

Furry aliens on Europe's hit list

A blacklist of 37 invasive species to be wiped out or controlled could protect native wildlife

Aisling Irwin

OBLIVIOUS to his sterilisation, Judas the raccoon dog treks through Sweden's countryside in search of a mate. At last he finds one, only for their liaison to end when she is shot. He trudges on and finds another, but she is killed too. This is his destiny: he is a

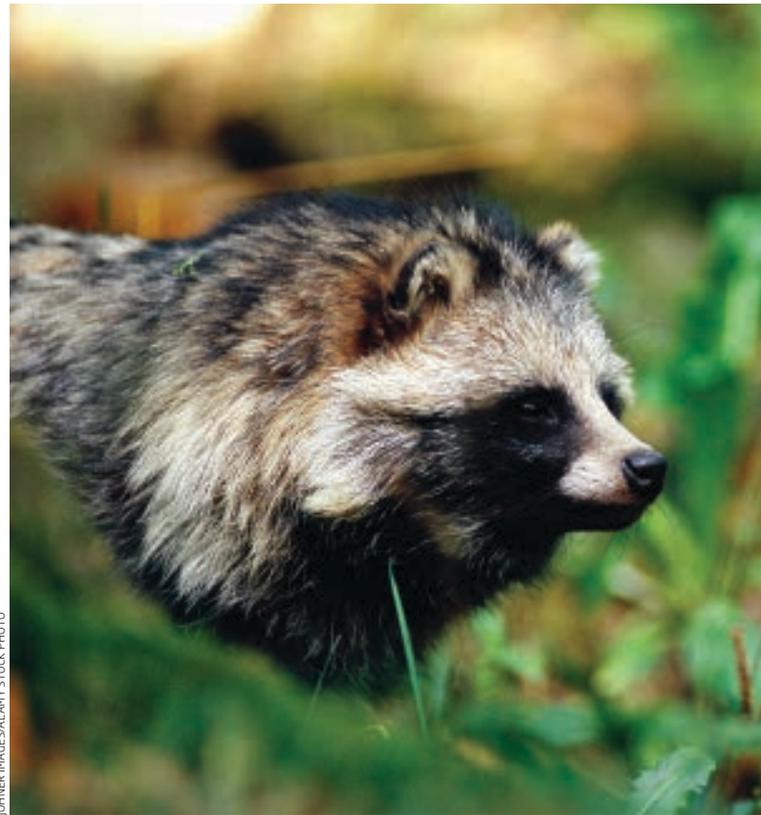
radio-tagged lure leading hunters to the last live raccoon dogs in the country.

The Swedish war on the raccoon dog (*Nyctereutes procyonoides*), a furry, short-legged mammal spreading west across Europe, is a rare success against alien species. And the European Commission hopes to support similar efforts when, later this month, it officially publishes a blacklist of 37 invasive plants and animals.

All these species will require action across the European Union under its regulation on invasive alien species, which became law last year. Member states will be obliged to prevent these species entering their countries; to quickly detect and eradicate them if they do invade; and to manage invasions that are already established. Also, purchases of these species and their commercial breeding and import will be illegal, as, of course, will wild releases.

The list will include several species of crayfish, plus the ruddy duck and the grey squirrel, nemesis of the red. Key future threats are also listed, such as the squirrel-like small Asian mongoose (see "Top 10 invasive threats to Europe", left).

The vast majority of alien species are benign, but some threaten native biodiversity. Leave it too long and it can be too late to deal with them, as the case of the raccoon (*Procyon lotor*), also on the list, shows. Raccoons were introduced into Germany from North America in the last century, and their population there has now reached 1 million. They feast on crops and eggs, cause damage



JOHNER IMAGES/ALAMY STOCK PHOTO

to houses and transmit diseases that humans can catch, such as raccoon roundworm.

"There's not much we can do now," says Marten Winter at the German Centre for Integrative Biodiversity Research in Leipzig. Even hunters can't be bothered with them nowadays, he says. "Once you have one hat you don't need more. And you can't eat them because of parasites."

The blacklist is motivated by European Environment Agency

"There's not much we can do about wild raccoons now. Once you have one hat you don't need more"

figures showing that invasive species cost Europe at least €12 billion per year in human and animal health costs, decreased crop and fish yields, damage to infrastructure and river navigability, and in harm to protected species. The idea behind the list is to get member states to

work together for more effective results, something Francisco José García, an independent biologist from Spain, says is essential.

Spain, too, has an epidemic of free-roaming raccoons, which began when a generation of kids fell in love with one in the film *Pocahontas* and demanded their own. Many pets ended up in the wild, and since then several regions have been assiduous in launching eradication campaigns, García says.

But in central Spain, where raccoons pose a great threat to migrating birds, crops and plants, the populations are older and larger as control programmes began too late and lack resources. Various public organisations are working "with an obvious lack of coordination and technical criteria", García says.

Escaped mammal predators, such as raccoons, can flourish in Europe for several reasons. Prey in intensively farmed fields is easier for them to spot, and as generalist

TOP 10 INVASIVE THREATS TO EUROPE

A team of 43 researchers across Europe has compiled a list of the top 95 invasive species threats to Europe over the next decade. The work was funded by the European Commission to inform future versions of its forthcoming blacklist (see main story).

The researchers assessed every species using factors such as the likelihood of its arrival and the scale of its impact. Here are their top 10:

Alligator weed

Alternanthera philoxeroides

Devil firefish

Pterois miles

Small Asian mongoose

Herpestes auripunctatus

Finlayson's squirrel

Callosciurus finlaysonii

Common kingsnake

Lampropeltis getula

Golden mussel

Limnoperna fortunei

Rusty crayfish

Orconectes rusticus

Northern brown shrimp

Penaeus aztecus

Western mosquitofish

Gambusia affinis

Striped eel catfish

Plotosus lineatus

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Destined to loneliness

eat, they can often survive on urban leftovers too. And rabies, which used to hold mammalian populations in check, has largely gone from Western Europe.

In such an environment, acting early and decisively is vital, says P-A Åhlén of the Swedish Association for Hunting and Wildlife Management. When the Swedish government tasked his association with eradicating raccoon dogs and gave him a budget – now at €800,000 a year – he swiftly recruited a team of professional hunters.

They erected cameras over an area three times the size of Denmark, trained dogs to sniff out the pests and encouraged the public to report sightings. The raccoon dog population is now so low that they have to recruit their “Judas” animals from outside the country.

But it can be hard to act decisively. For example, the American mink (*Neovison vison*) has devastated some ecosystems,

but it divides nations because those with lucrative mink fur farms fear its inclusion in the blacklist. In fact, mink will not be on the list because the damage it causes has yet to be scientifically assessed.

Divisions over how to treat newcomers are also illustrated by the golden jackal (*Canis aureus*), which is spreading rapidly from south-eastern Europe and the Caucasus – thanks in part to climate change.

But is it an alien?

The Baltic states, where it was first spotted in 2011, have declared it an alien. Yet in Italy it is protected. The European Habitats Directive lists it as an animal whose hunting should be compatible with its survival as a species.

This contrast arises largely because in some countries the golden jackal is thought to have returned after a long absence, whereas others have never seen it before. So, is this wolf-like creature to be welcomed or fought? Legally, the answer lies in whether it arrived through human intervention – in which case it is deemed an alien.

Last year, a team led by Wieslaw Bogdanovicz of the Polish Academy of Sciences in Warsaw revealed that Baltic golden jackals are descended from a population that moved there naturally. “We have proved it is not an alien species,” says Bogdanovicz. As a result, he says, Estonia has reversed its classification as an alien, and Lithuania may do the same. Being indigenous to parts of Europe, the golden jackal may never be added to the blacklist.

Over 90 per cent of newly arrived species are no trouble, says Helen Roy of the Centre for Ecology and Hydrology in Wallingford, UK, whose team has published its own report on future species threats to Europe. The value of studies like this, and the blacklist, is that prevention is always better than cure. n

Milky Way retired early from star-making

OUR galaxy is past middle age and could be gradually dying. A team of stellar archaeologists have found the first evidence that the Milky Way suddenly stopped giving birth to stars after it formed a thick saucer-like disc around 8 billion years ago, suggesting such “quenched” can happen even before a galaxy runs out of gas.

Galactic life cycles were thought to be driven largely by how much gas a galaxy has to build new stars with. But it was unclear whether most galaxies lose their raw material abruptly when it is ejected by supernovae or a central black hole, burn through their reserves slowly, or stop growing for some other reason.

Misha Haywood at the Paris Observatory and his colleagues decided that studying our own galaxy is the best way to address this question. They probed the chemical signatures of tens of thousands of stars – a clue to their ages – recorded by a high-resolution spectrograph at the Sloan Digital Sky Survey telescope in New Mexico. With the data, they were able to reconstruct a record of the Milky Way’s past.

They found that our galaxy’s star formation rate dropped by an order of magnitude between 10 billion and 8 billion years ago. It resumed forming stars after this sudden die-off, but at a much slower rate.

This epoch was also when our galaxy formed its bulging disc and bar-like concentration of stars at its centre. “There seems to be a connection between quenching in the Milky Way and its thick disc,” Haywood says.

That means a galaxy can stop growing even while it has reservoirs of gas, as the Milky Way does. Haywood argues that the disc and bar structures could disrupt growth by stirring up the gas, making it too hot to form new stars (arxiv.org/abs/1601.03042). Other spiral galaxies too distant to be probed by these methods could be ageing in a similar fashion.

“Star formation boils down to a battle between gravity and other things, like turbulence,” says Katherine Alatalo at the Carnegie Observatories in Pasadena, California.

“It was unclear whether most galaxies lose their fuel abruptly or burn through reserves slowly”

Our galaxy’s disc and bar cause the gas to become turbulent, injecting energy that prevents it from collapsing and initiating star formation, she says. “Their results with the Milky Way give us subtle clues about what we should be looking for in other evolving spiral galaxies, too.” Ramin Skibba n



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Over the hill