[17]USDA Forest Service, Rocky Mountain Research Station, Missoula, MT 59801, USA
[18]University of Freiburg, Wildlife Ecology and Management, 79106 Freiburg im Breisgau, Germany
[19]Norwegian Institute for Water Research, Freshwater Biology, N-0349 Oslo, Norway
[20]University of Eastern Finland, Biology, 80101 Joensuu, Finland
[21]Wageningen University, Nature Conservation and Plant Ecology, Wageningen, PB 6708 The Netherlands
[22]Stockholm University, Zoology, 106 91 Stockholm, Sweden
[23]Estación Biológica de Doñana, Conservation and Evolutionary Genetics Group, 41092 Seville, Spain
[24]Jagiellonian University, Institute of Environmental Sciences, 30-387 Krakow, Poland

*Correspondence: aaron.shafer@ebc.uu.se (Aaron B.A. Shafer) and jochen.wolf@ebc.uu.se (Jochen B.W. Wolf).

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Letter

A Balanced Data Archiving Policy for Long-Term Studies

Michael C. Whitlock,[1,*]
Judith L. Bronstein,[2]
Emilio M. Bruna,[3,4]
Aaron M. Ellison,[5]
Charles W. Fox,[6]
Mark A. McPeek,[7]
Allen J. Moore,[8]
Mohamed A.F. Noor,[9]
Mark D. Rausher,[9]
Loren H. Rieseberg,[10]
Michael G. Ritchie,[11] and
Ruth G. Shaw[12]

Long-term monitoring and experiments are crucial to understanding many important questions in ecology and evolution, and, consequently, the data sets that emerge from long-term projects can be extremely valuable. It is crucial that such data are treated in a way that supports the best interests of science. We must continue to encourage researchers to engage in long-term projects, and we must also ensure that such data are widely available in perpetuity [1,2]. Balancing these sometimes opposing goals is a difficult but not insurmountable problem, and certainly one that should be resolved in a way that balances the needs of those who produced those data with the best interests of science.

In a recent article in *TREE*, Mills *et al.* [3] argued that current data accessibility policies hinder long-term studies. They raised several important issues. While many of us strongly disagree with many of the points that they raised, we do think that some changes to data-archiving policies are warranted.

The current data-archiving policies of many ecology and evolution journals have provisions to attenuate the burdens of data archiving. First, the current policies do not require archiving of the entire data set from a project; they require only that authors make available the data necessary to recreate the analyses and results in the published manuscript. Second, embargoes of public access to archived data for a year after publication are typically automatic, but longer embargoes can be allowed with the discretion of the editor. However, while we think that editorial discretion is an important tool in a fair policy, such discussions can be inefficient and lead to inconsistent policies.

Despite these existing provisions, we do agree with Mills *et al.* that, in some situations, the current data-archiving policy adopted by many ecology and evolutionary biology journals does not adequately balance the needs of scientists producing long-term data sets with the needs of the community. As some of the original framers of the joint data archiving policy [1] and current editors of ecology and evolution journals, we propose the following as a balanced way forward (in many cases echoing the suggestions of Roche *et al.* [4]):

- As Mills *et al.* [3] suggest, a longer embargo period may often be appropriate for long-term studies. We suggest that, for projects for which the key data reported in the publication have been regularly collected from a population for more than 5 years, journals should allow a 5-year embargo period upon author request. This longer embargo allows authors the opportunity to make additional use of their own data while ensuring that the data underlying results in the paper are appropriately preserved and eventually available for reuse.
- With longer embargoes, the importance of careful data management and good meta-data becomes even greater, because the data cannot be easily vetted while the potential ambiguities are fresh in the authors' minds. Authors who opt for a longer embargo should take care that the data being archived are well presented for easy and unambiguous reuse in the future.
- As Mills *et al.* also note [3], original data collectors have insights into the data that cannot be fully extracted from previous papers and metadata. Journals and researchers who reuse data should recognize that, in most cases, data will be better understood and analyzed with the cooperation or collaboration of those who collected the data. We agree that reusers of data should strongly consider consulting and, in many cases, directly collaborating with,

depositors on new data analyses. However, we do not feel that this should be a mandatory policy, and such consultation will be less needed when the data are reused as a part of a larger meta-analysis (see [5]).

- For substantial reanalyses of data sets that do not include original data collectors as authors, journals should endeavor to enlist one or more of the original data collectors as reviewers, as Mills *et al.* suggest [3]. Obviously, this practice has the potential for abuse. However, reviews from data collectors will, in most cases, be invaluable for assessing the appropriateness of the data set for the questions being addressed in the new analysis.
- Scientific funders should make clear that long-term projects are valued, especially when the data from them are broadly available for reuse within a reasonable time frame. All scientific products made possible by the data sets, whether produced by the original data collectors or others, should be counted when assessing the return on investment of grants supporting long-term projects. We also think that it is reasonable and responsible for funders to set stricter standards on the openness of data than we suggest above for journals.

Data archiving allows the scientific community to produce new results economically [6] and permits the essential verification of existing results [7]. Without public archiving, data are lost [8] or simply not shared [9]. If journals provide more clarity, unity, and flexibility for longer embargoes for long-term data sets, the incentive to collect long-term data can be retained while still ensuring that the valuable data from long-term studies will not be lost to the broader scientific community.

[1]Department of Zoology, University of British Columbia, Vancouver, V6T 1Z4, Canada
[2]Department of Ecology and Evolutionary Biology, University of Arizona, Tucson, AZ 85721, USA
[3]Department of Wildlife Ecology and Conservation, University of Florida, PO Box 110430, Gainesville, FL 32611-0430, USA
[4]Center for Latin American Studies, University of Florida, PO Box 11530, Gainesville, FL 32611-5530, USA
[5]Harvard Forest, Harvard University, Petersham, MA 01366, USA
[6]Department of Entomology, University of Kentucky, Lexington, KY 40546-0091, USA
[7]Department of Biological Sciences, Dartmouth College, Hanover, NH, USA
[8]Department of Genetics, University of Georgia, Athens, GA 30602, USA
[9]Department of Biology, Duke University, Durham, NC 27708, USA
[10]Department of Botany, University of British Columbia, Vancouver, V6T 1Z4, Canada
[11]School of Biology, University of St Andrews, St Andrews, KY16 9AJ, UK
[12]Department of Ecology, Evolution and Behavior, University of Minnesota, Minneapolis, MN 55108, USA

*Correspondence: whitlock@zoology.ubc.ca (M.C. Whitlock).

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Letter

Solutions for Archiving Data in Long-Term Studies: A Reply to Whitlock *et al.*

James A. Mills,[1,53,*] Céline Teplitsky,[2,3,53] Beatriz Arroyo,[4] Anne Charmantier,[3] Peter. H. Becker,[5] Tim R. Birkhead,[6] Pierre Bize,[7] Daniel T. Blumstein,[8] Christophe Bonenfant,[9] Stan Boutin,[10] Andrey Bushuev,[11] Emmanuelle Cam,[12] Andrew Cockburn,[13] Steeve D. Côté,[14] John C. Coulson,[15] Francis Daunt,[16] Niels J. Dingemanse,[17,18] Blandine Doligez,[9] Hugh Drummond,[19] Richard H.M. Espie,[20] Marco Festa-Bianchet,[21] Francesca D. Frentiu,[22] John W. Fitzpatrick,[23] Robert W. Furness,[24] Gilles Gauthier,[14] Peter R. Grant,[25] Michael Griesser,[26] Lars Gustafsson,[27] Bengt Hansson,[28] Michael P. Harris,[16] Frédéric Jiguet,[2] Petter Kjellander,[29] Erkki Korpimäki,[30] Charles J. Krebs,[31] Luc Lens,[32] John D.C. Linnell,[33] Matthew Low,[34] Andrew McAdam,[35] Antoni Margalida,[36] Juha Merilä,[37] Anders P. Møller,[38] Shinichi Nakagawa,[39] Jan-Åke Nilsson,[27] Ian C.T. Nisbet,[40] Arie J. van Noordwijk,[41] Daniel Oro,[42] Tomas Pärt,[34] Fanie Pelletier,[21] Jaime Potti,[43] Benoit Pujol,[12] Denis Réale,[44] Robert F. Rockwell,[45]