

**BY
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Black bears are a longstanding symbol of North America's wild forests. They roamed across nearly every wooded area of the continent before Europeans arrived in the late sixteenth century. While American Indians hunted bears, they also revered them as symbols of strength and long life and as masters of the forest. In contrast, colonial hunters saw bears as resources. When George Washington was a land surveyor in Virginia's



BACK IN THE BLACK

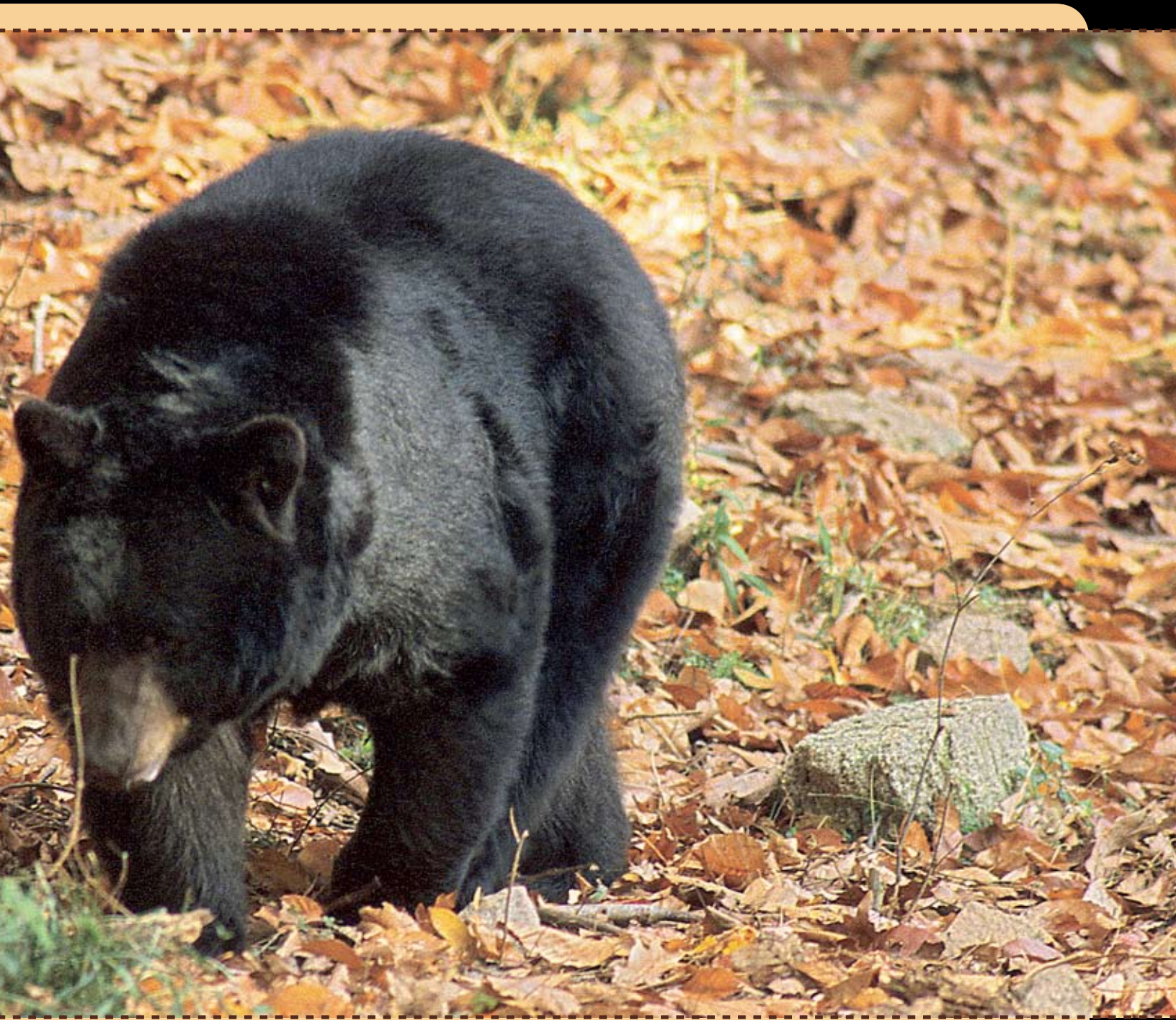
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Shenandoah Valley in 1749, he wrote to a friend, "I have not slept but three or four nights in a bed, but after walking a good deal all the day I have lain down before the fire upon a little hay, straw, fodder or a bearskin, whichever was to be had." As the nation expanded, folk heroes like Daniel Boone and Davy Crockett gained renown as bear slayers.

By 1900, intensive hunting, along with farming and development, had eliminated black bears from most of the United States except for remote mountains and coastal swamps. But over the past century these resilient animals have made a remarkable comeback. Today

they are present in at least forty states, and their numbers are on the rise in many areas—largely without help from reintroduction programs. Counts are inexact, but several recent estimates peg North America's black bear population at roughly 600,000 to 750,000, about half in Canada and half in the United States.

Reforestation in eastern states has



promoted the black bears' comeback by creating new bear habitat, including protected tracts in national parks and national forests. The end of unregulated hunting has also helped bear populations expand. With wolves and mountain lions eradicated from many of these areas, black bears have no natural predators left except for humans.

Black bears are well suited to life in a changing environment dominated by humans, but they prefer remote habitat with large hollow trees and thick understory brush for cover. They hollow out dens inside snags (standing dead or dying trees), and they sometimes help to create them by stripping bark from coniferous trees to eat the newly formed plant tissue beneath.

Black bears are used as a management indicator species to gauge forest health.

Bears can cause significant damage to timber, but at the same time snags are ecologically important; nicknamed "critter condos" by wildlife managers,

REST AND RENEWAL

Black bears den in winter and can hibernate for as long as seven months without eating, drinking, urinating or defecating. They don't lose bone density or muscle tone while they are inactive in their dens, even when females give birth and nurse cubs. During hibernation, bears' heart rates and body temperatures decline much less drastically than many other animals, which enables them to wake quickly if they are disturbed. In areas where winters are mild, they may not hibernate at all. Some scientists refer to black bears' winter sleep as torpor—a state of physical inactivity—to distinguish it from true hibernation.

To analyze how they maintain bone density, researchers perform bone biopsies on the bears before, during and after denning.

At Virginia Tech's Bear Research Center, Michael Vaughan and others are studying black bears' physiology to see how they avoid bone loss while they are denned. Each year from July or August through May, the center houses around half a dozen female "nuisance" bears that have been captured by state wildlife officials. (The bears are returned to the wild in summer.) To analyze how they maintain bone density, researchers perform bone biopsies on the bears before, during and after denning to see how their bone growth varies. "Our hypothesis is that a hormone or similar substance in their bodies helps them maintain a balance between bone growth and re-absorption," says Vaughan. This work may yield insights for human medicine, such as better treatments for osteoporosis and muscle atrophy.

they provide nesting and denning space for many other mammals and birds, including squirrels, raccoons, woodpeckers and great horned owls. Black bears also eat fruit and spread seeds. The U.S. Forest Service uses black bears as a management indicator species to determine how effectively forest managers are maintaining older forest communities and large contiguous areas with little human disturbance.

Although they prefer dense forest with thick undergrowth, black bears can live in all kinds of settings, from southern swamps to subalpine meadows. They eat grasses in spring, soft mast (plants that produce fleshy fruits) in summer and hard mast (plants with hard-shelled seeds like acorns and beech nuts) in fall. They are omnivorous and will consume insects, beetles, honey and occasional small animals, both fresh kills and carrion.

A robust bear population is good for a forest's ecosystem, but it comes at a cost. As forest habitat shrinks, conflicts between humans and bears are proving to be an ongoing challenge for wildlife managers. "Habitat loss is one of the biggest threats to black bears," says Michael Vaughan, professor of wildlife at Virginia Tech and an internationally known expert on bears. "People are expanding into rural areas and building houses in places that used to be wooded."

OMNIVOROUS, ADAPTABLE AND INCREASING

The state of Virginia illustrates the challenges of living with black bears. From near-extinction in the early

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twentieth century, the state's bear population has grown to approximately 7,000 to 9,000. Over the past decade, bears have been observed in eighty-five out of ninety-eight counties across the state, although they are concentrated in the western mountains—particularly in the George Washington and Jefferson National Forests and Shenandoah National Park—and the Great Dismal Swamp on the Virginia–North Carolina border. Managing human interactions with bears proactively is a priority for state wildlife regulators, who constantly remind the public, “If you live in Virginia, you're in bear country.”

Most friction between humans and bears, in Virginia and elsewhere, occurs over food. Throughout the state many rural areas are being developed, which means more people are residing in bear territory. Bears frequently raid garbage cans, bird feeders and pet dishes in residential areas, especially in spring when they emerge from their dens and in fall when they are gaining weight for hibernation (see sidebar, left). They also get into gardens, cornfields and beehives and occasionally kill sheep, calves or goats.

In Shenandoah National Park, where hunting is prohibited, bears sometimes forage around popular campgrounds and lodges. The 311-square-mile park is home to the most dense bear population in Virginia—300 to 500 bears, depending on the season.

“Overpopulation within the park is not a problem, but we do get concentrations of sows [mature females] and sub-adult bears in developed areas and around food that's been discarded improperly in dumpsters and fire rings,” says Ross Gubler, a National Park Service biologist. Female black bears care for their young through the cubs' first full year of life, then release them in the spring of their second year, a vulnerable period for young bears. “They haven't

really learned to forage on their own and may not be at a proper weight yet, so they're forced to become more opportunistic,” Gubler explains. “In poor soft-mast years they have to look for food in picnic grounds, campgrounds and lodgings.”

The George Washington and Jefferson National Forests have a bear population of about 2,000 (as of a 2003 survey). The forests cover 2,762 square miles, of which about 5 percent is classified as wilderness and 40 percent is managed for timber. The area includes diverse habitats, including portions of the Blue Ridge and Allegheny Mountains and the Cumberland Plateau, and is traversed by the Blue Ridge Parkway and the Appalachian Trail.

“Bears can live anywhere as long as they have food, water and cover, but

a lot of land in Virginia is privately owned or farmed. The national forests are very important because they're the only place where bears aren't perceived as causing problems and subject to control and removal,” says Jaime Sajecki, bear project leader for the Virginia Department of Game and Inland Fisheries.

Today, about 80 percent of the public hunting land in Virginia is in the state's two national forests. The state manages bears as a game species with an annual limit of one bear per hunter. Hunters can use archery,

Roads allow bears to travel along the same paths as humans, increasing potential interactions.





A robust black bear population contributes to the health of the ecosystem. Bears prefer dense forests, but easily adapt to a wide variety of habitats.

muzzleloaders and firearms; in addition, Virginia is one of eighteen states that allow the use of hounds to hunt or chase bears. Annual harvests have risen steadily since 1980, from roughly 400 bears per year to approximately

1,500 per year since 2004.

Wildlife biologists say that the bear population is healthy and that controlled hunting helps to regulate it. "There's no indication that we're over-harvesting, and we may be under-harvesting in some areas," says Virginia Tech's Vaughan. He helped lead the Cooperative Allegheny Bear Study, a public/private initiative that examined the hunted black bear population in western Virginia from 1994 through 2004 to measure population growth rates, distribution, habitat use and other important dynamics. Researchers marked and handled more than 1,200 bears and radio-collared 518 of them. Data from their study informed Virginia's Black Bear Management Plan, which was finalized in 2002, and sets goals through 2010 for increasing bear numbers in some parts of the state and stabilizing them in others.

National Park Service biologist Gubler agrees that hunting helps regulate bear numbers in Shenandoah National Park. Many bears are taken in the counties surrounding the park; about two-thirds of them are males, which tend to range more widely than females. "I think it's an appropriate level and it's necessary," says Gubler. "We have a healthy population, and the park serves as a kind of bear nursery—females stick to the protected areas up near the spine of the park. It's the males who roam down into apple orchards and cornfields outside the boundaries." The Cooperative Allegheny Bear Study found that adult female survival and reproduction was the most important influence on black bears' population growth rate, underscoring the park's importance as a protected place for black bears to den and raise their cubs.

NEW MANAGEMENT STRATEGIES

In Virginia and other areas with growing black bear populations, strategies

for managing human-animal conflicts have become more proactive and protective of wildlife in recent decades. Animal nuisance calls are a big drain on resources, so the state is working to teach people how to avoid problems with bears.

“We get hundreds of calls every year from people who have bears getting into their bird feeders and garbage cans,” says Sajecki. “Typically, they call us instead of dealing directly with the problem. Handling little issues adds up, even if we just spend half an hour on the phone telling them to secure their trash cans and bring pet food indoors.” The department has produced leaflets, fact sheets and a twenty-minute “Living With Bears” video that can be viewed on its website.

Wildlife managers say that if garbage and other easy snacks are removed quickly from the scene, bears will soon go back to more traditional food sources. It is illegal in Virginia to feed bears on public or private land. But if bears become habituated to the presence of humans—or, worse, conditioned to expect food from them—the risk of an attack increases. There are no records of fatal bear attacks on humans in Virginia, but several attacks have occurred recently on public land in Tennessee: a black bear attacked a family in the Cherokee National Forest in 2006, killing a child and injuring her mother and brother, and another bear injured an eight-year-old boy in Great Smoky Mountain National Park in 2008.

Last year, Shenandoah National Park started using aversive conditioning, a technique that involves changing animal behavior using unpleasant stimuli, to move habituated black bears and deer away from areas that humans use heavily. Two trained seasonal employees developed a database of events involving nuisance animals and chased animals out of

problem areas by shooting them with non-lethal tools like slingshots and paintball guns. “We want to establish dominance over those animals that have become habituated to humans and drive them back to a wild state,” explains Gubler. “The goal is to create buffers around campgrounds, so we stop the aversive conditioning once they move beyond that area. Bears are smart enough to know where the boundaries are.” Paintball pellets are especially effective with bears, he says: “They don’t like the noise from the gun or the sting when a pellet hits. It usually only takes one hit to make a lightly habituated bear move on.”

Food-conditioned animals that panhandle from hikers and cars pose a more serious threat, and usually have to be either aggressively conditioned or drugged and removed from the area. The park has trapped and relocated forty-five bears since 2000, although it only had to do one relocation after aversive conditioning was implemented in 2008. In the past wildlife managers trapped and relocated animals for minor nuisances, but this approach is becoming a last resort because it takes more time and resources. And it doesn’t always work.

“You can’t really pick up a bear that’s used to getting into trash and dump it somewhere else without expecting that it will get into more trouble,” says Sajecki. “They also can return to where they started. And if people keep leaving attractants in their yards, they’re going to have more bears. It’s more a people management issue than a bear issue.”

Bears in the George Washington and Jefferson National Forests are less habituated to humans, probably due to hunting. “I’ve seen more bears in the past five years than ever before. It seems as though I run into them everywhere. But when they see us, they’re gone,” says Jesse Overcash, a wildlife biologist in the Jefferson

National Forest’s Eastern Divide Ranger District. However, with the recent Tennessee attacks in mind, the Forest Service is posting information at parking sites about how to store food out of bears’ reach and installing bear-proof dumpsters at recreation areas.

“I talk to every visitor I meet about safety and bears,” Overcash says.

The Forest Service has also combined forces with private groups to help make sites bear-resistant. Bear Trust International, a nonprofit based in Montana, is working with the Forest Service and Virginia Department of Game and Inland Fisheries to raise money for bear-proof dumpsters at Lake Moomaw in the George Washington National Forest, which draws more than 25,000 visitors annually and is experiencing nuisance bear visits. The Trust’s Adopt-a-Dumpster program recruits private-sector sponsors to help pay for wildlife-resistant containers, which can cost \$3,000 or more depending on their size.

The group has installed dumpsters at sites in New Jersey and Wisconsin, and is collecting data that it plans to use to create educational materials for school classrooms. Additionally, a Forest Service educational coordinator gives presentations on bears at a campground near Lake Moomaw in summer months and speaks to children at local schools.

Human views of black bears are coming full circle since pre-settlement times. Their remarkable comeback from over-hunting and their adaptability in a world that people have altered are earning them new respect and protection. Keeping bears out of dumpsters and preserving enough wild space in which they can roam and forage will help them thrive in the wild for years to come. 