

Column John Dawes

EXOTIC, INVASIVE, OR EXOTIC AND INVASIVE?

During my undergraduate studies at the University of Keele in Staffordshire, England, I studied biology and geology. One of my assignments was to produce a geological map of a 10-square km. area of the Peak District that lies between the counties of Staffordshire and Derbyshire.

Something very strange happened during my first day...I was taking rock strata measurements in a small quarry when I heard a noise behind me. I span round and there, looking me straight in the eye, was...a small kangaroo!

I thought I was going crazy. A kangaroo? In Staffordshire, England? I took a black-and-white photograph (this was over 30 years ago) so that I could prove that I had, indeed, been visited by a kangaroo in the wilds of the Peak District.

Exotic or Invasive?

I subsequently discovered that there was not one, but a small colony of rock wallabies (*Petrogale* sp.) - as these small kangaroos are known - living and breeding in the area. Apparently, they had escaped from a private collection many years earlier and were surviving and breeding half a world away from their native lands. However, the number of individuals was, and remains, small; reports range from about 25 to 60.

A species such as this, that occurs outside its natural range, is referred to as an exotic or alien species in its adopted home. Within its natural area distribution, it is a native or indigenous species.

During my last visit to Sri Lanka in 1997, fellow OFI member Vibhu Perera (Lumbini Aquarium Wayamba Ltd.) kindly arranged for me to visit an aquarist who was breeding Bettas. On the way, we stopped at a large lake. At least, there was a large lake there, but it was almost completely smothered in a green carpet of water hyacinths (*Eichhornia crassipes*).

Just as the rock wallaby is not native to the English Peak District, these water hyacinths are not native to Sri Lanka. In fact, they are South American, although they are now found in numerous tropical and subtropical areas around the world. Also, like the



Rock wallaby (*Petrogale* sp.)...unlikely and unexpected resident of the English Peak District. Photo: John Dawes



wallaby, the Sri Lankan water hyacinths are an exotic or alien species.

However, there is also a very important difference between the two. The rock wallaby population has remained small and has not spread over any significant distance. In other words, it has not invaded or encroached on the range of native species to any extent. The water hyacinth, on the other hand, has not just invaded the range of other aquatic plants within Sri Lanka, but that of other species in numerous other regions as well. This plant is therefore, not just an exotic or alien species in these regions, but an invasive one as well.

A Matter of Definitions

The line dividing an exotic non-invasive species and an exotic invasive one is, of course, very difficult, if not impossible, to define with absolute accuracy. Nevertheless, it is there and we all need to be aware of its existence, just as we need to have it very clear in our minds what the difference between an exotic/alien species and an invasive one is.

By definition, an exotic or alien species is only so outside its natural range. It is, in other words, a species that has been introduced into an area from a foreign country or region. This, of course, has absolutely nothing to do with whether the species becomes established or not in this non-native environment. Going a stage further, biological dictionaries (e.g. Henderson's Dictionary of Biological Terms, 11th Edition, Longmans, 1995) define an exotic species as "a foreign plant or animal which has not acclimatised or naturalised".

The same dictionary goes on to define acclimatisation as "the gradual habituation of an organism to a different climate or environment; adaptation to slowly changing new conditions". It then defines a naturalised species as one that has "become successfully established".

This dictionary doesn't include a definition for invasive. However, other dictionaries do and, generally, they regard an invasive species as one that encroaches on the territory of another species. This has nothing to do with whether the invader is an exotic or a native species. Given favourable conditions, a native species which has the in-built capacity to out-compete other native species will do so.

If we apply the above to the two cited examples, it becomes clear that the rock wallaby, while being able to survive within the English Peak District, has not been able to acclimatise sufficiently well to become naturalised to the extent that it poses a threat to native species. The water hyacinth, in stark contrast, most certainly has. It is therefore, not just an exotic species (in that it originates elsewhere), but a highly invasive one as well.



There is a lake somewhere beneath this thick mat of water hyacinths.

Photo: John Dawes

Significance for the Industry

Both exotic non-invasive and exotic invasive species are very important to our industry, since we deal with large numbers of such species on a daily basis. It is only through being aware of what they are, as well as of the relative threats they pose to native species, that we can understand why it is so important to keep such species under control, and to devise the best ways of doing so.

Today, our industry is undoubtedly far more enlightened than it used to be with regard to all manner of environmentally-related issues, from the pivotal significance of sustainable harvesting of natural resources, to ethical methods of collection. Control of exotics/invasives, however, appears to lag a little way behind. It should not be, though. This is a red-hot issue that we should be taking full note of and taking proactive measures about.

Hardly a week goes by without one report or other of an exotic species creating problems for native species of fauna and flora. Furthermore, in numerous instances involving aquatic species, the blame is attributed - quite wrongly, in many cases - to the ornamental aquatic industry. Yet, in at least some instances, we may, indeed, be the prime offenders, even when the releases into the wild have occurred quite unwittingly. Recent reports involving so-called 'aquarium' species have referred to snakeheads (*Channa* spp) in the U.S., lionfishes (*Pterois volitans*) along the eastern U.S. seaboard and, perhaps, the latest, the Mozambique mouthbrooders (*Oreochromis mossambicus*) in Queensland, Australia...but there are many more.

As these reports continue, the ornamental aquatic industry is being ever-more-closely watched...and not always in a sympathetic or even well-informed manner. We need to be conscious of this, especially within OFI, as our reputation

continues to spread and our organisation is ever-more-frequently being looked to for a lead in such matters.

In the words of our president, Svein Fosså, "Hardly any other entity is involved in the global dispersal of alien species to the scale that the ornamental aquatic industry is. By trading in non-native species from all over the world, our industry has a special responsibility to do all we can to avoid releases into the wild. When an introduced species turns out to be a successful invasive species, we may already have harmed the environment...while our industry is certainly harmed by any release. Every operator should take the maximum precaution to avoid escapes or releases from its own premises, as well as take appropriate steps to instruct its customers accordingly."

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Members of OFI are committed to supplying their best services, livestock, plants and products, giving the welfare of livestock top priority at all times.

They also agree to operate in a spirit of co-operation with each other and according to honourable standards of trading, both between each other and with non-members of the organisation.

Members further agree to settle legitimate complaints promptly and satisfactorily.