

HUMAN POPULATION AND BIODIVERSITY LOSS

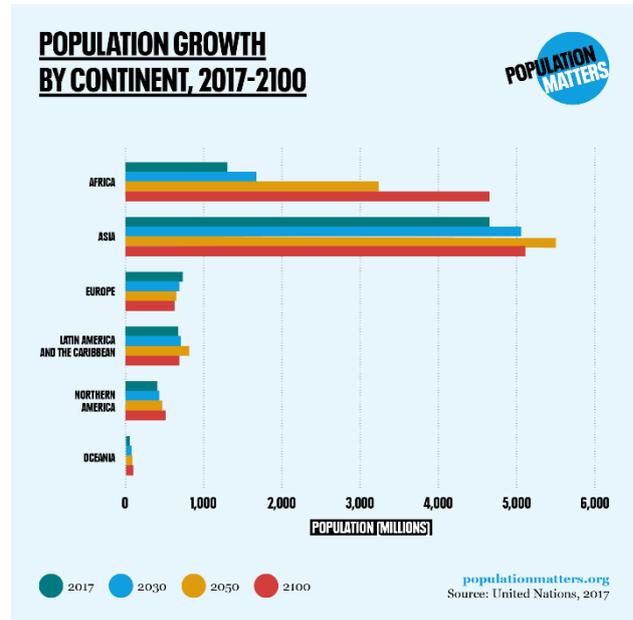
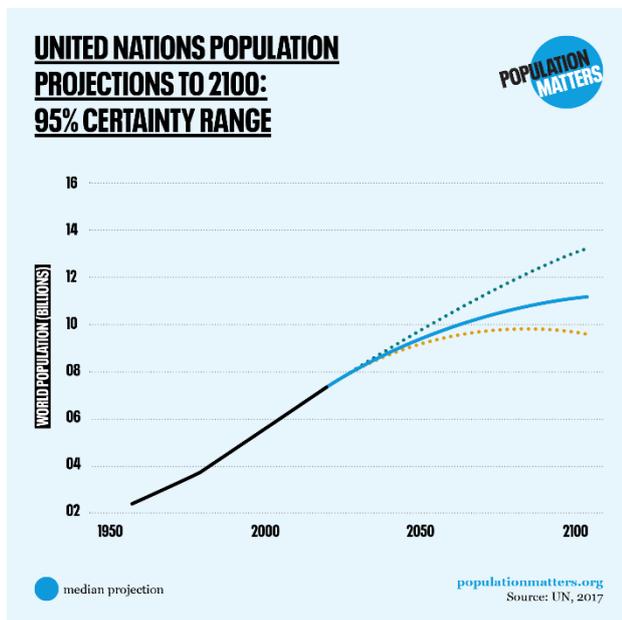
POPULATION MATTERS BRIEFING

Since 1970, populations of vertebrate wildlife have declined by 60%ⁱ - in the same period, the human population has doubled. Those extra billions have each required land, food, water, energy and finite and renewable resources. They have also contributed to the climate change that is driving some animals and plants from their habitats, changing disease patterns and acidifying the oceans. Plastic pollution, desertification and eutrophication of waterways through fertiliser use are among the multiple other problems exacerbated by unsustainable population growth.

As this briefing details, numerous authoritative scientific studies and reviews have identified human population growth as a driver of biodiversity loss. While multiple other factors also contribute and must also be addressed – not least unsustainably high and profoundly unequal per capita consumption – addressing population forms a critical part of the suite of solutions. Fortunately, the mechanisms which reduce fertility rates also improve human wellbeing in multiple ways, and speed up progress towards attainment of the Sustainable Development Goals.

POPULATION PROSPECTS

According to the most recent UN projections, population will continue to increase throughout this century. Its median projection is for a population of 11.2bn by 2100.ⁱⁱ



That population growth will be driven primarily by Africa – however, the regional projections do not account for migration, which is likely to change the distribution of populations substantially. According to a recent Gallup poll, more than 750m people currently would like to move permanently from their countries of origin.ⁱⁱⁱ Meanwhile, climate change is expected to drive migration of hundreds of millions both within and between continents.

HUMAN POPULATION AND BIODIVERSITY

The primary drivers of biodiversity loss are well-recognised:

- Habitat degradation/loss
- Exploitation
- Invasive species and disease
- Pollution
- Climate change

Human population growth acts as a direct driver of all of these factors, except invasive species and disease (where it nevertheless can contribute due to human population movements). The impact of population growth at local level - in particular, in regard to habitat loss and exploitation - is widely recognised. A number of recent scientific papers have also addressed the role of population in global biodiversity loss.

The most significant and high profile is the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) global assessment, published in May 2019. The report identifies direct and indirect drivers of biodiversity loss, itemising population growth as one of the latter, alongside consumption patterns, technological innovation and governance. In its prescription for vital and urgent action, the IPBES states “*changes to the direct drivers of nature deterioration cannot be achieved without **transformative change that simultaneously addresses the indirect drivers.***”^{iv} (Emphasis added)

Research published in the July 2017 *Proceedings of US National Academy of Sciences* reviewed data on 27,600 terrestrial vertebrate species, with a more detailed analysis of 177 mammal species. It identified the proximate causes of population extinctions as “*habitat conversion, climate disruption, overexploitation, toxification, species invasions, disease, and (potentially) large-scale nuclear war—and concluded that “the ultimate drivers of those immediate causes of biotic destruction [are] human overpopulation and continued population growth, and overconsumption, especially by the rich.*”^v

Extracting the specific role of population in biodiversity loss is a relatively complex task that has nevertheless been undertaken in two papers this year.

In *Nature Ecology & Evolution*, Marques et al examined biodiversity loss and carbon sequestration through the measures of bird biodiversity and deforestation and used decomposition analysis to quantify the particular impacts of drivers including population and affluence. The research identified that environmental impact per unit of GDP has been declining, suggesting a greater efficiency of environmentally relevant economic activities. However, these efficiency gains were cancelled by overall growth and the authors concluded that “Economic and population growth have been driving the upward trend of impacts on biodiversity and ecosystem services, despite a reduction of the impacts per unit of GDP.”^{vi}

Also published this year, the United Nations’ *Global Resources Outlook* report found that 90% of biodiversity loss and water stress are caused by resource extraction and processing (including agriculture). Analysis of specific drivers showed that globally, up to the year 2000, population growth was the strongest driver of increased resource extraction globally. From 2000 onwards, increasing affluence overtook population as the biggest driver, except for in Africa and West Asia, where rapid population increase remains the biggest cause.^{vii}

One of the scientific papers with the greatest impact of recent years^{viii} has been the World Scientists’ Warning to Humanity: Second Notice, published in *Bioscience* in 2017. This paper has now been endorsed

by more than 20,000 scientists. It details decline in almost every marker of environmental resilience, and warns of “catastrophic biodiversity loss”. The paper identifies “*continued rapid population growth as a primary driver behind many ecological and even societal threats*”. The Warning lists 13 policy measures essential to safeguarding our future, including the provision of family planning and girls’ education to reduce fertility and “estimating a scientifically defensible, sustainable human population size for the long term while rallying nations and leaders to support that vital goal.”^{ix}

Two very recent studies have specifically examined the relationship between food and environmental sustainability, including biodiversity loss.

The EAT-Lancet Commission report on global food sustainability examines how to feed the human population up until 2050 without causing irreversible damage to the environment. It notes the multiple impacts on biodiversity of food production, including that 80% of extinction threats to mammal and bird species are due to agriculture. The study concluded that only a “transformation” of food production and consumption would allow a global population of 10bn to be fed sustainably but that even with such a transformation, feeding a population of over 10bn without negative impacts on biodiversity and the environment is “increasingly unlikely”.^x

The World Resources Institute’s *Creating a Sustainable food future*, published in December 2018, was specific in including reducing human population growth in its “menu” of actions to ensure food sustainability. It specified the goal of achieving replacement level fertility rates through voluntary means, including “improving women’s access to education and healthcare in Africa to accelerate voluntary reductions in fertility levels”.^{xi}

SOLUTIONS

Mechanisms to secure lower fertility and sustainable populations through voluntary means are positive and effective. Most are already explicitly featured in the Sustainable Development Goals

- End poverty and reduce inequality - SDGs 1, 2 and 10
- Provide universal access to high quality education – SDG 4
- Women’s empowerment – SDG 5
- Access to and uptake of modern family planning – SDG 3 and 5

The fifth component of fertility reduction is encouraging smaller families. This measure is effective in all scenarios but particularly important in countries with a relatively high Human Development Index which have already met the first four goals to a large extent (although significant inequality may still exist within them) and which currently have relatively low fertility levels. These countries may still have significant local biodiversity problems and usually contribute significantly to global drivers of biodiversity loss, such as climate change or through demand for imported agricultural products leading to habitat loss.

Local actions

Programmes to protect biodiversity through reduction of population pressure are already being employed at local level across the world. The Population Health Environment model recognises the synergies and mutual benefits of improving the conditions of human communities in achieving local conservation goals,^{xii} including through the provision of family planning services to reduce local human population pressures on

biodiversity. Organisations successfully implementing this approach include Blue Ventures (Madagascar), Nature Uganda and Cheetah Conservation (Namibia).^{xiii}

HUMAN POPULATION AND THE CONVENTION ON BIODIVERSITY

Solutions to destructive population growth at global and national level are effective, tested, and consistent with and supportive of the Sustainable Development Goals.

As a key driver of biodiversity loss, human population is an appropriate and necessary issue for attention in the post-2020 framework of the Convention on Biodiversity^{xiv} – indeed, failure to address it under the existing Aichi Targets is likely to have contributed to the failure to meet them all. Recognition of the global extent and relevance of the problem is an essential first step, followed by discussion of appropriate mechanisms to progress towards sustainable population levels within the post-2020 framework. These could include the establishment of targets relating to population, addition of a suitable protocol and/or provision for their inclusion in National Biodiversity Strategies and Action Plans which are its key implementation mechanisms.

ABOUT POPULATION MATTERS

Population Matters is a UK-based charity which campaigns to achieve a sustainable human population, to protect the natural world and improve people's lives. We promote positive, practical, ethical solutions – encouraging smaller families, inspiring people to consume sustainably, and helping us all to live within our planet's natural limits. We believe everyone should have the freedom and ability to choose a smaller family. We support human rights, women's empowerment and global justice.

More information at populationmatters.org

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ⁱ WWF (2018) *Living Planet Report - 2018* https://www.wwf.org.uk/sites/default/files/2018-10/wwfintl_livingplanet_full.pdf

ⁱⁱ United Nations Population Division (2017) *World population prospects* https://population.un.org/wpp/Publications/Files/WPP2017_KeyFindings.pdf

ⁱⁱⁱ Gallup (2018) <https://news.gallup.com/poll/245255/750-million-worldwide-migrate.aspx>

^{iv} IPBE *Global assessment summary for policymakers* (2019) <https://www.ipbes.net/news/ipbes-global-assessment-summary-policymakers-pdf>

^v Gerardo Ceballos, Paul R. Ehrlich, and Rodolfo Dirzo (2017) *Biological annihilation via the ongoing sixth mass extinction signalled by vertebrate population losses and declines*, from: <https://www.pnas.org/content/114/30/E6089>

^{vi} Marques, A. et al (2019) Increasing impacts of land use on biodiversity and carbon sequestration driven by population and economic growth. *Nature Ecology & Evolution*, 2019; DOI: 10.1038/s41559-019-0824-3

^{vii} United Nations Environment Programme & International Resources Panel (2019) *Global resources outlook* (2019) <http://www.resourcepanel.org/reports/global-resources-outlook>

^{viii} The Altmetric tool ranks the paper as among the top 5% of all research outputs it has ever tracked <https://oxfordjournals.altmetric.com/details/28854048#score>

^{ix} Ripple et al. and signatories from 180 countries (2017) World Scientists' Warning to Humanity: A Second Notice, *Bioscience* <https://academic.oup.com/bioscience/article/67/12/1026/4605229>

^x Willett et al (2019) *Food in the Anthropocene: the EAT-Lancet report on healthy diets from sustainable food systems* <https://www.thelancet.com/commissions/EAT>

^{xi} Searchinger et al (2018), *Creating a sustainable food future*, World Resources Institute <https://www.wri.org/publication/creating-sustainable-food-future>

^{xii} USAid Environmental Health <http://www.ehproject.org/phe/phe.html>

^{xiii} Population and Sustainability Network <https://populationandsustainability.org/about/our-members/>

^{xiv} Convention on Biodiversity: preparations for the post 2020 biodiversity framework <https://www.cbd.int/conferences/post2020>