LETTERS

Edited by **Jennifer Sills**

Seeing the grasslands through the trees

IN HIS PERSPECTIVE "Ancient grasslands at risk" (8 January, p. 120), W. J. Bond makes a compelling argument for the need to identify, study, and preserve ancient grassland ecosystems because of their ecological importance. We strongly agree. However, we disagree with his claim that our Atlas of Forest Landscape Restoration Opportunities (*1*–*3*) promotes activities that threaten these grasslands by targeting them for afforestation or reforestation beyond their natural level of tree cover.

Bond claims that the Atlas "is linked to a global plan to reforest degraded lands to offset anthropogenic CO_2 emissions." This indicates a fundamental misunderstanding of the concept of Forest and Landscape Restoration (FLR) and of the Atlas. As we have previously indicated (*4*), FLR is not a "forest plantation project" and is not focused solely on offsetting CO_2 emissions (though sequestering carbon is one of many benefits of FLR). FLR does not call for increasing tree cover beyond what would be ecologically appropriate for a particular location, nor should it cause any loss or conversion of natural forests, grasslands, or other ecosystems.

Wildebeests graze in Serengeti National Park, Tanzania.

Rather, FLR is a process that seeks to regain the ecological integrity and enhance human well-being in deforested or degraded forest landscapes (*5*). The FLR approach includes a wide range of sustainable land-management practices applicable to both forest and nonforest ecosystems (*5*–*7*). A fundamental first step in the FLR process involves understanding the ecosystem at the landscape level, including its historical and cultural values, before making decisions on a restoration approach (*8*). FLR under this definition would promote exactly the same conservation of ancient grasslands that Bond advocates.

Bond's claims also highlight disagreement over how certain ecosystems should be classified. Grasslands and sparse forests are not mutually exclusive, often occurring together in mosaic ecosystems (*9*). Bond's Perspective and Veldman *et al.* (*10*) define grassland biomes broadly, whereas the Atlas defines forest landscapes as those with a potential tree canopy cover as low as 10%, consistent with the widely accepted FAO definition (*11*) but at a much lower level of resolution (1 by 1 km). As a result, some grassland biomes identified by Bond and by Veldman *et al.* overlap with forest landscapes identified by our Atlas. These mosaic areas require individual assessment, including identifying the natural level of tree cover before deciding on the appropriate management approach.

Further research and collaboration are needed to explore areas where "forests" and "grasslands" overlap. Agreement on terminology, refinement of maps, and identification of the appropriate management policies and practices for these complex ecosystems are among the outcomes we can achieve through collaboration. We invite Bond to work with us on these objectives, with the end goal of leveraging the principles of FLR to both preserve critical ecosystems and improve local livelihoods.

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Response

DEWITT *ET AL.* claim that the Forest Landscape Restoration (FLR) plan (*1*–*3*) would not return tree cover beyond what would be ecologically appropriate. However, the labeling system of the Atlas of Forest Landscape Restoration Opportunities stymies this goal. The Atlas defines a landscape as "degraded" if it is subject to any process that reduces the volume and canopy cover of trees. Consequently, misclassifications of ancient ecosystems, maintained by fire and/or herbivory, are inevitable. Under these assumptions, the FLR handbook would mark such areas as suitable for reforestation.

It has long been assumed that tropical grassy ecosystems were originally forests degraded by cutting, and especially burning (*4*, *5*). However, as shown by the studies I reviewed in my Perspective, evidence of fire does not mean that the landscape originated as forest. In striking contrast to closed forests, ancient grassy ecosystems are maintained, not degraded, by fire and herbivory. Yet they are misclassified by the Atlas as degraded forest. For example, the western Serengeti and Kruger National Park are mapped as deforested instead of as ancient savannahs, and the natural species-rich montane grasslands of South Africa and southern Brazil are both mapped as deforested and/or degraded.

The Atlas label of "forest" for any landscape with more than 10% tree canopy is also misleading. Restoration strategies differ for forests and grasslands. The FLR handbooks promote fire suppression as one of the tools to restore forests and landscapes (*6*, *7*). Although appropriate

for closed forests, fire suppression can be disastrous for ancient grassy systems defined, inappropriately, as forests based on the tree cover definition (*8*). A full restoration program would not only recognize ancient grasslands but also promote fire and herbivory to help maintain them. It would call for repeal of fire suppression legislation that inhibits grassland fire management and endorse active burning programs along with livestock farming as suitable land practices.

I appreciate DeWitt *et al.*'s call for collaboration with experts in open grassy ecosystems. Laestadius *et al.* (*3*) also noted the need for wider consultation. If the grassy biomes and the processes key to their ecological integrity are formally included in the restoration agenda, we will, at last, have put a century of misunderstanding of tropical vegetation behind us.

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Government: Plan for ecosystem services

NATURAL AND MANAGED ecosystems provide food, water, and other valuable services to human societies. Unnoticed by many in the scientific community, the values associated with ecosystem services have been integrated into U.S. government policy. A recent administration memo (*1*) put U.S. federal agencies on notice: The clock is ticking to integrate ecosystem services into their planning and decision-making. By 30 March 2016, agencies are to describe approaches for "conducting decision-relevant and scale-specific ecosystem-services assessments, as well as plans for effective monitoring and evaluation." The administration stresses that such policies may be most effective when incorporated into existing decision-making frameworks.

As members of the Ecological Society of America's (ESA's) Steering Committee on the Intergovernmental Platform for Biodiversity and Ecosystem Services (IPBES) (*2*), we urge U.S. federal agencies to consider how this recent mandate provides opportunities to leverage the global impact of IPBES while achieving national policy objectives. IPBES, which was established with support from the United States but not mentioned in the administration's memo, provides scientific assessments of the state of biodiversity and ecosystem services (*3*). At its fourth plenary, one month before the administration's deadline, IPBES will likely approve the first of its global ecosystem service assessments.

We encourage U.S. federal agencies to familiarize themselves with these assessments and the ongoing IPBES work program. Creating a cross-agency policy agenda for understanding, monitoring, and managing ecosystem services in the United States would reduce the risk of scattered and inconsistent national-level policy mechanisms and would align U.S. policy and IPBES goals. Seeking input from the country's scientific community would help build a secure foundation for these policies and offer U.S. scientists an opportunity to contribute their knowledge to the scientific foundations upon which effective environmental policy rests.

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TECHNICAL COMMENT ABSTRACTS

Comment on "Estimating the reproducibility of psychological science"

Daniel T. Gilbert, Gary King, Stephen Pettigrew, Timothy D. Wilson

A paper from the Open Science Collaboration (Research Articles, 28 August 2015, aac4716) attempting to replicate 100 published studies suggests that the reproducibility of psychological science is surprisingly low. We show that this article contains three statistical errors and provides no support for such a conclusion. Indeed, the data are consistent with the opposite conclusion, namely, that the reproducibility of psychological science is quite high.

Full text at http://dx.doi.org/10.1126/science.aad7243

Response to Comment on "Estimating the reproducibility of psychological science"

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Gilbert *et al.* conclude that evidence from the Open Science Collaboration's Reproducibility Project: Psychology indicates high reproducibility, given the study methodology. Their very optimistic assessment is limited by statistical misconceptions and by causal inferences from selectively interpreted, correlational data. Using the Reproducibility Project: Psychology data, both optimistic and pessimistic conclusions about reproducibility are possible, and neither are yet warranted.

Full text at http://dx.doi.org/10.1126/science.aad9163