnkey Recreational Area; Forest Management and Trail Center, hiking, scenic Locke's Falls, skiing, swimming, hunting (105 acres)	Turnkey	Rochester Neck Road (off Route 125)
Canoe landing, access to Isinglass and Cocheco, picnicking, fishing, boating	Turnkey	Rochester Neck Road (at bridge)

*These sites and the public access sites are depicted in the Recreation Sites map. Bow Lake and the Turnkey sites are the only sites formally given over to recreational uses.

(d) Public Access

List any existing public access sites located along the river. These may be formal or non-formal access points. Include the type of public access (e.g., canoe only), related facilities (e.g., parking), and if known, ownership at each site.

Location	Type of Access	Related Facilities	Ownership
Province Road bridge	Walk to River edge for viewing, fishing	Parking at edge of road	NH Water Resources Council
Route 202A bridge	Walk to River edge for viewing, fishing	Parking at edge of road	NH Department of Transportation
Foss Mill	Rough terrain for bank viewing of mill site	None	State of NH, lease to Town of Strafford
Route 126 Isinglass bridge*	Path to River edge for viewing, fishing, or canoe carry-in	Parking on road shoulder	Jon Olson
Route 126 just west of Province Road*	Walk to River edge for viewing, fishing, or canoe carry-in	Off-road parking	Heirs of Percy Berry
Route 202 bridge*	Walk to River edge for viewing, fishing, or canoe carry-in	Parking on wide shoulder	Linda and Daniel Murray, NH DOT
White Bridge off Scruton Pond Road to west side of bridge*	Walk to River edge for viewing, fishing, or canoe carry-in, walk in from road 1/4 mile	None	Town of Barrington
Brooks Road to White Bridge canoe access	Canoe access by walking in to bridge	Parking at intersection with Keliher Road	Jim and Ann Schulz, Swedish Farm
Keliher Rd. to Town Farm Road*	Walk in approximately one mile for viewing or fishing	Parking at edge of Keliher Road	Harlan Calef Revocable Trust
Green Hill Bridge with informal access to Barr Farm*	Walk to River edge for viewing, fishing, or canoe carry-in	Parking at edge of Berrys Road	Town of Barrington
Boston & Maine railway bed off Flagg Road	Walk to River edge for viewing, fishing, or canoe carry-in	Parking at edge of railway bed	City of Rochester and Guilford Transportation
Route 125 at bridge	Walk to River edge for viewing or fishing	Parking on narrow shoulder; steep path to River	Private and NH Department of Transportation

Rochester Neck Road at Turnkey Recreational Area	Off-road parking, trails, swimming, fishing, cross-country skiing, viewing of Locke Mills	Parking	Waste Management of NH, Inc.
Canoe Landing	Off-road parking, trails at former site	Picnicking and parking at canoe landing	Waste Management of NH, Inc.

Notes: *Indicates informal access. Access information acquired locally and from NH Office of State Planning (OSP), January 6, 1998 and from local residents. The table showing public access points has been expanded from the OSP list by local sources. The first two are not included in the Recreation Sites map because they were added after the maps were completed. They will be added in revised planning maps.

5. Other Resources

(a) Scenic Resources

Briefly describe any significant scenic focal points along the river including designated viewing areas and scenic vistas and overlooks. Indicate the location of the significant views to and from the river.

The Isinglass offers a variety of scenic vistas. The River offers an extraordinary opportunity to experience both the natural environment and historic ruins from numerous points in the River. For example, the Twombly's Grist Mill ruins at Route 202 near Scruton Pond Road can be seen from the bridge, providing a fine view of the River rushing through a sluice now within a wooded setting. Visitors can walk to the River to enjoy the woods, wade in the rapids, and climb over the stonework while contemplating the area's history.

Unique in the Seacoast area is the 25-foot high falls at the site of the historic Locke Mill. Turnkey has created attractive walking trails off Rochester Neck Road that lead to the falls which are particularly spectacular in during spring runoff, fall high water, and winter as the River falls over ice- and snow-covered boulders.

The boaters, anglers, and hikers who travel along the Isinglass length enjoy many secluded settings where they can see the activities of Beaver, the shifting channel of the River, and the varied vegetation of its floodplains. The large number of deciduous trees along the banks guarantees the traveler a special view at each bend in the River.

(b) Land Use

Briefly describe the general patterns of current land use in the river corridor. Include location of significant developments within the river corridor including agricultural, residential, commercial, and industrial developments, and solid waste management facilities. Also include location of lands used for forest management or which are undeveloped. Identify such features as roads along the river, railroads, bridges, and utility crossings. Describe the type and location of any proposals for major developments within the river corridor.

At one time, agriculture was common along the Isinglass. Today, only two small farms, one under the ownership of Turnkey, engage in minimal animal husbandry. The changed patterns of land use are evident in the Existing Land Use map.

Residential use occurs throughout much of the River corridor. Two residential developments are situated along the Isinglass: one just below the Bow Lake dam in Strafford and a second off Flagg Road in Rochester. The Isinglass is buffered from both of its high banks and strips of forest. Below the confluence of Nippo Brook, the Comprehensive Shoreland Protection Act requires a 50-foot setback from the River for primary structures. Barrington's Zoning Ordinances require a 100-foot setback and a vegetated buffer along the Isinglass. The combination of natural features and zoning ordinances result in there being little visual impact from the housing along the River.

Commercial activities occur primarily at Bow Lake Village and at the point at which the Isinglass flows under Route 125. At Route 125, the Riviera Motel operates on the northwest side of the highway, a construction equipment rental company on the southwest, and an auto sales business on the northeast. Turnkey owns two miles of river frontage on the north side. A portion of their commercial operations is within the corridor but it is well set back from the River. The Pike gravel pit, which formerly operated downstream of Turnkey, is now inactive.

No industrial activities occur in the River corridor except for a small energy-generation project at Turnkey, which produces power from methane gas (a by-product of their landfill/recycling operation) for its exclusive use. Turnkey is a solid waste management enterprise. Their first landfill site (now closed and capped) was along the Isinglass.

Forest management is practiced in several locations. Turnkey has established a 105-acre riparian forest, designated through the American Tree Farm System. A Certified Tree Farm of 55 acres in Barrington spans both sides of the Isinglass. Another, of approximately 50 acres, abuts Scruton Pond Road and runs along the River. Other acreage used for forestry includes two parcels in Barrington of approximately 300 acres each. Both are within the unfragmented lands north of the River and spanning Route 202 (see Conservation Lands and Unfragmented Lands map).

The Isinglass is bridged at Routes 202A, 126, 202, and 125, as well as at Province, Green Hill, and Rochester Neck Roads. The River's tributaries, Nippo Brook and Mohawk River, also are bridged. Two highways, Routes 126 and 202 run very briefly along the River. There are no railroad crossings. The former Boston & Maine railway corridor has reverted to private ownership in a number of locations. Utility transmission lines cross the River in Strafford and by Flagg Road in Rochester.

No plans for any major development within the corridor have been presented to any of the three communities involved. However, much of the corridor contains soils appropriate for development (see Soil Properties map). This, in addition to the existence of only one sizeable permanent conservation easement along the River, put the Isinglass at high risk for development. The consequent loss of wildlife habitat and filtering and shading vegetation over the river would seriously threaten its present water quality, healthy fisheries, and the varied flora and fauna along its banks.

(c) Land Use Controls

Identify the municipalities with existing master plans and zoning ordinances within the river corridor. Identify existing or significant proposed land use controls which affect the river and the river corridor (e.g., zoning, easements, subdivision regulations).

All three communities have Master Plans and have enacted zoning ordinances. Both Rochester and Strafford are revising their Master Plans with particular attention to land use.

Long-standing zoning ordinances in Barrington specifically require a 100-foot setback for any structures built along the Isinglass River. This ordinance enhances and complements the requirements of the Comprehensive Shoreland Protection Act (CSPA) which applies to the portion of the Isinglass below Nippo Brook (where the Isinglass becomes a fourth order stream). Current wetlands regulations relate buildable lot sizes to the presence of wetlands. Previously, minimum lot size was 80,000 square feet, with at least 60,000 of that area not being wetland and 35,000 square feet being contiguous. In March, 2001, voters accepted a new regulation requiring that a natural buffer of 50 feet be preserved along wetlands (a no-cut zone) and that 40,000 square feet of a buildable lot be contiguous non-wetland.

Rochester regulations provide few restrictions on the use of land bordering the River or wetlands within its corridor. No primary structure setbacks, vegetated buffer requirements, erosion/sediment controls, or other local restrictions have been placed on land use in "shoreland protection districts." One exception is a provision for a 100-foot setback from the 100-year floodplain or 200 feet from the thread of the Isinglass and Cochecho Rivers required for solid waste facilities, a provision made during the approval of the Turnkey Project. Another is a reference to the *possibility* of a required setback greater than 30 feet from the shoreland for the erection of primary structures. This applies to the Isinglass through the Comprehensive Shoreland Protection Act as the River flows through Rochester. Wetlands have virtually no protection in Rochester's existing local regulations. Land use restrictions governing wet areas apply only to very poorly drained soils, permitting "any use that does not involve the erection of a structure and

does not alter the land surface with fill or dredging. Agriculture is permitted provided it is not shown to be detrimental and will not cause soil erosion.”

Strafford’s role in protecting the Isinglass is the most complex of the three communities through which the River flows. The CSPA does not apply here because the River is a third order stream until the Isinglass’s confluence with Nippo Brook. Several of the River’s important tributaries also lie within Strafford’s borders.

Strafford’s zoning measures are different from those of Barrington and Rochester. Strafford regulations meet the DES requirements for a 50-foot setback from wetlands for buildings¹⁸ and requires a (high) 100-foot for septic systems (increasing with slope to 200 feet for slopes of greater than 15%). Wetlands are defined as jurisdictional wetlands in accordance with the 1989 federal manual. However, both the Building Inspector and the Planning Board apply wetlands setbacks to all great ponds, ponds, rivers, and stream courses. In addition, Federal Emergency Management Agency (FEMA) regulations apply to all lands designated as special flood hazard zones by FEMA through its flood insurance study for the Town of Strafford.

(d) Water Quantity

List the location of all operating stream gauge stations maintained by the US Geological Survey, US Army Corps of Engineers, or the Department of Environmental Services. Include the number of years of record and whether it is a partial or full record station.

There are no gauges in the Isinglass corridor.

(e) Riparian Interests/Flowage Rights

Briefly describe any riparian interests in the corridor, including any known flowage rights, historic water uses, and legislative authorizations or appropriations (for example, a town given legislative authorization to water for public consumption in the 19th century).

(e) Riparian Interests/Flowage Rights

Withdrawal Flowage Rights

Withdrawal rights can be granted by the state legislature and may be found in New Hampshire chapter law. There are five instances of the state legislature granting water rights in the Isinglass watershed. None of the rights granted specify volumes and most do not identify locations.

1877, CHAPTER 152. – AN ACT TO INCORPORATE THE ROCHESTER AQUEDUCT AND WATER COMPANY

This act incorporated the Rochester Aqueduct and Water Company. In terms of water rights it simply stated that, “Said corporation is authorized to enter upon and appropriate any streams, ponds, or springs not belonging to any other aqueduct company and to secure by fence or otherwise such streams, pond, or springs...” This section of the law allowed the Rochester Aqueduct and Water Company to acquire land and waterbodies for distribution into “...the compact part of Rochester village, in said Rochester...”

1881, CHAPTER 242. – AN ACT TO AUTHORIZE THE TOWN OF ROCHESTER TO ESTABLISH WATER WORKS IN SAID TOWN.

This act allowed the Town of Rochester to establish their own Water Works. One can only guess the status of the Rochester Aqueduct and Water Company empowered in 1877. In term of water rights the Town was “...empowered to enter upon, take, and appropriate any streams, spring, or ponds in Rochester or other towns (not belonging to any other aqueduct company), and to secure by fence...” Again there are no specifics but the word ‘take’ has been included and in a later section a process for payment of damages has been included.

1891, CHAPTER 263. – AN ACT IN AMENDMENT OF CHAPTER 242 OF THE SESSION LAWS OF 1881, AUTHORIZING THE TOWN OF ROCHESTER TO ESTABLISH WATER-WORKS IN SAID TOWN.

With this Act the legislature allowed the Town of Rochester to extend their pipes to supply the villages of Gonic and East Rochester. Further, the Town of Rochester was "...authorized to purchase and hold the property, franchises, and stock, of the Rochester Aqueduct and Water Company..." The 1877, CHAPTER 152 law only allowed the Town of Rochester to purchase stock in the Rochester Aqueduct and Water Company.

1897, CHAPTER 188. – AN ACT IN AMENDMENT OF CHAPTER 263 OF THE LAWS OF 1891, AMENDING CHAPTER 242 OF THE SESSION OF 1881, AUTHORIZING THE TOWN OF ROCHESTER TO ESTABLISH WATER-WORKS IN SAID TOWN.

With this Act the Town of Rochester (now the City of Rochester) was authorized to extend water pipes to the village of Lebanon, Maine.

1973, CHAPTER 478. – AN ACT PERMITTING THE CITY OF DOVER TO DRAW WATER FROM THE ISINGLASS RIVER IN THE CITY OF ROCHESTER.

This Act authorized to City of Dover to purchase land in the City of Rochester along the Isinglass River, establish a pump station, and pump to the Hopper Well. The use of the water was authorized with the stipulation that the use by the City of Dover not damage or infringe on any others water rights.

Dam Flowage Rights

Unlike the flowage rights one might see associated with a modern dam of modern dam transfer, the rights to the dams-in-ruin along the Isinglass are generally not well defined. Where a modern flowage right may refer to allowing flooding up to a specific contour interval of the land those for the Isinglass River tend to say that "all rights of the grantor are transferred to the grantee" without elaborating on those rights. With that said there is one key transfer that covers nearly the entire Isinglass River, dams-in-ruin dated February 26, 1962 from: Grantor "Public Service Company of New Hampshire" to Grantee "New Hampshire Water Resource Board."

- Foss Mill: Rights of Grantor to Grantee
- Locke Lower Mills: Rights of Grantor to Grantee including right to "...use the road, as it existed on December 16, 1942, extending by the house of A.I. Hall to the mill..." "...together with the right of way over the old driveway on the northerly side of the River leading from the Rochester Road southeasterly along the bank of the River."
- Parcel of Land around the Locke Mill Site: Land rights transferred as well as the right to "pass and repass from the road to the North end of the mill dam..." and "...such rights of flowage as the grantor possesses."

The Winkley Mill Site (Dam Code 015.06) which was known as the "Arthur McDaniel & Buzzel Dam" from at least 1935 to 1978, has not yet had the transfer located but the owner from 1978 to present is listed as J. Douglas Macrae (or Macroe depending upon the document).

The defined flowage rights of the dams-in-ruin leave something to be desired but such seems to be the case with older documents.

Final note: Before submitting the nomination, please check the form for completeness. Nomination forms are reviewed for completeness by the Department of Environmental Services. Be sure to consult Env-C 700 and RSA 483 to make sure that all information requirements have been met. Incomplete nominations will be ineligible for consideration by the State Legislature in the next legislative session.

Notes

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- ¹ *Appalachian Mountain Club River Guide*, New Hampshire-Vermont, AMC
 - ² *Identifying and Protecting New Hampshire's Significant Wildlife Habitat: A Guide for Towns and Conservation Groups*
 - ³ *Bedrock Geology Map of New Hampshire*
 - ⁴ *River Basin Management Plan for the Isinglass and Cochecho Rivers and Evaluation of Hydropower Potential at Existing Dam Sites*
 - ⁵ *Geology and Agricultural Potential of Late Wisconsin Marine Deposits Located in Northeast Barrington*
 - ⁶ *Geohydrology and Water Quality of Stratified Drift Aquifers in the Bellamy, Cochecho, and Salmon Falls River Basins, Southeastern New Hampshire*, Water Resources Investigation Report 90-4161
 - ⁷ *Isinglass River Water Quality*
 - ⁸ NH Department of Environmental Services Ambient Monitoring Program, Isinglass River Protection Program, and Volunteer River Assessment Program
 - ⁹ *National Hydroelectric Power Resources Study Regional Assessment*
 - ¹⁰ *River Basin Management Plan for the Isinglass and Cochecho Rivers and Evaluation of Hydropower Potential at existing Dam Sites*
 - ¹¹ *A History of Strafford, New Hampshire*
 - ¹² *A History of Barrington*
 - ¹³ *Barrington New Hampshire 1772-1972*
 - ¹⁴ Oral histories from Harlan Calef and Mike Helfgott, long-time Barrington residents and riparian landowners
 - ¹⁵ *Barrington Master Plan*
 - ¹⁶ *New Hampshire Fish and Game Department Freshwater Fishing Guide*
 - ¹⁷ *New Hampshire Atlas & Gazetteer*
 - ¹⁸ *NH Department of Environmental Services Wetlands Administrative Rules [Wt-100]*



**The Isinglass River from above Route 202
[front cover: Isinglass River from along Route 126]**