Alien invaders!

Words by Dan Eatherley

Many Brits pride themselves as stoic defenders of a green and pleasant land, boasting a record of resistance against aggressors dating back centuries, be it weathering the Spanish Armada or defying Hitler's Blitzkrieg.

Yet a cursory examination of the natural world reveals that, while many interlopers of the human variety have been kept at bay, our islands have been colonised throughout history by a succession of animals, plants, fungi and other organisms that apparently belong elsewhere.

Cumbria has its fair share of invasive species, and is doing what it can to manage them. Everyone's familiar with the introduced grey squirrel, which has spent more than a century spreading inexorably north, stripping bark, chewing cables, bossing suburban bird-feeders, and, worst of all, displacing our native red squirrel. A valiant rearguard action is now being fought by thousands of volunteers against the bushy-tailed troublemaker, with sixteen reserves set aside across the county and neighbouring Northumberland to protect the beleaguered red. But there are plenty of other invaders menacing Cumbria.

Many of these have been deliberately introduced by people for food, leisure or out of simple curiosity, while a host of others have arrived accidentally as

stowaways. These include plankton suspended in the ballast water of ocean-going vessels, the legions of wood-boring beetles holed up in internationally traded furniture, the seeds and spores peppering the mud of a tourist's hiking boots, the soil-borne invertebrates hitching a ride in plant pots.

In recent decades, the pace of arrivals has risen as today's globalised economy drives unprecedented levels of exchange between countries and regions, offering an unparalleled wealth of invasion opportunities for hitch-hiker organisms. Fortunately, most plants and animals brought to Britain fail to establish here – the weather has a lot to do with that! – and of those do succeed, only a fraction will ever earn the title "invasive species" by spreading uncontrollably, harming native fauna and flora and causing other environmental, economic or social problems.

Signal crayfish (*Pacifastacus leniusculus*)

Hailing from the west coast of North America, this crustacean gets its name from a whiteish patch atop the rear section of the hefty brick-red claws which were once (erroneously) thought to be brandished, flag-like, at other crayfish. Signals are now widespread across England and Wales since their introduction in 1976 by the Ministry of Agriculture, Fisheries and Food in a bid to diversify agriculture. Unfortunately, the signals pass on a fungal-like disease, called 'crayfish plague', to indigenous white-clawed crayfish which die within weeks of being infected. Meanwhile, the signal's burrowing activity undermines river banks, increasing the risk of flooding. The silt which is released into the water smothers invertebrates and clogs the spawning grounds of salmon and brown trout, whose eggs and fry the signal will also consume. Eradicating signals from Britain's waterways has so far proved impossible: simple trapping tends to remove only the larger crayfish, while releasing pesticides risks harming other wildlife. In fact, research in the Czech

Republic found that signals shrug off chemical treatments toxic to most other lifeforms. What's more, when crayfish-infested ponds were pumped dry in the autumn and refilled the following year, the animals reappeared as if nothing had happened even though winter temperatures had plunged to -20°C.

American mink (*Neovison vison*)

The American mink, a member of the mustelid family (which also features weasels, stoats and otters) got off to a relatively sluggish start in Britain. The first animals were brought in 1929 from eastern Canada and Alaska for fur farming, and although escapes occurred within a few years of their

Above: American mink (Jan den Oudentif). Below: killer shrimp (Environment Agency). Left: New Zealand pygmy weed (Ashley Balsam Baz/CC-by-2.0). Previous and facing pages: signal crayfish (Astacoides/CC-by-3.0 & Roger Tabor/USFWS)

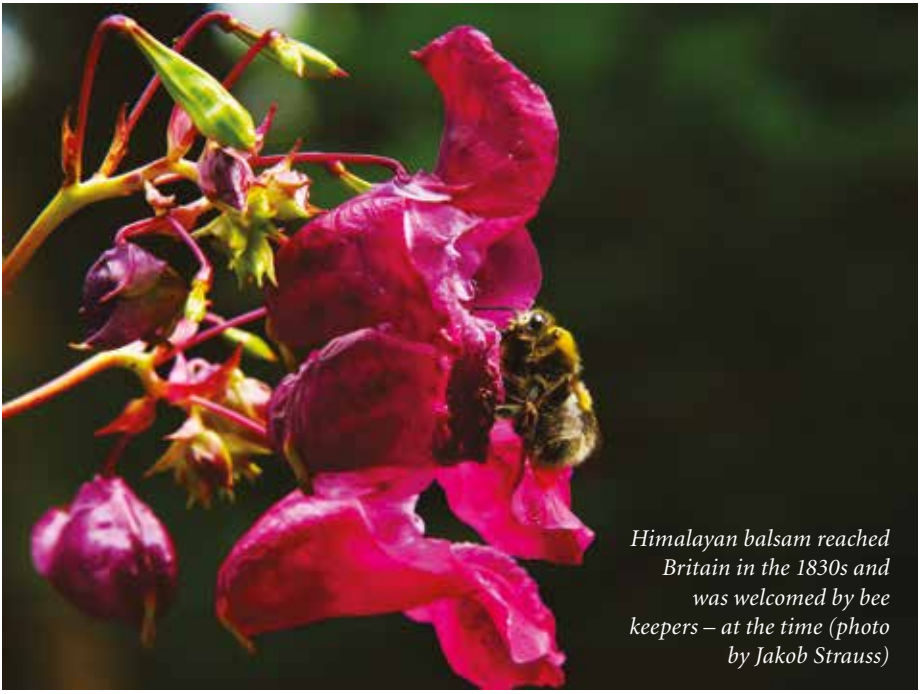
introduction, until 1956 the species wasn't known to breed in the wild. The industry intensified after World War II, peaking in the early 1960s, with 700 establishments across England, Wales and Scotland. Mink farming took a nosedive during the late 1980s, partly the result of the collapse of the Soviet Union, then a major export market. With businesses folding left, right and centre, unwanted mink were often turned out into the surrounding countryside to save any further expense. Today the species is entrenched the length of the country, even colonising remote Scottish islands where the species wipes out colonies of nesting gulls, terns, lapwings and redshanks. On the mainland, meanwhile, the mink is blamed for devastating the UK's water vole population. Fortunately, a resurgence in populations of native otter, a much larger mustelid which will aggressively dislodge the American interloper, seems to be turning the tide in some parts of England.

Killer shrimp (*Dikerogammarus villosus*)

The killer shrimp – yes that is its actual name! – is one of Britain's newest freshwater arrivals, turning up in a Cambridgeshire reservoir in 2010. No-one is sure how it got there, but the likelihood is that it arrived by hitching on contaminated boats, clothing or fishing equipment. This fast-breeding omnivore with outsized mouthparts is notorious for indiscriminately shredding invertebrate prey, and is among a host of aquatic invaders that are spreading from the Black, Azov and Caspian Seas. Collectively known as Ponto-Caspian species, these also include the closely related demon shrimp (another voracious predator), as well as the quagga and zebra mussels, all of which are now breeding in our waterways. Since the 1990s, major new canals in eastern Europe have acted as trans-continental highways for invasion, with aquatic organisms hitching a ride on passing ships or simply drifting with the current. Like other Ponto-Caspian species, the killer shrimp has a natural tolerance to wide fluctuations in water salinity, an adaptation enabling it to exploit a range of new habitats, and is thought to have covered an astonishing 500 kilometres in a single year. Most alarming of all is that Ponto-Caspian species seem to facilitate each other's invasiveness: for instance, accumulations of tiny quagga and zebra mussels offer perfect hiding places for the killer shrimp, whose striped pattern allows it to blend in. The shrimp – which benefits from a ready source of nutrition, the mussels' droppings – is in turn eaten by other larger non-native predators, including fish like the round goby, whose population is now massing in the rivers of western France.

New Zealand pigmyweed (*Crassula helmsii*)

Identifiable by its tiny succulent leaves, pinkish-white flowers and long straggly stems, this aquatic perennial made its debut in 1911, when some plants were brought over from Tasmania to oxygenate British ponds. This is something of an irony, since pigmyweed often does the reverse, forming dense floating mats of vegetation and slowing down currents that would otherwise



Himalayan balsam reached Britain in the 1830s and was welcomed by bee keepers – at the time (photo by Jakob Strauss)

aerate the water. In addition, when the plants die off, the rotting process further depletes oxygen from the system, killing off fish and other aquatic organisms. As with many invasives, the species took a while to naturalise; the first wild record wasn't until 1956 when the plant was spotted in ponds near the Essex village of Greenstead. Since then, pigmyweed has made up for lost time and is today found throughout much of Britain and the European continent, as well as in the USA. Getting rid of it is almost impossible. Conservationists have thrown everything at it: herbicides, boiling hot foaming agents and dye treatments to stop photosynthesis. They've also tried covering the stuff with black plastic bags and have even resorted to digging a whole new pond, transferring everything across – minus the pigmyweed – and burying the old one. Nothing seems to work.

Himalayan balsam (*Impatiens glandulifera*)

Ranking high on lists of Europe's worst invasive plants, the Himalayan or Indian balsam is sometimes known as "jumping jacks" or "stinky pops", referring to the facility with which its seed pods, when ripe, detonate at the slightest disturbance – be it a drop of rain or the flick of a child's finger – spraying their contents far and wide. The species was first brought to Britain from its native foothills in Nepal, India and Pakistan in the late 1830s. By 1890, Himalayan balsam – which, when full-grown, attains heights of two metres or more, making it Britain's tallest annual plant – was spreading at a rate of 645 square kilometres every year. The

A family of coatimundi: could escapees still be living wild in Cumbria? (Murray Foubister/ CC-by-2.0)

balsam was helped along by the nation's beekeepers, appreciative of its lengthy flowering season and abundance of nectar, who deliberately planted it close to their apiaries. Shooting up on prime waterfront early in the growing season, the balsam shades out perennial natives while monopolising insect pollinators with its irresistible summer-long bonanza of nectar. Then, at the end of the season, being an annual, it promptly dies off, leaving behind an empty bank which, in the absence of the stabilising roots of the displaced perennials, washes away in the first major flood of the winter, the released silts choking fish eggs and aquatic invertebrates.

A few others

Among the other non-natives in Cumbria is the topmouth gudgeon (Pseudorasbora parva), a small freshwater carp from Asia known to strip away the scales of live adult fish to nibble at the exposed flesh. A population of topmouth was eradicated from Ratherheath Tarn near Kendal in 2005. Then there's the coatimundi (*Nasua nasua*), a raccoon-like mammal from South America thought to have escaped from a local zoological collection; small numbers might still be living wild. And we haven't even mentioned sika deer, skunk cabbage, giant hogweed or rhododendron… ■

● *Environmental consultant Dan Eatherley is author of* Invasive Aliens: Plants and Animals From Over There That Are Over Here *(William Collins, £16.99), due to be published on July 11.*