

A mountain hare is captured in mid-leap on a snowy mountain slope. The hare's body is a mix of grey and white, and its long ears are upright. The background is a vast, snow-covered landscape under a clear blue sky. The word "Hidden" is overlaid in white text on the upper part of the image.

# Hidden

Winter's here and Britain's mountain hares, ptarmigans and stoats are swapping their summer colours for white winter coats to blend with the landscape and evade predators. We look at the amazing art of animal camouflage

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icture this: a white mountain hare nibbles bark from a young tree. It should be nearly invisible, its pale fur blending into what's normally a snowy backdrop. But, against this brown landscape, it's as conspicuous as the cue ball on a snooker table. A golden eagle circles above. A fox stalks it from afar. Immensely vulnerable, its plight brings home one more unfortunate implication of climate change.

It's a scene that is playing out today in the Cairngorms National Park. Nicknamed the 'roof of Scotland', this is one of the most mountainous landscapes in the UK, with 1,300m-high peaks, steep-sided glens covered with ancient pines and swathes of heather.

It's Britain's largest national park and has long been celebrated as the place to go to feast your eyes on amazing Arctic-style landscapes without having to set foot on a plane. But its dramatic snowy ridges may soon be a thing of the past.

Rising winter temperatures here mean that snow is falling later, sticking less and melting earlier. Couple that with the odd colossal dump of snow and you have a very unpredictable environment. 'The trends in snow cover are bewilderingly

in plain sight

difficult to understand,' says Professor Des Thompson, principal advisor on biodiversity at Scottish National Heritage and co-author of the book *The Changing Nature of Scotland*. 'Although we've seen a great reduction in snow cover over the past decade, we've also seen a rise in extreme snowstorms,' he says.

The unpredictability of the weather has created what experts have dubbed a 'mismatch' – the twice-yearly colour change that several British creatures have evolved to protect themselves is now putting them in danger. 'Winter-white ptarmigans and mountain hares are more exposed to golden eagles on higher ground, while the stoats lower down are more likely to be taken by predators such as foxes and owls,' says Thompson.

### Survival of the fittest

In winter, the ptarmigan, an ice-age survivor nicknamed the Arctic grouse, trades its grey-brown plumage for white. It also develops thick feathering on its feet that acts like snowshoes and helps keep them warm.

Meanwhile, the stoat changes its chestnut summer coat for ivory winter camouflage, with just the tip of the tail remaining black. These 'stoats in ermine' have been hunted for centuries for their pelts, which were made into luxurious black-spotted capes for the nobility. In 1937, 50,000 stoat pelts were sourced for the coronation of King George VI.

Then there's the mountain hare, which switches its russet brown fur for a white winter pelt to help it escape predators such as the Scottish wildcat and golden eagle, whose eyesight is up to three times sharper than that of humans. ●

## In white against a rocky backdrop, the hare's ability to freeze stock still is useless



Top: A white mountain hare is a sitting target for predators against the rocks. Above right: a ptarmigan crouches low to escape the eye of a bird of prey. Left: A golden eagle feeds on a hare




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### Where to see the colour changers

- **WINTER-WHITE PTARMIGANS** can only be spotted in the Scottish Highlands, notably in the Cairngorms National Park.
- **MOUNTAIN HARES** are most commonly found in northern Scotland, but they can also be seen in the Peak District.
- **STOATS** can be spotted across Britain, but are more likely to develop their ermine pelts in colder parts of the country.



Words: Catherine Gray, Photographs: Alamy, iStock

Trapped against a rocky backdrop in their winter white, these three creatures are effectively screaming 'eat me' to their predators. Peregrine falcons have a fondness for ptarmigans and hen harriers scan the mountainside for stoats, while foxes will happily eat any of the three.

In such conditions the hare's ability to freeze stock still becomes useless, while its 45mph running speed is not enough to escape an eagle. At the same time, the benefit of the stoat's black tail – which aims to draw predators into striking that rather than its white, near-invisible body – also disappears. The lack of camouflage limits its chances of hunting success, too, rendering it instantly visible to prey.

The animals' switch from brown to white doesn't happen

magically overnight. Instead, the change is similar to the greying process in humans as we age, when we gradually lose our naturally pigmented hair and it grows back white. The difference between humans and animals is that the ptarmigan, stoat and mountain hare shed their darker coats over a much shorter period – and, sadly, unlike them, we can't switch back our white hair in spring. These creatures' new winter coats and plumage are pigment-free. Light reflected off the transparent hairs and feathers is scattered diffusely, making it look as though it's white. Instead of pigment, each hair is filled with tiny air pockets that operate as a natural form of insulation, and the scattering of light in the lower layers of fur and feathers also helps keep the creatures warm.

### How is the colour change triggered?

The big colour change is thought to be triggered by the seasonal decrease in daylight hours and, possibly, falling temperatures. Fur and feathers get their colour of black, brown, red and anything in between from a chemical called melanin. In autumn, hormones send a message to the brain telling it to slow or halt melanin production. In spring, longer daylight hours trigger a reversal and the creatures' colour returns. In all cases, it's an automatic process, so even when there's no snow, the animals have to wear their winter garb.

Some experts say Britain's seasonal-switching species will

## 'The creatures will need hundreds of years to adapt to the changing snowfall'

evolve to fall in line with the later snowfalls and earlier melts. 'But the ptarmigan, mountain hare and stoat will need hundreds of years to adapt,' says Professor Thompson. Indeed, evolution is a slow process. 'That is the greatest difficulty of all, since the speed and unpredictability of the weather change is so great,' he adds.

But there is some hope. Thompson also reports an 'upward expansion of woodland, as grazing pressures are reduced.' More Scots pine, birch, alpine willows and heather on higher ground in the Cairngorms could provide them with places to hide from prey while they adapt their moulting calendars.

It would be terrible if the trait that's evolved in these animals leads to them becoming the feast at too many banquets for Britain's foxes and eagles. But, as the tale of the snowshoe hare (left) shows, nature is adept at providing solutions. Let's just hope it happens soon enough. 🐾



### The tale of the snowshoe hare

In the US, biologist Dr Scott Mills noticed white snowshoe hares hopping around against a brown landscape and noted they were moulting around 10 October, regardless of snow. After tagging studies and examining climate-change models, he concluded that, by 2050, the hares could be mismatched to snowfall by up to 36 days, increasing their chance of death by seven per cent. Yet some US snowshoe hares are changing later, while others on the Pacific coast aren't changing at all. 'It makes me optimistic they can adapt by evolutionary change,' says Dr Mills.



Top: A change in daylight hours is thought to trigger the stoat's switch from brown to white