250th anniversary souvenir issue

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‘Simplify’, advised Henry David Thoreau, America’s great 19th-century naturalist. Simplify your needs and your ambitions and learn to delight in the simple pleasures that the world of nature affords. True to his words, near the end of March 1845, Thoreau began his ‘experiment in living’, described in his literary masterpiece Walden.

Not yet 30, he borrowed an axe and built a shack in the woods by Walden Pond, where he embarked on what would be a life-long study of the fields, wetlands and forests near the village of Concord, Massachusetts. ‘Over many decades, he wrote extensively about the natural history of the countryside, and kept meticulous notes on plant species and their flowering times,’ says Charles Davis of Harvard University Herbaria. Now, 150 years on, Davis and his colleagues have delved into Thoreau’s records and re-surveyed the locality to find out how well wild plants have fared in the intervening years.

The news is not good. Although two-thirds of the Concord countryside remains undeveloped, more than a quarter of the plant species Thoreau documented have been lost, and more than a third are now so rare that they too seem doomed to local extinction.

Davis suspects that climate change is to blame for much of the decline. The evidence lies in the pattern of loss among the 473 species that Thoreau recorded. ‘Certain lineages in the plant tree of life are far more susceptible to decline under rapid climate change than others,’ Davis says. ‘And those in decline include many of our most charismatic temperate wildflower species.’ Particular plant families have suffered far more than others, with the victims including anemones and buttercups, asters, blackberworts, dogwoods, lilies, mints, orchids, roses, saxifrages and violets.

What all these plants have in common is their flowering pattern. The species that have failed to respond to a rise in spring temperature by flowering earlier are the species that have suffered a dramatic decline in their abundance. By contrast, species that have advanced their flowering time in step with the warmer conditions still survive among the Concord flora (Proceedings of the National Academy of Sciences, vol 105, p17,029).

‘Our study has established for the first time that an evolutionary perspective is crucial when considering the pattern of species loss due to climate change,’ says Davis. ‘Groups of closely related species are being selectively trimmed from the tree of life, rather than individual species being randomly pruned from its tips.’

Thanks to Thoreau’s keen eye and appreciation of the natural world, this research may help to predict which plant species will be lost to rapid climate change, he says.

Gail Vines