MASSACHUSETTS WILDLIFE

No. 4, 2021 $3.00

Black Vultures,
Burning for Wildlife,
Fly-Fishing

ICE STRENGTH AND SAFETY

Photo by Troy Gipps/MassWildlife

This ice strength and safety information is presented for the benefit of ice anglers and other winter sports people recreating on iced-over bodies of water. The figures in the table below are for new, clear or blue ice on lakes and ponds. Reduce strength values by 15% for clear blue, river rice. Slush or snow (white) ice is only one-half the strength of blue ice and can be very dangerous. "Honeycombed" ice, which occurs in the spring or during major winter thaws, is the most dangerous type of ice and is best avoided unless the angler is certain there is a safe layer of solid ice beneath the honeycombed surface.

Under 2 inches:	STAY OFF
4 inches:	Activities on foot
5 inches:	Snowmobile or ATV
8–12 inches:	Car or small pickup truck
12–15 inches:	Medium truck

Guidelines above are for new, clear or blue ice.
New ice is stronger than old white ice.

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MASSWILDLIFE

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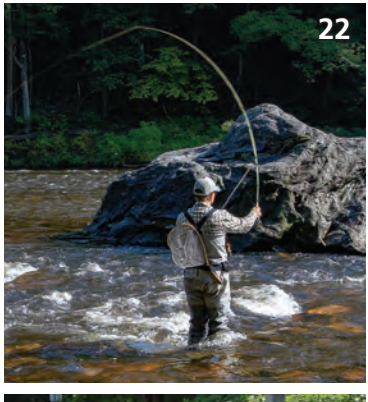


Photo © Troy Gipps

Photo courtesy Groundwork Lawrence

MASSACHUSETTS WILDLIFE

Vol. 71 No. 4

FEATURES

On the Cover: A black vulture grooms another at a communal roost site. Photo © Bill Moses

Photo by Bill Byrne/MassWildlife

BURNING FOR WILDLIFE

by Alex Entrup and Caren Caljouw

Photo by Alex Entrup/MassWildlife

The first known inhabitants of Massachusetts came to the region about 12,000 years ago, as glaciers receded, to hunt ice-age mammals such as mammoths, mastodons, and giant beaver. As the climate continued to warm and shifts in vegetation occurred, these large animals became extinct, and smaller animals such as elk, moose, bear, and white-tailed deer moved in. The vegetation patterns that we see today in New England became established during the Woodland Period (2,000–500 years before present) as people continued to expand their numbers and range. The early inhabitants developed and improved upon technologies and cultural practices adapted to the local environment, one of the most important being fire. In addition to cooking, keeping warm, and discouraging predators, fire played an important role in creating and maintaining the landscape inhabited by those who would become the Native American tribes. The "wilderness" encountered by European explorers and early settlers was in many ways a landscape managed by the indigenous peoples and shaped by fire.

Some European settlers viewed the bountiful wildlife as being untouched by humans, but others recognized the role that the indigenous people played in managing the land and wildlife. Early settler accounts of the forests of Southern New England described the tribes burning "the country" at different times of the year. In 1637, Thomas Moore, an English settler, described in a report to the king an open and park-like appearance of the woods that he attributed to the practice of intentional burning. Large areas of New England were dominated by fire-influenced ecosystems, such as chestnut-oak-hickory forests, open marshes, meadows, berry fields, birch stands, and shrublands, that supported a wide variety of wildlife. Modern scientists have verified the accounts of frequent burning by studying fossil pollen and charcoal deposited over thousands of years in lakes, ponds, and bogs. The management of landscapes by Native Americans, especially with fire, were in large part responsible for the "abundance" of wildlife and "beautiful" country early settlers described.

Extensive land-use changes followed European settlement. Forests were cleared and converted to agriculture, only to later be abandoned and to grow back as forests and woodlands. Fire remained a major disturbance on the land. Farmers used fire to maintain fields and help clear land. Escaped brush-pile fires often burned unchecked. Many of the fields abandoned in the mid-1800s through early-1900s became the oak, white pine, and pitch pine forests that can still be found throughout New England.

A combination of intensive logging, large storm events, and tree disease outbreaks created a buildup of flammable vegetation, also called fuel, across much of the United States around the turn of the 19th into the 20th century. A series of massive wildfires erupted leading to fire suppression and prevention becoming a national priority. Over time, improved firefighting capability, expanded road networks, new regulations, and increased development decreased the average wildfire size across the country. In recent years, especially in the drier areas of the western United States, the magnitude and area of wildfire damage has exploded because of the buildup of fuels and changes in climate over the last century, which have caused fires to burn more intensely. In Massachusetts, however, the trend has not yet reversed. The average wildfire size has decreased despite the occasional large fire. The success in fighting wildfires

Photo by Alex Entrup/MassWildlife

has saved lives and property, but it has not been without an environmental cost.

With fewer fires on the landscape, many ecosystems continue to undergo gradual yet drastic changes. Without fire, most grasslands gradually grow into woodlands and woodlands become dense forests. The transition from open fire-influenced systems such as grasslands, pine barrens, and woodlands to mixed forests is detrimental to some types of wildlife. It is estimated that over 45% of rare and declining species in Massachusetts require habitat that is created through fire management. Game species such as American Woodcock, Ruffed Grouse, Wild Turkey, Black Bear, Moose, and White-tailed Deer all prefer habitats managed with fire. The deterioration of open habitats precipitated the decline of numerous plants, insects, birds, mammals, amphibians, and reptiles. Without intervening management this trend will surely continue, with rare wildlife and plants disappearing.

Where should fire be?

Glaciation created a wide array of soils in Massachusetts, which led to a diversity of ecosystems. The underlying soil is an important factor determining the plant community that grows in any location. Oftentimes, soils with high levels of moisture support plants that have few or no fire adaptations. For example, some moist hardwood-hemlock forests burn so infrequently that for all practical purposes they do not burn at all. Sandy soils and thin, rocky soils retain less water and consequently support drought-tolerant plants. Adaptations such as high oil content and waxy leaves, common in plants of the dry pine barrens, conserve water but are also more flammable. Grasses flourish in dry soils, producing thick thatch that burns easily.

In some wetlands such as calcareous fens, wet meadows, coastal plain ponds, and some marshes, fire, along with salt spray, groundwater inputs, or periodic flooding, plays a critical role in maintaining their open character. Generally, dry soils tend to support more flammable vegetation and moist soils tend to support less flammable vegetation, but it is not always so.

The kinds of vegetation growing on the soil can determine fire frequency, but, conversely, fire frequency also determines the composition of the vegetation. For instance, frequent fires favor grasses and wildflowers over shrubs and trees. Grassy areas are highly flammable and can burn as often as every 1–3 years. These frequent fire cycles help prevent tree and shrub growth, keeping the grassland and the wildlife that depends on this open habitat established. It's a feedback loop: fire promotes plants that promote fire.

Longer intervals between fires create more trees and shrubs. Shrublands, such as blueberry heathlands or scrub oak shrublands, may burn every 3–8 years. With longer interludes between fires, patchy burns, and low-intensity fires, trees can become established. Some types of trees are better adapted to fire than others. Oaks, hickories, pitch pine, and American chestnut historically dominated the fire-influenced forests and woodlands of Massachusetts. The leaves and needles of these species are more flammable than their generalist counterparts (maple and white pine) and

Photo by Alex Entrup/MassWildlife

MassWildlife crew members securing the unit at the end of a prescribed burn at Leyden WMA in May of 2021. The burn is part of an ongoing ridgetop blueberry heathland restoration project and will be lush with blueberries by mid-summer.

Photo by Thomas Wansleben/MassWildlife

their trunks more fire-resistant. American chestnut has largely disappeared as a canopy tree because of disease but the other trees can still thrive under the right conditions. Just one or two fires in a young forest can change the trajectory of the overstory to favor oaks and hickories over maple and white pine. However, to maintain the oak-hickory habitat requires additional occasional fires and disturbances.

In New England, it is said that any open, upland habitat left alone long enough will grow into a forest. In many areas within the state that is a good thing, but fire-influenced habitats, such as oak woodlands, pine barrens, and grasslands, that change into a dense forest can be problematic for many important plants and animals. Without fire or other disturbances, the encroaching forest may take one of two pathways. In all but the driest soils, most of the fire-influenced ecosystems will begin to establish an understory dominated by some combination of red maples, eastern white pines, beeches, birches, and other hardwoods. As the understory trees grow, they cast dense shade that prevents oak seedlings, grasses, and wildflowers from becoming established. They shed flat, moisture-retaining leaves, creating increasingly damp forest soils that will no longer readily burn. As the leaves decompose, the soils become more nutrient-rich, further favoring generalist trees. Finally, the overstory oaks and hickories die off and the forest type is completely converted. This is another feedback loop: the absence of fire prevents fire.

The other pathway of fire exclusion occurs in the driest and most well-drained soils. Without fire, pitch pine barrens grow thick with pine needles, shrubs, and young pine trees. The canopies become dense, and the scrub oak and huckleberry understory builds up a deep bed of highly flammable surface fuels. A pine midstory connects flammable vegetation from the shrub layer into the tree canopy. Forests with these conditions are susceptible to extreme, catastrophic wildfire. When the

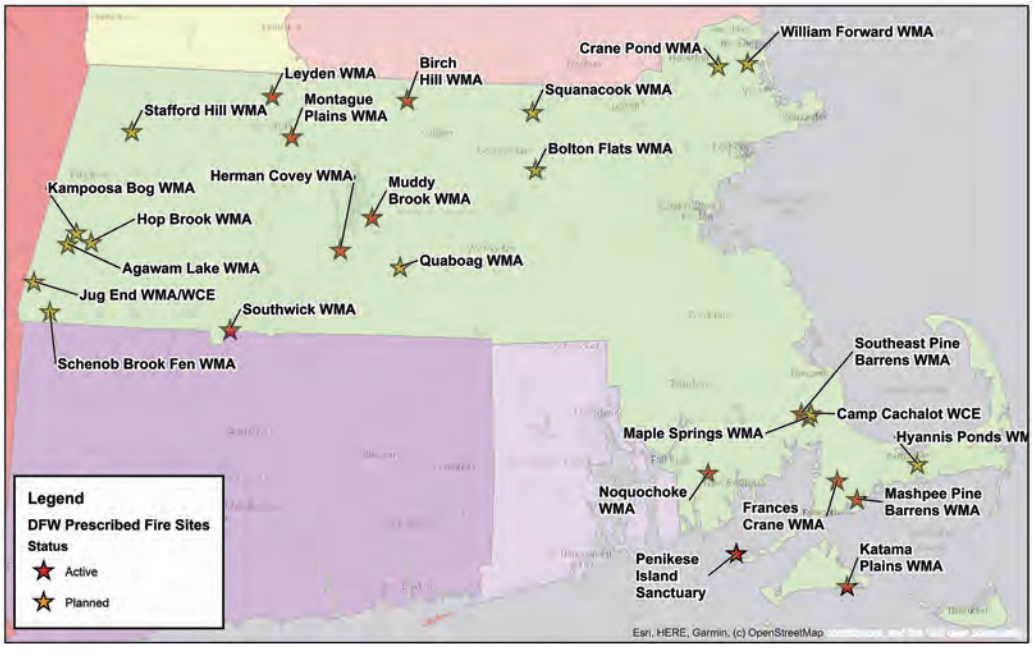
right (or, rather, wrong) conditions align, a forest can be consumed in one massive, uncontrollable wildfire. Although Massachusetts has not had a large, catastrophic fire in almost 40 years, there are many areas of the state where conditions are ripe for such an event. Under dry, windy conditions, especially in the early spring, overgrown pine barren fires can be explosive. From the 1930s through the 1980s, large pine barren fires burned. A massive fire in 1957, in Plymouth, burned 15,000 acres in under 12 hours and did not stop until it reached the ocean. Any fire of that magnitude would surely endanger life and property today.

What is MassWildlife doing about it?

It is neither practical nor desirable to return to the days of free-roaming wildfires. In its place, MassWildlife has implemented a prescribed fire program to safely apply fire management to Wildlife Management Areas (WMAs) in fire-influenced ecosystems across the Commonwealth. MassWildlife manages to promote habitat on its WMAs for all wildlife, including rare plants, animals, and game species. The prescribed fire program plays a critical role in furthering that mission. Over the past 30 years, MassWildlife and its partners have been restoring and managing lands with prescribed fire and other methods at an increasingly large scale.

Fire alone cannot restore habitat on all the impaired, fire-influenced systems. Often the first step in the habitat management process involves heavy machinery. Step one to restoring forests overtaken by red maple and eastern white pine is removing those trees. In dense stands of pitch pine, the overstory may be thinned. If trees are large enough, they may be harvested in traditional logging operations. In areas where they are too small, heavy-duty mulchers and mowers will often do the job. Restoration of native grasslands from pastures may be as simple as repeated burning, but sometimes it requires removing woody vegetation and planting native grass seed. Generally, the early phases of restoration are not pretty, but the eventual payoff for wildlife—and aesthetics—is worth it.

Photo by Troy Gipps/MassWildlife



The number of prescribed fires and acres burned has been growing year by year. Target habitats include grasslands, woodlands, pine barrens, blueberry heathlands, forests, fens, and marshes. Each year, new sites are added to the burn portfolio, expanding the agency's fire-management footprint to improve a wide array of habitats.

In 2017, MassWildlife developed, and the Fisheries and Wildlife Board adopted a Prescribed Fire Management Policy and Handbook (mass.gov/prescribedfire) that reflect MassWildlife's commitment to maintaining a strong prescribed fire program in furtherance of our mission and the many wildlife-related benefits. Fire can be dangerous, so safety is always the top priority. The handbook outlines all planning, training, and implementation requirements for the agency and stresses partnerships. The fire crew is trained to a national standard and meets official fitness requirements. Every burn has habitat goals, as well as objectives for smoke management and public safety, and the weather and environmental conditions must meet a strict "prescription" defined in the burn plan (see A Prescription for Fire, *Massachusetts Wildlife*, No. 1, 2018)

How does fire benefit wildlife?

Fire can benefit wildlife by altering different elements of the habitat. Benefits to individual species can be general or very specific. Other management techniques such as mowing, plowing, planting, or herbicide treatments may be used to achieve some habitat goals, but there is no substitute for the unique effects fire produces. Overall, fire can benefit wildlife by altering habitat in four major ways: structure, composition, nutrition, and spatial arrangement.

Structure refers to the height, density, and arrangement of vegetation. Fire forms structural gaps in the canopy, allowing sunlight to reach the ground which in turn stimulates new plant growth. Fires kill, or top-kill smaller trees, shrubs, and other plants. Top-kill occurs when the above-ground portions of a plant are destroyed but the plant regrows from still-viable roots or stumps. Fires can create open structure where shrub density is reduced or a dense thicket of heavily resprouted shrubs. Areas of exposed bare ground produced by fire also benefit many plants and animals.

Continued on page 20

Wildlife that thrive after the flames

Many common and rare plants and animals benefit from the effects of fire on the land. Following is a sampling of wildlife species that benefit from fire-managed landscapes.

Grasshopper sparrow: This bird is a state threatened and regionally rare songbird that requires large areas of sandplain grassland habitat (usually more than 30 acres). Sandplain grasslands are grasslands dominated by native clump warm-season grasses between areas of bare (often sandy) ground and with very few shrubs, a structure that is encouraged by frequent prescribed fires. Large areas of sandplain grasslands are now rare in Massachusetts, and therefore the wildlife that needs grasslands to survive and thrive, such as the grasshopper sparrow, is often rare as well.

Grasshopper sparrows eat, sleep, and nest on the ground. When threatened by a predator, they will usually scurry along the bare ground between clumps of grass rather than fly. The clumps of native warm season grasses are umbrella shaped, providing overhead protection for nests and cover from predators and offering space on the ground to move and forage. Grasshopper sparrows survive largely on insects, which are abundant in fire-managed grasslands.

Whip-poor-will: A Species of Special Concern, it often nests in densely covered areas adjacent to open habitats with low ground cover. Whip-poor-wills are nocturnal, hunting flying insects by moonlight. Prescribed fire provides the open structure needed for hunting, and their prey, moths and other insects, are attracted to burned areas. Wildlife Management Areas such as Montague Plains, Southeast Pine Barrens, and Bolton Flats are hotspots for whip-poor-wills because they feature open habitats adjacent to wooded areas.

Ruffed grouse: Over the past few decades, the iconic spring "drumming" echoes of ruffed grouse have dwindled across Massachusetts, partly because specific habitats this game bird requires have come to be less common. Though they utilize a variety of forested habitats, ruffed grouse particularly need dense, brushy shrublands and young forests of 5 to 30 years of age offering ample food and cover from predators. Currently, less than 10% of Massachusetts forests habitats contain these ephemeral habitats. Without regular disturbances such as blowdowns, cutting, or burning, these habitats quickly mature, no longer suiting our native partridge's specific needs. Prescribed fire improves the habitat structure needed in all life phases of ruffed grouse. As chicks, ruffed grouse require a protein-rich diet of insects that are abundant in fire-managed landscapes. On recently burned areas, broods of young grouse can readily roam the forest floor, making it easier for them to find food and escape predators. As adults, ruffed grouse rely on the seeds of herbaceous plants, especially legumes, and short-lived trees and fruiting shrubs such as sun loving cherry, aspen, and hazelnut. In pine barrens, ruffed grouse use scrub

Photo by Bill Byrne/MassWildlife

oak for cover and love to eat acorns. Fire also encourages shrubs to produce more blossoms and fruit. The shrubs not only provide food as fully developed fruit, but the highly nutritious flower buds are available in the late winter and early spring when few other foods exist.

Photo by Troy Gipps/MassWildlife

Wild turkey: Throughout the wild turkey's range, prescribed fires have helped to improve their habitats. As habitat generalists, wild turkeys thrive in diverse habitat types throughout all phases of their life. Poults (newly hatched turkeys) need overhead cover from predators provided by resprouting shrubs. Bare, open ground allows poults and adult hens easy access to the forest floor. Insects, a critical source of protein for poults, are abundant in grassy open areas that are also used by adult toms for spring courting displays. If the forest structure is too dense, the turkeys' main protective defense, sight, is compromised and they may avoid the area. As ground nesters, hens prefer habitat growth most often found in areas burned within the previous three years. These locations are unlikely to burn hot in a wildfire or to be scheduled as sites for prescribed fire. Most research shows that very few nests are lost in springtime burns and if so, hens usually renest. The overall population gains and habitat benefits from springtime burns outweigh occasional nest losses.

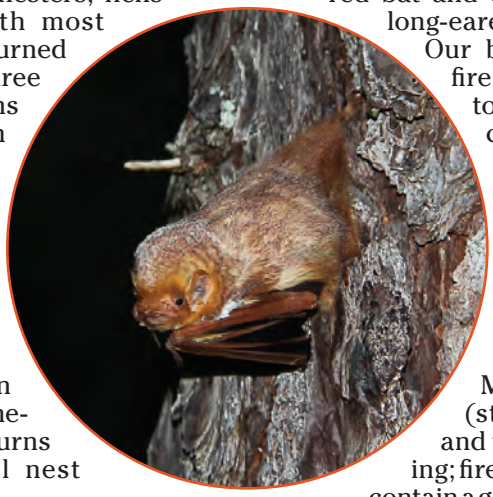


Photo by Jake McCumber/MAARNG

White-tailed deer: Of all wildlife species, deer arguably garner the most interest from both the public and researchers. Prescribed fire has long been recognized as an important tool for improving habitat for deer. Fire stimulates growth in many important food plants, such as legumes and other forbs. Fire top-kills shrubs and small trees, causing them to resprout. After a fire, resprouting trees and shrubs contain double the protein, triple the minerals, and are 10 to 25 times more preferred by deer. White-tailed deer also benefit from the flush of flower buds in the early spring when does are pregnant and other food is scarce. Fire favors important mast-producing trees like oaks and hickories, favorite food sources, and can help create thickets used for cover and bedding. As many hunters and wildlife photographers already know, recently burned areas are deer magnets.

Bats: They may not normally be considered the poster child for prescribed fire, but fire can play an important role in ensuring good habitat for bats. Fire can be helpful to bats, including the Eastern red bat and endangered Northern long-eared bat, in three ways. Our bats feed on insects; fire managed areas tend to produce more insects compared to areas that don't experience fire. Because bats fly to catch their prey, the open canopy and less cluttered forest structure created by fire allows bats to navigate more easily. Many bats need snags (standing dead trees) and tree cavities for roosting; fire managed sites tend to contain a greater number of snags and cavities than non-fire managed sites. Lastly, low intensity prescribed fires are much less likely to destroy the snags or harm newborn pups than an uncontrolled wildfire.

Eastern box turtles: These reptiles have a more complicated relationship with fire. Box turtles prefer to spend their time in fire-managed habitat, but they are susceptible to being killed in fires. Box turtles grow slowly, reaching sexual maturity around 13 years old, and some may live more than 50 years. Because of their slow reproduction rate, box turtle populations can be susceptible to large mortality events. Fire management can improve habitat, but it must be done in a way that will not endanger the area's vulnerable turtles.

Photo by MassWildlife

Fire creates habitat conditions that help improve box turtle nesting and foraging. They prefer to nest in areas with bare soils that are open to sunlight, in grasslands, in woodlands, and in disturbed ground. Turtles often travel great distances, crossing dangerous roads, to find suitable nesting habitat. In fire-managed areas, turtles may find nesting areas closer to where they forage. Eastern box turtles are omnivorous, eating nearly anything including berries, seeds, leaves, mushrooms, insects, slugs, worms, and even carrion; fire helps increase the density of insects and herbaceous plants, making food more plentiful.

During a fire, box turtles have been documented trying to find safe refuge by digging in loose soil, moving to a wet area, or finding bare ground. In areas with frequent fires, turtles know the safe places and tend to stay near them. In areas with sensitive populations, the fire crew may limit the season in which a burn takes place and/or perform "turtle sweeps" to find turtles in the planned burn plot or area prior to starting ignition and then keep them safe until after the burn. Burn plots are ignited in a pattern that allows gaps in the pattern of fire spread, allowing turtles and other wildlife to escape without having to pass through flames. Areas managed with prescribed fire tend to have less leaf litter and vegetation buildup, so are less likely to experience large or deep-burning wildfires that could kill turtles. MassWildlife is working with other conservation partners on research to better understand the interaction between fire and box turtles.

Native bees: At last count, 390 species of native bees have been documented in Massachusetts. Unfortunately, bees here and around the world are facing a host of threats and are in decline. While one species of non-native bee, the honeybee, gets most of the attention, the many species of our native bees are arguably in more need of help.

Photo by Chris Buelow/MassWildlife

The importance of native bees to the environment and to our food production cannot be overstated. Most plants with flowers depend on bees, butterflies, or moths for pollination to reproduce, and much of the heavy lifting is done by native bees. Without pollination there is no reproduction, which means that there are fewer seeds or fruits for wildlife (or people) to consume without healthy populations of native bees.

Recent studies show higher bee diversity in fire-managed areas when compared to nearby unburned areas. This is not a surprise because fire-managed areas

typically have higher plant diversity (especially wildflowers) than non-fire-managed areas. The high production of blueberries, huckleberries, legumes, and other fruits that appear after a fire begins with flowers visited by bees. Fire promotes fresh growth and flowering in many plants and shrubs. The flowers provide food for bees, and the seeds and berries provide food for wildlife.

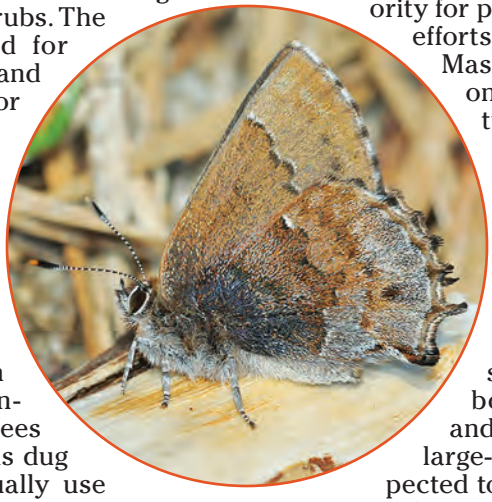


Photo by Michael W. Nelson/MassWildlife

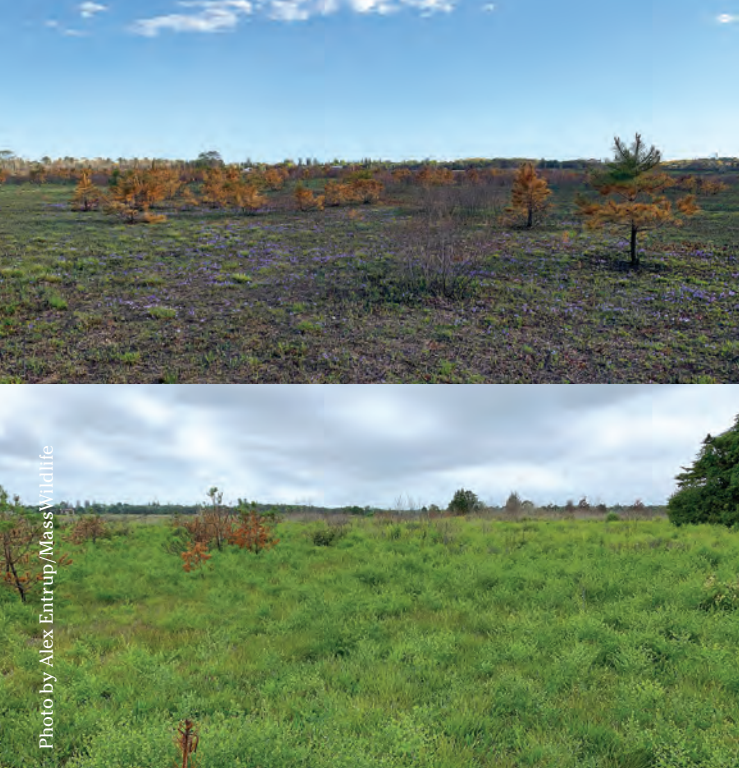
Fire also provides for other critical parts of their lifecycle. Most native bee species nest underground in areas with plentiful sun and bare ground; a condition common in fire-managed systems. Other bees nest in narrow tunnels dug into wood. They usually use dead limbs, downed logs, or other punky or dry, rotting, crumbly wood and pithy stems that are prevalent after a fire.

Frosted elfin, a state-listed butterfly, is one of many butterflies and moths that live in the fire-influenced landscapes of Massachusetts. This small nonmigratory and rather sedentary butterfly was historically found from southern Canada around the Great Lakes and along the east coast from New England to Florida and west to Texas, but its range has dwindled in recent years. Fire-maintained pine and scrub oak barrens, woodlands, grasslands, and heathlands are home to more than 20 species of rare and declining butterflies and moths. Larval host plants for these uncommon insects include fire-adapted barren plants such as scrub oak, low-bush blueberry, and New Jersey tea. Some butterflies, including the frosted elfin, select specialized host plants such as wild yellow indigo or wild blue lupine to lay their eggs and never move far from the host plant for their entire life.

The frosted elfin is considered an "at-risk" species by the U.S. Fish and Wildlife Service, meaning that it is a priority for proactive conservation efforts. It is relatively rare in Massachusetts, currently only known from about two dozen sites across the state. Threats include habitat loss and exclusion of disturbance such as fire. Fire promotes growth of wild lupine and wild indigo and maintains the open habitat structure needed by both the frosted elfin and its food plants. While large-scale wildfires are expected to have adverse effects on the frosted elfin, carefully timed prescribed fire within portions of the frosted elfin's habitat is key to the species' survival. MassWildlife has conducted prescribed fire at the Frances A. Crane, Montague Plains, and Southeast Pine Barrens WMAs to improve habitat for frosted elfin.

Photo by Caren Caljouw/MassWildlife

Managing with science: MassWildlife works with scientists and other partners to better understand the effects of fire on the environment. Monitoring is conducted at WMAs across the state to study a wide range of plants and animals, and their response to prescribed fire and other management. Prescribed fires are implemented to achieve specific habitat goals and promote resilient landscapes. Monitoring helps determine if the goals are being met, and as more is learned, plans are adjusted, management practices updated, and cycle continues.



Sandplain Grasslands are one of many habitats that benefit from prescribed fire. The burn unit shown above at the Frances A. Crane WMA was burned by MassWildlife in March 2021. The top image is one month post-burn and the bottom image is three months post-burn. Bird's foot violet (top), native grasses and wildflowers (bottom) emerge quickly after a burn.

Continued from page 15

Composition refers to the plants present and their abundance within an area. Some plants are better adapted to respond to fire than others. Native warm-season grasses such as little bluestem and switch grass respond well to fire. Additionally, many wildflowers, including some orchids, produce more flowers, seeds, and growth after a fire. Many plants need bare soil to germinate, and others may emerge after years of dormancy following a burn. Oaks, hickories, and pitch pines survive and reproduce better in the presence of fire. Areas managed with fire tend to have greater plant diversity, providing a greater variety of food sources for animals.

The amount and variety of nutrition available to wildlife in a fire-managed site is typically much greater than in a non-fire-managed site. Fire releases a pulse of nutrients into the soil and allows light to reach the ground. This combination stimulates growth in many types of plants. Many forbs, also called broadleaf plants, respond well to fire. They provide highly nutritious browse, produce pollen and nectar in the form of wildflowers, and supply seeds consumed by wildlife. Trees and shrubs top-killed by fire resprout, and the fresh growth is packed with nutrition and contains fewer of the chemicals produced by the plant to prevent browsing. Some insects will only lay eggs on the fresh growth created by a fire. Fire also increases many types of fruit production. Bumper crops of blueberries typically follow one to two years after a fire. Acorns and other nut tree production spikes after fire and is generally higher in fire-managed woodlands.

Fire does not burn evenly across the landscape, which can affect the spatial arrangement of habitats. Some areas may burn to bare ground while other areas may not burn at all. Each fire has a different intensity that produces different effects on the plants. Burning during different seasons can favor some types of plants over others. Prescribed burns conducted in different years or seasons form a loose checkerboard pattern of diverse conditions across the landscape. All the aforementioned factors increase variability in a fire-managed area, which means there are many habitat types within a smaller area. This is an important advantage for many wildlife species. Mating, nesting, brooding, and adult phases of life often require different habitats. A fire-managed site may include areas of cover to rest or hide, and areas of fresh growth for food in closer proximity.

Members of the Mashpee-Wampanoag Tribe participate in a prescribed burn on tribal lands in Mashpee to improve wildlife habitat.

Limiting the need for wildlife to travel long distances during different times of their day or lifecycle can improve their chances of survival and good health.

What happens during the burn?

While fire-managed habitat is preferred by many kinds of wildlife, fire itself can still present a danger to individual animals. Fortunately, because fire has been an influence on the landscape for millennia, native wildlife have evolved strategies to avoid being killed or injured by fire.

Additionally, compared to a wildfire, a prescribed burn's fire intensity (the amount of heat energy released) is lower, and protective strategies are used by our fire team to minimize impacts to wildlife. We avoid burning during sensitive seasons or conditions, or in areas known to harbor susceptible wildlife. The decisions of where and when to burn are based on clear management goals and in consultation with biologists. Despite our best efforts, occasionally some animals may be killed in a prescribed fire, but, because these are landscape-scale actions, animal populations will benefit and thrive in the long term. Fire-maintained habitats and ecosystems allow for greater survival of young, which helps a whole population grow, and they support at least half of the species of greatest conservation need in Massachusetts. Rather than focusing management on a single species, we manage landscapes for a suite of plants and animals.

Fire as medicine

Fire is one of the most important and impactful tools we have for habitat management. However, to understand fire as only a tool is to miss out on the role fire can play in the environment. Fire is a fundamental process needed for the healthy functioning of many ecosystems. Frank Lake, a Native American forest ecologist for the U.S. Forest Service, describes his tribe's understanding of fire as medicine. "Too much or too little medicine can make the land and people sick," he said. "But the right dose at the right time keeps the ecosystem healthy." All living things (including people) are part of a system that has developed over millennia with fire as one of the defining features. Returning fire to the landscape restores one critical piece of the system.

About the Authors

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During the winter months you may encounter large groups of deer. This behavior, known as "yarding," can enhance white-tailed deer survivability in harsh climates. Gathering in areas with less snow, such as in thickets and under dense woodland canopies, helps deer conserve energy while searching for food and provides protection from the elements. In addition, the well-packed trails that large groups of deer create in deep snow provide avenues of escape from predators. Photo © Dean Cerrati, deancerratiphotography.com