



Galanthus elwesii is one of 13 snowdrop species native to Turkey. Below: Matthew Mustard among the spectacular bulb carpets of Turkey's high plateaux



Turkish delights

In Turkey, native snowdrops and cyclamen, along with many other wild bulbs, are under threat from habitat destruction and over-collection. Matthew Mustard and Sırrı Yüzbaşıoğlu explain how scientists from Kew and Turkey are working together to conserve this unique resource

PHOTOGRAPHS BY MATTHEW MUSTARD

Where in the world can you still witness mile-wide crocus carpets, mountains smothered with snowdrops, and entire woodlands underlain by cyclamen? In Turkey. Not surprisingly, this country's richness of species, including about 13 snowdrop species (two endemic) and ten cyclamen species (six endemic), has led to commercial harvesting of bulbs from the wild and an international trade in bulbs.

Fortunately, Turkey has one of the best systems for balancing bulb collection from the wild with the conservation of the species in their natural habitats. In this sustainable-use programme, international trade in snowdrops and cyclamen is regulated by CITES (the Convention on International Trade in Endangered Species) because, without controls on harvesting, international trade could threaten their survival.

However, as is the case for many wild-collected species, there is frustratingly poor information about them. Where are they found? How threatened are their populations? What is the best way to conserve them? For the last three years, Kew scientists and Turkish botanical institute staff have been investigating the conservation status and sustainable use of snowdrops (*Galanthus*) and cyclamen – an initiative funded by the Department for Environment, Food and Rural Affairs (Defra).

Our work involved a mixture of traditional field botany and social and economic research. Using historic herbarium records, local knowledge, and the botanical expertise of Kew and Turkish scientists, we first located the species in their habitats. This was the difficult part: in the sites where they grow, snowdrops and cyclamen do tend to have large populations, but finding these sites usually involved interviewing local people, trekking for miles in the mountains and a very keen eye.

We often depended on legendary Turkish hospitality. To find possible sites, local people thought nothing of taking us on an hour's drive into the mountains and a long trek after that. At the sites, we recorded species and habitat information and collected plants for the national living plant and herbarium collections in Istanbul. Much of the night would then be spent writing up field records, pressing plants and preparing equipment for the next day.

Given the richness of Turkish species, it's surprising that only two snowdrop species and three cyclamen species are currently harvested for international trade, and these are actually some of those most frequently found in the wild. One example,

the giant Turkish snowdrop *Galanthus elwesii*, of which we've collected specimens with metre-long leaves, grows in the spectacular Taurus mountain range. Here, Turkish flower bulb companies employ local villagers to collect plants from targeted habitats. The Turkish authorities regulate these collections, set the annual collecting quotas and allocate them among the various bulb companies. The quota currently stands at 6 million wild plants per year – this may sound like an enormous



number but it represents only a very small proportion of the wild population.

There are also initiatives for local villagers to propagate plants for international export in their gardens and fields. In these areas, local communities benefit from the sustainable harvesting of their wild resources, and the habitats in which they live are conserved to provide a valuable commodity. As a result, the species-rich high-altitude plateaux where these bulbs are collected remain a magnificent multi-coloured sight in spring. The local people value this wonderful resource, which also helps to secure its future.

But for species that aren't collected, the picture is very mixed. Some are known only from very rare sites of which there is little

Clockwise from top left: 6 million *Galanthus elwesii* plants can be gathered per year in the Taurus mountains; only three of Turkey's ten cyclamen species are gathered for sale abroad;

Sırrı Yüzbaşıoğlu (left) finds out about a village bulb propagation scheme; *Cyclamen hederifolium* is one of the most popular cyclamen species sold in the UK

local knowledge or interest. In March 2003 we visited the only known locality of *Galanthus trojanus* (newly described by Kew botanist Aaron Davis in 2001). This habitat fragment sat in the middle of intensively grazed pasture and was clearly showing signs of grazing damage. Even worse, a quarter of the habitat had just been cleared for a new road. We even found plants flowering in the roadside rubble! Fortunately, as night fell on the same day we discovered a completely separate and much larger population of *G. trojanus*, so its future may not be as bleak as we first thought.

It is clear that species such as this are not valued enough to warrant conservation. At

present their future in their natural environment seems uncertain. However, attempts to propagate them and introduce them into trade are under way.

Investigating the propagation and trade in snowdrops and cyclamen was the other aspect of our research. We visited villages that propagate the species, as well as the bulb companies, documenting propagation techniques, harvesting systems and views on the flower bulb trade and conservation.

There are four companies in Turkey that propagate snowdrops, cyclamen and other Turkish bulbs, such as *Fritillaria*, *Sternbergia* and lilies, for

international trade. All the companies were happy to show us their systems. They're clearly keen to incorporate new species and techniques into their business. Outside Izmir in western Turkey, Mr Yasemin of Yasemin Nurseries took us through his rapidly expanding bulb propagation system. In his main nursery, he showed us how

Top row, left to right: Sırrı Yüzbaşıoğlu enlists local help to track down rare bulb populations; propagation trials of *Galanthus fosteri*

Bottom row, left to right: cyclamen grow readily from seed; women planting cyclamen; commercial production of *Galanthus elwesii*

he propagates cyclamen from seed. One large bucket of seed, he told us, would turn into five truckloads of cyclamen in three years' time. We were also surprised to come across medium- to large-scale propagation of a snowdrop species and cyclamen varieties yet to enter international trade. It's clear that Turkish bulb companies are not only interested in but are actually researching the propagation of rare varieties for national and international trade.

In spite of such initiatives, several snowdrops and cyclamen species are increasingly threatened with extinction and their natural habitats are at risk. The Turkish government has designated a number of these important

sites as nature reserves. However, to ensure the long-term survival of these species and habitats, local communities have a vital role to play. Sustainable harvesting and propagation of these bulbs enforces the traditional role of the communities as guardians of the land and protectors of their livelihoods. We hope our research can provide the scientific data needed to ensure the best management of this unique resource. 🌱

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Left, top to bottom: *Cyclamen coum* is one of the hardiest cyclamen; *Sternbergia lutea* at Yasemin Nurseries; the survival of newly discovered *Galanthus trojanus* is uncertain

Above: after a long and exhausting day's plant collecting in the mountains, much of the night is spent pressing specimens and writing up field records