

FEATURE ARTICLES

BREEDING EXPERIENCE AND DEMOGRAPHIC RESPONSE TO ENVIRONMENTAL VARIABILITY IN THE WHITE STORK

MARIE NEVOUX¹, JEAN-CLAUDE BARBRAUD^{2,3}, AND CHRISTOPHE BARBRAUD^{1,2,4}

¹*Centre d'Etudes Biologiques de Chizé, Centre National de la Recherche Scientifique, 79360 Villiers en Bois, France*

²*GOAS, Palais des Congrès, 17300 Rochefort, France*

³*La Nougerée, Bercloux, 17770 Brizambourg, France*

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⁴E-mail: barbraud@cebc.cnrs.fr

Abstract. Whereas demographic performance increases with experience, little is known about the experience-related response of demographic performance to environmental variations. In long-lived birds, theoretical studies consider experience-related differences in performance to be greater under more restrictive conditions, but this has rarely been tested. We tested this hypothesis on the White Stork (*Ciconia ciconia*), using a long-term capture-mark-recapture dataset. We studied the demographic response of a population from Western Europe to climate by analyzing adult survival and breeding success as a function of breeding experience. Birds reproduced less well during their first breeding events than during subsequent ones, suggesting that they undergo a learning process. In addition, high mortality in Storks inexperienced at breeding may reflect an important cost associated with the first reproduction event. Presumably, birds subject to the highest cost of reproduction would die during the ensuing winter, with selection favoring birds able to maximize their survival. The first reproductive occasion could be considered a key event for White Storks, for whom mean breeding performance as well as survival probability increased over time in the population, likely as a result of a combination of learning and selection processes. Interannual variation of breeding success was partly explained by spring precipitation on the breeding ground, reflecting environmental variation. By contrast, winter conditions in the Sahel could not explain fluctuations of the survival. Contrary to our predictions, over this 12-year study, inexperienced individuals seemed to be affected by climatic fluctuations, regardless of their severity, in the same manner as experienced ones.

Key words: Adult survival, breeding experience, breeding success, *Ciconia ciconia*, environmental variation, White Stork.