

## **Blue Hills Trailside Museum - Guided Nature Experience**

Welcome to Blue Hills Trailside Museum. This Sensory Trail is here for your enjoyment. Please take only pictures and leave only footprints. Enjoy your visit today and return to experience the trail in different seasons.

Operated by a partnership between Mass Audubon and the State Department of Conservation and Recreation, the Museum tells the stories of the nature of Massachusetts and our Blue Hills backyard. The indoor and outdoor exhibits are a gateway to the trails of the Blue Hills Reservation and to a greater appreciation of the natural world.

Established in 1893, the Blue Hills Reservation consists of over 7,000 acres. More than 125 miles of trails travel over and through the many hilltops, forests, ponds and wetlands. Next to the Museum is Great Blue Hill, the highest of the hills at 635 feet above sea level. Trails in the Reservation vary in difficulty and terrain; please ask at the Museum's front desk for advice if you would like to explore the Reservation further.

Visitors to Trailside Museum have the opportunity to experience native wildlife up close. The wild animals on exhibit at the Museum are here for several good reasons. None of the animals kept here could survive on their own in their natural habitat. The animals were either raised by humans or are disabled by injury. These animals represent some of the species which are found year-round in Massachusetts or are regular winter visitors.

Mass Audubon created this self-guided, fully accessible nature trail so everyone could experience the very special habitats and wildlife found in the Blue Hills. This project is made possible by a grant from the U.S. Institute of Museum and Library Services.

This tour is also available in audio format. You can call 617-618-1164 on a cell phone from April thru December. The audio tour is available online at [www.massaudubon.org](http://www.massaudubon.org) where you may download it to your personal audio device. The audio tour is also on an MP3 player that you can borrow during Museum hours.

The Trailside Museum consists of many outdoor wildlife exhibits as well as an indoor section depicting numerous habitat exhibits and more live animals. The outdoor and indoor portions have their own guided tours.

### **Outdoor Tour Stops 1-10**

The outdoor tour is approximately 1,000 feet long and will take about 30 minutes. All narrated stops along the trail are marked by a round bead in the guide rope which runs along a post and rail fence. Within reach of the bead, there will be a signpost with the stop name and number in print and Braille. A square bead in the rope indicates that there is a bench nearby. There are many places to sit and relax along our trail. While the trail is pavement in some places and gravel in others, there do exist rocks, culverts and stairs along our trail. Please pay special attention to navigational directions given before or after interpreted stops. Ask for assistance if required within our Museum, open 10am-5pm Thursday thru Sunday and Monday holidays.

We hope you'll enjoy your visit and that this trail will enrich your senses in new ways.

#### **1. Bird Feeding Station**

The bird feeding station is visited by wild birds which either nest around the museum, live in the nearby forest, or pass through on migration. About five feet away from the fence and six feet off the ground, a wire stretches parallel to the fence for almost 40 feet. Several bird feeders hang from the wire. The feeders provide sunflower seed year round, sugar water during the summer,

and suet cakes during the colder months. Fifteen feet away from the fence and at opposite ends of the feeding station, two nesting boxes are mounted on poles. Native shrubs and trees have been planted between the wire and the nesting boxes to provide food and shelter

Black-capped Chickadees are small, chunky birds, just a little bit more than five inches long from the tip of their beaks to the tip of their tail. They have a black “cap” which covers their head from the top down to their eyes, white cheeks, and a triangular black patch on their chin. Their backs are grayish green, wing and tail feathers are black and white, and their bellies are white. A chickadee weighs about a third of an ounce, or about the same weight as a standard piece of paper. Their tweezer-like beaks are short and are specialized for probing cracks in tree bark and spaces between twigs for insects and insect eggs. Because their beaks can’t open a sunflower seed like a nutcracker, chickadees will dart in to a feeder, select a seed, and fly away with it. They will hold the seed against a branch using their foot and crack it open with a few blows of their beak. Chickadees usually visit the feeders in small family groups. The “dee, dee, dee, dee” calls you may hear are members of a family keeping track of each other. The louder “chick – a – dee – dee – dee” call serves as an alarm or a signal that a family member has become separated from the group.

Small flocks of House Sparrows show up at the feeding station and seem to stay forever, filling the air with their chirping. Their beaks are thick and stout, and crack sunflower seeds easily. Females and young birds are a dingy graybrown, but a male is much more colorful, with a thin gray cap, rusty red on his back, white on the stomach, and a black stripe which starts at the base of his bill and widens to cover his chest. House sparrows are slightly over six inches long and weigh nearly an ounce. In late summer, the parents will still be feeding the younger birds. You may see a bird as big as its parents fluttering its wings, opening its beak wide, and occasionally getting a seed popped into its mouth. Birds grow much faster than humans and other mammals because

an adult-sized body is needed to fly efficiently. Most of the birds visiting the feeder grew from freshly hatched chicks to adult sized birds in fewer than fourteen days!

The tiniest birds visiting the feeders are the Ruby-Throated Hummingbirds. These birds are less than four inches long and weigh only about one-tenth of an ounce. The tops of their heads and backs are covered in electric green feathers which flash in the sun. Hummingbirds have white bellies, but the adult males have brilliant red feathers on their throats. Instead of singing to claim nesting territory, a male hummingbird sits in a sunny location and flashes these highly reflective, ruby-colored feathers. Instead of solid seed, hummingbirds sip a liquid diet of sugar water which mimics the nectar they obtain from flowers. Like the flowers they feed on, the hummingbirds are only here during the warmer months. If they are present, you may hear their sharp, sputtering chatter.

Suet cakes in the winter are favorites of the White-breasted Nuthatch. This bird has a white face, chest, and belly. A black stripe runs from its beak, over the top of its head, and down the back of its neck. Its back and the tops of its wings are blue-gray. Nuthatches will cling to suet holders upside down, the same way they will cling to the trunk of a tree while searching the bark for insects. You may hear their “nerp, nerp, nerp” call as they fly back and forth from suet, to a sunflower seed feeder, to the trees. Once they’ve picked up a seed, they’ll wedge it in a crack in tree bark and break it open with their beaks.

Please note, if you need assistance, the Visitor Center is at the 6:00 position, about 10 feet away, up two steps. Come through the door and through the second door, which is 4 feet to your left once inside the foyer. Also, there are two benches at the 6:00 position from Stop 2, 10 feet away.

## 2. Snowy Owls

Five feet away from the fence is the Snowy Owl enclosure. The enclosure is about fifty feet wide, thirty-five feet deep, twelve feet high, and is closed at the top. The ground is covered in round river gravel; there are several upright dead trees and logs at different heights to serve as perches. A small living evergreen tree and a shaded perch high in the upper right corner provide shade and cover. A cast concrete and stone water basin on the left side of the enclosure provides water for bathing and drinking.

Standing a foot and a half tall and covered with glowing white feathers, Snowy Owls are one of the most breathtaking birds in North America. Snowy Owls are well adapted for the extreme conditions found in their arctic home. Their white feathers provide camouflage against the snow, while their toes are covered with a dense coat of feathers. Their stocky build also helps them to conserve precious body heat during the cold of winter. Adult male Snowy Owls are nearly pure white, while females are streaked with brown.

Snowy Owls spend their summers defending their nesting territories on the tundra which rings around the North Pole. They warn each other away by making high pitched, slurred whistles or sharp sounds which have been compared to a duck's quack or a dog's bark. Trees do not exist on the tundra nesting grounds. Nests are simply a depression kicked into the ground, possibly lined with a little grass, feathers, or moss. Four to nine eggs are cared for by the female until they hatch. The female's darker feathers help her hide the nesting area from hungry foxes and other predators. The male helps his mate by catching and delivering food to the hungry babies. Snowy Owl hatchlings need a lot of food, since they will grow as large as their parents in only 50 to 60 days.

So what's an arctic bird doing in Massachusetts? Every winter, some –but not all – of these birds trade arctic snow drifts for coastal New England sand dunes. Because of its location, terrain, and adequate food supply, Boston's

Logan Airport is a common stopping point for these magnificent birds. Humans have been trying for decades to find a pattern to their southward wanderings, but with no success. Unlike a true migration, these southward journeys have no definite destination. The Snowy Owl's wandering behavior still remains a mystery.

Since 1981, the Blue Hills Trailside Museum has been working in partnership with the United States Geological Survey to solve some of the mystery of the Snowy Owls' migration patterns. In order to identify the migration routes of these birds, tiny satellite transmitters are attached to selected wild owls wintering at Logan International Airport. For more information about this project, log onto [www.massaudubon.org](http://www.massaudubon.org) , click on "Birds and Birding" and then click on "Snowy Owl Project."

### **3. White Tailed Deer**

The deer enclosure is five feet away from the fence. This enclosure has an irregular shape which is approximately eighty-five by sixty feet at its widest points. The floor is dirt covered with coarse wood chips, and there is another concrete and stone basin which provides drinking water. Five living trees and an open-sided shed provide shelter. Inside the shed is a manger for hay.

Found throughout Massachusetts, White-tailed Deer are a little more than three feet high at the shoulder – most adult people could hold their hands at waist height and be able to touch a deer's back. Its long, graceful neck puts a deer's head at chest height. Long, slender legs with cloven hooves give deer their grace and speed. Deer usually weigh between one hundred forty and two hundred pounds. The bellies and the underside of the deer's tail are white. The other colors and antlers found on a deer vary with the sexes and the changing seasons.

White Tailed Deer respond to changing seasons, just like the oak trees in the forests where they live. In early spring as the leaves begin to grow on the oaks,

male deer, or bucks, develop two buds on their heads which slowly grow into antlers. Antlers are specialized bones, just like teeth. The growing antlers are covered with skin which protects and nourishes them. This skin is in turn covered by short, fuzzy hair that looks and feels like velvet.

As the forest moves from winter gray to summer's green, deer change color as well. Their gray hair falls out to be replaced by finer rust-red hair. The gray hairs are hollow and keep insulating bubbles of air trapped against the deer's skin. This gray coat is too warm for summer wear. The rusty red hairs are solid and do not provide as much insulation. Ironically, there are more hairs in the summer coat than the winter coat.

As the acorns begin to develop on the trees in June, female deer, or does, give birth to that year's crop of fawns. A doe will often give birth to twins, especially if she has been feeding well. Fawns have white spots for camouflage and are scentless to help hide from predators. Fawns can walk with staggering steps a few hours after birth, but won't be able to keep up with their mothers until they are a few weeks old. Until the youngsters are old enough to follow, the doe will leave them in a safe hiding place and return only at feeding time.

When autumn arrives, oak leaves change color, and the ripe acorns and leaves begin to drop. The deer go through changes as well. The rusty summer hair is replaced again by winter's gray coat. The velvety skin which protected and nourished the bucks' developing antlers dies. To get the dead skin off, bucks will beat their antlers against saplings. These antlers are way of displaying fitness because the oldest and best-fed bucks have the biggest antlers.

As winter comes and the oaks begin a long period of dormancy, bucks drop their antlers and move through winter's snows with bare heads. Winter is the hardest time for deer. They stay in the same areas and use the same trails to conserve energy. With luck, they won't consume all the food in the area

before the weather lightens. Those deer fortunate and fit enough to survive will continue the cycle as spring arrives and the forest becomes green again.

### **3A. Fox**

You are standing in a wood-framed barn. Two large picture windows in the back of the barn look out on the fox enclosure, which is built on a steep stretch of hillside. The enclosure is irregularly shaped, with a straight fence about 60 feet long running across the back. The left and right sides curve in toward the barn and the barn itself is an additional side. From the barn to the back fence is about 40 feet. In the center of the enclosure is a large rock set into the hillside. The side facing the barn is about four feet high, but from the back it's an easy fox-hop to the top of the rock. Just to the left of the rock, a small artificial waterfall flows into a pool which in turn flows down a channel running underneath the barn creating the sound of flowing water. Other large rocks, tree stumps, hollow logs, and two very tall witch hazel shrubs are scattered inside the enclosure.

Now, imagine watching the boundary between the forest and a field. A graceful, dog-like animal trots into view. It's about four feet long from nose-tip to tail-tip, and about eighteen inches high at its shoulder. The top of its body is a rusty red, with white on its belly, cheeks, throat, and the tip of its tail. The backs of its ears and its long legs are dark black. Those long legs and the animal's thick fur make it hard to believe that this animal weighs no more than a large cat. Perched on top of a sharply pointed, long-whiskered face are two triangular ears, each about the size of the palm of your hand. The Red Fox slows to a gradual stop as it becomes intensely interested in a spot in the grass. Ears swiveled forward, the fox freezes for a moment, and then abruptly leaps into the air, coming down hard on its two front feet and pinning something to the ground. Its head quickly dips into the grass and comes back up again with lips smacking. Fox has caught his dinner.



That leap is the essence of foxiness, the moment when the animal becomes arrow, bow, and archer rolled into one. Like an archer, a fox must use its senses to locate and define a target. A fox's long ears are perfectly attuned to the sounds created by the rustling movements of small animals. And like most canids (the family that includes dogs, foxes, wolves, and coyotes), foxes have an excellent sense of smell. Like a bow, a fox must launch an object - itself - through the air. After adjusting for size differences, it's apparent that foxes have the longest hind legs of any canid. These legs provide the mechanical power needed to catapult the fox as far as sixteen feet. Like an arrow, a fox must fly through the air with great accuracy. The fox's long, fluffy tail performs the same function as an arrow's feathered end, helping the animal sail accurately through the air. A fox can even adjust its trajectory in mid-flight with slight motions of its tail.

With their slitted pupils, graceful builds, whiskered faces, and long, expressive tails, foxes bear a greater resemblance to cats than to other canids. But these attributes contribute to the fox's ability to locate, target, and accurately strike prey, making it one of the most successful and widely distributed land carnivores in the world.

Foxes are very territorial and one of the few animals whose territorial markings are easily noticed by humans. You may smell a very strong, musky odor near this enclosure, created when the fox sprays the borders of his territory with urine, like a domestic dog. Foxes will also mark their territory with droppings, usually left on top of a rock or in another very visible place. Winter is the best time to hear their barks, yips, and screeches as each mated pair warns other foxes to stay away.

#### **4. Bald Eagle**

This enclosure is divided into two sections, one for the eagle, and the other for the turkey vultures which we'll visit next. The whole enclosure is about fifty feet long, twenty-five feet deep, and twelve feet high. It's built on a slope with

the highest side closest to you. Inside there are two massive perches made of logs about four inches in diameter and about fifteen feet long, suspended horizontally about seven feet off the ground. An open-sided perching box hangs from one wall of the structure, and a watering fountain about three feet in diameter is on the ground in the enclosure to your right.

The Bald Eagle is a huge bird with a wingspan that is often greater than six feet. While their size and appearance are impressive, the sounds they make are not. If the eagle calls during your visit, you'll hear a sound that most people compare to a loud, cackling chicken. Young eagles look like extremely large, dark brown hawks splattered with white paint. The feathers' color pattern changes each time they grow a new set of feathers. In about five years the eagle will be mature, the pattern will stop changing, and the bird will have a pure white head and tail. Eagles are long-lived birds, living up to 33 years in the wild and 36 years in captivity.

Bald Eagles build the world's largest bird's nest. Made high in a tree out of huge branches and stuffed with sod and plants, the average nest is about six feet in diameter and about four feet tall. An inner cup, lined with softer materials and about one foot wide, is made in the center of the nest. Eagles often reuse an old nest, adding to its mass every nesting season. One nest in Ohio grew to an estimated weight of almost 2 metric tons.

Human disturbance, habitat change, and unregulated hunting led to the slow disappearance of Bald Eagles from Massachusetts more than a century ago – but there is a happy end to this story! The Bald Eagle's return to the commonwealth has been a tremendous conservation success. Between 1982 and 1988, the Division of Fisheries and Wildlife introduced 41 young birds into the wilds of Quabbin Reservoir in central Massachusetts in the hope that they would return to the same area as nesting adults. This project succeeded in 1989, when a nesting pair of eagles raised two chicks, the first born in

Massachusetts since 1902. Since then, Bald Eagles have spread throughout the commonwealth, with 30 successful nests counted in 2013.

## **5. Turkey Vulture**

These birds are housed in the other section of the enclosure described above. This half of the enclosure has perches in an even greater range of heights than the other side to accommodate a flightless bird.

Unlike owls, Turkey Vultures have one of the best senses of smell of all the birds. In the southern United States, crew members maintaining natural gas pipelines know to watch for these birds. The rotten-eggs smell added to natural gas is attractive to Turkey Vultures and they will gather around a leak in a pipeline, often well before humans can detect the scent. Why the attraction to such a disgusting scent? Turkey Vultures specialize in eating carrion – the remains of animals that have already died –and decomposing bodies release some of the same sulfur compounds used to scent natural gas. The birds which are just looking for their next meal warn humans of a dangerous situation.

To protect themselves from the disgusting goo often found on rotting bodies, vultures have almost no feathers on their heads and upper necks. These places on the bird's body are nearly impossible to clean and any feathers there would quickly become a haven for disease-causing bacteria. Instead of the dark chocolate brown feathers covering the rest of its body, a Turkey Vulture's bare head is bright red with an intermittent fuzz of short, hair-like feathers.

With their six-foot wide wings held up in a V, Turkey Vultures are often seen soaring above the Blue Hills, taking advantage of the air currents the hills create. Once they are high in the air, they hardly ever need to flap and merely rock gently from side to side. The undersides of their wings are two-toned with the trailing half of the wing off white in sharp contrast to the dark chocolate color of the rest of the feathers.

They may eat a disgusting diet and have a face only another Turkey Vulture could love, but these birds are actually friendly and gregarious. Unlike the more solitary hawks and owls, Turkey Vultures will share food when it is abundant and are constantly on the lookout for members of their species who might have found a meal. A wild Turkey Vulture might swoop by during your visit today to see if our captive birds have any food to share.

## **6. Red Tailed Hawk**

This enclosure is about 32 feet long, 15 feet deep, and 12 feet high. Several dead trees provide perching space for the birds. An open-sided perching box hangs from the upper left corner.

With a wingspan of just over four feet, the Red Tailed Hawk is one of the largest regularly seen hawks in the eastern United States. Red Tails get their name from the adult bird's rusty red tail feathers. Young birds less than a year old have brown and tan striped tails instead of the adult's red. With brown backs and streaked bellies, these hawks have a lightly colored, barely streaked zone about the size of a softball in the center of their chests with a band of darker, heavily streaked feathers just underneath. A bony, jutting brow keeps their eyes shaded and keeps their face in a perpetual majestic scowl.

Red Tailed Hawks were born to ride the wind. They don't sit in a tree and sing like songbirds, they soar and dip in the air above their territories, occasionally dropping their feet and flashing their talons to warn away intruders. Pair bonding is cemented with fierce midair dances between the male and female. Red Tailed Hawks are one of the few birds which can hover, facing into the wind with extended wings, arched backs, tails slightly cupped beneath their bodies, and looking for all the world like giant kites. In flight they will sometimes call with an unforgettable raspy, scraping scream which is used to frighten trespassers and impress females.

Red Tailed Hawks are found throughout North America and are year-round residents of Massachusetts. In early to mid November, many additional Red Tails pass through the Blue Hills. Most of these hawks are from Canada and the northern half of New England and are passing through on their way to their wintering grounds in the southern United States and Mexico.

## **7. Seasonal Stream**

While you sit at this bench, listen for the natural sounds around you. You might hear bird song from the forest at your back or the wind brushing the treetops above. Chipmunks live in the woods here and you will hear their chirping calls in the spring and summer. You might hear the gurgling of water rushing downhill from the stream on your left. What other natural sounds can you hear?

## **8. Turtles**

Massachusetts is home to a wide variety of turtles. During the warmer months, turtles are on display in this outside exhibit. When wild turtles spend the winter buried in mud or soil, Trailside's turtles are moved to our indoor animal care facility. This outdoor enclosure is shaped like a large bowl 15 feet in diameter. An island fills the center, with an evergreen mountain laurel bush growing on the island. A wire ladder helps turtles climb up out of the water and onto the island.

If you were a turtle, your ribs would run the entire length of your backbone, not just your chest. Your ribs would be wide enough to touch and fuse to each other, like the halves of your jaw connected at your chin. Your ribs and backbone would form the upper part of your shell, or carapace. The lower part of your shell, or plastron, would be made of your sternum. In humans, the sternum is about half as wide as your palm and runs from the base of your throat, down your chest, to the top of your stomach and connects to almost all of the ribs. In turtles, this bone covers the entire chest and stomach. A layer of skin covered with large scales completes the turtle's armored shell.

Box Turtles are usually found on the island in the middle of the exhibit. These turtles have high, domed shells about six inches long colored the yellows, browns, and blacks of fallen leaves. Box turtles get their name because their plastron is hinged so that the turtle may shut its head and forelegs up entirely inside its closed shell. When their heads are out of their shells, it is easy to tell male and female Box Turtles apart. The males have red or orange eyes while the females have brown or black eyes. Box Turtles are poor swimmers, rarely venturing into the water and bobbing like clumsy corks when they do.

The most brightly colored turtles in the exhibit are Painted Turtles. These turtles get their name from the red, yellow, and orange stripes which decorate their heads, necks, and sides of their shells, which are about five inches long. Their carapaces are a very dark olive green while their plastrons are a bright peach color. Unlike Box Turtles, Painted Turtles have a flattened, very streamlined shell and large, webbed back feet which make them swift and graceful swimmers. They are often seen hauled out and basking in the sun around the edges of natural bodies of water. This behavior not only keeps them warm, but it also kills algae that would otherwise grow on their shell and slow their swimming.

Musk Turtles are the most secretive and best hidden of the turtles in this exhibit. Usually clinging underwater to the floating driftwood, Musk Turtles will sometimes go all day with only the nostrils at the tip of their pointed snouts occasionally poking out of the water. These palm-sized turtles have lumpy, gray skin which looks like tree bark on their necks, heads, and legs. Musk Turtles also allow green algae to grow on their high, domed shells, completing their camouflage. Also known as Stinkpots, these turtles release a musky scent when alarmed.

## 9. River Otter

This oval enclosure is about 25 feet long and 15 feet deep. Most of the space is filled by water, the rest is solid ground. Pieces of driftwood float in the water while two huge hollow logs rest on the solid ground. A keeper's shed in the middle of the enclosure is covered with stone and gives the otter a structure to climb on.

Can you smell a musky, fishy smell? River Otters mark their territory with a mild, skunk-like scent which can be noticed at this exhibit. If you listen, you may hear the sounds the Otter makes while it is active: soft plops and splashes as it springs off the side of its pool, the soft patter of running feet as it moves over the dry portions of the exhibit, the occasional soft clunk of driftwood set into motion by the Otter's activity. Usually silent, River Otters can make soft chips, squeaks, and the occasional growl.

River Otters are covered with thick, waterproof brown fur which keeps an insulating layer of air trapped against their skin. They have small ears close to their body and relatively short legs with webbed feet. These traits help the Otter slip through the water with its four foot long body stretched out like underwater missile. When an Otter stands on its hindquarters to get a better look at something, it is about as tall as the average toddler. A flat-topped, muscular head with a short, dog-like muzzle completes the picture of the River Otter.

River Otters are very active animals. When they're not in the water, they are usually running on dry land. They move with a rolling gait caused by alternately arching and extending their backs. Because they are large predators, River Otters spend much of their waking hours in motion as they move on a nearly constant quest for food. Otters will eat fish, frogs, snakes, birds, eggs, small mammals, and anything else they can catch. Males may travel about nine miles in a single day, sometimes showing up in urban

locations. Otters seem to have only two speeds: either swimming and running or curled up sleeping.

River Otters have a reputation for being playful. The Otters at Trailside push snow around with their noses until they've created a small snowball. The snowball then gets batted around the exhibit until it lands in the water and melts or ends up in an Otter's mouth where it will be crunched and enjoyed.

## **10. Pond**

There are many sights, sounds, and smells to observe at the edge of this small man-made pond. The pond is surrounded by many native shrubs and trees, with bird nesting boxes mounted in some locations. Large logs are partially submerged in the water to provide basking areas for wild turtles. There is also a small island directly in front and to the right of this viewing area.

The gurgling sound you hear to the right comes from the small brook which flows from the side of Great Blue Hill into the pond. From this pond, the water flows into the Neponset River, then into a salt marsh below Milton Lower Falls, past Pope John Paul II Park, and finally into Boston Harbor and the Atlantic Ocean. If you listen carefully, you may also hear mysterious plops and splashes coming from the pond. There are several possible sources for these sounds. This pond is home to painted turtles and small fish which occasionally rise to the surface to snatch an insect. In early summer, there are several insects such as Mayflies, Dragonflies, and Damselflies which lay their eggs by dipping the tips of their abdomens repeatedly into the water. Decaying matter on the bottom of the pond occasionally releases a bubble of gas, creating a soft pop and releasing a small amount of earthy scent.

The birds which visit the pond and make it their summer home are the biggest sources of sound. Mallard Ducks are usually swimming in the pond during the summer months. The quacking sounds you may hear are usually made by the females, not the males. Males make "rhaeb, rhaeb" sounds, especially when



they are arguing among themselves. Ducks splash the water as they feed, display, and groom themselves. And if you are lucky, you may hear the distinctive rattling sound of the Belted Kingfisher. This one foot tall bird perches on branches hanging out over the water and watches for fish which venture too close to the surface. It will then dart down and snatch the fish out of the water with its long beak.

If you would like to feed the birds, there is a vending machine behind you as you face the pond.

Visitors in late summer will smell the sweet, spicy scent of Sweet Pepperbush. In August, the twigs of this shrub will be covered with spikes of tiny white flowers which are irresistible to bees, butterflies and other pollinating insects. Sweet Pepperbush is the most common shrub in the wet swampy regions of the Blue Hills. Later in fall, the flower spikes dry as the seeds ripen. The brown seeds are the same size and shape as black peppercorns. The name of this shrub comes from a combination of its flowering and seed characteristics: “sweet” from the aroma of the flowers and “pepperbush” from the appearance of the seeds.

## **Conclusion**

This concludes the tour of the outdoor exhibits. Please remember that you’ve only visited part of the museum and there is an additional audio tour of the exhibit hall. We hope that you’ve enjoyed learning about this small sample of the wildlife of Massachusetts. Thank you for visiting us today!

If you borrowed any of our publications, binoculars, or adaptive equipment, please return these items to the Museum’s front desk.

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](http://www.massaudubon.org) to complete the questionnaire online.

## **Indoor Tour Stops 11-17**

The indoor Museum is best experienced with a sighted companion, there are three stairwells and numerous exhibits which may pose collision hazards. The exhibits are fully narrated, taking visitors on an imaginary nature hike through the Blue Hills, with stops at each of the different habitats found here. You'll also step back in time to discover the history of the hills' earliest human residents. Many of the exhibits feature live animals, so listen for their sounds as you explore! The exhibit hall is divided into two levels. The upper level gently slopes upward and ends in a roofed tower structure that mimics the observation towers on Great Blue and Chickatawbut Hills. Large wooden cutouts representing trees are scattered throughout the hall. Taxidermy mounts of hawks, eagles and other animals help bring the habitat scenes to life. Upon entering the lower level, a large bark structure, a Native American wetu, is the first structure you will find on your left, upon entering the Human History section and following with a variety of wetland exhibits.

### **Stop 11. Fields**

Fields are open, sunlit places with grass and wildflowers. At first glance, fields appear empty. Look closely and you can see hidden creatures. Mice, spiders, butterflies, ants, dozens of flowers and tiny trees all compete for food and sunlight. One hundred years ago the Blue Hills was farmland with sheep, pastures and stone walls. Today, the only fields are along pipelines, ski slopes, and the fields of Brookwood Farm. Without fire or lawn mowers, most fields would grow into forests.

To your right as you enter the hall, a display shows what at first glance may be just the leaf-covered edge of a field. Look carefully and you may find 12

different animals hidden in the display, ranging in size from an insect as long as your finger to a skunk the size of a small cat. To your left is an artificial stone wall. You may feel the rough stones. Peek between the stones for evidence left behind by animals.

People are often surprised to find stone walls in remote areas of the forest. These relics from the past were built when most of the Blue Hills land was being used for agriculture. The abandoned fields then grew into forest. This process is still continuing: from 1971 to 2005, 71,400 acres of Massachusetts farmland naturally reverted to forest. The stone walls left behind become habitat for forest animals like chipmunks, weasels, and snakes.

Where fields meet forests, edges form with plants from both habitats. Many animals are attracted to an edge. Herbivores come to feed on the varied plant roots, shoots, and berries. Carnivores come to feed on the herbivores. Edges are popular and populated places. If you're looking for a spot to observe wildlife in the Blue Hills, try an edge.

To your right is a large window. On either side of the window are enclosures for some of the live animals found in the forest and at the forest edge. The enclosures curve around into the next habitat. Tucked around this exhibit and the next are boxes which will play recorded owl and hawk sounds when the appropriate buttons are pushed.

## **Stop 12. Forest**

Today, most of the Blue Hills is forest. Different types of trees now grow in different parts of the Blue Hills. Beech, maple and ash occupy the valleys. Tall stands of pine grow in sandy soils; rich dark hemlocks on cool, northern slopes. Oak and hickory forests dominate the uplands. Each type of Blue Hills' forest supports appropriate birds, insects, mammals, and wildflowers.

Along the bottom of this display are three touchable objects: a large slice of tree trunk, a branch with strange carved markings, and a very large and very real mushroom.

As the trees grow, growth rings form within the wood. Growth rings are visible as alternating light and dark circles, the dark wood is denser and will form raised ridges in dried wood. These rings tell the life history of the tree. Wide rings are produced in good years, narrow rings during dry ones. The tree slice has a large crack in the eleven o'clock position. If you put your fingertips inside the crack, you can feel the ridges created by the denser dark wood.

Insect damage also leaves signs on living trees. Bark beetles, also known as engraver beetles, are only about an eighth of an inch long. As they feed on the layer of wood just below the bark they create long curved tunnels. Eggs laid in the tunnels will hatch into grubs. The grubs will create new tunnels which branch off of the original tunnel created by their parent. Tunnels created by grubs start small but become wider as the grubs grow. Touch the branch and feel the textures created by the grubs' activity.

Dead trees are home to a wealth of living things which slowly consume the wood until it crumbles into soil. The shelf fungus grows inside dead trees and forms a hard bracket on the outside. As big as this mushroom can be, it is still only a fraction of the entire mass of the rest of the fungus. Look for raised rings created by the formation of each new crop of ripe spores. Sometimes this mushroom is called "Artist's Fungus" because lines drawn on a fresh fungus will turn brown and last for years. Run your fingers along the top of the shelf fungus and you may notice bumpy ridges created by its growth.

### **Stop 13. Hilltops**

Did you notice how the floor has been rising as you've walked the length of the exhibit hall? This section of the hall has an observation tower that mimics the towers on Great Blue and Chickatawbut Hills. There are live animal exhibits

here which feature the timber rattlesnake and copperhead, two venomous snake species which are native to the Blue Hills.

The tops of some of the Blue Hills are covered with stunted trees, while others are barren, rocky, or grassy. All are prone to fire. Notice how the trees are smaller, more bent, and further apart. High winds make tall growth difficult. Fire kills many plants. There is little moisture, the soil is thin and of poor quality. You may see chestnut oak, bear oak, pitch pine, and poverty grass, plants which can survive the harsh conditions found on the hilltops.

Hilltops are also home to the timber rattlesnake. This venomous snake is endangered in Massachusetts. In addition to the usual senses, rattlesnakes also have the ability to detect the body heat of their warm-blooded prey. A small pit located between the eye and the nostril on each side of the snake's head contains the sensory receptors which make this remarkable ability possible. When threatened, rattlesnakes will vibrate their tails to produce a loud buzzing sound. Rings of hard, dried, dead skin connected to each other on the tip of the tail make a "rattle" which is responsible for the sound. A device on the right as you face the snakes plays a recording of the sound of the rattlesnake's rattle.

Between the sound device and the rattlesnake enclosure is a smaller enclosure for the northern copperhead. Like the rattlesnake, this species possesses heatsensing pits and venomous fangs. In the heat of the summer, members of this species often move from the rocky ridges and hilltops to the wetland areas between the hills. Your tour of the museum will now do the same, moving from the hilltop to the wetland habitat exhibits, with a stop along the way to look at the human history of the area.

## **Stop 14. Human History**

For centuries, Native Americans lived in the Blue Hills. Deer were a source of food and clothing. Clay for cooking pots was obtained on lakeshores. Corn, beans, and squash were raised in cleared fields. Known as the Massadchuseuck, or “people of the great hills,” they gave our state its name. The Massadchuseuck spent winters in the Blue Hills and summers in the harbor islands, which can be seen from some Blue Hills’ hilltops. They were a strong tribe until European settlers arrived, bringing smallpox and other diseases, which decimated the original people of the Hills.

To your left as you enter this exhibit is a partial reconstruction of a wetu, the building used by the Massadchuseuck as a home. Feel the rough bark on the outside. These slabs of bark cover the outside of the home like gigantic shingles. On the inside of the wetu, you can feel the frame made of flexible sapling trunks. The Massadchuseuck were hunters as well as farmers, and there is a deer hide inside the wetu which you may touch. Because it is so brittle, deer hair is usually removed from hides before tanning. This reconstruction is half of an entire building. A wetu this size would be big enough to house one family.

In the seventeenth century, European settlers reached the Blue Hills. They established farmhouses, barns, and pastures in the valleys. Settlers introduced apple orchards and honey bees, cleared fields, constructed miles of stone walls, logged the hillsides for lumber, and built roads for their farm carts. They changed the landscape of the Blue Hills forever. Today, you may come across old stone walls or an apple tree in the midst of a forest – signs of the former settlers of the Blue Hills.

## **Stop 15. Wetlands**

Not all of the Blue Hills Reservation is dry hills. Tucked between the hills are many types of wetlands: swamps, bogs and marshes. Each type of wetland

has unique characteristics and is home to specialized plants and animals, some of which are found nowhere else.

Swamp is another name for a wet forest. It is drier than many other wetlands. Swamps are often shady and dark with trees, woody shrubs, and ferns. In spring and fall, the swamp can be identified at a distance by the brightened color of the buds or leaves of the red maples. Frogs, toads, and salamanders are commonly found in swamps. In the Blue Hills, you can see swamps in many low-lying areas or visit the Great Cedar Swamp.

Ponkapoag Bog began forming thousands of years ago, when a glacier scooped out Ponkapoag Pond and filled it with melted ice. Chilly water and poor drainage created acid conditions. Small plants, such as water willow and sphagnum moss, formed a floating mat around the pond edge, and then grew across it. Carnivorous plants such as sundews and pitcher plants grew in the extreme conditions found on the floating moss mat. Later, high bush blueberry and leatherleaf shrubs, as well as Atlantic white cedar trees, moved into the bog. This process may continue until the entire bog is converted into a wet forest.

Part of this exhibit is a trunk of a “witches’ broom.” This white cedar looks as if it has short, shrubby bushes growing out of the trunk in some places instead of normal branches. This unusual branch shape is caused by a mutation and is often found on the white cedars growing in bogs. Please feel the texture of the cedar’s trunk.

Marshes are former ponds. The years pass, mud fills the pond and plants begin to grow above the water – cattails, purple loosestrife, sedges. Red-winged blackbirds nest in the cattails, muskrats make hilly homes out of sedges, bees visit the marsh to collect nectar from the many flowers. Fowl Meadow, a 650acre reservation adjacent to the Blue Hills and bordering the Neponset River, protects an extensive freshwater marsh. Marshes soak up water and

prevent floods. They also provide valuable habitat for birds, frogs, and other wildlife.

On your right as you walk through this exhibit section there is a touch table with rotating exhibits. Please stop and explore the touchable items.

### **Stop 16. Bees**

Honeybees generate heat with muscle activity to keep their hives a comfortable 90° F. Try touching the glass of the observation hive to find out if you can sense where the bees are clustered. There are two small metal disks on the side of the hive that protect ventilation holes. Put your one of your ears on a ventilation disk to listen to the buzzing of the colony.

Honeybees were brought from Europe by the early settlers. There were several other types of bees already here: mason, leafcutter, sweat, carpenter, and digger bees to name a few. The Boston area is home to at least seven species of bumble bees. All of these bees use nectar and pollen produced by flowers for food, while many flowers need bees to transfer pollen from one flower to another to create seeds and fruit.

Honeybees are the most social of the bees found in Massachusetts. A colony of up to 60,000 honeybees is made of three distinct types of bees: the queen, workers, and drones. Each healthy colony has one queen who specializes in laying eggs and who can lay up to 2,000 eggs in a single day. The worker bee is the most numerous type in the hive. These female bees do not reproduce but do all of the work of maintaining the colony, dividing the tasks according to age. Drones are all male bees that do nothing to maintain the colony but will leave at maturity to find a mate. Found in the hive only during the summer, there is never more than a few hundred of this type of bee.



## **Stop 17. Ponds**

The windows in this part of the exhibit hall look out toward Trailside Pond. There are many sights, sounds, and smells to observe at the edge of this small pond. A small brook flows from the side of Great Blue Hill into the pond. From this pond, the water flows into the Neponset River, then into a salt marsh below Milton Lower Falls, past Pope John Paul II Park, and finally into Boston Harbor and the Atlantic Ocean.

The pond is home to creatures with many different “lifestyles.” Some pond creatures can walk on water – on the tension created by the surface film! Beetles and waterbugs remain on top, but larvae cling underneath. In the open water, tiny animals, such as crustaceans and rotifers, drift along, while fish and turtles swim past. On the bottom of the pond are snails, earthworms, insects, crayfish, and dragonfly nymphs. Plants also live in suitable spots – on the shore, floating in the water, or beneath the surface.

Among the loudest of the pond residents are the frogs. This exhibit includes a device which will play different frog calls when the appropriate buttons are pushed.

## **Conclusion**

This concludes the audio tour of the exhibit hall. Please remember that you’ve only visited part of the museum and there is an additional audio tour of the outdoor exhibits. We hope that you’ve enjoyed learning about this small sample of the wildlife of Massachusetts and the habitats where they are found. Thank you for visiting us today!

If you borrowed any of our publications, binoculars, or adaptive equipment, please return these items to the Museum’s front desk.

We would appreciate your feedback on this segment of the trail. 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](http://www.massaudubon.org) to complete the questionnaire online.