

Broadmoor Wildlife Sanctuary



A Sensory Trail for the Spring Season

FOR ALL SENSES, ALL PEOPLE

An audio tour is available from May – November through your cell phone by calling **508-530-0002**. The recording and tour booklet are also available online at **www.massaudubon.org**.

Welcome to Broadmoor 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.



Welcome to Broadmoor's multi-sensory interpretive guide to our marsh boardwalk trail in spring. Broadmoor undergoes an extraordinary transformation from the final blustery days of winter in March to the balmy cusp of summer in June. Hibernators emerge and migrants return. Birds and animals begin to rear their young. Trees leaf out and plants flower. The forests and fields grow green. There is much to hear, smell, feel, and see. We hope our guide encourages you to make an in-depth, sensory exploration of the nature of Broadmoor and heighten your sense of wonder. Before you begin, we'd like to orient you to our sanctuary, give a few quick instructions, and point you in the right direction.

Broadmoor contains more than 600 protected acres of field, forest, and wetland habitat. We have nine miles of walking trails. The trail that you are about to explore is a quarter-mile loop that is accessible to everyone. The wide path through the woods and the boardwalk through Indian Brook marsh accommodate wheelchairs, walkers, and baby strollers. There are benches along the boardwalk where you can sit. The marsh boardwalk is a favorite with young and old alike, new visitors or experienced outdoors people. The narration portion of the multi-sensory guide takes about 60-70 minutes. There is no time limit for walking the trail, but many people take an hour and a half or more to fully enjoy the experience.

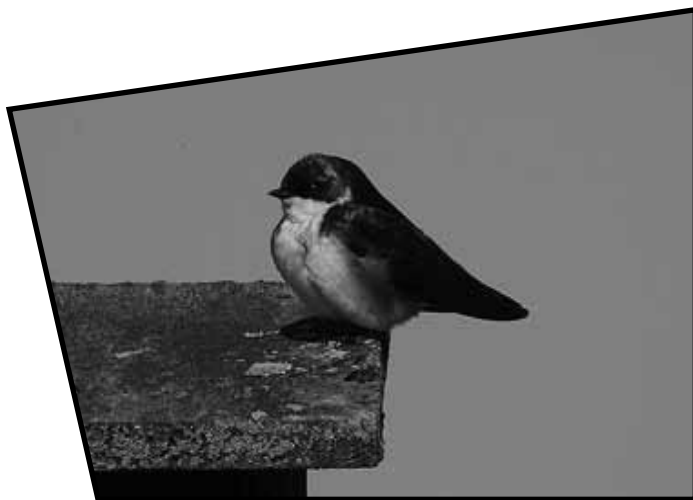
Because we are a wildlife sanctuary, all of the plants and animals here are protected. Please do not collect, pick, or eat anything. For your safety as well as for that of the wildlife, remain on the trail to avoid poison ivy, thorny vegetation, rocks, roots, and ticks.

This part of the trail runs parallel to a large field on your right. Take a few moments to explore the field by making a sensory impression of this habitat. This is one of the activities that we will ask you to do from time to time. Listen to the sounds of the field and breathe in the scent. Can you detect the differences between early and late spring?

Fairly dormant in March, the field comes to life after the ground unfreezes by mid-April. The earthy aroma of “mud season” is more pungent than the grassy scent of the field in June. In May, note the light fragrance of the flowering wild crab apple and cherry trees. Can you detect the buzzy droning of the bees that pollinate the delicate white blossoms?

Meadow voles, tunneling through snow and dried grasses all winter, now share the field with other herbivores. One of our only true hibernators, woodchucks emerge from winter burrows. During the spring, they waddle through the field in broad daylight to fatten up on the rapidly growing vegetation. Eastern cottontail rabbits graze early in the morning or near dusk. They scrape shallow depressions, called forms, in the field, where they bear their first litter as early as March. The herbivores attract predators: foxes, coyotes and raptors. Listen for the red-tailed hawk’s “keeeeer...keeeerrr” as it soars overhead. These majestic hawks have a wingspan that is four feet wide.

Bird song increases in volume and variety as the migrants return. Tree swallows come back to Broadmoor in April. Dark, iridescent blue above and white below, these small birds “hawk” for insects over the field, catching their prey in midair. Listen for their twittering calls. Eastern bluebirds are lighter blue and have orange-red breasts. Bluebirds and tree swallows nest in the boxes we provide in the fields.



Before you move on, there is one more activity that we will ask you to repeat at various places along the trail. Let yourself become a sensory barometer to measure wind and weather. Also, you can be a human compass and figure out the direction you are traveling by noting where you feel the sun on your face and what time of day it is. Ready? First, turn and be sure that you are standing with the field and split rail fence on your right. Next, lift your face slightly to the sky. In the morning, the sun is in the east; it will shine warmest on your left side. By midday and early afternoon, the sun will appear in the south so that you will feel it on your entire face. From the west later in the afternoon, the sun will feel warmest on your right. Okay, feel that sun. In which direction are you heading? You are going south.

Now, feel the wind on your face. From what direction is the breeze blowing? Another way to test wind direction is to lick your finger, then hold it up to feel the breeze. Finally, what is the general “feel” of the habitat you are in? Cold or hot? Shady or sunny? Exposed to the wind or sheltered from it? Noisy and bustling or calm and quiet?

Now that you have an impression of the open field, it’s time to explore the forest habitat. Please remember to walk along the right side of the trail, but don’t step in the vegetation at the edge of the path. It may contain poison ivy.

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You have just entered one of Broadmoor’s other major habitats. This is a mixed white pine and oak forest, one of the most common forest communities in southern New England. A large oak is close by on your right. You may have to turn and take a step or two so that you can reach out and touch its furrowed trunk. Feel the rubbery lichens and soft mosses that grow on the bark. Look upward and try to get a sense of the forest. Have the oaks and other broadleaf trees formed their dense leafy canopy overhead yet? Do you sense warmth and dappled light? Or are you walking in darker, shaded woods?

The forest responds to spring more slowly than the field. Red maple trees are one of the first harbingers of spring. As days lengthen and light strengthens, the tips of red maple twigs turn red, creating a reddish haze on the tree tops by early March. The buds swell like miniature red cherries until they burst into flower by the end of the month. In April breezes, the male catkins of birches and willows send forth wind-borne pollen. By the first week of May, most of the deciduous trees have leafed out, followed by the oaks a week later. Tender lime-green when they unfurl, the new leaves contrast with the dark waxy needles of the pines until they mature into the thick emerald green canopy of the forest in June and summer.

A word of caution before you walk through the forest: poison ivy is quite common at the edge. Poison ivy has three shiny green leaves, but they might be maroon when they first emerge in spring. Sometimes the leaves have a thumb-like lobe. The stems are always smooth, with no thorns or prickles, and the berries are greenish-white. Poison ivy grows as a low plant, a small shrub, or a climbing vine. The vines are hairy with aerial roots and can give you a rash even if they have no leaves.

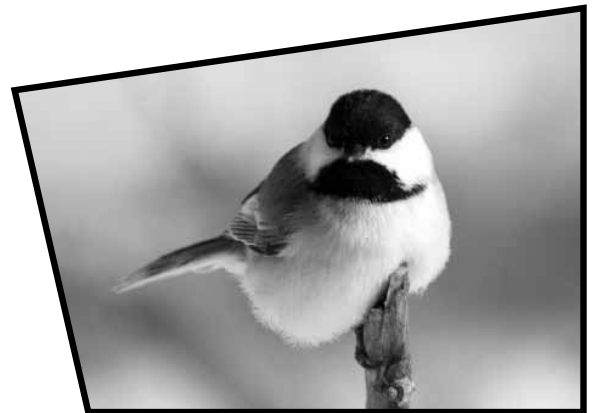


You are standing at a bend in the forest trail. This is a great place to hear the changing variety of sounds in the forest and beyond. Not all of the spring music is bird song. From March through November, chipmunks punctuate the woods with their loud chipping.

Red squirrels are highly territorial. They warn off other red and gray squirrel intruders with their guttural chittering. Red squirrels feed on the buds and flowers of the forest trees in spring and on fruits, nuts and pine cones in summer and fall. They hide most of their fall bounty in a single cache for the winter. Red squirrels often feed in the same place every day, leaving a large midden—or pile—of nutshells and pine cone debris below.

You may hear this faint quacking between late March and early April. No, they are not ducks, but wood frogs calling from one of Broadmoor’s vernal pools. Amphibian migration to vernal pools is one of the highlights of early spring. “Big Night,” occurs on the first warm, rainy night of spring when wood frogs and spotted salamanders return en masse to their natal pools to mate and lay eggs. Days later, the adults head back to the upland woods, leaving the next generation of tadpoles and salamander nymphs to transform into adults before the vernal pools dry up. Other callers of the frog chorus include spring peepers, with their bell-like call and American toads that trill in May.

When you stop now, there should be a large tree on your left. It is a white pine. Broadmoor’s pines, oaks and shrub thickets provide food and shelter for mixed flocks of resident songbirds all winter. Now the birds are moving into individual territories for the nesting season, the males calling to attract a mate. By early March, our year-rounders are singing. Few calls are more piercing than that of the bright red northern cardinal. Song sparrows and white-throated sparrows have distinctive melodies. Compare the song sparrow’s with the white-throated sparrow’s “old Sam Peabody, Peabody, Peabody”. The nuthatch’s makes a nasal “yank yank” sound. The titmouse has a “cheeva cheeva cheeva” call. Joining the “chickadee dee dee” call, the black-capped chickadee’s courtship song fills the air. This musical “fee-bee” is often confused for the call of the eastern phoebe, one of our summer migrants. The phoebe does, indeed, call its name, but as a quiet, matter-of-fact “febbe” that can’t compare to the chickadee’s exuberance.



Summer migrants add their tunes to the dawn chorus in late April, May and June. The bird chorus is at its fullest in May. By late May and in June, the birds are busy raising young and have quieted down considerably. Many wood warblers pass through Broadmoor on their way to breeding grounds farther north, and we catch their songs for only two or three weeks in May. The common yellowthroat and the yellow warbler breed at Broadmoor, often nesting in wooded thickets near the water's edge. The male yellow warbler is entirely yellow and has reddish streaks on its breast. You can tell it apart from a goldfinch because a goldfinch has black wings. The common yellowthroat, with its black mask and bright yellow throat, skulks low in the underbrush. It is often heard rather than seen. Listen for its "witchity witchity witchity" call. Almost everyone's favorite spring bird is the brilliant orange and black Baltimore oriole with its gorgeous song. Listen for all these songs as you walk on.

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We'd like to give you some information so that you can familiarize yourself with the boardwalk part of the trail. The boardwalk itself is 430 feet long and 8 feet wide. The left edge of the boardwalk has a short curb approximately six inches high, but has no rail. The right edge has a three-foot high railing that you can hold to get your bearings, so please keep toward the right side of the boardwalk. There are two benches along the boardwalk for rest and contemplation, and you will be prompted to stop at each one. There is another stop midway between the benches. Please take the time to walk at a pace that is comfortable for you. Stop and explore anywhere and everywhere you are curious.

Before the boardwalk heads into the open marsh, it passes through a small wetland buffer zone where the forest and the marsh grade into each other. This upland/wetland interface is composed of a shrub thicket, wetland plants, such as jewelweed and vines of fox grape.

This is a good place to test your sense of direction. Lift your face toward the sun. Where is it shining brightest on your skin? You are facing south.

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At this small jog along the railing, you are overlooking an area of very shallow water on the right. Warmed quickly by the morning sun, this is the most likely place to find painted turtles, frogs and water snakes when they first emerge from winter hibernation in March. From mid-spring throughout summer, turtles are active in the marsh on sunny days. They paddle lazily just below the surface or float among the water lilies, poking their heads above the water. Others bask on muddy tussocks and emergent logs. If you walk by and cast shadows on the turtles, they'll dive into the water. Listen for the gentle "plop."

In May or June, female turtles leave Indian Brook and head upland to lay their eggs in sandy or gravelly soils, along the edge of the trails or fields. It's not uncommon to find a painted turtle heading up the hill in the woods. Snapping turtles may travel farther away from the water to

lay their eggs. We've found female snappers right next to the Nature Center looking for a good nesting spot. Turtles use their hind feet and legs to dig and often make several false nests. Although they cover the true nest after depositing their eggs, many nests are preyed upon by raccoons and skunks.

Now, turn around so that the railing is behind you and walk five or six steps to the bench. Have a seat. Feel where the sun is strongest on your face and take a human compass reading. Ready? Do you feel the full power of the sun's energy warming you?

Plants fuel the web of life in the marsh and everywhere else on earth by harnessing the sun's energy to produce food—sugars—through the process of photosynthesis. Their roots, shoots, leaves, flowers, fruits and seeds feed a wide variety of animals, including humans. Indians and colonial people utilized almost all parts of native cattails for food, for example. They ate the tender vegetative shoots, added the nutrient-rich pollen to their bread, and ground the rhizomes into flour or cooked them like potatoes. Indians ate the starchy tubers of the arrowhead, which is also called “duck potato.” In addition to feeding and sheltering the inhabitants of the marsh, wetland plants act as filters to purify water and as sponges to control flooding.

In March and April, the plants of Indian Brook marsh show few signs of new growth. But the days keep lengthening and warming up and by the end of May, the marsh greens up with lush vegetation. The sword-like leaves of the cattails and the spearhead-shaped leaves of arrowhead and arrow arum dominate the shallows. And then in June, you can smell the perfumed fragrance of the white water lilies that float on the surface.

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What impressions can you gather from the shallows near the shore? Is the area hopping with activity or does it feel like a drowsy, lazy place? Is today raw and windy, balmy and breezy, or hot?

No matter what the season, the waters of Indian Brook are teeming with life. Many aquatic insects have larval forms, called nymphs, that overwinter under water and metamorphose into delicately-winged fliers from mid spring to early autumn. Dragonflies and damselflies are fierce predators of mosquitoes and other insects as they fly over the marsh. Their larvae are equally voracious, eating any aquatic invertebrates that are smaller than they are – including other dragonfly and damselfly nymphs. Caddisfly larvae build elaborate cases from pebbles or leaves or sticks to protect themselves until they are ready to leave their watery habitat for the air. The most ephemeral, mayflies, emerge as adults for only twenty-four hours in early May. If you are lucky enough to be here when they emerge, you will find fluttering mayflies all over this boardwalk and the surface of the marsh.

Warm weather brings swarms of whirligig beetles and water striders to the water's surface. Many more insects find food and shelter on stems and leaves of submergent vegetation or on the undersides of lily pads. Others creep along the muddy bottom. Insects are an important source of food for Indian Brook's fish: pickerel, bass, sunfish, catfish, and bluegill.

Beavers and muskrats, too, live in this marsh. Beavers build lodges out of logs, branches and mud. The large mound straight across the marsh on the far left is a beaver lodge. Muskrats build lodges out of mud and cattails in the open water. They also make bank dens. One of these dens is at the shore to your right. You can often find adult muskrats out swimming during the day, and sometimes young ones are out playing near the den. A swimming muskrat makes a narrow, ribbon-like wake with its long, thin tail. Muskrats are much smaller and less elusive than beavers. Beavers feed at dawn and dusk and work on their dams and lodges at night.

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The red-winged blackbird's hoarse "conk-a-reee" is the most common and easily recognized call in the marsh. The male red-winged blackbird is glossy black. His yellow-margined red "shoulders" flash a brilliant scarlet when he flies. Female red-wings have drab, mottled brown plumage, providing them with good camouflage when they are nesting in the cattails.

Great blue herons have always fished in Indian Brook marsh, virtually motionless while they stalk their prey. Primarily fish eaters, they also eat frogs and crayfish. They usually nest in large rookeries, but a couple of pairs have nested at Broadmoor over the past few years. Their large nests are loose and messy platforms of twigs high up in dead trees or white pines. How incongruous to watch these huge, long-legged waders flying into the treetops! Belted kingfishers are also fish-eating birds with a loud harsh call. When they hunt, kingfishers hover above the water like helicopters, then plunge into it head first to catch a fish.



While you are sitting, take the opportunity to look and listen for ducks and geese. In the spring, mallards and Canada geese nest in the dense vegetation. Most of us are familiar with the loud honking of Canada geese and the quacking of mallards. In May and June, the ducklings and goslings are paddling around the marsh with the adults. If you listen carefully, you can hear the babies softly peeping back to their parents.

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Use your senses to investigate this dead maple tree. Knock sharply on the trunk and listen. Does the tree sound hollow or hard? Feel the rotting wood. Is it punky and soft or dry and dusty?

Fungi, bacteria, insects, and rain are all working to decompose the wood. Birds, squirrels and raccoons take shelter in cavities that are easily excavated in the soft, dead wood. Bark beetles, termites, and carpenter ants colonize the rotting wood. You can feel vertical tunnels and sawdust where they have come and gone. Woodpeckers make large, uneven holes in the wood to get at those insects. Eventually, a dead tree becomes so hollow and riddled with rot that it falls to the ground where it continues to decompose into soil. One of the giant limbs of this maple came crashing down in a storm, and now lies in the shallow water parallel to the boardwalk.

These shallows are prime skunk cabbage habitat. The first wetland plant to flower in early spring, skunk cabbage relies on flies for pollination because most other pollinators haven't emerged yet. What attracts flies? The smell of rotting meat and garbage. Can you detect the skunk cabbage's unpleasant odor?



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Now that you are back in the woods, stop and take a sensory impression of this part of the forest. The odors of the forest will change over the course of the season. The thawing ground in early spring gives the air an earthy, organic smell like warm mud. Perhaps you'll catch the pungent smell of skunk cabbage here as well.

The air turns sweeter in late spring. In May, the fragrance of lilies of the valley is overpowering. It has escaped cultivation to bloom along this slope next to its diminutive cousin, Canada mayflower. Native wildflowers that bloom at Broadmoor in May include Canada mayflower, star flower, polygala, wild sarsparilla, Indian cucumber-root, wood anemone, and pink ladies slipper. These flowers are called spring ephemerals because they bloom for a brief time in the green-gold dappled light that reaches the forest floor before the trees leaf out fully and create too much shade.

In June, try to detect a sweet, grassy scent. You may be surprised at the scent of fresh-mown grass so far away from a field, but this is not grass. It is hay-scented fern, a woodland fern that blankets the slope. If you can't smell it yet, breathe deeply to catch the scent.

Careful listening will clue you into Broadmoor's recent weather conditions and this time of year. If you hear the gurgling of water running along a stony channel, this means that the intermittent – or temporary – stream is currently flowing under the bridge into Indian Brook. The brook flows continuously at winter's end and in early spring. It dries up quickly unless we've had a particularly wet spring. Water will flow through the channel again whenever we've had a good, soaking rain within the past few days.

People have lived near Indian Brook probably for as long as humans have inhabited the area. Native Americans lived here because fresh water was plentiful, and the brook and marsh provided a bountiful source of food. They paddled along Indian Brook to the Charles River, their "highway system" to Boston harbor. The first gristmill in Natick was built on the Charles River, commissioned by native people and constructed in 1697 by a settler, Thomas Sawin. Over the years, another gristmill and a sawmill were powered by the waters of Indian Brook. The land on the other side of the brook and marsh used to be a dairy farm. The land on this side was once a truck farm. The farmers grew vegetables that they trucked into Boston to sell. On the right, between the bridge and the marsh, lie the rusted remnants of the pump and some of the piping used to irrigate the crops. Broadmoor is rich in both human and natural history.



We would appreciate your feedback on how this trail worked for you. Please spend a few minutes answering some questions now or after you get home. To provide feedback now, you can talk with one of our staff or volunteers or fill out a written questionnaire. To provide feedback at home, you can take home a questionnaire and return it at your convenience or visit us at www.massaudubon.org/accessibility to complete the questionnaire online.

We hope you have enjoyed your visit and have learned some new things about this special wildlife sanctuary.

This audio tour and booklet were produced with the help of:

Jerry Berrier - advisor, narrator, sound and recording engineer; Lang Eliot - bird, insect and amphibian recordings; Jini Fairley -advisor; Paula Lyons - narrator; Tony Kahn - studio recording engineer; and Marsha Salett -writer. The tactile map was produced by the Braille and Talking Book Library at the Perkins School for the Blind. The tour is funded by the family of Helen November Wile who cared about making the world easier for people with visual limitations, and supported services on their behalf.

Broadmoor Wildlife Sanctuary

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Nature Center:

**Tuesday through Friday, 9 am to 5 pm, Saturday, Sunday,
and Monday holidays, 10 am to 5 pm**

Trails

**Open Tuesday through Sunday, dawn to dusk.
Closed Mondays except Monday holidays.**

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.

