

Land-use change to subsistence farming has negligible impact on birds in Zimbabwe

J Stephen Pringle¹, Ngoni Chiweshe², and Martin Dallimer³

¹University of Leeds Faculty of Environment

²CIRAD Zimbabwe

³University of Leeds

September 25, 2021

Abstract

Habitat alterations that often accompany land-use change are one of the major drivers of global biodiversity losses. In Africa, these threats are especially severe, as this continent has the most rapidly growing of all human populations. Inevitably, increasing areas of land are being transformed for agriculture, including drought-prone drylands in southern and central Africa, despite often having poor soils. In Zimbabwe, a land reform programme provided a unique opportunity to study the biodiversity response to abrupt habitat modification in an extensive dryland area of mixed grassland and woodland savannah. Small-scale subsistence farms were created rapidly during 2001-2002 in formerly semi-natural savannah. We measured the changing compositions of bird communities in transformed and untransformed land over an 8-year period, commencing one decade after subsistence farms were established. Over the study period, repeated counts were made along identical transects in order to assess species' population changes that may have resulted from trait-filtering responses to habitat disturbance. We recorded significantly increased abundances in both land-use areas, accompanied by increases in species diversity and functional redundancy. Temporal trends showed increased abundances across all feeding guilds, and in species of virtually all sizes. Influxes of new species did not increase functional traits' diversity, and no species with distinctive traits appear to have been lost as a result of land-use change. Nearly two decades after habitat transformation, the bird communities in the transformed and untransformed areas had become more similar in composition. The broadly benign impact on birds of land conversion into subsistence farms is attributed to the relatively low-level of human activities and disturbance in the transformed land, and the large regional pool of non-specialist bird species.

Hosted file

Pringle et al 2021 as submitted.docx available at <https://authorea.com/users/436997/articles/538941-land-use-change-to-subsistence-farming-has-negligible-impact-on-birds-in-zimbabwe>

Hosted file

Figure 1.docx available at <https://authorea.com/users/436997/articles/538941-land-use-change-to-subsistence-farming-has-negligible-impact-on-birds-in-zimbabwe>

Hosted file

Figure 2.docx available at <https://authorea.com/users/436997/articles/538941-land-use-change-to-subsistence-farming-has-negligible-impact-on-birds-in-zimbabwe>

Hosted file

Figure 3.docx available at <https://authorea.com/users/436997/articles/538941-land-use-change-to-subsistence-farming-has-negligible-impact-on-birds-in-zimbabwe>

Hosted file

Figure 4.docx available at <https://authorea.com/users/436997/articles/538941-land-use-change-to-subsistence-farming-has-negligible-impact-on-birds-in-zimbabwe>

Hosted file

Figure 5.docx available at <https://authorea.com/users/436997/articles/538941-land-use-change-to-subsistence-farming-has-negligible-impact-on-birds-in-zimbabwe>

Hosted file

Figure 6.docx available at <https://authorea.com/users/436997/articles/538941-land-use-change-to-subsistence-farming-has-negligible-impact-on-birds-in-zimbabwe>

Hosted file

Figure 7.docx available at <https://authorea.com/users/436997/articles/538941-land-use-change-to-subsistence-farming-has-negligible-impact-on-birds-in-zimbabwe>