The Convention on Biological Diversity (CBD) established a framework of indicators to evaluate the state of biodiversity, and measure biodiversity loss at the level of genes, populations and ecosystems. The 2010 Biodiversity Indicators Partnership (BIP) brought together members of some 30 organisations representing a suite of indicators.

In May, 2010, 45 scientists from the organisations represented in the BIP analysed the results across the range of indicators to evaluate the success of the CBD in reaching its target. The study was coordinated by the UNs Environment Programme World Conservation Monitoring Centre (UNEP-WCMC), and was the first to jointly analyse this set of indicators to provide an integrated outcome.

The study delivered sobering findings, showing a worsening situation for biodiversity fairly consistently across the board.

Evaluating the outlook for the world’s species

The BIP indicators fell into four main categories:
- Indicators of pressure on biodiversity;
- Indicators of the state of biodiversity;

In 2002, leaders of the world’s governments, recognising the threat posed by the high rate of species declines, committed to significantly halting the rate of biodiversity loss by 2010. Yet, a 2010 study by Dr Stuart Butchart and others in the journal *Science* shows that leaders have failed to deliver on these commitments and have instead overseen alarming declines. In this article the author considers the urgent new initiatives to contain and reverse these global losses.
• Indicators of response (meaning actions taken to try to reverse biodiversity decline);
• Indicators of benefits for humans from biodiversity.

Among the findings, the study reported that vertebrate populations are declining, as are populations of shorebirds and habitat specialist birds.

Fragile habitat areas that support rich biodiversity are being eroded: for example, the areas of forests, mangroves and seagrass beds are getting smaller and more fragmented, and the condition of coral reefs is getting worse, though with decelerating rates of decline.

“Extinction risk is increasing at an accelerating rate: during the time period from 1970 onward the number of species facing extinction has increased every decade, reaching its highest rate during the 2000s.”

The study also showed an increased risk of species extinction for mammals, birds, amphibians, and corals, as measured by the Red List Index (RLI). The RLI results reported in the Science study show an increase in the number of species likely to go extinct. They also show that extinction risk is increasing at an accelerating rate: during the time period from 1970 onward the number of species facing extinction has increased every decade, reaching its highest rate during the 2000s.

Accounting for human demand

Why was the failure in achieving the goals set forth in the CBD so great, and what are the challenges to reversing, or at least slowing, the key threats to biodiversity?

The Science study concluded that, at a global level, leaders' efforts to slow or reverse biodiversity decline have not been sufficient. A mismatch exists between the trends of pressure on biodiversity, which are increasing, and responses to these trends, which are slowing.

Multiple reasons have been identified for the failure to deliver on the 2010 target: for instance, many policies are not adequately targeted, others are not sufficiently implemented, and this is coupled with the lack of focus on pressures on ecosystems and threats to biodiversity and the absence of adequate measures of the economic value of biodiversity in the decision-making processes.

“Human pressure on ecological assets is exceeding – and by an ever-increasing margin – what nature can renewably provide.”

But one of the most over-arching challenges is this: human pressure on ecological assets is exceeding – and by an ever-increasing margin – what nature can renewably provide.

The Ecological Footprint, one of the indicators in the BIP, is a measure of the aggregated human demand...
on the biosphere’s ecological assets. It measures the amount of productive land and sea area needed to produce all the resources the world population consumes and absorb its carbon dioxide emissions. It summarises in a single value anthropogenic pressures that are usually evaluated independently and provides a more comprehensive approach to tackle multiple issues concurrently. Such aggregate human demand is then compared with the Earth’s biocapacity, or the amount of resources the planet’s ecosystems are able to produce.

The Ecological Footprint is just one of the multiple pressure indicators and therefore the variables it measures are just some of the environmental stresses we need to consider when looking at the overall pressure mankind poses on the environment. However, it does provide a large-frame view of human metabolism of resources, and how that squares with biocapacity, or what the planet is able to provide.

“Human demand on nature has increased by approximately 80 per cent from 1970 to 2006, and it is now outstripping nature’s regenerative capacity by 44 per cent.”

Ecological Footprint accounting shows that human demand on nature has increased by approximately 80 per cent from 1970 to 2006, and it is now outstripping nature’s regenerative capacity by 44 per cent. The result is that resource stocks are depleted while waste, in the form of carbon dioxide, accumulates in the atmosphere.

The issue is amplified by the way these pressures interact to compound their effects. For example, when trees are cut down faster than they re-grow, nature’s ability to filter carbon dioxide is also reduced, and the rate at which carbon accumulates in the atmosphere increases. That is why we need to use a holistic approach to tackle multiple issues concurrently.

Humanity’s Ecological Footprint has grown 80 per cent over the last four decades. This trend is reflected throughout the pressure indicators evaluated in the Science study: among these indicators, nitrogen deposition is the only one that may have been slowing since the 1960s.

If population and per capita ecological demand continue to grow at the current rate, within the next 25 years it will take the resources of two planets to generate the amount humanity consumes and absorb its CO₂ emissions. Such a yawning deficit clearly has significant implications for biodiversity.

Indicators show local gains; more needed at planetary level

The one area of the Science study that showed positive signs were in the group of response indicators measuring actions taken to reverse declines.

The Science study found that the surface of protected areas is globally increasing; the area of FSC certified forests is increasing; an increasing number of policies are being adopted at both national and international level to tackle the issue of invasive alien species; and more funding is invested by national governments and international organisations in biodiversity-related aids to target the objectives of the CBD.

“Actions on the response side may no longer be sufficient given how fast human pressure is growing.”

Positive trends exist at local level and for particular populations, groups of species (taxa), and habitats: water-bird populations in North America and Europe, for example, have increased by 44 per cent since 1980 due to wetlands protection and sustainable management practices. This suggests that when adequate measures are taken, biodiversity loss can be reduced or reversed. However efforts need to be substantially strengthened to address the loss of biodiversity at planetary level.

Protected areas are essential to safeguard our planet and species richness, but actions on the response side may no longer be sufficient given how fast human pressure is growing.

Most decision-makers are still far from being aware of the real extent of human-induced pressures and their potentially debilitating consequences for both the planet’s health and our society’s social and economic stability. As a consequence, policies aimed at reducing the pressure human activities place on the state of biodiversity are yet to be adequately implemented.
Global Footprint Network is working to bring the reality of resource constraints into the national and international policy debate, by means of the Ecological Footprint. We aim to help policy analysts and decision-makers more deeply understand the threats our activities pose on biodiversity and, in turn, the risks that resource limitation and declining biodiversity pose to our societies’ social and economic stability.

The Nagoya Biodiversity Summit: how we can succeed

In October 2010, governments and decision-makers will gather in Nagoya, Japan, and decide whether to adopt a new biodiversity target and new indicators for the post-2010 era. But for this effort to have greater success than its predecessor in tackling the biodiversity crisis, new approaches to implementation are needed.

Protected areas are essential to safeguard our planet and species richness, but actions on the response side only are no longer sufficient given how fast human pressure is growing. Decision-makers’ efforts to address the loss of biodiversity at planetary level need to be substantially strengthened, and new systemic approaches are needed that will enable us to tackle multiple issues concurrently (e.g. preserving biodiversity while ensuring the well-being of mankind).

“Decision-makers’ efforts to address the loss of biodiversity at planetary level need to be substantially strengthened, and new systemic approaches are needed that will enable us to tackle multiple issues concurrently.”

Traditional conservation measures (protected areas, biodiversity-related aids, legislation on invasive species, etc) must be coupled with others that directly target human causes of pressure on biodiversity, and adequately value the benefits (both economic and socio-cultural) that biodiversity has for humans.

Our economics and governance systems must begin to recognise this fundamental truth: our well-being depends on the well-being of our natural capital. As long as humanity’s metabolism of the earth’s resources continues to outstrip the rate at which nature can regenerate the resources, biodiversity will come increasingly and ever more perilously under threat.

Acting on the drivers of biodiversity loss is a first necessary step that will help us address the biodiversity decline issue and also sustain the human population on the planet.

Contact Details

Dr Alessandro Galli is a Senior Scientist at Global Footprint Network, an international think-tank working to advance sustainability through use of the Ecological Footprint, a resource accounting tool that measures how much nature we have, how much we use and who uses what. Galli contributes to research on the Ecological Footprint methodology and technical publications and he is member of the Global Footprint Network’s National Accounts Review Committee. He is a co-author on the study published in Science evaluating the CBD in reaching its goal of halting biodiversity declines. Dr Galli’s research focuses on the analysis of human dependence on natural resources and ecological services through the use of sustainability indicators and environmental accounting methods. Currently, he is also working as technical advisor with the Emirates Wildlife Society (EWS-WWF) on the Al Basama Al Beeiya (Ecological Footprint) Initiative in the United Arab Emirates. He holds a Ph.D in Chemical Sciences from the University of Siena in Italy.

The Global Footprint Network was established in 2003 to enable a sustainable future where all people have the opportunity to live satisfying lives within the means of one planet. An essential step in creating a one-planet future is measuring human impact on the earth so we can make more informed choices. The Network’s work aims to accelerate the use of the Ecological Footprint, a data-driven metric that tells us how close we are to the goal of sustainable living.

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