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The United Nations must get its new biodiversity targets right

Global goals to reduce biodiversity loss will be revised this year. All eyes are on China, which must ensure the new targets are measurable and meaningful.



River systems, such as this one in China, need better protection from encroaching industrialization. Credit: Costfoto/Barcroft Media/Getty

Most measures of biodiversity suggest that things are going badly wrong. Some one million plant and animal species face extinction, according to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES). And French President Emmanuel Macron last week called the battle for biodiversity and climate change “the fight of the century”.

A decade ago, countries united to create a 10-year plan, sub-divided into 20 targets, for protecting and conserving natural systems. The plan, also known as the Aichi Biodiversity Targets, expires at the end of this year — and most of the targets will not have been reached. Between 24 and 29 February, representatives of the international community will meet in Rome to discuss a new plan. A lot is at stake, and it’s vital that the world unites behind the effort.

The meeting will consider a draft of an updated set of global goals, which must be agreed by the summer. Then, in October, world leaders will gather in Kunming, China, for the Conference of the Parties to the United Nations Convention on Biological Diversity. China will be in the chair, the first time [it will lead on a conference of the parties](#) to one of the ‘big two’ global environmental conventions.

These discussions are as important to biodiversity as the Paris agreement was to climate, and are likely to be similarly fraught. Conservation groups back more stringent and more measurable targets. European countries sit somewhere between the United States — which has long refused to sign the biodiversity convention — and developing countries, which will be looking to China to fight their corner. But China’s efforts to build consensus have been set back by the coronavirus, which has seen parts of the country closed down.

To be fair, not every biodiversity policy has failed. Among the hard-won achievements is the 2014 Nagoya Protocol, an agreement stating that the benefits of genetic resources must be shared equitably among all of those — including Indigenous communities — who have contributed to their development. This can take time, and the World Health Organization has been discussing how to reduce potential delays when genetic information needs to be shared in public-health emergencies. But the protocol’s existence is a win for multilateral science and environmental diplomacy.

By contrast, there’s been no clear progress on the headline ambition to slow and eventually reverse the loss of biological diversity around the world.

The Aichi targets failed, in part, because their format makes progress hard to measure. Ahead of this year's talks, a group of researchers led by Elizabeth Green at the Centre for Conservation Science in Sandy, UK, scanned the literature for mentions of the Aichi targets since 2010. The team then invited an expert group to score the targets on a scale of one to ten. All of the targets scored highly for being comprehensive, but most scored relatively poorly on being measurable and realistic (E. J. Green *et. al. Conserv. Biol.* **33**, 1360–1369; 2019).

Take the first target, intended to ensure that “people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably”. It's clear this aims to raise public awareness of and engagement with biodiversity, but it's not clear when success has been achieved.

Those drawing up a new generation of biodiversity goals and targets understand this. The text of a new draft released last month contains spaces in square brackets, ready to be filled in when [more-quantitative measures are agreed](#). Such measures include ensuring strict protection for important ecosystems and finding nature-based solutions that increase resilience to natural disasters.

Ambition versus achievement

The Aichi targets didn't fail solely because they weren't measurable. They also failed because countries did not need to report what they were doing to achieve them.

The biodiversity convention's member states have to publish biodiversity action plans — but these are often statements of a country's ambitions, rather than records of its achievements. For the next set of goals this has to change, and fortunately there seems to be a way forward. This is the UN System of Environmental Economic Accounting (SEEA), a mechanism for reporting environmental data, and it needs to become the global standard for environmental reporting.

SEEA was adopted in 2012 to encourage countries' national statistical offices to take responsibility for collecting and reporting environmental data. Asking statistics offices to do this was a stroke of genius. These offices are already responsible for reporting national economic data to the UN. They work to the best available standards and strict deadlines — and they get the job done. Charging them with reporting environmental data ensured that these data would be treated in the same way.

What began as a trickle of countries following the system has surged to more than 80 states sending updates to the UN on a multitude of environmental indicators, from the state of their forests to the state of their fisheries. Developing countries will need to be supported to get up to speed and contribute their own ideas. But the die is cast.

As is sometimes the case with the UN, a lack of joined-up thinking allowed SEEA to emerge independently of other indicators, such as the Aichi targets and the Sustainable Development Goals (SDGs). Now, moves are under way towards some harmonization. Last July, the UN published a global indicator review ([go.nature.com/2ssazbc](https://www.nature.com/2ssazbc)) in which researchers confirmed that countries could use SEEA to report 34 of the 147 Aichi target indicators and 21 of the 230 SDG target indicators. This is an important start, but also indicates how much needs to be done before more goals and targets can be reported using the SEEA framework — an opportunity which researchers must not pass up.

Measuring and reporting numerical targets, although vital, is not the whole story. If the world is to understand why the Aichi targets failed — and improve on them — it must assess the broader obstacles.

One is the historical tension between development and the environment — and the expectation of poorer countries that they should be able to develop, just as richer countries did. There is also a perception that new environmental standards will hold them back. No one can contest their case for developing, but, considering the state of the planet, their concerns need to be met through greener development. They need support to provide their citizens with basic amenities — such as clean water, nutrition and power — in a way that is sustainable and protects future generations. This means making significant changes to how economic decisions are made.

No contest

Usually, in any contest between industrial growth and the preservation of species and ecosystems, growth comes out on top. Biodiversity is rarely allowed to stop or delay a new airport runway or power plant. If a wetland needs to be concreted over to make way for a housing development, in many countries it has little chance of being protected, even though losing the wetland means sacrificing the services it provides to people — such as wildlife habitats and flood defences. These services are rarely quantified.

Fortunately, researchers and policymakers globally are taking a stronger interest in valuing biodiversity's contribution to economies and to societies. IPBES is deep in a project that will advise countries on the many ways to value biodiversity; a report is due to be presented next year. And last year, the UK Treasury launched its own independent review, chaired by the economist Partha Dasgupta of the University of Cambridge, that is due to report in time for the biodiversity conference in China.

We know that working in an economic and financial system that places little value on the natural world will make it difficult to meet goals in biodiversity and sustainable development. That's why it is prudent to tackle smaller aspects of the system — at least for now. At the same time, it's imperative that the new biodiversity goals find synergies and avoid conflicts with the Paris climate agreement and the SDGs, neither of which existed a decade ago.

The road to the Kunming convention will be long and complicated. This is inevitable, both because life on Earth is itself beautifully complex, with so many global systems influencing biodiversity, and because the outcomes matter. Humanity's future depends on our ability to protect the planet. Greater awareness of threats to the natural world — perhaps an intangible impact of the Aichi targets — has created a moment ripe for action. The challenge will be to keep the devil in the detail from derailing the process itself.

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COMMENT 18 FEBRUARY 2020

Set a global target for ecosystems

The conservation community must be able to track countries' progress in protecting wetlands, reefs, forests and more, argue James Watson and colleagues.

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Coral in a mangrove swamp in the Raja Ampat Islands, Indonesia. Credit: Giordano Cipriani/Getty

Next week, representatives of more than 190 nations are gathering in Rome to discuss how to halt the biodiversity crisis during this decade and beyond.

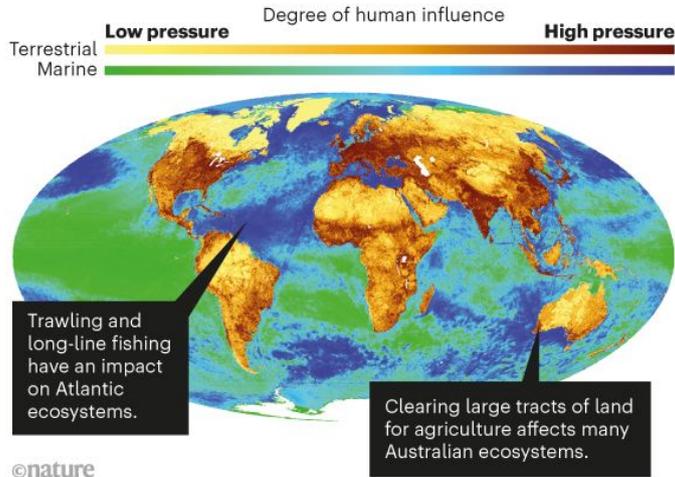
Since 2010, targets for conserving species have shaped policy and galvanized efforts to halt species loss worldwide, as part of the Convention on Biological Diversity (CBD; see www.cbd.int/sp/targets). Yet no such targets exist for ecosystems — despite the wealth of evidence showing that their health and functions are essential to the processes that maintain all life.

Targets that are specific, measurable, attainable, relevant and timely (SMART) are central to project planning and have proved to be effective in policies that seek to address global problems. For example, during the 1980s, a group of 20 nations agreed to set various limits on the production and consumption of chlorofluorocarbons. This helped to guide the phase-out of these substances under the Montreal Protocol, which came into effect in 1989.

It is now possible to establish a SMART target for ecosystems, as well as metrics to track progress in meeting that goal. Nations are no longer limited by a lack of knowledge or methods when it comes to ecosystem mapping and assessment (see 'Under pressure'). What's more, they can use a proven and standardized approach for ecosystem risk assessment: the Red List of Ecosystems protocol, which was adopted by the International Union for Conservation of Nature (IUCN) in 2014.

UNDER PRESSURE

Mapping of human pressures (from land use, development of infrastructure, fishing and so on) reveals the degradation of natural systems across Earth.



Sources: J. E. M. Watson *et al.* (map); data from O. Venter *et al.* *Nature Commun.* 7, 12558 (2016)/B. S. Halpern *et al.* *Sci. Rep.* 9, 11609 (2019).

We urge those attending next week's meeting to place an ecosystem-based goal and target alongside species-based ones in their discussions. Nations have a chance to ensure that all of the world's remaining intact ecosystems are retained by 2030, that overall ecosystem area and integrity increase by 2050, and that all that fall below a level of degradation defined by the Red List of Ecosystems protocol are restored.

The ratification of an international target will compel governments to act. This is the only way to halt the decline of ecosystems.

Species and ecosystems targets

In 2010, the 193 nations that were parties to the CBD agreed to work together to prevent the extinction of known threatened species and improve their conservation status by 2020. They did this by ratifying Target 12 of the CBD 2011–20 strategic plan for biodiversity (see www.cbd.int/sp/targets).

Actions taken because of this and previous CBD targets have reduced the risk of extinction for many species, although direct links are hard to prove. For example, conservation efforts over the past 30 years have helped to cut the extinction rate of endangered birds by at least 40%, according to one analysis³. Previously endangered populations that are now growing include the Seychelles magpie-robin (*Copsychus sechellarum*) and a Brazilian parrot called Lear's macaw (*Anodorhynchus leari*).

Over the past decade, nations have been identifying and protecting the marine, terrestrial and freshwater sites that are of international importance to the conservation of vulnerable species. More than 16,000 of these 'key biodiversity areas' have now been identified worldwide (see go.nature.com/2xdtqb8). Government reports submitted to the CBD indicate that such areas are increasingly being protected⁴. One example is Itombwe Natural Reserve in the Democratic Republic of the Congo, which was formally established in 2016 to conserve several rare species, including the enigmatic Itombwe puddle frog (*Phrynobatrachus* sp.).

Such species-focused conservation activities are crucial. But they are not sufficient to sustain biodiversity and the benefits of nature to humanity.



Human impacts such as overfishing have affected the Amazon River ecosystem in Brazil. Credit: Ricardo Oliveira/AFP/Getty

Ecosystems, from the boreal forest and wetlands to coral reefs and mangroves, are more than the total of the plants and animals living in them⁵. Complex interactions between biological and physical systems drive processes that sustain all life. This includes production of clean water, regulation of air quality and climate through carbon sequestration and storage, soil formation, pollination and the production of food and wood for houses¹. Indeed, natural systems are key to dealing with the effects of climate change, as highlighted by a 2019 study⁶. It estimated that, between 2000 and 2013, the impact on carbon levels of losing intact tropical forests (including indirect effects such as reduced biodiversity and increased selective logging) might be six times greater than was originally proposed⁶.

Thanks to substantial advances in mapping and monitoring, scientists can now diagnose ecosystems' defining [features and the processes that threaten them](#)^{5,7}. Take the demise of tidal flats revealed by satellite technology. Such mapping showed that coastal development and sea-level rise destroyed 16% of these ecosystems between 1984 and 2016. This has reduced storm protection and food provision for billions of people⁸. Remote sensing is similarly monitoring tropical forests⁹, ice cover¹⁰, coral reefs¹¹ and mangroves¹². For instance, at least 12% of the world's mangroves were lost between 1996 and 2010 because of human activities¹³.

Pivotal to these efforts has been the development of the Red List of Ecosystems protocol, a set of criteria for identifying ecosystems that are most at risk of collapse¹⁴. It lays out how to define and map ecosystems, and enables systematic risk assessment using an array of indicators of extent and degradation.

So far, the Red List criteria have been used to assess more than 2,800 ecosystems in 100 countries across all continents¹⁵; 45% of those systems were found to be at risk of collapse (D.A.K., unpublished observation). These efforts could serve as a starting point for work towards an international target for conserving ecosystems.

Ecosystem-level conservation is already affecting decisions on resource use and management made by national governments, non-governmental organizations and industry¹⁵. For example, a 2017 assessment of ecosystems in Colombia — Amazon rainforests, tropical dry forests, high Andean cloud forests, lowland savannah and other types — classified almost half (44%) as either 'endangered' or 'critically endangered', as defined by the Red List protocol¹⁶.

This results from human activities such as forest clearance for illegal coca crops, cattle ranching and mining. The finding has prompted the Colombian government to focus on the amount of land given protected area status, and to consider the restoration of critically endangered ecosystems.



Workers cut down trees in southeast Cameroon as part of a sustainable initiative to help local groups with forest management. Credit: Brent Stirton/Getty

In South Africa and Australia, businesses wanting to encroach on ecosystems that are classed as critically endangered or endangered must first conduct a full environmental impact assessment for their proposed project. Likewise, Finland's first government-led systematic ecosystem assessment, completed in 2008, resulted in increased protection of threatened forest under the nation's Environment Protection Act and Forest Act¹⁷.

In China, assessments of the rapid decline of tidal-flat ecosystems has catalysed efforts to better understand, manage and protect them. Tidal flats surrounding the Yellow Sea in east Asia support the migration of up to three million shorebirds and stabilize the coastline for more than 150 million people, also providing them with storm protection and food¹⁸. In July 2019, two of these important migratory sites were added to the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage List after being classified as endangered under the IUCN criteria.

Action and accountability

It is difficult to accurately assess progress towards conservation targets at the species level — a major constraint on their effectiveness. Monitoring of at-risk species is often infrequent and numbers fluctuate naturally from year to year. Such species also tend to be elusive. At the ecosystem level, a SMART target should therefore enable frequent tracking of ecosystems using remote sensing and modelling. This could result in more-transparent reporting of the status of Earth's ecosystems, enhancing public awareness of their current trajectories and the consequences of their decline.

Any ecosystem target should set limits on degradation that mark the irreversible loss of key processes¹⁴. A target should also highlight the importance of conserving healthy ecosystems over restoring degraded ones. Such restoration is technologically and economically challenging and, as yet, there is no evidence that complete restoration of an ecosystem is even possible. Nevertheless, restoration has a key role in avoiding species extinctions and mitigating climate change, and should be part of an ecosystem goal.

The Rome meeting is the second of three working-group meetings for negotiations leading up to a new set of biodiversity targets, which will replace those agreed in 2010. This 2030 global strategic plan for biodiversity will be formally established in October by the signatories to the CBD.

This year marks the implementation of the pledges made in the Paris climate agreement, and the United Nations Decade on Ecosystem Restoration begins in 2021. The launch of the 2030 strategic plan in October is an unprecedented opportunity — perhaps the last — for humanity to address multiple environmental problems at once. Whereas a species target forces nations to report on their progress only in relation to biodiversity, an ecosystem target would necessitate simultaneous reporting on wins across three fronts: biodiversity, climate change and sustainability (specifically, on the United Nations Sustainable Development Goals for human development and well-being).

World leaders must be held accountable for the current and future state of their countries' ecosystems.

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