Correspondence

Don't let triage put a gloss on extinctions

Conservation triage, the prioritization of conservation efforts by explicit economic accounting, may not be used to determine listing decisions under the US Endangered Species Act of 1973. This could change with the proposed US H.R.717 Listing Reform Act that has been submitted to Congress (see also go.nature.com/2e6s8fo and go.nature.com/2bftgd4).

The bill proposes to "preclude the listing of a species as threatened due to the likelihood of significant, cumulative economic effects that would result from such listing or from the likely resulting designation of critical habitat of the species". Economic effects include those relating to public and private lands, property values, the provision of public services, employment and revenues available for governments. This triage process would effectively legitimize species extinctions by ruling out conservation programmes that conflict with economic interests.

Conservation triage puts a mathematical gloss on extinctions, presenting them as neutral outputs of optimization algorithms and branding itself as effective science that is based on data and not dogma. It is crucial to oppose the 'new conservation' paradigm: it is performing a conceptual triage on conservation itself.

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Pakistan heading for groundwater crisis

The United States, China, India, Iran and Pakistan together account for more than 60% of the groundwater that is removed worldwide each year. Pakistan alone withdraws 6.6%, amounting to 65 cubic kilometres annually — 10 km^3 more than is replaced each year by natural processes.

Pakistan, as a leading exporter of water-intensive crops such as rice, uses more global groundwater (29%, based on 2010 estimates) for agricultural exports than any other country (C. Dalin *et al. Nature* **543,** 700–704; 2017). It recycles just 1.2% of its urban wastewater, whereas China and India reuse 71% and 22% of theirs, respectively (A. L. Thebo *et al. Environ. Res. Lett.* **12,** 074008; 2017). Wastewater that is dumped into natural streams or used in irrigation ultimately finds its way into groundwater.

To improve management of Pakistan's groundwater and avert a crisis, research is urgently needed into the impact of these practices on the quality and quantity of groundwater.

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Add societal impact to the syllabus

We agree that societal impact should be rated more highly in scientific publishing and research evaluation (*Nature* **553,** 5; 2018). To this end, we suggest that ways to achieve it should be introduced as an important component of curricula at higher-education institutions.

Degree theses and university classes in academic publishing are generally structured with bibliometric output in mind because that is the main driver of tenure and promotion. They rarely touch on the merits of societal impact. This monotheistic evaluation of academic pursuits means that few faculty members make time for public outreach. Even new journals for applied excellence address a symptom of insufficient societal impact in research, not the cause.

Instead of relying solely on papers and citations as proxies for impact, funders and research organizations need to broaden their assessments of scientific output. They should also acknowledge other important outputs, such as developments in scientific products and services, important data sets, platforms and software, as well as their influence on policy.

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Maximize impact of Earth observations

To address challenges such as climate change, disaster resilience and the security of water and food, it is crucial for countries, organizations and individuals to work together to coordinate Earth observations. They need to ensure that these are sustained, and share data to inform decision-making (see, for example, G. Huadong *Nature* **554,** 25–27; 2018). As secretariat director of the Group on Earth Observations (GEO), I can vouch for the group's progress in realizing the global Earth observatory envisaged by Markku Kulmala (see *Nature* **553,** 21–23; 2018).

Over the past decade, the GEO community of 105 national governments and 118 partners has been building the Global Earth Observation System of Systems (GEOSS). Collaboration on more than 70 targeted activities is under way in the GEO programme (see go.nature.com/2nvvgo6). This coordinates and integrates observations from space-based and *in situ* platforms, fills data gaps, and increases capacity across a range of geographical, thematic and cross-cutting areas (including several that Kulmala mentions). GEOSS has already brokered more than 400 million open-data and information resources from some 5,000 providers (www.geoportal.org).

We welcome extra partners from countries, international organizations, research institutes, academia and the private sector to join us in this endeavour and in helping to fulfil the actions and resources for which Kulmala calls.

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Japanese photo of Rosalind Franklin

I happened upon a snapshot of Rosalind Franklin — whose landmark papers in *Nature* contributed to the unravelling of DNA's structure in 1953 — in a Japanese journal of carbon science (see S. Sonoda *Tanso* **3,** 133–136; 1953). It seems fitting to have rediscovered it this year, which marks 60 years since Franklin's death at the age of 37.

Franklin's earlier work on the structure of graphite was known worldwide in the carbon field (for a review, see P. J. F. Harris *Interdiscip. Sci. Rev.* **26,** 204–210 2001). Japanese carbon researcher Susumu Sonoda visited her in London in 1953, after she had completed her two-year study of DNA at King's College London and had moved on to investigate tobacco mosaic virus at Birkbeck College, London. He was travelling around Europe and the United States to interact and exchange ideas with fellow carbon researchers.

Sonoda discussed the problems of carbon graphitization with Franklin. With her permission, he then took a photo (see go.nature.com/2eeg2tx) to illustrate his report for *Tanso*.

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