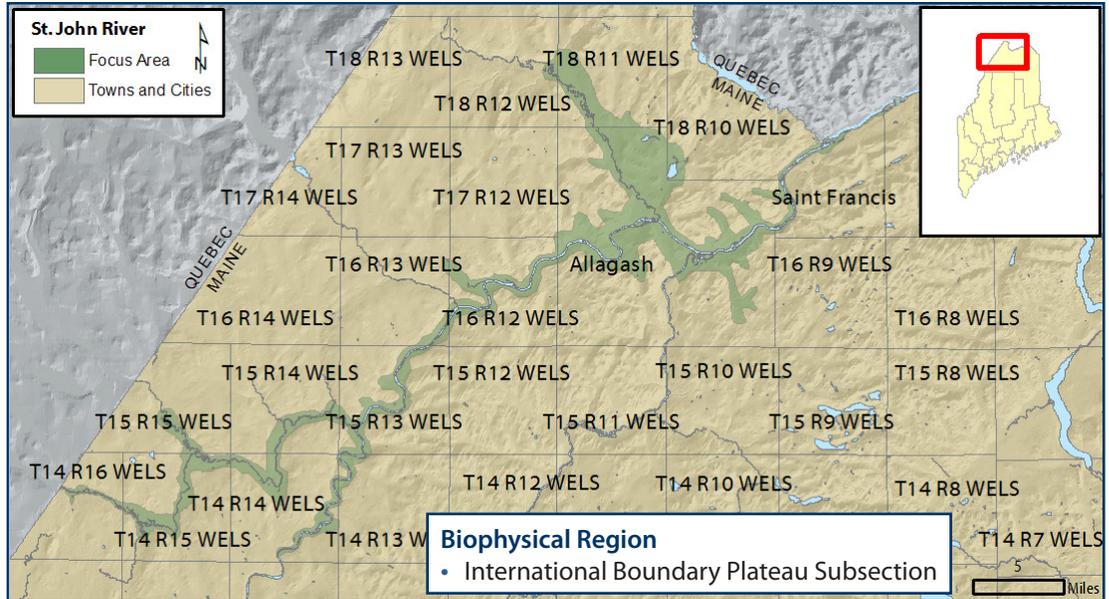


St. John River



WHY IS THIS AREA SIGNIFICANT?

The St. John River Focus Area is among the most ecologically significant areas in Maine. Several rare plant species live on the banks of the undammed upper section, including Furbish's lousewort, Maine's only federally listed endangered plant. These species require environmental conditions that are provided by the Focus Area due to its geography and glacial history. Rare animals in the Focus Area include the wood turtle and the pygmy snaketail, a dragonfly that requires clean, free-flowing rivers. The area has several noteworthy natural communities, including Maine's best examples of circumneutral riverside seep and bluebell-balsam ragwort shoreline outcrop.

OPPORTUNITIES FOR CONSERVATION

- » Maintain and reestablish forested buffers along the banks of the St. John River.
- » Avoid degradation of water quality and hydrology that can be caused by dams, timber harvesting, road building, vegetation clearing, and development.
- » Protect rare plants and their habitat by stopping the dumping of trash and the removal of sand and gravel.
- » Work with willing landowners to permanently protect remaining undeveloped areas.

For more conservation opportunities, visit the Beginning with Habitat Online Toolbox: www.beginningwithhabitat.org/toolbox/about_toolbox.html.

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Rare Animals

- Pygmy Snaketail
- Wood Turtle
- Canada Lynx
- Rusty Blackbird

Rare Plants

- Alpine Rush
- Vasey Rush
- Hairy Arnica
- Huron Tansy
- Black Sedge
- Marsh Valerian
- Capillary Sedge
- Garber's Sedge
- Soft-leaf Muhly
- Blueleaf Sedge
- Bulrush Sedge
- Canada Burnet
- Purple Clematis
- Blue-leaf Willow
- Clinton's Bulrush
- Dioecious Sedge
- St. John Oxytrope
- Alpine Milk-vetch
- Northern Gentian
- Lapland Buttercup
- Alpine Sweet-broom
- Neglected Reed-grass
- Cut-leaved Anemone
- Auricled Twayblade
- Furbish's Lousewort
- Mountain Timothy
- Horned Beak-rush
- Mistassini Primrose
- Northern Bog Sedge
- New England Violet
- Northern Woodsia
- Northern Painted Cup
- Showy Lady's-slipper
- Smooth-sheathed Sedge
- Swamp Fly-honeysuckle
- Fragrant Cliff Wood-fern
- Few-flowered Spikerush
- Glaucous Rattlesnake Root

Rare and Exemplary Natural Communities

- Appalachian-Acadian Basin Swamp Ecosystem
- Rivershore Outcrop
- Tall Grass Meadow
- Riverside Seep
- Laurentian River Beach
- Streamshore Ecosystem

Significant Wildlife Habitats

- Inland Wading Bird and Waterfowl Habitat
- Deer Wintering Area



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FOCUS AREA OVERVIEW

The St. John River Focus Area is one of the most ecologically significant areas in Maine. Several rare plant species live on the banks of the undammed upper section of the St. John River. These imperiled species—including Furbish’s lousewort, Maine’s only federally listed endangered plant—need special hydrologic conditions, such as calcium-rich seeps. The Focus Area provides these conditions because of its unique geography and glacial history. Two rare animals in the Focus Area are the wood turtle and the pygmy snaketail, a dragonfly that requires clean, free-flowing rivers. In addition, the Focus Area features several noteworthy natural communities, including the state’s best examples of circumneutral riverside seep and bluebell–balsam ragwort shoreline outcrop.

Long and narrow, the St. John River Focus Area includes the river, the adjacent riparian habitat and floodplain, and in some places a narrow upland buffer. The Focus Area covers the main stem of the St. John River from T14 R14 WELS to the west side of St. John PLT, as well as a small stretch in Fort Kent. The Focus Area also includes parts of a number of tributaries, the largest two being the Little Black and Big Black Rivers.

CHARACTERISTIC SPECIES

The St. John River is home to Furbish’s lousewort (*Pedicularis*

furibishiae), a flower found nowhere else in the world. In the spring, when the river is free of ice, the lousewort grows a cluster of leaves that are four to seven inches long, lined with a silvery edge, and fern-shaped. Young plants stay as a leafy cluster all summer. When they grow large enough, they produce a flowering stem that ranges in height from one to three feet, changing from green to deep red in late summer. Atop the stem are one or more clusters of yellow flowers that resemble snapdragons. The flowers bloom from mid-July through August, and the tiny seeds, which mature by late September, are carried away by wind and water.

Louseworts grow only within a narrow band of the riverbank, usually steep, damp banks that are well shaded. Most louseworts live on north-facing riverbanks, where vegetation is less dense. Shade provided by the forest canopy above is crucial. They are never found in the spruce-fir forest, the lower cobble beach, or areas of standing water. Furbish’s lousewort shares its riverbank habitat with other rare plants such as northern painted cup and the St. John tansy, as well as common roadside wildflowers such as asters and clover.

The banks of the St. John River are a perilous home. In spring, massive pieces of ice scour the banks, sometimes wiping

out entire populations of louseworts. Ironically, however, the lousewort owes its existence to the ice. Scouring by ice and spring floods keep the riverbanks clear of trees and tall shrubs that would crowd out the lousewort. As the riverbanks change, the lousewort establishes itself in suitable new places, and its populations gradually shift up and down the river over the years.

The only place that Furbish's lousewort grows is the banks of the St. John River in northern Maine and adjacent New Brunswick. It is currently known to occur from the confluence of the Big Black River in Maine to Andover, New Brunswick. The populations downriver are few and widely scattered; at least ninety-five percent of the louseworts occur upriver of Fort Kent. Despite extensive searching, the lousewort has not been found on nearby rivers such as the Big Black, Allagash and St. Francis. Why it lives solely on the St. John River is a mystery. Most likely, the lousewort requires a very specific combination of environmental conditions (see box at right).

The St. John River is distinctive in many ways. It is the longest free-flowing river in the northeastern U.S., covering 200 miles from its headwaters to the first dam at Grand Falls. Because there are no impoundments upriver, spring flooding still occurs. Also, unlike most Maine rivers, the St. John flows north. In the spring, its headwaters usually thaw earlier than the river's northern reaches, causing damage by ice and flooding that keep the riverbanks open and spacious. In addition, calcium-bearing rocks—left behind by the glacier and now exposed by erosion—neutralize the acid



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soil, creating an ideal habitat for many unusual plants. And the short, cool, moist summers mimic a sub-arctic climate. All of these conditions create a unique river ecosystem with more than thirty rare species of plants.

With the exception of Mount Katahdin, the St. John River supports more rare plants than anywhere else in Maine. Many of these species typically grow farther north in the Canadian sub-arctic or on mountaintops. Some are plentiful in other states or provinces, while others, such as the St. John tansy, are rare wherever they grow. Each of these plants grows only under very specific conditions or habitats. The St. John tansy, for example, lives only on the open cobble beach, flooded in winter, baked dry in the summer. The New England violet manages to survive in cracks of rock outcrops at the river's edge. Prairie rattlesnake root is found on grassy shores that resemble a prairie habitat. Some of the species favor wet, limy seeps, such as the bird's-eye primrose, which in early June brightens the shores with magenta flowers, or the striking grass-of-parnassus with its five cream-colored petals beautifully striped

Why Is Furbish's Lousewort So Rare?

- » This rare plant species is linked inextricably to the hydrology of the St. John, growing only in a narrow band of rivershore habitat between the forest edge and the riverbed.
- » The species recolonizes only by seed, but recolonization is slow because the lousewort requires other plants growing nearby for root attachments. The lousewort will germinate, but not survive, unless it can attach to another plant via its roots. This slows recolonization after major disturbance.
- » Furbish's lousewort requires a free-flowing river, and it is absent or much reduced along dammed rivers.
- » Clearing of riverbank tops for agricultural or residential purposes and cutting trees too close to the river's edge have degraded lousewort habitat in parts of its geographic range.

with green. With few places available to grow, these plants are more sensitive than common plants to loss of habitat.

The Focus Area has extensive areas that are mapped as Inland Waterfowl and Wading Bird Habitat, particularly in the northern end of the Focus Area. Streams, ponds, and large, open wetlands that feed into the St. John River provide a diversity of habitats used by waterfowl and wading birds. In addition, two of the largest Deer Wintering Areas in the state have been identified here. Through cooperative landowner agreements with Irving Timberlands very large tracts of private forestland



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Ami Vitale

are currently being managed as Deer Wintering Area.

The wood turtle (*Glyptemys insculpta*) inhabits a section of the St. John River in the Focus Area. Primarily a northeastern species, wood turtles are declining throughout their geographic range and are a species of special concern in Maine. The state likely has some of the largest and most viable remaining populations of wood turtles in the United States. Wood turtles need well-oxygenated streams and rivers for over-wintering, and sandy, gravelly banks for nesting sites. Both of these habitat features occur in the St. John River Focus Area.

The pygmy snaketail (*Ophiogomphus howei*), a dragonfly of special concern, has been documented along the St. John River within the Focus Area. This species spends most of its life in rivers and depends on clean, free-flowing rivers and streams with forested riparian areas and sand and gravel bottoms. It is one of the least tolerant types of dragonflies to changes in water quality. Increased sedimentation, non-point sources of pollution (such as runoff from roads and storm sewers, agricultural fertilizers, and pesticides), dams, and intensive watershed development contribute to their decline. The pygmy snaketail has declined and disappeared from many rivers in the Northeast. Surveys have shown that Maine, with its relatively clean, free-flowing rivers in forested watersheds, has some of the best populations of pygmy snaketails in the Northeast. As such, Maine will play a major role in the future conservation of this species.

High quality fisheries resources were present for wild brook

trout in the main stem St. John River, Big Black River and Little Black River. Muskellunge are, however, now the most prevalent sport fish in the upper St. John River, Big Black River and lower section of the Little Black River and have had a significant impact on the trout fishery here. Muskellunge were introduced into Lac Frontier, Quebec beginning in 1970 by government biologists and have now spread throughout the St. John drainage from headwaters to the Bay of Fundy. Smallmouth bass are also now present in the St. John River as the result of an illegal introduction in a tributary system located in New Brunswick above Grand Falls. As their population continues to increase, bass will continue to spread upstream into this section of the St. John River where they will provide an additional sport fishery. The headwater section of the Big Black River and Little Black River continue to support wild brook trout populations. Small coldwater tributaries to this section of the St. John River in the Focus Area continue to support resident populations of brook trout.

NATURAL COMMUNITIES

Although rare plants live throughout the St. John River Focus Area, they tend to be clustered in areas with rare natural communities. Six types of rare and exemplary natural communities have been documented in the Focus Area. Among the most notable is the circumneutral riverside seep, which owes its existence to the glacial history of the region. The St. John River winds its way through a landscape made largely of glacial deposits, many of which are relatively high in calcium. Groundwater seepage through these deposits emerges in spots along the riverbank and creates calcareous conditions that support rare plants restricted to high-pH growing conditions. The circumneutral riverside seep is a globally rare community type that is one of Maine's rarest natural communities and is found only on the larger rivers of northern Maine. The seep community supports high numbers of Furbish's lousewort.

In the upstream section of the Focus Area are two very significant natural communities: bluejoint meadow and bluebell-balsam ragwort shoreline outcrop. The bluejoint meadow occurs on a section of the riverbank that floods seasonally. Bluejoint grass (*Calamagrostis canadensis*) dominates the meadow, and periodic scouring by ice keeps the area fairly open. The bluebell-balsam ragwort shoreline outcrop consists

of sparse vegetation on a dry, circumneutral bedrock outcrop along the St. John River. A number of rare plants live at the site, including alpine sweet broom (*Hedysarum alpinum* var. *americanum*), dioecious sedge (*Carex sterilis*), and neglected reed grass (*Calamagrostis stricta* ssp. *stricta*).

In Maine, the rare sand cherry–tufted hairgrass river beach natural community occurs only at three sites within the St. John River Focus Area. Two sites lie near the middle of the Focus Area, and the third site is near the downstream end. This natural community exists only where flooding and ice-scour have deposited small rocks and coarse soils. The dry, cobbly soils receive full sun and host a cover of low shrubs, forbs, and grasses. The community includes several rare species with northern affinities such as the Huron tansy (*Tanacetum bipinnatum*). Other rare plant species found along these shores include soft-leaved muhly (*Muhlenbergia richardsonis*) and glaucous rattlesnake root (*Prenanthes racemosa*).

CONSERVATION CONSIDERATIONS

- » Forested buffers along the St. John River serve several important functions. They decrease erosion and nutrient runoff, help prevent the spread of invasive plants, and provide critical shade to some rare plant species such as Furbish’s lousewort. Unchecked erosion can cause formerly stable banks to slump and completely wash away under heavy runoff conditions. Maintaining or restoring a healthy 75-foot-wide buffer of native trees—such as balsam fir, red spruce, and quaking aspen—is perhaps the single most important action that can be taken to protect the integrity of the St. John River ecosystem.
- » The health of the St. John River ecosystem and the survival of its rare plants depend on the area’s hydrology and water quality. Dam construction and other human activities that disrupt the natural cycle of spring flooding and ice-scouring that take place on the St. John River could have devastating consequences for the rich diversity of rare plant species that are found in this Focus Area. Intensive timber harvesting, vegetation clearing, soil disturbance, road building, and development on buffering uplands can result in greater runoff, sedimentation, and other non-point sources of pollution that degrade water quality.
- » Direct alteration of riverbank habitat through removal of sand and gravel or by dumping of refuse or fill can devastate plants and their habitats. Refuse and fill may contain the seeds of exotic plant species, which can further displace native plants. No dumping or excavating should occur along the riverbank.
- » Travel along the riverbank, especially by ATVs and other vehicles, can destroy plants, cause erosion, and promote

Ecological Services of the Focus Area

- Water-quality protection
- Habitat connectivity for wildlife
- Protection against downstream flooding

Economic Contributions of the Focus Area

- Recreational fisheries
- Recreational paddling industries
- Destination for snowmobiling

Public Access Opportunities

- » Heritage Rail Trail
- » Fall Brook Lake

channelization of the riverbank. No vehicular traffic should be allowed along the riverbank. Traveling along the river by foot or canoe instead of vehicle can help prevent erosion and protect plant communities.

RARE SPECIES AND EXEMPLARY NATURAL COMMUNITIES OF THE FOCUS AREA

	Common Name	Scientific Name	State Status*	State Rarity Rank	Global Rarity Rank
Animals	Pygmy Snaketail	<i>Ophiogomphus howei</i>	T	S2S3	G3
	Canada Lynx	<i>Lynx canadensis</i>	n/a	n/a	n/a
	Rusty Blackbird	<i>Euphagus carolinus</i>	SC	S2S3	G4
	Wood Turtle	<i>Glyptemys insculpta</i>	SC	S4	G4
	Cut-leaved Anemone	<i>Anemone multifida</i>	T	S1	G5
	Hairy Arnica	<i>Arnica lanceolata</i>	T	S2	G3
	Alpine Milk-vetch	<i>Astragalus alpinus</i> var. <i>brunetianus</i>	SC	S3	G5
	Neglected Reed-grass	<i>Calamagrostis stricta</i> ssp. <i>stricta</i>	T	S2	G5
	Black Sedge	<i>Carex atratiformis</i>	SC	S2S3	G5
	Capillary Sedge	<i>Carex capillaris</i>	SC	S2	G5
	Garber's Sedge	<i>Carex garberi</i>	SC	S2	G5
	Northern Bog Sedge	<i>Carex gynocrates</i>	SC	S2	G5
	Smooth-sheathed Sedge	<i>Carex laevivaginata</i>	SC	S1	G5
	Blueleaf Sedge	<i>Carex rostrata</i>	SC	S2	G5
	Bulrush Sedge	<i>Carex scirpoidea</i>	SC	S2	G5
	Dioecious Sedge	<i>Carex sterilis</i>	SC	S3	G4
	Plants	Northern Painted Cup	<i>Castilleja septentrionalis</i>	SC	S3
Purple Clematis		<i>Clematis occidentalis</i> var. <i>occidentalis</i>	SC	S3	G5
Showy Lady's-slipper		<i>Cypripedium reginae</i>	T	S3	G4
Fragrant Cliff Wood-fern		<i>Dryopteris fragrans</i>	SC	S3	G5
Few-flowered Spikerush		<i>Eleocharis quinqueflora</i>	SC	S2	G5
Northern Gentian		<i>Gentianella amarella</i> ssp. <i>acuta</i>	E	S1	G5
Alpine Sweet-broom		<i>Hedysarum alpinum</i> var. <i>americanum</i>	SC	S3	G5
Alpine Rush		<i>Juncus alpinoarticulatus</i> ssp. <i>nodulosus</i>	SC	S3	G5
Vasey Rush		<i>Juncus vaseyi</i>	E	S1	G5?
Auricled Twayblade		<i>Listera auriculata</i>	T	S2	G3
Swamp Fly-honeysuckle		<i>Lonicera oblongifolia</i>	SC	S3	G4
Soft-leaf Muhly		<i>Muhlenbergia richardsonis</i>	SC	S3	G5
St. John Oxytrope		<i>Oxytropis campestris</i> var. <i>johannensis</i>	T	S1	G5
Furbish's Lousewort		<i>Pedicularis furbishiae</i>	E	S2	G2
Mountain Timothy		<i>Phleum alpinum</i>	T	S2	G5
Glaucous Rattlesnake Root		<i>Prenanthes racemosa</i>	SC	S3	G5
Mistassini Primrose		<i>Primula mistassinica</i>	SC	S3	G5
Lapland Buttercup		<i>Ranunculus lapponicus</i>	T	S2	G5
Horned Beak-rush		<i>Rhynchospora capillacea</i>	T	S1	G4
Blue-leaf Willow		<i>Salix myricoides</i>	T	S2	G4
Canada Burnet		<i>Sanguisorba canadensis</i>	T	S1	G5
Huron Tansy		<i>Tanacetum bipinnatum</i> ssp. <i>huronense</i>	SC	S2S3	G5
Clinton's Bulrush		<i>Trichophorum clintonii</i>	SC	S3	G4
Marsh Valerian		<i>Valeriana uliginosa</i>	SC	S2	G4
New England Violet		<i>Viola novae-angliae</i>	SC	S2	G4
Northern Woodsia		<i>Woodsia alpina</i>	T	S1	G4

Natural Communities	Appalachian–Acadian Basin Swamp Ecosystem	Appalachian–Acadian Basin Swamp Ecosystem	S4	n/a
	Rivershore Outcrop	Bluebell–Balsam Ragwort Shoreline Outcrop	S3	G3
	Tall Grass Meadow	Bluejoint Meadow	S3	G4
	Riverside Seep	Circumneutral Riverside Seep	S2	G2
	Laurentian River Beach	Sand Cherry–Tufted Hairgrass River Beach	S2	G3?
	Streamshore Ecosystem	Streamshore Ecosystem	S4	n/a

State Status*

- E Endangered: Rare and in danger of being lost from the state in the foreseeable future, or federally listed as Endangered.
- T Threatened: Rare and, with further decline, could become endangered; or federally listed as Threatened.
- SC Special Concern: Rare in Maine, based on available information, but not sufficiently rare to be Threatened or Endangered.

**State status rankings are not assigned to natural communities.*

State Rarity Rank

- S1 Critically imperiled in Maine because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres).
- S2 Imperiled in Maine because of rarity (6–20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- S3 Rare in Maine (on the order of 20–100 occurrences).
- S4 Apparently secure in Maine.
- S5 Demonstrably secure in Maine.

Global Rarity Rank

- G1 Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because some aspect of its biology makes it especially vulnerable to extirpation.
- G2 Globally imperiled because of rarity (6–20 occurrences or few remaining individuals or acres) or because of other factors making it vulnerable to further decline.
- G3 Globally rare (on the order of 20–100 occurrences).
- G4 Apparently secure globally.
- G5 Demonstrably secure globally.