**Data should be united: Data Integration for increased insight into ecological processes driving population fluctuations of a vulnerable alpine bird species**

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In recent decades, two fundamental changes have created new opportunities for better use of existing data. First, following the open science movement data is increasingly shared and published openly. Second, development of advanced hierarchical statistical methods allows data to be integrated much more efficiently. We use the willow ptarmigan in Norway as a case study and show how these two factors contribute to increased understanding of the ecological processes underlying population changes. First, we integrate data from a long term national wide line transect survey with data from opportunistically collected citizen science repositories, and test hypothesis about the relative role of biotic and abiotic weather conditions on observed population dynamics. Then, we use a novel open population stage-structed distance sampling model integrating data from the line transect surveys with data from an individual based study. We discuss how these approaches could be implemented into management decisions.