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# Editorial

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This year, the International Year of Biodiversity, up to an estimated 58,400 species ceased to exist on Earth. This sobering statement is based on Conservation International's estimate of one species extinction every 9–44 minutes <[www.conservation.org](http://www.conservation.org)>. Although alarming, this information also serves as an imperative for international activity to face the facts of species decline.

The big, the cute and the cuddly rate high in promoting the biodiversity cause. They are good at attracting media attention and donations. Sadly, the likes of plants, fish and microbes are often relegated to the sidelines of public awareness. In the words of Global Crop Diversity Trust's Cary Fowler (p.4): "Charismatic biodiversity will be celebrated. Less charismatic biodiversity will be eaten."

Put simply, biodiversity is the variety of life on Earth. More specifically, Fowler makes the point that diversity within a species is just as important as overall species diversity. He also highlights our important historical, cultural and biological connections with plants, via food, and reminds us that both wild and domesticated species (plant and animal) are at risk due to factors such as climate change.

Given our unpredictable future climate, Michael Hermann of Crops for the Future (p.9) posits that we should be diversifying rather than reducing the number of edible plant species. Unfortunately, trade globalisation and lifestyle have funnelled research and funding to a select few crops to the detriment – and in some cases extinction – of others.

And we are losing more than a hedge against climate change. Concurring with Fowler about plant heritage, Hermann says: "Food plants, as well as others once more widely used for fodder,

fibre, medicine or construction material, are part of a rich economic, social and cultural heritage and diversity that need not only preserving but promoting".

Lack of edible plant diversity leads to a lack of diversity at the table – in both the developing and developed world – and to the "hidden hunger" of micronutrient deficiency. Using the example of Kenyan farmers, Emile Frison of Bioversity International (p.16) explains how "agricultural biodiversity can also deliver better nutrition, enhanced resilience, greater sustainability and higher farm incomes, all of which are particularly significant for poor smallholder farmers".

T.J. Higgins at CSIRO Plant Industry (p.18) acknowledges the benefits and drawbacks of agricultural intensification: "The benefits [in the past 50 years] included sparing of wild lands for biodiversity. There was less malnutrition of the human race. The costs, however, included much more water use and abuse, more chemical run-off (closely related to water abuse), more soil erosion and increased greenhouse gas emissions." He discusses the future role of genetically modified crops in a "sustainable intensification" regime, in both food and ecological security.

Domestication of wild species can assist the financial security of farmers in developing countries, says Kate Langford of the World Agroforestry Centre (p.21). Christophe Missé, a Cameroon farmer, learned how to develop improved varieties of indigenous fruit trees and has built a new house with the income from his new business.

"Ecosystem and biodiversity conservation are seriously threatened in countries pursuing irrigation as a strategy for economic development," says Kiribandage Jinapala of the

International Water Management Institute (p.25). Jinapala explains how the project on the left bank of the Walawe Irrigation Scheme in southern Sri Lanka aimed to “ensure that agro-ecosystems were managed within a sustainable development framework that would contribute to improved livelihoods and biodiversity conservation.”

So plant biodiversity has global implications for food security – the theme of this year’s annual Crawford Fund conference (p.6), with several speakers contributing to this edition of *Issues* – and associated areas such as nutrition, the economy and climate change. What about animal diversity?

According to James Fitzsimons of The Nature Conservancy (p.29), “Australia is now facing a new wave of mammal extinctions that, left unchecked, threatens the survival of numerous small- and medium-sized mammals.” A recent report shows that, “based on current trends, many native mammals will become extinct in northern Australia in the next 10–20 years”. As well as further investment in ecological research, “Fires need to be better managed, feral cats and other pest animals need to be effectively controlled and the management of cattle grazing needs to be improved,” Fitzsimons says.

Animals do not have to be wild to have their biodiversity threatened. “About one-fifth of the world’s 7616 breeds of domestic livestock are at risk of extinction,” says Carlos Seré, Director-General of the International Livestock Research Institute (p.32). This includes cattle, sows and chickens. Understandably, poorer farmers are favouring the most productive breeds. Although we must support them, Seré says, “we cannot afford to altogether lose the breeds that are abandoned. These not only have intrinsic value, but many possess genetic attributes critical to coping with threats such as climate change or emerging pests and diseases.” He advocates international cooperation and the establishment of dedicated livestock gene banks.

National and international links need to be established or revived to preserve our plant genetic resources, explains Tony Gregson, Victorian grain grower and chair of Plant Health Australia (p.35). “Australia does have unique plant genetic resources ... that have never been systematically collected, analysed or properly documented. This could be a major

Australian contribution to the global [plant genetic resource collection] effort and could provide novel candidate genes to help broaden the adaptation of crops and so mitigate the effects of climate change,” he says.

Further afield, a global effort is afoot to save Europe’s most important fruit and berry collection at the Pavlovsk Experimental Station in Russia, which is set to be sold by the Russian Housing Development Foundation. According to one of the many letters written to President Dmitry Medvedev: “The more than 6000 varieties of fruits, berries, grasses and grains are the lasting legacy of a collection effort made painstakingly over the course of 80 years that has survived wars, famines and droughts to remain where it stands today: 90% of the varieties at Pavlovsk no longer exist anywhere in the world outside of the station’s grounds...” (p.38).

A diverse fish community characterises the world’s tenth-longest river, the Mekong, with a species richness second only to the Amazon, according to Chris Barlow of the Australian Centre for International Agricultural Research (p.41). Employment, income and food are all benefits flowing from this river, but its sustainability is under threat from barriers to fish migration.

Stephen Hall of the WorldFish Center (p.44) reiterates the importance of biodiversity to those whose livelihoods involve fishing or fish farming. He closes this edition of *Issues* with remarks aligned to Fowler’s opening piece, albeit in the context of aquatic ecology. There is more to consider than just the number of species. “Understanding and conserving biodiversity at all three of these levels – genetic, species and ecosystem – is vitally important for many reasons,” he writes. “For those of us involved in trying to help the poor of developing countries escape poverty and hunger, they all demand attention.”

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