

During winter in Yellowstone National Park, US, bison gather around the steaming hot springs at Lower Geyser Basin, Firehole Valley. On very cold nights, when the mercury drops below -20°C , the steam freezes onto their coats and forms frost. In the coldest season many bison migrate into the valleys from their higher summer ranges as the warmth from the geysers helps melt deep snow and some grazing areas remain accessible. The grass contains elevated levels of silica, which wears the bison's teeth down more quickly, and reduces their lifespans. Locals say: "In summer bison feed on cereals, but in winter they eat the box."

IN THE BLEAK THE MIDWINTER

When temperatures fall in Yellowstone National Park, US, it can be a hostile place to live in. Discover how animals survive during the coldest months. Words and photos by **Nick Garbutt**.





ABOVE The reintroduction of wolves in 1995 is one of Yellowstone's defining achievements. The subsequent shifts in the ecology of the park have been dramatic. Before the wolves returned, the elk population was artificially high, riverside vegetation was overgrazed and beaver populations had declined. Now, elk numbers are kept in check, riparian areas such as Soda Butte Creek have recovered and beavers are thriving.

LEFT Geothermal changes caused the Firehole Valley to become flooded with hot water from nearby geysers. This killed the lodgepole pines, which now stand in stark, ghost-like splendour. They look especially dramatic in the monochrome palette of winter.



ABOVE Many moose move to lower elevations outside the park during winter, but they can still sometimes be seen grazing in the area where Soda Butte Creek joins the Lamar River. This bull will shortly shed his antlers, before regrowing them in time for the autumn rut. Being mainly at high elevations, Yellowstone is not ideal moose habitat: the park supports fewer than 200 animals.

LEFT During the summer, bighorn sheep are found on high mountain pastures throughout Yellowstone, but in the colder months they make their way down to the valley bottoms. Where snowfall is deep, they dig away with their front legs to reveal the coarse grass beneath.



While bobcats are not uncommon, they are rarely seen and can be frustratingly secretive. However, during the winter, they often move to more accessible areas such as the Madison River Valley to hunt. Because the river is fed by hot water from geothermal springs – via the Firehole and Gibbon Rivers – it never freezes, even when the air temperature drops below -30°C . This makes it a regular haunt for goldeneye ducks, trumpeter swans and other waterfowl, which bobcats hunt. This individual was remarkably tolerant while Nick watched it patrol along the edge of the river. The feline walked through areas of deep snow, which made following it to get in a good position to take a photograph, a big challenge.



LEFT This sun pillar at Grand Canyon of the Yellowstone is an optical phenomenon that forms when light is reflected off ice crystals suspended in the atmosphere. When temperatures drop below -25°C at night, spray from the Lower Falls of the Yellowstone River freezes and hangs in the air. When the sun rises over the canyon rim, light hits the crystals and they twinkle in the air like fairy dust. From a particular viewpoint nearby, the beam always appears to strike the same tree that grows precariously on the cliff edge.



ABOVE A red fox hunts in the Hayden Valley. This remote area has a lower coyote population than other places in the park and is an excellent location to spot red foxes in winter. It's possible to encounter as many as five or six individuals on the lookout for rodents that live in the labyrinth of tunnels beneath the deep snow.



LEFT North America's largest waterfowl species rests on the frozen edge of the Yellowstone River. By 1930, trumpeter swans had disappeared from 48 states due to habitat loss and hunting – Yellowstone was one of their few refuges. Today, the population on the continent has recovered to about 46,000 birds but fewer than 30 live in Yellowstone. They can be seen along the Madison River and Upper Yellowstone River.

NICK GARBUTT is an award-winning wildlife photographer and author with a passionate concern for biodiversity. He has been visiting Yellowstone National Park for many years to photograph the species that live there. Find out more at www.nickgarbutt.com