

Broad Meadow Brook Conservation Center and Wildlife Sanctuary



Sensory Trail

FOR ALL SENSES, ALL SEASONS, ALL PEOPLE



Mass Audubon
Protecting the Nature of Massachusetts

This tour is also available in audio format. You can call 508-713-6099 on a cell phone from April thru December. The audio tour is available year-round at www.massaudubon.org where you can download it to a personal audio player. The audio tour is also available on MP3 players that you can borrow during Visitor Center hours.



Welcome to Broad Meadow Brook Conservation Center and Wildlife Sanctuary. This Sensory Trail is here for your enjoyment. Please take only pictures and leave only footprints. Enjoy your walk today and return to experience the trail in different seasons.

Before Broad Meadow Brook became a wildlife sanctuary, it was home to farms. The Holdredge family was the most recent landowner of the portion overlain by the sensory trail and the Visitor Center was originally a family horse barn. Much of the sanctuary, cleared for farm fields and pastures two hundred years ago, is now regrowing trees. Meanwhile the City of Worcester has steadily grown around this urban oasis, and nature has been resilient. Muskrats, frogs, and nesting warblers coexist with powerlines and sewer pipes, and the diversity of wildlife continues to amaze both sanctuary visitors and biologists alike.

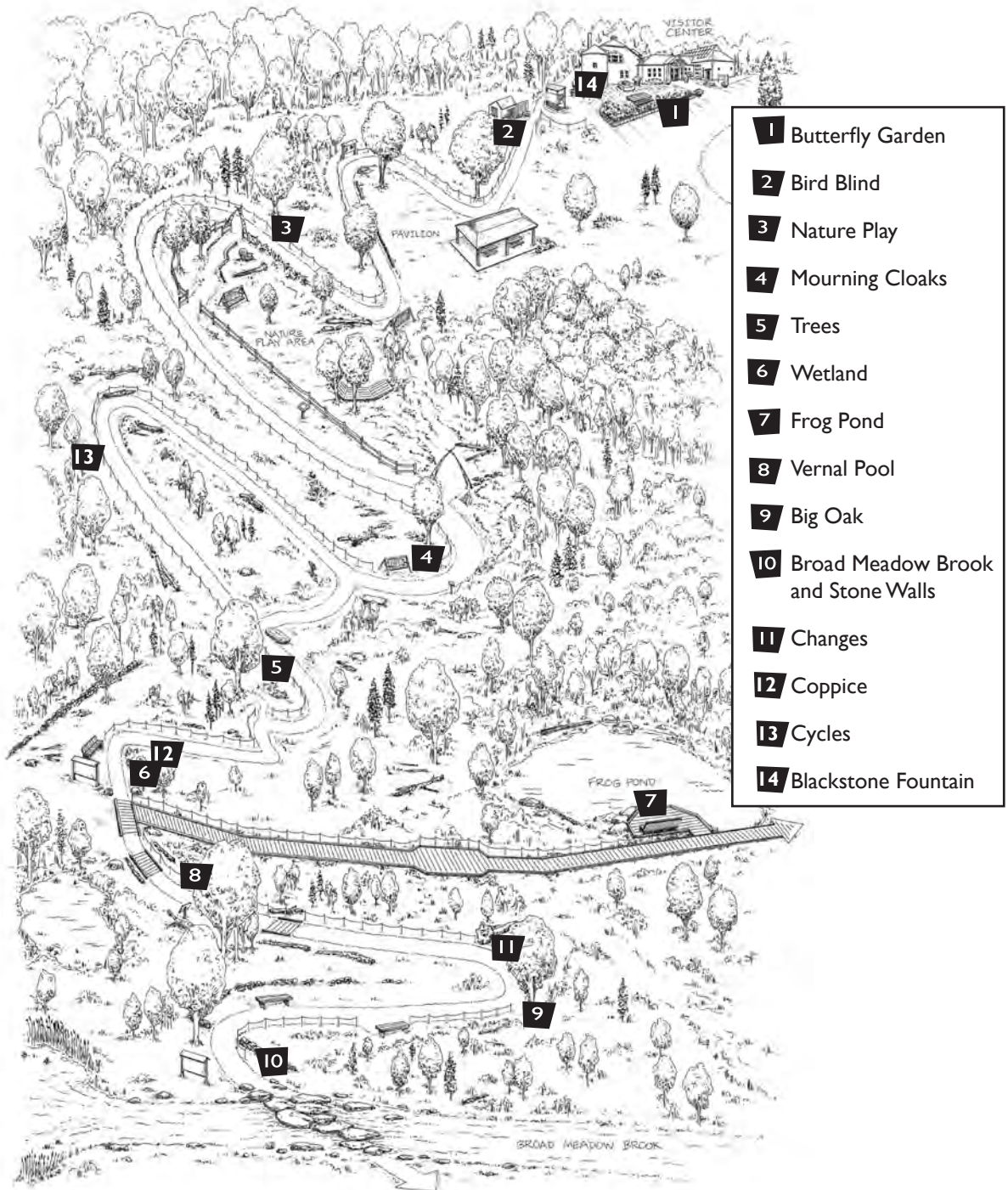
This 400-acre sanctuary is a model of modern conservation partnerships, working together to protect wildlife and provide an experience of nature for everyone. We invite you to experience the beauty and wonder of a New England forest, as you explore this sanctuary in the city.



**If you need assistance during Visitor Center hours,
call 508-753-6087.**

A Sensory Trail

FOR ALL SENSES, ALL SEASONS, ALL PEOPLE





I Butterfly Garden

Welcome to the butterfly garden, a patio surrounded by plantings. In the spring, summer, and fall, you may hear water running, a small fountain which will be the last stop on this audio tour. If you like, find a nearby chair or the picnic table, and spend a few minutes listening and smelling. The garden may be alive with insect activity. If it's sunny, listen for a far-off clicking sound made by the rooftop solar panels as they capture green energy from the sun. Feel the sunlight and maybe a breeze. You are in the open with no trees overhead.

Do you smell the flowers? The garden is planted so that something is always blooming from spring through fall. Aromatic herbs such as catmint and sage provide a sensory feast, and many native flowers provide food for butterfly caterpillars and other insects. Insects are controlled naturally, without chemicals, and you may hear wasps buzzing and birds flitting as they search for an insect meal among the plantings.

The garden has two parts. As you face the parking lot, the left side of the garden is planted with flowers that tolerate heat and dryness while needing very little water. Lambs ear, false indigo, purple coneflower, black-eyed susan and goldenrod provide color and nectar for butterflies, and later, seeds for hungry birds.

The right side of the garden is longer, with a variety of flowers and shrubs, mainly native plants that can be found here in Massachusetts. Flowers in this garden bloom from May through September to provide nectar and pollen throughout the season. Depending on the time of year, you may smell catmint, sage, sweet pepperbush, phlox, Joe-pyeweed or even several kinds of milkweed. Some plants in and also near the garden provide food for young insects, especially butterfly caterpillars. These are called "host" plants. Spicebush is an example of a hostplant that is planted just outside the garden. Spicebush swallowtail butterflies look for spicebush and

sassafras to lay their eggs on, as their caterpillars are specialized to eat only these plants. “Nectar” plants attract grown butterflies which feed on the sugary liquid. Milkweed is an example of a plant that is both a host plant for monarch butterflies and a nectar plant for many different kinds of butterflies.

Milkweed is a valuable source of food for monarch butterflies and over 60 other insects. There are several different species of milkweed, including butterfly weed with its bright orange flowers that bloom in mid-to-late summer, while the leaves provide shelter and food for monarch caterpillars all summer long. Our garden is planted for all kinds of butterflies, but it is specially certified as a monarch waystation, in which volunteers, or “citizen scientists” count monarch larvae and tag adults to determine migration patterns and track population changes from year to year.

Flowers in the garden also attract bees and birds. If you are lucky, you might hear the low rumble of a hummingbird at the right edge of the garden near the hummingbird feeder or near a favorite hummingbird nectar source - red bee-balm, or monarda.

2 Bird Blind

This small building is a blind, a structure from which to observe wildlife. The blind is the size of a small shed. It was assembled downtown for a Worcester Flower Show and moved out here to the Sanctuary with the help of Henry Camosse and students from the Gerald Creamer School. A display at waist-height around the walls informs visitors of local birds that might be seen here.

The back wall is lined with sliding wooden windows at various heights. Open one quietly to spy on the birds that may be at the feeders 20 feet away. Do you feel a breeze coming through the open window? Listen for the short calls of house sparrows, the peter-peter of the titmouse, or the familiar “chickadee-dee-dee” of the black-capped chickadee, the state bird of Massachusetts.

You are at the edge of a small meadow, which attracts not just birds, but many different insects and small mammals such as voles, shrews, and mice. Once a grassy backyard, the meadow has grown up in white-stemmed raspberry bushes, yellow goldenrod, and purple New England asters, providing a protective habitat. In late fall, white-throated sparrows forage among the weeds, all year long goldfinches

come to the thistle feeder and chickadees shelter in the white pines that line one side of the meadow. Maybe you'll come across our resident flock of turkeys. Listen for their soft clucking as they keep in touch with each other.

Once much of Massachusetts was open habitat such as this, but as forests matured and less grazing took place, meadows and grasslands became increasingly rare. We mow this meadow and some of our other grasslands every other year in late fall, to keep trees from taking over.



3 Nature Play

You have arrived at the Nature Play Area, a place for families and children to explore safely in the woods. A curving archway of hickory saplings and grapevine borders the play area trail entrance directly across from you, leading down the hill. Rhododendrons that line the steep slope have been planted to control erosion on the hill. The elements of this area include a triple-deck climbing structure, a large log also for climbing, gopher tunnels, discovery boxes, and a place to build. Unlike other sanctuary areas, where you are asked to stay on the trails to avoid impacting wildlife, in this area you are invited to roam and play, to dig and to climb, all for the purpose of having fun. Parents can relax on swings or chairs or enjoy the occasional art installations here in the woods.

This area shows the impact that people have had here. The topography is level, and a brick foundation underneath the climbing structure is evidence of a former sugar shack. Explore and you will find bricks that were unearthed here as well as lanky privet bushes trying to survive in the shade, another clue that the area was once open and landscaped. As time went on, the area was used for dumping household waste and old machinery. In fact, an old car had to be removed before we could create the playspace.

The upper half of this hill contains black cherry, a tree that needs sunlight to become established. This is another clue that the area was once open, perhaps a pasture or other kind of field. The stone walls that border it also indicate it was part of a farm.

Listen to your surroundings. Do you hear children at play? Or perhaps animals rustling in the trees? Gray squirrels and forest birds use this area, and you may hear the high-pitched scream of a broadwing hawk that lives here. Sanctuary bird feeders are behind you and small birds may be flitting in and out of the area.

4 Mourning Cloaks

You are now halfway down the hill. There are two seats nearby, a bench just downhill on a shortcut trail covered in woodchips, and a swing to your right in a sunny area along the gravel-covered trail. The rope stops just before the swing, leaving room for a wheelchair at the end.

Listen for birds. You may hear the caw caw of crows, the plaintive but insistent mew of a gray catbird, chips and whistles of cardinals, or even the repeated “cuh cuh cuh” of a cooper’s hawk. In winter, smell the brisk crispness of the frozen ground, in summer, the heat warming the layer of fallen and decomposing leaves. Listen for the breeze rustling the leaves or the trees squeaking a little as their trunks rub together. In summer this area is in deep shade, but through mid-May there is lots of sunlight for wildflowers to bloom and quickly grow before the trees leaf out and block the sun.

This is a special spot along the trail because the first butterflies always appear here in the spring. Mourning Cloak butterflies are named for their soft brown color, edged with a yellow band and a row of blue spots, resembling the muted colors which people in mourning used to wear. Mourning cloaks are fairly large with a 6-inch wingspan, and are one of the few butterflies that live through the New England winter. They tuck under a loose piece of bark, under a log, or in a rock crevice ... anywhere out-of-sight, and freeze solid through the winter months, thanks to a special kind of anti-freeze in their blood called “glycerols”.

Come March, if the day is sunny, Mourning Cloaks wake up and may be seen basking—warming up—on the trail or on top of a log. You may even see males flying out from a perch to intercept females or chase other males away in a spiraling flight that climbs ever higher until both butterflies break away. Mourning cloaks are thought to survive on tree sap rather than nectar, since there aren’t many flowers blooming in March. They will mate throughout the spring, then disappear while the caterpillars grow up. Mourning cloak caterpillars are hairy and black with red spots. They feed together on willow, American elm, aspen and cottonwood leaves until they enter the chrysalis stage in mid-summer. New Mourning Cloak butterflies emerge in July and August. Some will spend the winter here, and some are thought to migrate elsewhere.

Tall stumps across the trail are all that remains of giant white ash trees that long ago blanketed this hillside. They were once covered in hairy vines, called “monkey tails”



which are actually poison ivy vines climbing toward the sunlight. Did you know that we are the only animal allergic to poison ivy? Although we may dislike it, poison ivy is a valuable wildlife plant, giving shelter and food to small mammals and birds. Migrating warblers will flock to poison ivy-covered trees such as this to feast on the nutritious berries. Poison ivy leaves add to our colorful fall, providing a brilliant red display. Typically, poison ivy grows in areas that have been disturbed, or in habitats that border forest and grassy spaces, yet another clue that this area wasn't always wooded.

Here, the forest transitions from formerly cleared pasture with few rocks to a moister oak woodland with boulders left where the glacier dropped them 12,000 years ago.

5 Trees

There is a board in front of you with samples of bark from different trees. Each kind of tree has its own unique bark patterns. Feel the different types of bark on the board. Red maple bark has thin, wide sections, called "plates". White ash bark has thin high ridges and deep furrows that form the letters X and Y. Red oak has alternating smooth and rough patches. Musclewood is smooth and sinewy. In addition to their bark, trees can be identified by their branching pattern, the way that twigs grow out from a larger stem. Maple trees have an opposite branching pattern, as do ash, dogwood, and horsechestnut. These resemble the way our arms are positioned across from each other. Most other trees have alternate branching, which you can imagine as what it would look like if you were to stick out one arm and one leg. Can you find examples of each kind of branching around you at this stop?

Turn to face the rope. Further down the trail on the right, you may notice that the rope diverts to a tree about 15 feet away, with a very wide base that quickly narrows as the trunk rises up. Some people call this "the Elephant Tree" because it broadens at the bottom and resembles an elephant's foot. An opening in the far side of the base leads to a hollow cavity that extends partway up the trunk. Larger trees even when alive will often have hollow places inside which provide dens, or shelter for many different creatures large and small. A large tree that has died but is still standing has a special name. "Snags" provide homes for many insects, birds, raccoons and other creatures. Hollow snags also make instruments for woodpeckers to drum on, to advertise their territories to other birds and to call for mates. Look up and around to discover snags in this area.

You may notice nearby a small tree with smooth and sinewy bark. Musclewood is a small tree in the birch family, and is also sometimes called ironwood or hornbeam. Its strong wood is too hard for general carpentry, but it has been used where strength is required, such as for piano mechanisms, cutting boards, and tool handles. Musclewood is found near but not in streams and wetlands, a sign that the forest is wetter in this spot.

6 Wetland

You are at the edge of the woods and may feel the sun when you step out from the forest canopy. A bench on the right just ahead is a nice place to enjoy the spot.

Beyond and to the left, the trail runs through a long, narrow opening that is part of a larger wetland area. Wetlands are places where the water table is nearly as high as the soil, and the ground remains saturated through much of the year. Some plants are adapted to live in wetlands, and you may find the bright green leaves of spicebush, the knobby fruiting fronds of sensitive fern, and the peeling golden bark of yellow birch along the trail. In late spring or summer, look for small plants that resemble miniature Christmas trees. These are horsetails, descendents of ancient plants that were once the size of trees. Horsetails, or *Equisetum*, are spore plants like ferns. Find one with a soft cone at its tip, and you have found a reproducing plant. Early settlers used horsetails for scrubbing because of their rough texture, which comes from silica deposits in the stem and leaves.

Breathe in – what do you smell? Wetlands have their own special smells, and on a warm day you may be able to pick up the mucky scent of the “swamp” around you. In the fall, you may enjoy the warm fruity smell of wild grapes and hear flocks of birds enjoying the fruit. Robins, American redstarts, and even foxes love this aromatic fruit. Many birds and animals are drawn to water and this is a wonderful area to listen for birds. In summer and early fall, flowers will be blooming in the small wet meadow, and you may hear the buzz of bees or dragonflies as they search for small flies and mosquitoes. In early spring and summer, different kinds of frogs will be calling from nearby pools along the trail ahead of you. Listen for a moment – can you hear them?



This part of the trail is overlain along a sanitary sewer line, and occasionally you will see a manhole cover off to the side. Many places in Broad Meadow Brook sanctuary are fitted together with the infrastructure needed to support homes, businesses and roads. Some trails follow historical patterns of land use, such as cart roads and rock quarries. We invite you to enjoy the experience of nature in this urban sanctuary, knowing that places don't need to be pristine to support wonderful wild things.

7 Frog Pond

This small body of water, no more than two feet deep and shaped like a bean, is named because it is home to dozens of frogs during the summer season. This is one of the most popular destinations in the sanctuary, and you may be sharing this spot with school children or day campers. The wooden deck around you has curbing and extends forward from the bench and to the right side about 15 feet. The pond is just beyond the decking.

Do you see all the logs and rocks in the water? They provide hiding places for creatures that live in the water and sitting places for resting on top of but still close to the water. Look for frogs floating or sitting on top of a log or rock. Wood frogs use the pool in early spring, bullfrogs and green frogs arrive a little later and stay until fall. Most New England frogs are camouflaged, with green or brown backs to blend in with surrounding plants and mud. Bellies and underparts are white or very light yellow, so that predators looking up from beneath won't see them against the sky.

As you approached the pond, you may have heard plopping noises. It could be frogs jumping or maybe even a turtle slipping into the water. Take a seat on the bench or just stay very still for a while as you listen for the sound of green frogs calling. It



sounds like a banjo string being plucked. They are calling to attract mates and to defend territories. Males and females can be told apart by the size of their ears, visible as a circular membrane just behind their eyes. Males have ears much larger than their eyes, and this may be related to how important sound is in their life.

The tiny green plants floating on top of the water are duckweed, the world's smallest flowering plant. Each one has a trio of leaves that support its own root. Although small, this pond is full of life. Macroinvertebrates include many kinds of creatures that are large enough to be seen without a microscope, and they live here in many kinds of habitats within the pond. Aquatic isopods and flatworms crawl over the pond bottom looking for their next meal. Beetle and damselfly nymphs hang onto plant stems hoping small crustaceans or tadpoles will swim a little too close. Colorful dragonflies may hover over the water, dipping their abdomens on the surface to lay eggs.

After a long hot summer, this small pond may dry up completely. Can your nose tell you if the pond is dry? Tadpoles that have grown into froglets will get to leave while there is still time. Aquatic insects will burrow into the mud, perhaps under a log, waiting for the next storm to refill their home. Come winter, life slows down under the ice, and frogs and turtles will burrow into the mud to await the spring thaw.

Sit a little longer and listen for the wind rustling through the trees. Many animals are attracted to small water bodies such as this one, and if you stay long enough, you may hear small birds coming in to search for insects or even get a drink. Downy woodpeckers love this stretch of the trail. Listen for their sharp squeak, high descending whinny, or soft, short tapping in the trees around you.



8 Vernal Pool

Across the path in front of you is the Holdrege Vernal Pool. Vernal pools are important, critical habitat for some of our common creatures, including wood frogs and some salamanders known as mole salamanders. Some vernal pools even support fairy shrimp. A vernal pool is a temporary body of water that has no permanent inlet or outlet, and most importantly, dries out every so often so that it cannot support fish. In other words, it's a "wicked big puddle".

Can you smell the mud? Imagine you are holding chocolate pudding with a few grains of sand between your fingers -- this is what the silky bottom of this vernal pool feels like. This particular vernal pool tends to be very shallow and mucky. In addition to wood frogs, many beetles and aquatic insects call this home. Although you may not be able to see it, this puddle is teeming with life!

Vernal pools are important habitats that can support turtles, birds, and the delicate creatures that make up the food chain in New England forests. Some creatures can breed only in vernal pools. Without these pools, there would be no spotted salamanders or wood frogs, or “Big Night”. It begins on a warmish spring night, when wood frogs, frozen all winter under a log or buried under leaves, wake up and venture out toward the pool. Black salamanders sporting large yellow spots, which have been overwintering in tunnels dug by moles and other small animals, also wake up and slither over the forest floor toward the vernal pool. Once in the pool, male salamanders “congress” together, depositing small white packages of sperm, and courting females to mate. The female picks up the sperm, fertilizes her eggs and lays them in the pool, then the animals wait for the next warm rainy night to head back out into the forest. No one knows in advance when Big Night will happen, but for three weeks in early spring you may be able to spot egg masses in the water, and for nearly six weeks after that, tadpoles and larval salamanders will be in the pool. Tadpoles of wood frogs and salamanders that rely on vernal pools must grow quickly and change into adult form before the pool dries up. It is truly a race against time.

Vernal pools are like a birds’ nest, critical to raising babies but not a year-round home. Once grown, the frogs and salamanders move into the nearby woods, perhaps up to a half-mile from their natal pool, to hunt and to grow, spending their time until the next spring cycle arrives.

Vernal pools are more common than many people realize. You may even have one in your neighborhood. Listen for the quacking of wood frogs or the peep-peep of spring peepers for a few weeks in early spring. Look for the purple hooded flower of skunk cabbage near the ground in early spring, tadpoles making ripples in the water in early summer, and whether a pool that was there in spring is dry in late summer or iced over in the winter.



Tree bark changes shape as it ages, much like our skin. When a tree is young, its bark is smooth, like a baby's skin is smooth. As it grows older, the bark roughens and takes on characteristic shapes. Very old trees will have bark in a third stage of growth, which is how dendrologists (people who study trees) determine whether a forest is "old growth", that is, never logged. All of Broad Meadow Brook's forest has been cut at some point, and the oldest trees date back to the mid-1800's.

Large trees are important because they provide food and shelter for insects, birds, and mammals. The forest is transitioning here to a more open area, and abounds with large oak trees.

Oaks are valuable in a forest for many reasons. Can you guess one? If you said acorns, you are right! Acorns provide food for many animals, including squirrels, chipmunks, and deer, but also birds and insects. Here are some facts about acorns. Blue jays and some woodpeckers will hide acorns in favorite places for later use, burying them or stashing them in tree hollows. A blue jay can hold up to three red oak acorns at a time in its bill. Red and black oaks take two years to grow acorns, white oaks take just a year. Some years the tree may produce a lot of acorns. Trees seem to know what their neighbors are doing, and some years all the trees in an area may produce a lot of acorns.

This is called a mast year and is a bounty for wildlife. We know it is a mast year when there are a lot of acorns on this part of the trail. Be careful when you walk, especially in the fall, as acorns can cover the trail like ball bearings.

There is a bench just beyond the tree on the left. If you like, take a few minutes to sit and listen to the brook flowing gently beyond you. You may hear rustling on the ground from the many chipmunks that live in this part of the woods. Chipmunks are members of the squirrel family that create underground burrows with several entrances. You may hear them scurrying through the underbrush, squeaking loudly just before they run away. If a chipmunk suddenly disappears, its doorway is nearby. Chipmunks also have an alarm call that sounds much like a bird, but can be repeated tediously for several minutes. Listen for a few moments. Have any chipmunks spotted you?



10 Broad Meadow Brook and Stone Walls

Once most of Massachusetts was cleared for agriculture. As the trees disappeared, their roots no longer held down soil, and stones that had been buried deep underground found their way upwards over time. To clear their fields, farmers used stones to line roads and fields, form cattle runs, or mark property boundaries. The sanctuary walls tell of land that once enclosed orchards, pastures, and perhaps a few crop fields.

New England fences were made of stone not by choice, but because wood was once scarce and rock was plentiful. Our rocky soil comes from glaciers that once covered this area under a mile of ice. The glaciers scraped chunks of granite from the bedrock as the ice flowed south, leaving them to lie miles away when the ice melted 12,000 years ago. These orphan rocks are called “glacial erratics” and make up the stone walls and solitary boulders characteristic of New England.

Stone walls attract wildlife, providing hiding places large enough for a chipmunk to survey the landscape. Listen for rustlings that indicate the small animals in or near the wall. Look for bits of acorn shells heaped up on a rock. This is a midden, where the squirrel (or chipmunk) perches to eat.

Broad Meadow Brook is about 20 feet wide at this point, two miles south from its beginnings in a small wetland surrounded by homes and businesses. The brook receives much of its water from neighborhood storm drains; small streams feed the waterway once it enters the sanctuary. From this point, the brook flows south under Route 20, eventually feeding into Dorothy Pond in Millbury and then the Blackstone River.

In other places, the brook flows quietly through open wetlands, sometimes in a straight channel, sometimes meandering through a marshland. But here it is bounded by forest and forced to flow around rocks and boulders. Fallen trees span the brook, creating alternating pockets of deep pools and shallow water that harbor



fish, tadpoles, and larval salamanders. Caddisfly larva hide under flat rocks, spinning nets to catch small bits of food carried along in the current. This small brook supports many different kinds of life, from insects to crayfish, frogs, fish, beavers, and even river otters. Herons come to the open wetlands above and below this shady crossing, drawn by the frogs and small fish they can feast on.

Listen a while. What is the brook doing today? Does it gurgle or rumble, or perhaps it is quiet and singing softly? Smell the damp earth, and we invite you to sit on a nearby bench or on the cool rocks of the stone bridge, enjoying the shade and listening to the water pass by.

II Changes

Why is the soil clinging on the roots yellow? It is part of the subsoil, a layer of earth with little organic matter that lies just under the brown topsoil. This area of the sanctuary contains very little topsoil, the result of years of repeated low fires that burned it away and damaged the trees. Looking around, you may find triangle-shaped scars near the bottom of tree trunks. These scars were made when low-burning fires lapped at the base of the tree.

Behind you is an oak forest. This part of the forest has a different feel. It is open, with little undergrowth. In summer, the forest floor is covered with delicate hay-scented ferns that grow as single stems, rather than clumps like many other ferns. Hay-scented describes these delicate plants very well. Can you smell their scent in the air?

Listen also for the sounds and songs of birds. Woodpeckers like to frequent this spot, gently tapping on the trees. Small flocks of robins also travel through the woods in this area. In midsummer, although the birds are busy nesting, you may hear small quick movements in the trees or on the forest floor as wood thrushes busily turn over leaves searching for insects. You will likely still hear the brook gurgling softly in the background noise.



12 Coppice

Trees with multiple trunks have usually been cut in a way that causes them to sprout at the base of the stem. In this part of the sanctuary, the presence of multi-stemmed trees suggests the landowners may have practiced the ancient art of “coppicing”, where trees were harvested for wood, fuel, or livestock feed in a way that encouraged resprouting. This is how woodlots were managed sustainably, for renewable fuel and lumber. Some places in New England and Great Britain are still coppiced, for wildlife habitat and for crafting baskets and furniture.

This coppiced tree is a red maple and would have made firewood or simple furniture, or have been tapped for maple syrup. The size of the stems suggest it was harvested about 80 years ago, and its overall large diameter indicates it is probably much older than that. Red maples tend to live about 170 years, so this is a mature tree. Red maples are tolerant of many conditions and can withstand flooding or drought. They tend to have shallow but long root systems. Red maples are the first trees to bloom in the spring and you may find their red flowers or small winged seeds along the trail.

13 Cycles

Many logs are lying on the forest floor in this area. It may look a little messy, but everything here is important. These downed logs provide homes for many forest creatures. Redback and spotted salamanders, earthworms, beetles, slugs, ants, and spiders all find shelter here. Fungi live and grow on decaying logs. If you were to break apart a rotting log you might find white threads growing through it. These are hyphae, the body of a fungus. More than one fungus is “fungi”. Mushrooms are the fruiting bodies of fungi and are eaten by mice, turtles, and many different insects. Although we often overlook them, and they are often out of sight, fungi are everywhere, playing an important role in connecting the different parts of the forest together. Fungi help trees pull nutrients from the soil and they break down dead material so it doesn't bury us. As fungi and other creatures slowly break down the logs, fallen branches and last years' leaves, nutrients and rich organic material are released back into the forest soil. Decaying logs are also often a tree nursery, creating a sheltered, nutrient-rich environment for germinating seeds.

Use your fingers to explore the log at this stop. Can you trace the curving paths on its surface? Those tracks were made by small beetles which live and reproduce under the bark of dead or dying trees. The paths start out quite narrow at the beginning, growing ever larger until they reach the end of the track. Each path was made by a single beetle larva, starting as an egg, hatching into a grub and growing in size as it ate its way through the tree, until it changed into an adult, came out of the tree, and left to start a family of its own. Perhaps you can find a gallery, where tracks radiate out from a central area. This is where a clutch of beetle eggs was laid, hatched, and grew up together. In some parts of the world, bark beetles can be pests of living trees, but here in New England they are an important part of nature's recycling system.

Many of the logs here are from white ash trees that formerly dominated the canopy. White ashes that are part of a mixed forest such as this one were impacted heavily by a disease-causing micro-organism in the 1990's. But such changes in nature often benefit other organisms. As the ashes on this hill have died, they have created snags, the dead standing trees that provide nesting cavities for woodpeckers, chickadees, titmice, and other cavity-nesting birds. Look high up for holes, or listen for the "angry chicken" call of the red-bellied woodpeckers that often nest in this area.

14 Blackstone Fountain: (from April – winter frost)

You are in front of a small oval fountain, waist-high and approximately 3 by 6 feet wide. The fountain symbolizes the Blackstone River and its watershed. A watershed is simply all the land around a river or stream that drains rain and melting snow into a particular waterway. In this mosaic tile sculpture, smaller tributaries run along valleys from the higher part of the fountain into the main stream of the Blackstone River, then drop into a basin that symbolizes the ocean. You may be able to see the colorful ocean creatures in the bottom.

A waist-high plaque on the right tells about the Blackstone River, watersheds, and the river's history. The Blackstone River begins in Worcester and flows 48 miles south through Massachusetts and Rhode Island into Narragansett Bay. The Blackstone River watershed covers 640 square miles, about half the area of Rhode Island. The Blackstone was once known as America's Hardest Working River. As the birthplace of the American Industrial Revolution, the river supported many working mills and dams, along with a canal that had 45 separate locks to bring boats from

Providence to Worcester. Now, people are helping to steward this hard-working river by watching what we put into it, keeping it clear of invasive weeds, and helping fish navigate around the old dams so they can return to their historical breeding places.

Listen to the sound of the water as it sprays against the tiles and gurgles down the channel. Can you hear where it falls into the ocean?

Use your sense of touch to examine the smooth tiles if you don't mind getting a little wet. Can you feel the channels where the tributaries enter the main river? Follow the outline of the watershed, dip your hands into the cool spray and trail your fingers through the basin.



If you borrowed any of our publications, binoculars, or adaptive equipment, please return these items to the Visitor Center.

THANK YOU

Jerry Berrier

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This project is made possible by a grant from the U.S. Institute of Museum and Library Services.



Broad Meadow Brook Conservation Center and Wildlife Sanctuary

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Visitor Center

Tuesday through Saturday, 9 a.m. to 4 p.m.

Trails: Open every day, dawn to dusk.

Mass Audubon works to protect the nature of Massachusetts for people and wildlife. Together with more than 100,000 members, we care for 35,000 acres of conservation land, provide school, camp, and other educational programs for 225,000 children and adults annually, and advocate for sound environmental policies at local, state, and federal levels. Founded in 1896 by two inspirational women who were committed to the protection of birds, Mass Audubon has grown to become a powerful force for conservation in New England. Today we are respected for our sound science, successful advocacy, and innovative approaches to connecting people and nature. Each year, our statewide network of wildlife sanctuaries welcomes nearly half a million visitors of all ages, abilities, and backgrounds and serves as the base for our work. To support these important efforts, call 800-AUDUBON (800-283-8266) or visit www.massaudubon.org.

