Yellowstone Wildlife

DISCOVERY OF A WONDERLAND

More than a century ago, explorers and fur traders returning from the wilderness of the Montana Territory astounded the American people with tales of a land of lakes, forests, mountains, and canyons where giant geysers spouted, springs boiled, and wildlife abounded. Coming from such men as Jim Bridger—a notorious teller of tall tales—these accounts were received with some skepticism. But in 1870 an expedition of distinguished citizens led by Gen. Henry Washburn returned from the "Land of the Rock Yellow River," as it was called by the Indians, confirming its marvelous character. A movement to set aside this wonderland for all the people was soon launched by a group of foresighted citizens. Their efforts resulted in establishment of the world's first national park.

Wildlife was recognized, in the 1872 act of Congress that set Yellowstone aside, as one of the major resources of the new park. But apparently the idea that wildlife had rights of its own, or that its survival might even be important to man, was slow in taking hold. For the killing of bison and other Yellowstone animals continued even after the park was established. A later act (May 7, 1894) provided, in part, "that all hunting, or the killing . . . of any bird or wild animal, except dangerous animals . . . is prohibited . . . ."

With growing recognition of wildlife as a valuable inspirational and scientific resource, and with rejection of the pioneer philosophy that animals were meant to be either hunted for food or destroyed as enemies of man's interests, real protection was extended to the park's native animals. The large predators were the last to gain the sanctuary that had been accorded legislatively to all animals of the park. In an effort to build up the populations of elk and bison, a prolonged campaign against cougars, wolves, and coyotes was instituted. The killing did not end until the early 1930's.

Today, a new ecological awareness, a wider appreciation of the esthetic and scientific value of wild animals, and extensive research have led to better understanding of wildlife populations in Yellowstone and other national parks. Despite the mistakes of the past and the gaps in our understanding of the ecology of the park, it is today a haven for wildlife and a mecca for people who wish to see animals in a natural state. Indeed, Yellowstone today still provides habitat for virtually all the species known to have been present when the park was established.

Your appreciation and enjoyment of Yellowstone's wild creatures will be enhanced by a better understanding of how each fits into the intricate web of plant and animal life. This booklet has been prepared to contribute toward this understanding and to serve as a guide to finding, observing, and photographing some of the more noticeable, more interesting, and rarer species.

Snow falls early and leaves late in Yellowstone. The "off" seasons offer unusual opportunities for wildlife observation. This is an early-October scene (above) in Hayden Valley, a particularly good place to look for bison from fall through spring.

WEB OF LIFE IN YELLOWSTONE

Basic to the understanding of the web of life is the fact that plants directly or indirectly support all animal life. Chemical compounds in the soil, water, and air combined with energy from sunlight are transformed into plant growth. Plants serve as food for herbivorous animals, which in turn serve as food for carnivores. The deaths of plants and animals release chemical compounds back into the soil, water, and air for reuse in the next cycle of life.

Within this web all animals live—like man himself—in communities. A community is an association of plants and animals occupying a specific physical environment. Each kind of animal lives in its particular community because that environment provides its basic needs—which are the same for all animals: food, water, air (oxygen), shelter, protection from enemies, and living space. Each species fills a particular *niche* in the community—which might be compared to the job and the social position a man holds in a human community.

Thus, in the sagebrush-grassland community of Yellowstone, the white-tailed jackrabbit feeds on green plants and is itself food for such predators as the coyote, red-tailed hawk, and golden eagle. In other words, its functional niche in the community is as a direct or primary consumer of green plants and as a source of food for secondary consumers. A little thought leads to the conclusion that flesh eaters, the carnivores, are just as dependent on the green plants as are plant eaters, or herbivores.

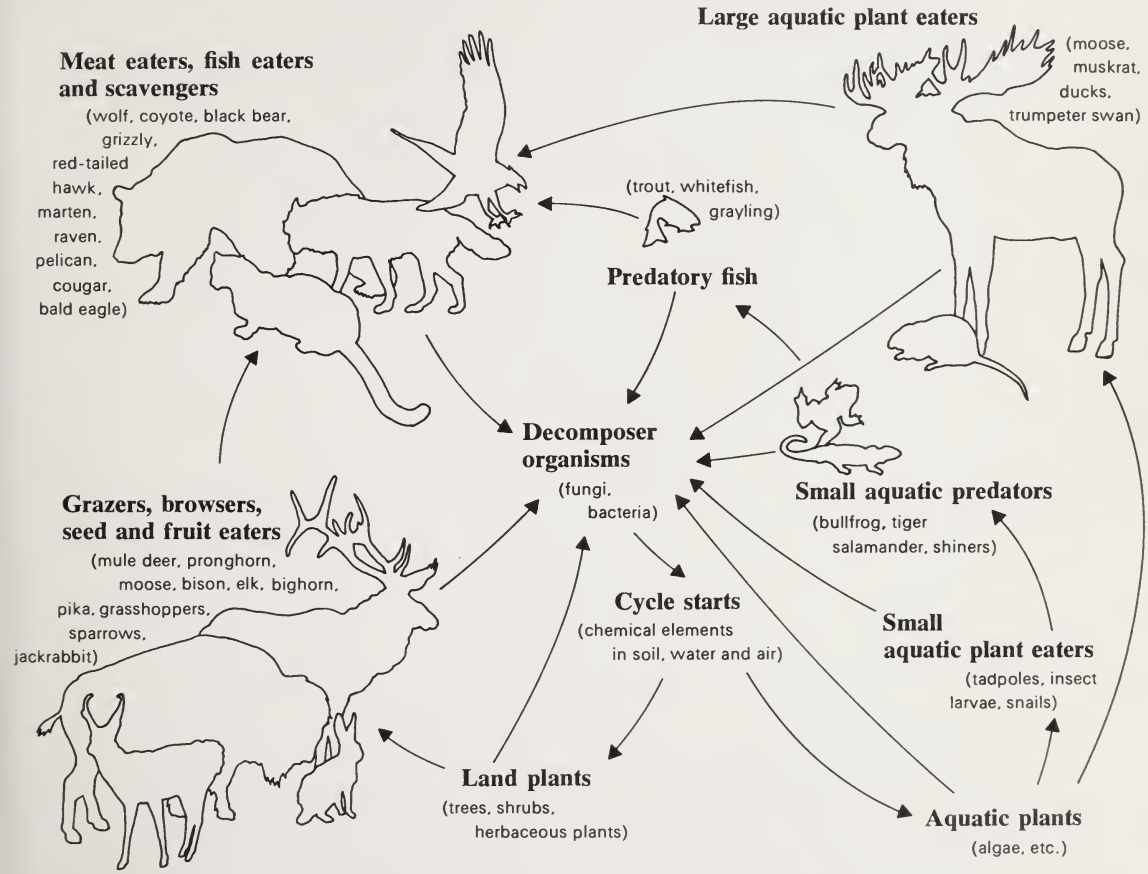
Within a natural community there is overlap among the niches occupied by the many kinds of living things. Thus, the jackrabbit uses some of the same food plants as the pronghorn. So do other small plant eaters. Indirectly, the jackrabbit helps the pronghorn by providing one of many food sources for coyotes.

Dead animals—carrion—are an important element in the web of life. Two grizzlies (left) feed upon the carcass of a winter-killed elk. Later in the same day, two ravens feed on the same carcass.

Many kinds of animals make use of more than one community. Yellowstone's elk, for example, in summer can be found in nearly every plant community in the park, from sagebrush-grasslands to alpine meadows.

Communities in a complex natural area such as Yellowstone always include many kinds of plants, a number of plant eaters, and at least a few flesh eaters. The combination of these organisms provides a system of checks and balances. Indeed, shifts in the relative numbers and distribution of the members of the community are occurring constantly as the natural environment changes. Rarely do these shifts in complex communities have drastic consequences.

In a national park, management policy aims at maintaining a natural habitat in a state as close as possible to what would prevail without the influence of modern man. This may mean not only protecting the trees from lumbering and the animals from sport hunting, but also allowing *natural* controls—such as weather, disease, predation, and fire—on animal and plant populations.



HUNTING YELLOWSTONE'S WILDLIFE WITH CAMERA AND BINOCULARS

Once you're on the road looking for wild animals in Yellowstone, there's a simple formula that almost insures success: SLOW DOWN . . . STOP . . . LOOK . . . LISTEN. The rewards will be greater, however, if you familiarize yourself with a few ground rules in advance.

First, learn which species of animals are most likely to be seen near the park roads during the season of your visit. Learn what time of day they are most active, how to recognize them, and where to look. The standard field guides will help. This booklet gives a few guidelines for spotting some prominent species. Ask a park ranger; he will have current information on the movements of the animals.

Learn the park's major natural communities or wildlife habitats. In Yellowstone they include the following:

Grassland-sagebrush Community: Uinta ground squirrel, pronghorn, jackrabbit, badger, coyote, grizzly, bison; mule deer and elk in winter.

Coniferous Forest: snowshoe hare, lynx, red squirrel, black bear, pine marten, porcupine, moose.

Alpine Meadow: pika, marmot; bighorn in summer.

Upland Herb Meadow: marmot, bighorn; mule deer, elk, and bison in summer.

Willow-cottonwood-sedge Valley Bottom: elk, bison, moose, muskrat, mink.

Sharpen your powers of observation. Listen as well as look. Be alert for the raven's croak, the trumpeting of swans and sandhill cranes, the honking of geese, and the eerie cry of the loon. Mammals, too, can sometimes be detected by voice—or scent, for that matter. Listen for the coyote chorus—which sounds like a pack of yelping puppies. The bugling of the bull elk resounds throughout the park in fall, and the squealing of cow and calf elk in summer may alert you to their presence in the vicinity.

Be an early riser, and an early diner. This will enable you to be out in the first light of day and in the last light of evening, when wildlife watching is at its best for many species. Always, as you drive, have others in your car scan the *edges*—where the meadow and forest meet.

And remember, parks aren't zoos; satisfaction comes not from quantity, but from the thrill of spotting—by accident or by using your "hunting" skills—an animal in its natural surroundings behaving as a free creature of the wilderness.

As close study of the three maps and the comments on vertebrate species in this booklet will make evident to you, the "off" seasons offer the greatest rewards in watching or photographing Yellowstone's wildlife. These seasons offer several practical advantages. Most of the hoofed browsers and grazers disperse and move into the less-accessible high country in summer. In spring, fall, and winter they can be found in greater concentrations and in more accessible localities. Autumn foliage and winter snows lend color and contrast to your animal pictures. A snowy background also makes most animals stand out more clearly, an advantage in spotting and photographing them. Not the least of the reasons for coming to Yellowstone in the off season is that fewer visitors are in the park to disturb the animals or get in the way of your lens.

The great Yellowstone wildlife show begins in October when, to escape the heavy winter snows, the big northern elk herd moves down to the lower slopes of the Yellowstone River drainage.

Photo Tips

Except for photographing larger animals spotted near the roads, long-focus lenses will be an advantage. A 35-mm. camera with a 100- to 500-mm. lens is perhaps the most practical choice for photographing small birds and mammals or for portraits of large animals. For habitat shots, a normal or wide-angle lens is fine.

With extremely bright light prevailing on sunny days in Yellowstone, you will not generally need fast films. In fact, you will be wise to guard against overexposure. But in the early morning and the evening hours when wildlife watching is at its best, you'll have good use for fast-emulsion films.

When photographing a backlighted animal or one that is in the shade of trees, allow for greater exposure. A meter reading or automatic exposure influenced by a bright sky or foreground can result in underexposure of a moose or mule deer browsing in the forest edge.

Be thoroughly familiar with your camera and have it ready to capture those great shots that come unexpectedly, as when you pull your car to the side of the road because a moose is crossing and you want to get a photograph before it disappears into the forest.

Your car can serve at times as an observation station or photography blind. Many wild animals that take flight at the approach of man on foot

All seasons are good for wildlife photography in Yellowstone. Shown here are mule deer in fall, a coyote in winter, and nesting trumpeter swans in June.

will tolerate his presence at close range in an automobile. Coyotes, for example, will sometimes come close enough for a camera portrait. For safety's sake, too—as when photographing a bear—your car often will be the best spot for you. It may pay to drive to the observation site before daylight, choosing your vantage point and parking your vehicle with the expected angle of the sun in mind. You will then have time to set up your camera and be waiting quietly when light reveals the scene. Banging car doors, talking loudly, starting up the motor, and other noisy activity will work to your disadvantage.

A tripod will vastly increase your photographic opportunities, particularly in poor light conditions and when using a telephoto lens. It will help prevent blurred pictures that result from hand-holding any camera at slow shutter speeds. Shutter speeds necessary to stop movement of an animal depend on such factors as distance and whether the animal is moving toward the camera or across the field of view.

If you lack a long-focus lens you may have to be satisfied with pictures of the animals as part of the habitat scene. It is not safe to approach a bison or other large animal closely enough to get a portrait of it with a normal lens. And never try to put a person in the picture with your wildlife subject. *Failure to observe these precautions can result in injury or worse.*

Remember, too, that trying to approach an animal on foot is likely to frighten it and move it back out of view from others. Be considerate of other visitors and the animals by watching from the roadway.

There are six species of hoofed mammals, or *ungulates,* in Yellowstone—pronghorn, bison, bighorn, moose, mule deer, and elk. The ungulates are the most conspicuous animals in the park, and provide many of the visitor's greatest wilderness thrills. They are accustomed enough to man's presence that you can often watch them at your leisure and at fairly close range. But don't mistake their tolerance of your presence for tameness. Don't approach them on foot—or try to drive off the road to get closer.

To identify these species, you need know only one or two distinguishing characteristics of each. A pair of binoculars is sometimes essential. Keep in mind that it is difficult to judge distance when you are in unfamiliar surroundings, and identifying by size is unreliable without a known object for comparison.

Bighorn

In Yellowstone, the bighorn, or mountain sheep, may be a leftover from an earlier post-glacial time, when favorable habitat was much more extensive, supporting a larger population than presently exists. The bighorn is well suited to steep, rocky, sparsely wooded slopes and alpine areas. Today, with a more moderate climate, forests have increased, true alpine areas are limited to the highest peaks, and the bighorn population is limited.

In summer the bighorn migrate to the higher reaches of the northeast sector of the park—Mount Washburn and the Absaroka Range. You can see those on Mount Washburn by hiking the road or trail to the top. In winter most of the bighorn migrate to lower elevations, becoming especially concentrated in the area between Mammoth and Gardiner, on the base of Mount Everts. They are often seen above the road in Gardner Canyon, on the cliffs of the Yellowstone River near Tower, and on the slopes above where Soda Butte Creek enters the Lamar River.

Because bighorn occupy a specialized habitat—steep, rocky slopes—to which few other animals are so well adapted and which these mountain sheep use for escape, they are relatively invulnerable to predators. When migrating, however, they must cross territory where their surefootedness is of no special advantage, and may be taken by cougars or other large predators. Lambs, during their first week or two of life, are subject to predation even by coyotes.

Bighorn are easily distinguished from other Yellowstone ungulates. Both sexes show a conspicuous white rump patch. The rams weigh about 200 pounds, have massive horns curling a partial to a full circle. Ewes are smaller, and their smaller horns curve slightly backward.

Bighorn migrate to lower elevations of the park in winter; these were photographed in Gardner River canyon.

Bison

Yellowstone's bison are unique in the United States: they are truly wild—free-ranging, unrestricted by either internal or boundary fences, and subject to no management interference by man. These bison are descended, in part, from the only wild bison in the United States to survive the time of near extinction during the late 1800's. Although the mountain bison of Yellowstone survived, they were poached to such low numbers during the early decades of the park's existence that plains bison from captive herds were introduced to Yellowstone in 1902. The hybrid descendents from both subspecies have retained

Bison (shown here on Old Faithful cone in March) can usually be seen in winter in the Lower Geyser Basin. The pronghorn buck (above) was photographed while grazing in the Mammoth-Gardiner area, in September.

Symbols on the map show where some of Yellowstone's larger mammals can be most easily seen by the car-borne visitor in spring and fall.

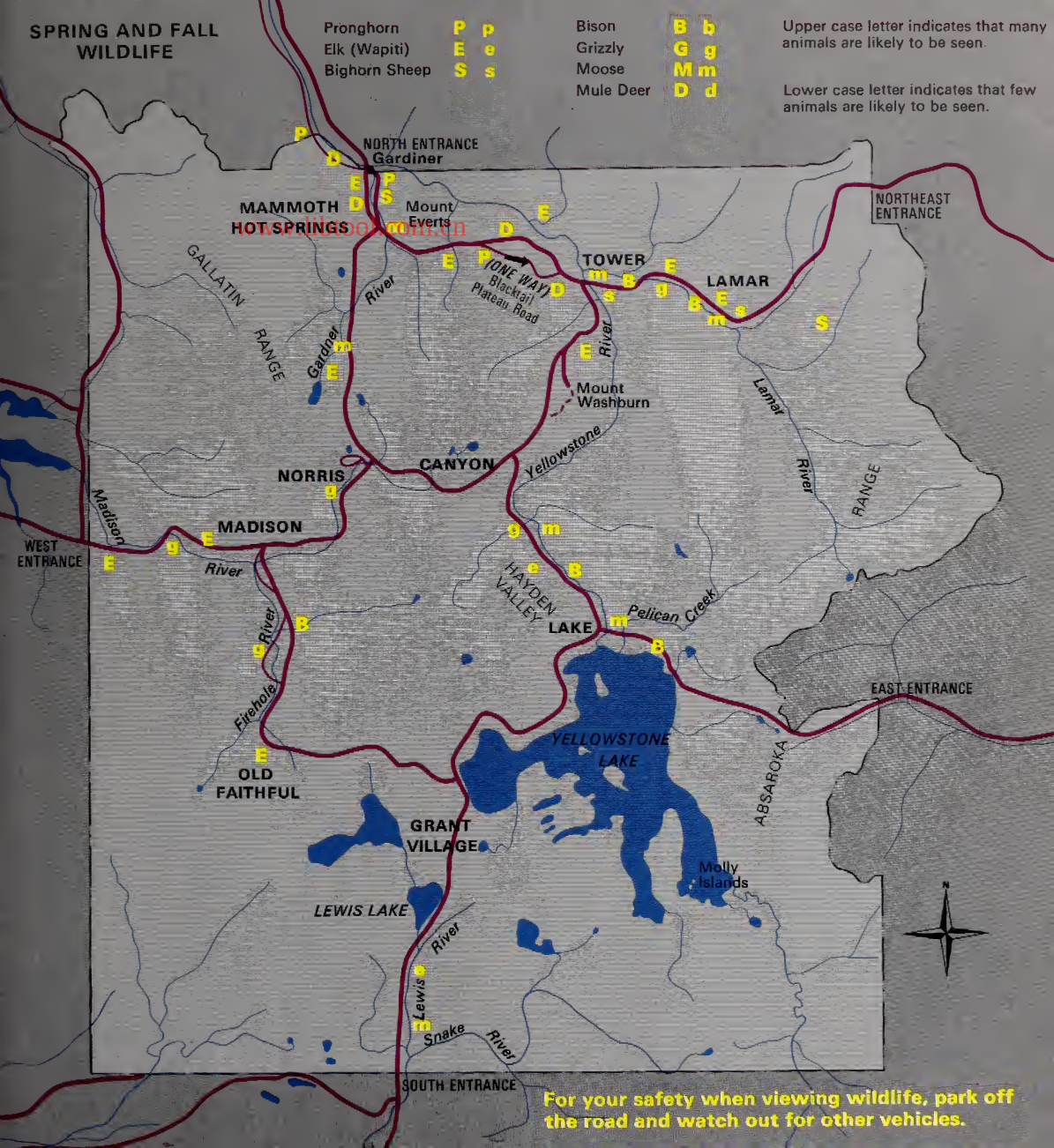
the hardiness and behavior patterns of the original mountain bison.

The bison groups are most easily seen where roads cross wintering areas in the valleys of the Lamar and Firehole Rivers. The Lamar road is open all winter; watch for the bison from Junction Butte to Lamar Canyon, from the end of November through May. On the Firehole, from late September through May, the bison are most often somewhere in the Lower Geyser Basin. Oversnow vehicles provide access via the Firehole road in midwinter. One of the best times to see the bison is in May, when the frisky, red, newborn calves cavort about their protective mothers. In summer the herd groups are in less accessible parts of the park, but lone bulls are often seen, particularly in Hayden Valley.

The numbers of bison inhabiting Yellowstone are greatly influenced by winter conditions. Bison are hardy and well-adapted to foraging in fairly deep snow, but winters are long and periodically quite severe. Mortality resulting from the stress imposed by the combination of deep snows, wind, occasional times of crusting, and prolonged storms is important in the natural regulation of the population size. Winter-killed bison are a vital food source for grizzly bears, coyotes, ravens, and other scavengers.

Pronghorn

Popularly but mistakenly called an antelope, the pronghorn is actually the only species of its family—a group distinct from the true antelopes. This swift and beautiful creature of the plains is one Yellowstone animal that you can count on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seeing *any* time of the year—if you look in the right places. It is limited to the northern region of the park, in the Yellowstone River drainage. A few pronghorn live the year around on the flats in the Gardiner, Mont., area and on slopes on either side of the Gardner River toward Mammoth Hot Springs.

In spring many pronghorn migrate up the Yellowstone River, across Blacktail Plateau and eventually into the Lamar River valley and the junction of Soda Butte Creek with the Lamar River. But there is too much snow in these areas in winter; and, among Yellowstone's ungulates, the pronghorn is the least tolerant of snow. Before the heavy fall snowstorms, the pronghorn returns to its main winter range at the north edge of the park below Mammoth.

Since they live on sage and other low-growing shrubs in open dry areas that don't get much snow, and since they depend on fleetness of foot and excellent eyesight for protection from predators, pronghorn avoid the forest. Consequently, they may be seen at any time of day.

Although both males and females bear horns and have conspicuous white rump patches like the bighorn, they are easily distinguished. Pronghorn are smaller, adults weighing about 100 pounds. Their erect horns curve backward only at the tip; the body markings are more striking; and they occupy relatively level, open areas rather than steep, rocky slopes.

The long-legged moose (below), primarily a forest browser, is often seen feeding on aquatic plants. The elk (opposite) is also both browser and grazer; it feeds on woody shrubs and trees and on soft-stemmed plants of the meadows.

The pronghorn, like the bighorn, may once have been more widely distributed in Yellowstone. A warmer period some centuries ago may have created habitat conditions favorable to pronghorn even in the central part of the park. Today pronghorn numbers as well as distribution have shrunk. Changes in habitat, decreasing availability of winter range, and some of man's activities have all affected the pronghorn population.

Moose

This big, awkward, photogenic animal of the forests is scattered over the park, and numbers perhaps 1,000 to 2,000 individuals. It is a permanent resident, its long legs enabling it to manage quite well in the winter snows. Moose are not herding animals; you will see loners, family groups, and occasionally several bulls together. Look for them in broken forest and in willow-covered meadows. They are often seen in summer in Hayden Valley and near the mouth of Pelican Creek; and in winter, between Tower Junction and the Northeast Entrance.

The moose maintains itself in winter by eating the needles of subalpine fir, Douglas-fir, and other conifers, and bark and twigs of willow, birch, and aspen. It is principally a browser on land, but is often seen in summer standing in water several feet deep, plunging its head under the surface to feed upon bottom-rooted aquatic plants.

The moose is the world's largest mammal with antlers. Its great size and formidable hooves make the moose relatively secure against predators other than wolves and grizzlies. Studies indicate that the wolves of Isle Royale National Park subsist almost entirely on the moose herd. But it is not known to what extent wolves prey upon Yellowstone's moose. Grizzlies may take a few. Although it is sometimes possible to approach these animals quite closely, cows with calves can be quite belligerent, and bulls during the fall rutting season tend to be nasty-tempered. Play it safe, and keep your distance.

A hump-backed body on stilt-like legs, big head with pendulous muzzle, and massive, palmate (broad-bladed) antlers make the moose recognizable at some distance. The cow moose, antlerless and less massive, is easy to distinguish from other members of the deer family by her long legs, heavy shoulders, and big muzzle.

American Elk *(Wapiti)*

Mention Yellowstone wildlife to anyone and he may first think of "elk." And with good reason, for this is the most abundant large animal in the park. Although it is not a true elk, the wapiti has been saddled with the name elk, and this is harder to shed than the big antlers. The elk is almost moose-sized, but it is majestic rather than ungainly in appearance. The bull's great, spreading antlers are not palmate like the moose's, and both males and females have a large, *buff* or *pale-yellow* rump patch that distinguishes them from other hoofed animals.

The elk is both a browser and grazer, feeding upon a wide range of vegetation including sedges, grasses, and other herbs, various shrubs, willows, the bark of aspens, and the needles of Douglas-fir and subalpine fir. This species, probably totaling

more pounds of flesh than all the other ungulates in the park combined, is important in the ecosystem as a consumer of plantlife and as food for predators and scavengers. It is preyed upon by cougars and by grizzlies, and coyotes may take some fawns.

In winter the population of elk in the park is several thousands; in summer Yellowstone is home to many more. There are four main herds. The southern herd descends into Jackson Hole in winter. Most of the Gallatin herd leaves in winter, too, going down the Gallatin River Valley. The Madison herd, about 1,000 animals, does not leave the park, but remains in the Madison River region throughout the year. It is naturally regulated, and has never been subjected to reduction programs or artificial feeding.

It is the northern herd, whose numbers fluctuate from about 7,000 to about 12,000, that provides the great wildlife show for winter visitors.

Part of this herd moves outside the park in winter, but many remain on the south-facing slopes of the Yellowstone River drainage and on exposed slopes that don't become snow covered. Look for them in late fall or winter on the road from Gardiner to Cooke City. In summer elk frequent the area between Mammoth and Norris. The best time of the day to see large numbers of elk from a road is early morning before they have been "spooked" by the traffic. They are not easy to spot when they're among the trees, but look near the forest edge. Binoculars will help in scanning distant open slopes.

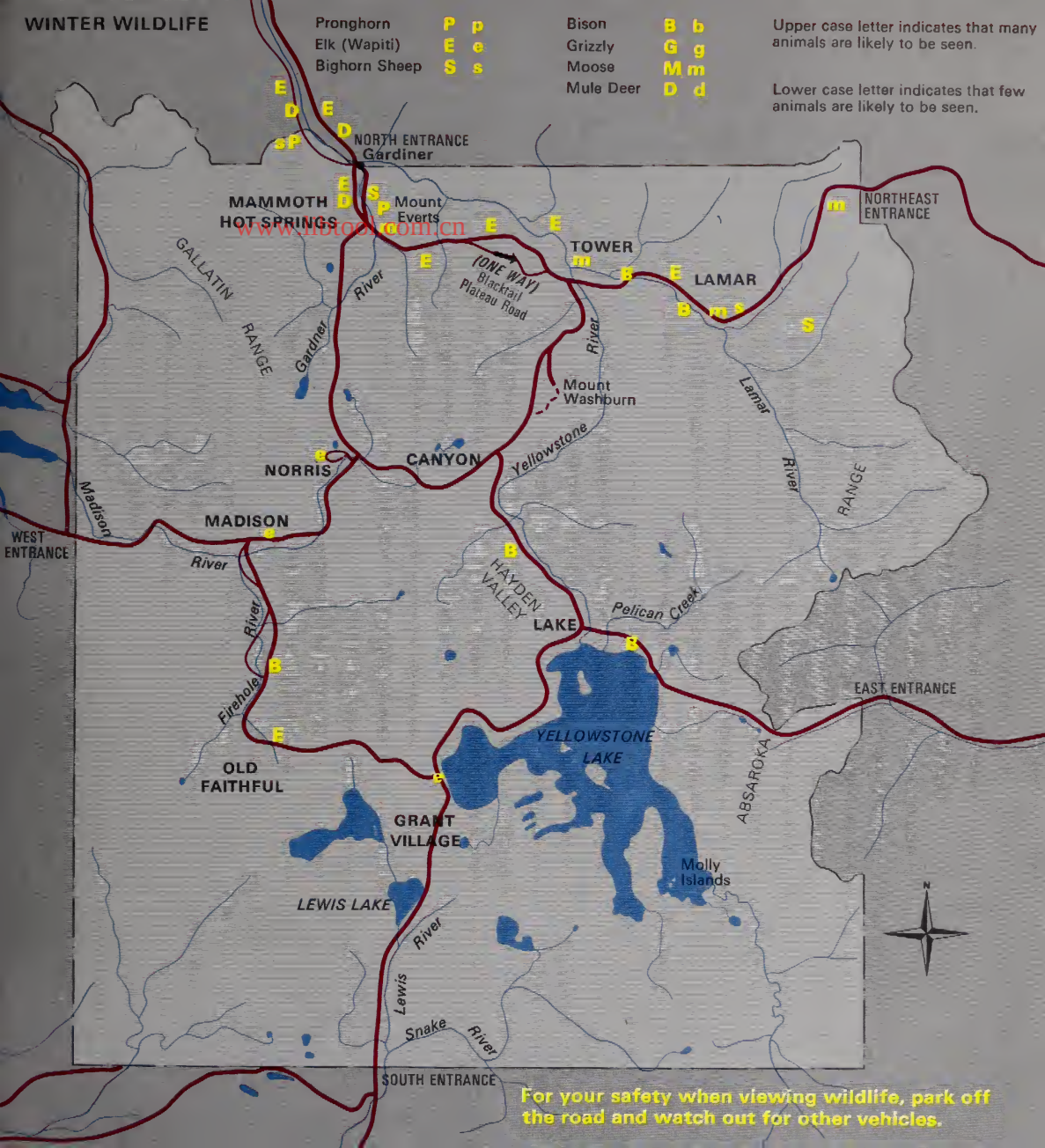
Mule Deer

This is the smallest of Yellowstone's three members of the deer family; it weighs less than one-quarter as much as the moose, one-third as much as the elk. A large summer population is scattered throughout the park, except in dense forest. Look in broken forest and small meadows. A browser rather than a grazer, the mule deer feeds principally on shrubs and coniferous trees. There is plenty of food for it in summer, but mule deer can't tolerate deep snow, so most migrate out of the park in winter. The small winter population is augmented in spring by individuals returning from Jackson Hole to the south, the Shoshone River drainage to the east, the lower Madison River valley to the west, and the Yellowstone River valley in the north. In winter you can see huge numbers in and near the park, around Mammoth Hot Springs down to Gardiner and beyond.

The mule deer is preyed upon by cougars and grizzlies, and probably by the park's few wolves. Fawns and disabled adults are vulnerable to the coyote.

You should have no trouble recognizing this species. The mule-like ears, body form and size, and bouncing, bounding gait set it apart from the other ungulates.

A good way to see mule deer (below), pronghorn, and moose is to drive slowly along one-way Backtail Plateau Road.
Winter wildlife-observation opportunities are indicated on the map on the opposite page. The road between the North and Northeast Entrances is kept open all year.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You will see fewer four-footed predators and scavengers in the park than hoofed animals—not only because they are more secretive, but also because plant-eaters always vastly outnumber the carnivores that feed upon them. Some of the predators of the park have made a comeback from the days of persecution, some are barely holding their own, and some have maintained good populations throughout the park's history. We still have much to learn about the exact role predators play here, but it is clear that their presence is vital to the health of Yellowstone's ecosystem.

Coyote

The coyote, which has always been common in Yellowstone, has been much abused by man throughout its vast natural range—which even today extends from Alaska to Mexico and from California to Massachusetts. Along with other large predators, it was persecuted during the early years of the park. In a 12-year span at the turn of the century, for example, 2,236 coyotes were poisoned, trapped, or shot in Yellowstone. Since 1934, however, a more enlightened policy toward predators has prevailed, and the coyote has rebounded to its former abundance.

This wild canine functions in the park ecosystem as a predator on ground squirrels, pocket gophers, meadow voles, and other small mammals and as a scavenger on larger animals that have died or been killed. While the primary factor controlling populations of herbivores is the supply of plant foods, the coyote's role may tend to even out the fluctuations in numbers of rodents and hares, minimizing the chance of overpopulation that could unbalance the ecosystem.

Coyotes are among the least finicky of animals. They eat grass, insects, fruit, carrion, fish, birds, mice, hares, porcupines, crayfish, and frogs.

The coyotes of Yellowstone, where they are unmolested, have become accustomed to the presence of man. You may see them by the roadside, and one may even approach your car out of curiosity. Look for them in the drier, larger open areas—sagebrush and grassland—and especially in Hayden Valley, Lamar Valley, Tower, Mammoth, and the Blacktail Plateau. And be sure to listen for them at night.

Don't confuse this medium-sized wild dog with the much larger wolf. Your chances of seeing the latter are remote. The wolf is far warier than the coyote, and is extremely rare in the park.

Wolf

The wolf, perhaps the most maligned, most persecuted mammal in America, is now gaining a measure of compassion and respect from mankind. Moderate numbers of wolves were present in the early years of Yellowstone. But in those days—when even some biologists subscribed to the belief that "the only good predator is a dead one"—it was trapped, poisoned, and shot mercilessly. By 1926 it was thought to have been eliminated from the park. Records indicate, however, that there have always been a few wolves present in the park or its immediate vicinity; today a few are known to range in the northern part of the park.

Look for grizzlies in valley bottoms and other open areas. The bear family (opposite) was photographed in Hayden Valley.

The wolf in Yellowstone, as elsewhere, no doubt has a culling effect on the ungulates it hunts, by weeding out sick, weak, or crippled individuals—those easiest to overtake and subdue. But Yellowstone's small wolf population today has little impact on the populations of hoofed animals.

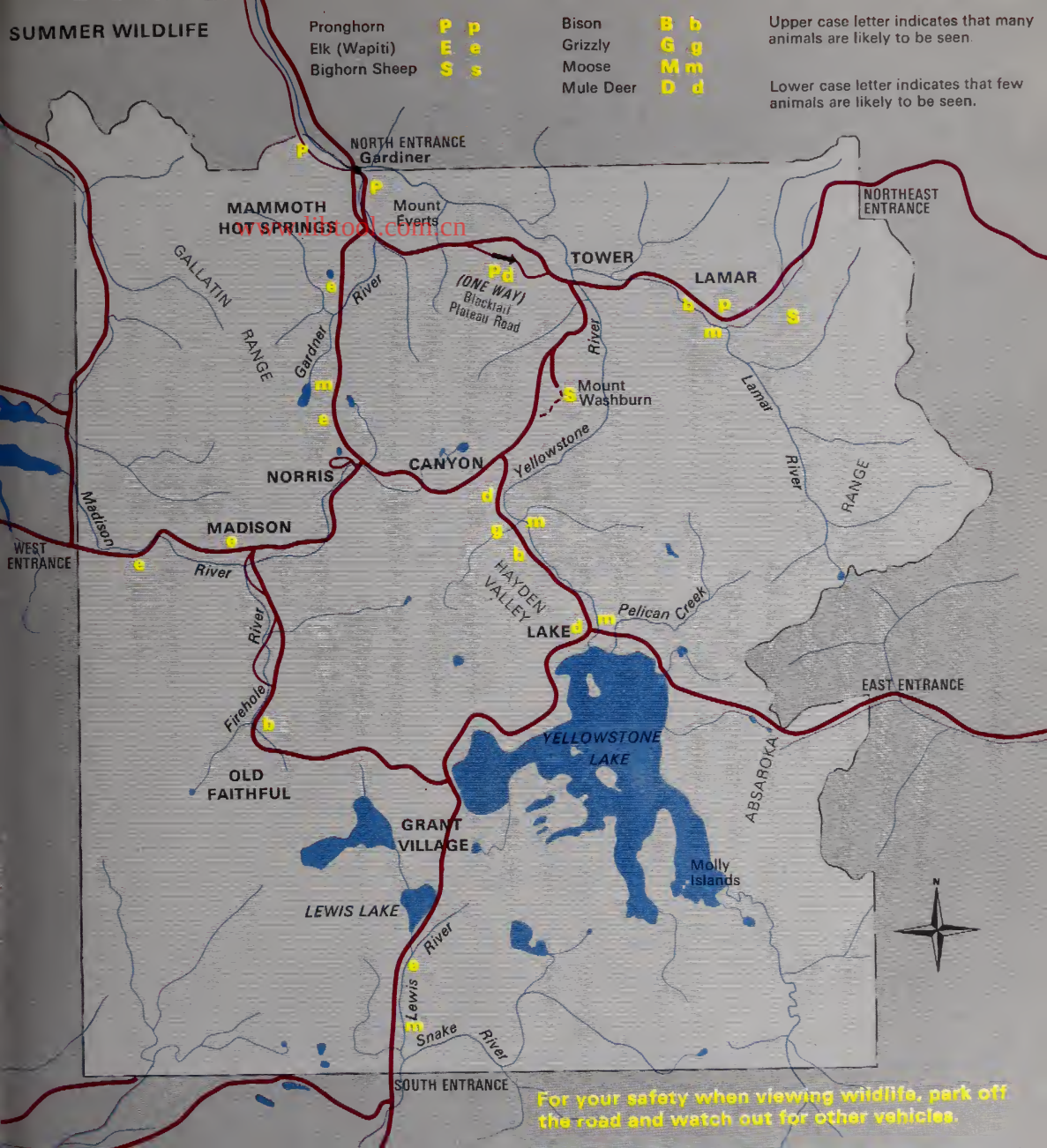
Don't expect to see a wolf in the park; but if you're there in spring, keep a weather eye out for it along the road between Mammoth and Cooke City. There is nothing to fear if you do encounter one, for no wild, nonrabid North American wolf has been known to attack a man.

Pine Marten

The pine marten, as its name suggests, inhabits the coniferous forest. The most arboreal of weasels, it preys upon squirrels and birds, as well as ground-dwelling rodents, shrews, and pikas. It is one of several members of the weasel family in Yellowstone (others: skunk, fisher, both shorttail and longtail weasels, mink, otter, badger, and wolverine).

You may encounter a marten when hiking or camping. Don't mistake its seemingly friendly behavior for tameness—it is probably mere curiosity that makes this 2-pound carnivore appear so sociable. A hardy animal, it neither hibernates nor migrates to lower levels in winter. It is seldom far from the forest. Identify it by its minklike form, prominent ears, bushy tail, and buffy chest spot.

The coyote (below, left), which ranges widely and will eat almost anything, can sometimes be seen stalking small animals in the sagebrush-grassland. The forest-dwelling pine marten (below), more strictly carnivorous, preys chiefly on rodents. In summer, Yellowstone's larger animals are widely dispersed and are not seen in great numbers near the roads. The map indicates good summer observation spots.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Lamar River
Mount Washburn
NORRIS
CANYON
MADISON
WEST ENTRANCE
Madison River
HAYDEN VALLEY
Pelican Creek
LAKE
EAST ENTRANCE
Firehole River
YELLOWSTONE LAKE
ABSAROKA
OLD FAITHFUL
GRANT VILLAGE
Molly Islands
LEWIS LAKE
Lewis River
Snake River
SOUTH ENTRANCE
N
For your safety when viewing wildlife, park off the road and watch out for other vehicles.

The rare and elusive cougar (left) is virtually never seen by park visitors. You are more likely to see a black bear than a grizzly; note the latter's shoulder hump—a good identification character.

River Otter

A delight to watch, this large, playful member of the weasel family is nowhere common in the park, but keep your eye peeled for it. Like bald eagles, ospreys, and pelicans, the otter is dependent on fish, especially cutthroat trout. It is for these fish eaters, and others such as the grizzly and great blue heron that rely partly on fish, that the park's stringent fishing regulations have been imposed.

Imagine the excitement of watching a curious otter poke his head out of the water alongside your canoe in Yellowstone Lake or seeing a frolicking otter family in one of the park's ponds! Look for these animals in any of Yellowstone's major rivers as well as along the edges of lakes and ponds.

Cougar

This sleek, graceful, sinewy cat is generally called mountain lion in the Rockies. In other sections of the country it goes by the name puma, painter, panther, or catamount. An estimated 100 cougars lived in Yellowstone in the first decade of this century, but they were almost wiped out during the prolonged anti-predator campaign in this region. For reasons we don't fully understand, they have never recovered, and are so scarce now as to have little impact on the park's ecology.

These big cats are always associated with deer—in fact, they are unknown outside of deer range—and in Yellowstone probably subsist chiefly on mule deer, though they will take smaller mammals. Years ago, however, in Yellowstone the cougars apparently depended upon elk as a major food source. To the extent that elk numbers and distribution on the northern range can again more nearly duplicate conditions that prevailed during early decades of the park's existence, the cougar may in time increase.

Only by the sheerest accident will you see a wild cougar. Very few persons have—except hunters using dogs to tree their quarry. If by remote chance you do encounter a big cat with a long tail, this is it. But don't be alarmed; a wild mountain lion is never a threat to man.

Black Bear

Although classed as a carnivore, the black bear is actually, like man, an omnivore. It eats fruit, flesh, fish, and fowl, as well as grass, insects, roots, carrion, and garbage. Much of the year it is more vegetarian than meat-eater.

Today, persons who visited Yellowstone years ago when roadside bears were commonplace are asking, "Where are the bears?" The answer might well be, "Where they belong—in the

woods." The change has come about because park managers and public alike now recognize the folly of roadside feeding of bears and of allowing garbage to be available to them. Strict enforcement of the ban on feeding, use of bearproof garbage containers, and elimination of open pits for garbage disposal have forced the bears to return to natural ways—digging, picking, grazing, foraging, and hunting for their food. They are much better off for it, and injuries from human-bear encounters have diminished. True, fewer bears are seen today along the roadside; but when you do come upon one, you will be seeing an animal behaving as it did before modern man intruded into its environment and disrupted its life-style.

You can tell the black bear from the grizzly by its generally smaller size; more pointed head with straight, not dished, profile; and lack of shoulder hump. Black bears are not always black; a single litter may contain one black, one brown, and one cinnamon-colored cub.

★ Note this well: if you feed a bear, even from a "safe" distance, by tossing food scraps, you are endangering the lives of other park visitors—and you may be serving the bear's death warrant.

Grizzly

Perhaps one-fourth of the grizzlies remaining in the contiguous United States are in Yellowstone. There is concern that this big bear, to many the symbol of the American wilderness, may be vanishing from the earth. While you are not likely to see one in Yellowstone during the peak of the visitor season, it should give you a measure of satisfaction just to know that you are in grizzly country—to know that here at least they are given protection. The small population of grizzlies—perhaps 250—is widely distributed in the park. It is not, like the black bear, primarily a forest animal. There are certain open areas close to the traveled routes where it may be seen digging for roots and rodents.

The grizzly is not ordinarily a hunter, tracking and pursuing a selected victim, but is in fact more vegetarian than carnivore. In spring, it comes out of its long sleepy period 2 or 3 weeks earlier than the black bear. At this time elk and mule deer are likely to be weakened from the rigors of winter, with some individuals on their last legs. Easy kills, as well as carcasses of dead ungulates now emerging from the melting snows, provide an abundance of fresh meat and carrion from early May until mid-June.

One of Yellowstone's greatest wildlife thrills is to watch a grizzly in spring as it grazes on new green grass, turns up sod to get at roots, bulbs, and rodents, or tears apart rotting logs for ants. Spring spawning of the cutthroat and other trout give these bears the opportunity to indulge in a favorite food. Watch for fishing grizzlies in the Pelican Creek area and the Yellowstone River outlet of Yellowstone Lake.

Later in the season, when the surviving elk and deer are in good shape again and moving to higher country, the grizzly depends largely on bulbs, sedge, green shoots, and berries.

Your best opportunity to see grizzlies is from the road in spring when they are feeding in the valley bottoms. They are widely distributed in the back country. Before you venture on the trails, for safety reasons you should be sure to discuss your plans with a park ranger.

Grizzlies, as long as they remain truly wild, tend to flee from man's presence. They usually smell or hear approaching humans, and leave without being seen. Most dangerous is an accidental, sudden encounter that startles the bear. To avert such occurrences, make noise whenever on foot in grizzly territory.

When camping in bear country, camp near trees if possible; adult grizzlies cannot climb trees. Keep food out of your tent and out of reach of bears, and keep a clean camp. Never fail to give these powerful and unpredictable animals a great deal of respect. Remember, in Yellowstone you are the visitor—in one of the few homes left to the grizzly bear.

GNAWING ANIMALS

The gnawing animals, including both the rodents and the hare-and-rabbit order, are the most abundant of Yellowstone's mammals, with more species and larger populations than any other groups. Consequently, they are close to the core of the park's web of life. They are almost entirely herbivorous, though some rodents devour quantities of insects and other invertebrate life, and a few species prey upon small birds or even upon smaller rodents. Most importantly, they provide a staple diet for predators ranging in size from shrews—the smallest of mammals—to grizzlies, the largest of the carnivores.

Pika

This tiny, almost tailless cousin of the rabbits and hares is a hardy individualist. Its home is often the park's severest environment, the rockslides close to timberline, and this accounts for another of its names—rock rabbit. Listen for its telltale buzzy squeak near the summit of Mount Washburn, in the Golden Gate area, or on any of the higher, open rockslides in the park; then look for it scurrying for the safety of a crevice.

In summer the pika busily gathers twigs, leaves, grasses, sedges, and other green plant matter, which it piles beneath a jumble of rocks. In winter it lives snugly but actively among the rocks beneath the snow, subsisting on these haystacks. During its summer daytime foraging for plants it is vulnerable to weasels and pine martens. Hawks sometimes pounce on a pika that has strayed too far from the safety of its rock pile.

The little ball of fur you see—or hear—in the rockslides on higher slopes is the pika, famous for its summertime harvesting activities.

Uinta Ground Squirrel

Like other ground squirrels, this rodent is often called "picket pin," from its habit of sitting upright, looking much like a peg driven into the ground. Your attention may first be attracted by its voice—a descending, birdlike squeal. This burrowing animal lives almost entirely on stems, leaves, flowers, and seeds of green plants. It is preyed upon by hawks, weasels, badgers, foxes, and coyotes. The picket pin is associated in Yellowstone with sagebrush. Look for it at Lamar, Tower, and Mammoth. But since it goes into hibernation as early as mid-August and doesn't come out until early June, its active season is about the shortest for any Yellowstone vertebrate.

Yellow-bellied Marmot

This rodent, similar to but larger than its eastern cousin, the woodchuck or groundhog, is adapted to open rocky slopes where grass is plentiful. It is common in Yellowstone's high country, but visitors more often see a marmot along the road through the Golden Gate, at Storm Point on Yellowstone Lake, or along the road between Mammoth and Tower.

During that part of the year in which it is active a marmot is likely to be seen at any time of day sunning itself on the most prominent boulder in its grassy domain. A shrill alarm whistle may be your first hint of its presence. The marmot is one of the winter sleepers, retiring as early as September and coming out of hibernation in June, when it may have to burrow through snow to reach daylight.

Watch for the muskrat (below) in the park's ponds and marshes. The Uinta ground squirrel (opposite), like the pika, may be heard before it is seen; look for it in sagebrush.

Muskrat

One of the most widely distributed of North American mammals, known in every State but Hawaii, the muskrat occupies many of the ponds, lakes, and larger rivers of the park. Look for the muskrat's lodge—a conical mound of aquatic-plant stalks, more symmetrical and much smaller than the house of sticks and mud built by the beaver. Although it shares its aquatic habitat with otter, beaver, and mink, the chances are that a small mammal you see swimming in the Yellowstone River or almost any pond or marsh will be a muskrat.

Along with its principal diet of leaves, stems, and roots of aquatic plants, the muskrat eats frogs, salamanders, and an occasional fish. In turn it is preyed upon by otters, coyotes, and bald and golden eagles.

Beaver

This industrious four-footed engineer—builder of dams, lodges, and canals—is the creator of habitat favorable to an array of mammals, birds, fish, and amphibians. There is visible evidence that beavers abounded in Yellowstone in former years: the remnants of dams (including one that was thought to be the world's largest beaver dam—which you can see from the road near Obsidian Cliff, between Norris and Mammoth) and the many meadows that appear to have been formed through natural succession from abandoned beaver ponds. Today these big, busy rodents are found in the park in relatively small numbers. Biologists are not certain of the reason for their apparent decline. You can still see active lodges and dams, and if you're lucky you may see one of the builders.

Beavers are strict vegetarians, feeding upon aquatic plants in addition to the twigs and tender bark of the trees they cut. They are preyed upon by a number of carnivores—in Yellowstone, by coyote, wolf, cougar, lynx, and bobcat. But beavers are more important as environmental engineers than as links in the food chain.

BIRDS

Endless hours of bird-watching pleasure and excitement are yours if you come armed with a good field guide and a pair of binoculars. With well over 200 species known in the park, we can suggest here only some guidelines on a few of the prominent species. The park's water birds—fish-eating birds of prey, wading birds, grebes, gulls, shore birds, and ducks, geese, and swans—offer particularly rewarding watching. Look on and over the ponds (especially at Lamar), lakes, rivers, and marshes. Hayden Valley is the best area.

White Pelican

This huge white-and-black bird, with a 9-foot wingspread, is another of America's endangered animal species. The decline in numbers of pelicans appears to be due primarily to agricultural pesticides that are acquired by way of the fish they eat during their southward migration and wintering period outside the park. In Yellowstone pelicans are summer residents only. Their breeding colonies on the Molly Islands in the southeast arm of Yellowstone Lake are secure—for that part of the lake is off limits to motorboats, and not even canoes are permitted to approach within one-quarter of a mile of the islands.

Identify flying pelicans—often at great heights—by black wing tips, head hunched back on shoulders, and long, flat bill resting on the curved neck. Look for them drifting along the Yellowstone River and on Yellowstone Lake.

These young ospreys, soon to leave their nest on a pinnacle in Yellowstone Canyon, have been reared on fish brought to them by their two parents.

The white pelican relies on Yellowstone's cutthroat trout, which it scoops up in its basketlike bill. In this wilderness park the pelican and other native fish-eating animals have prior rights over man, and park fishing regulations are designed to insure that this food source remains as it was in primitive times.

Trumpeter Swan

One of America's rarest birds, the beautiful trumpeter can yet be seen by almost any alert visitor. It breeds here in summer; and some swans remain in the park through the year, in areas where there is open water. Seventy individuals were observed at the outlet of Yellowstone Lake in the winter of 1969.

Although 20 to 25 pairs habitually nested in the park, there has been a recent decline, for unknown causes. Its protected habitat in Yellowstone and the nearby Red Rocks Waterfowl Refuge is a key factor in survival of this species so long feared on the way to extinction.

Look on the larger lakes, on the Madison and Yellowstone Rivers, and in Hayden Valley. The trumpeter can be distinguished from the whistling swan—a migrant and winter resident but not a breeder in the park—by its much louder, lower-pitched, more bugle-like voice. Especially if you have a long-focus lens, this photogenic bird will be a prime subject for your camera.

Bald Eagle

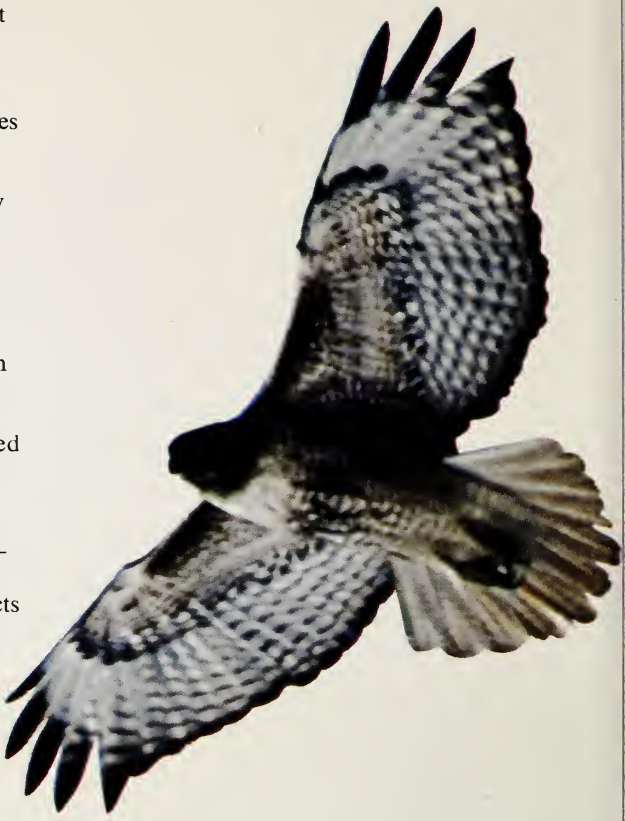
A generation ago the bald eagle, our national symbol, was widely distributed over America. Today the pleasure of watching this great bird as it soars high on almost unmoving wings, plunges to the water to capture a fish, or feeds its young on a bulky nest built atop a towering pine is rare, outside of Alaska.

Not even in Yellowstone, once an ideal habitat for this wilderness bird of prey, is the bald eagle common today. The chief reasons are guns, poison, and environmental pollution—primarily DDT, which is accumulated in the eagle's tissues from the fish it eats. Unfortunately, Yellowstone's eagles, though they are secure from bullets, poison, and contaminated fish when they are in the park, face these dangers as soon as they leave in fall. Some individuals remain in the park through the year.

Since its principal food here is trout, look for the eagle at Lake, Hayden Valley, the lower valley of the Yellowstone River, and the Madison River. In spring this eagle, which is a scavenger as well as predator, can be seen feeding on thawing carcasses of deer or elk that have perished during the winter.

Osprey

Like the bald eagle, the osprey is a fisherman—a more skilled one, in fact. And like the bald eagle it is declining in numbers from the effects of guns and pesticide pollution. The osprey is still fairly common in Yellowstone from late spring, when it arrives from the south, until the fall freeze. It is frequently seen at



The strikingly patterned male Barrow's goldeneye (left) is a choice subject for the cameraman with a long-focus lens. Look for these ducks along the Yellowstone River just north of Hayden Valley. The big red-tailed hawk (above) soars over the more open areas of the park in search of small-animal prey. The Molly Islands, a nesting ground that the white pelican shares with California gulls and Caspian terns (not shown), are off limits to visitors. The magpie (far right) is more common in the park in winter than in summer; watch for it in open valley areas.

Yellowstone Lake, in Hayden Valley, and in Yellowstone Canyon. From any of the canyon overlooks, watch for the ospreys soaring back and forth over the river; you may spy one going to its nest perched on a rocky pinnacle on the side of the canyon.

Well adapted for its way of life, this smaller relative of the eagles lives exclusively on fish captured by plunging feet first into the water. Although its head is largely white, it should not be confused with the adult bald eagle, whose head and tail are both entirely snow-white with the rest of the body dark. The osprey is blackish above and clear white below, the only large bird of prey so marked.

Magpie

Eastern visitors to the park often ask about this strikingly patterned bird seen in Yellowstone's open country. It is not as big-bodied as a crow, but its very long tail gives it the impression of great size. Watch for it especially in the lower Gardner and Yellowstone River valleys, and along Slough Creek and the Lamar River. It's the only large black-and-white land bird with a long tail.

Like the larger raven, the magpie is a scavenger, feeding on any animal carcasses it can find, and is an occasional predator on small animal life.

Raven

The *big* all-black bird you see throughout Yellowstone is the raven, not its much smaller cousin the crow, which is much less common here. A raven flies with hawklike alternate flapping and soaring. It has a shaggy neck and a wedge-shaped tail, and it croaks rather than caws. In spring a flock of ravens can alert you to a dead elk or other carcass, for they are scavengers and often feed alongside coyotes or even grizzly bears. During the spawning season you may see them feeding on fish washed up on the bank.

COLD-BLOODED VERTEBRATES

Unless you are a fisherman, you are likely to be unaware of Yellowstone's cold-blooded vertebrate animals. The most abundant and ecologically important—cold-blooded vertebrates are the fishes. Less than a dozen species of reptiles and amphibians live here, and these are not, in most areas of the park, numerous enough to play a significant role in the ecology.

Not surprisingly in a park lying above 6,000 feet, the environment supports only five species of snakes—and of these only one species of garter snake is widely distributed. Also present are bull snakes, rubber boas, and, in a very limited area near Gardiner, the prairie rattlesnake. One lizard, the sagebrush, is most commonly seen near thermal areas, especially Norris.

Amphibians are represented by more species, and some are present in fairly large numbers in places. The western toad occurs in a variety of habitats. Listen in early summer for the tiny chorus frog, which is abundant in some wetlands below 8,000 feet. This and other frogs can be identified by their voices, as readily as birds. The voiceless tiger salamander is common, and may be seen on wet evenings in summer, when it is found at or near its breeding ponds. Look for it particularly at the ponds in the Lamar area.

As cold-blooded animals, the amphibians and reptiles must hibernate, and can be seen only in the warmer months, if at all. Some are so scarce—or, like the rubber boa, are so secretive in their habits—that you may have difficulty finding them.

Always keep in mind that, in this national park wilderness, all species of vertebrates, from eagle to coyote to jackrabbit to garter snake to toad, are protected. The only exceptions are fish caught according to park regulations. It is your right to enjoy Yellowstone's animals, and your responsibility to respect their sanctuary.

The widely distributed tiger salamander (upper left) and the spotted frog (left), a northwestern species, are predators—primarily on insects. In turn, these amphibians provide food for birds, fish, reptiles, and mammals. The Lamar Ponds (opposite) are a good place to look for amphibians as well as water birds.

PROTECTING WILDLIFE HABITAT

Wildlife managers everywhere recognize today that there is nothing so important in wildlife preservation as maintaining good habitat. This means an environment in which all the basic needs—food, water, air, shelter from the elements, protection from enemies, and living space—are available in sufficient quantity and quality. An inadequate supply of just one of these will affect the health and stability of an animal population. Living space, in the case of large browsers and grazers that move from the high country to the lowlands in fall, can be a problem even in a park as large as Yellowstone—for the historic winter range of some animals may lie outside the park boundaries, in lands that are fenced for domestic stock or open to hunting.

"Living space" entails also the freedom from crowding or disturbance by humans. It is because of this that boats are excluded from the streams of Yellowstone. If canoes, rafts, or motor craft were allowed on the rivers, the presence of humans would drive many species away—in effect depriving them of needed nesting, feeding, and resting areas.

The fishing restrictions, which may seem severe to some visitors, are designed to help protect another element of good habitat—an adequate supply of natural foods. The list of wild animals in Yellowstone dependent wholly or partly on fish includes dozens of species.

Winter and early spring in Yellowstone cannot be surpassed for offering countless opportunities to see and photograph wildlife. Snow forces the elk, deer, bison, and bighorn down from their high country summer range to the valley bottoms and surrounding open slopes, many of which are adjacent to park roads. Only at this time of year can you get a true impression of the huge numbers of Yellowstone's animal populations, which in summer are distributed over a much larger area of the park.

But at any time of year Yellowstone presents one of North America's classic wildlife displays. Very few places remain where a visitor can thrill to the sight of the magnificent trumpeter swan, watch wild bison grazing in a totally unrestricted environment, or just know that he is a guest in one of the last domains of the grizzly and the wolf.

—Bill Perry

Hayden Valley (above) is one of America's prime wildlife-observation areas.

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