

IMPACT: BIODIVERSITY

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Note to the reader: This fiche summarises the effects of Following on BIODIVERSITY. It is based on 2 synthesis papers¹, including 35 and 127 primary studies.

1. WEIGHT OF THE EVIDENCE

CONSISTENCY OF THE IMPACT

Natural fallows² have a significantly positive effect on biodiversity (i.e. increase of biodiversity) compared to cultivated arable land, according to 1 synthesis paper that included data from Europe and reported a positive effect both for population density and species richness and abundance. Another synthesis paper reported a non-significant effect on biodiversity after rice fields abandonment in Japan because some species benefit while others, particularly wetland species, are prone to be negatively affected (see **Table 1**).

The table below shows the number of synthesis papers with statistical tests reporting i) a significant difference between the Intervention and the Comparator, that is to say, a significant statistical effect, which can be positive or negative; or ii) a non-statistically significant difference between the Intervention and the Comparator. In addition, we include, if any, the number of synthesis papers reporting relevant results but without statistical test of the effects. Details on the quality assessment of the synthesis papers can be found in the methodology section of this WIKI.

Out of the 2 selected synthesis papers, one included studies conducted in Europe (see **Table 2**).

Table 1: Summary of effects. Number of synthesis papers reporting positive, negative or non-statistically significant effects on environmental and climate impacts. The number of synthesis papers reporting relevant results but without statistical test of the effects are also provided. When not all the synthesis papers reporting an effect are of high quality, the number of synthesis papers with a quality score of at least 50% is indicated in parentheses. The reference numbers of the synthesis papers reporting each of the effects are provided in **Table 3**. Some synthesis papers may report effects for more than one impact or more than one effect for the same impact.

Impact	Metric	Intervention	Comparator	Statistically tested			Non-statistically tested
				Significantly positive	Significantly negative	Non-significant	
Increase biodiversity	Population density	Natural fallow	Cultivated arable land	1	0	0	0
Increase biodiversity	Species richness and abundance	Natural fallow	Cultivated arable land	1	0	1	0

QUALITY OF THE SYNTHESIS PAPERS

The quality of each synthesis paper was assessed based on 16 criteria regarding three main aspects: 1) the literature search strategy and primary studies selection; 2) the statistical analysis conducted; and 3) the evaluation of potential bias. We assessed whether authors addressed and reported these criteria. Then, a quality score was calculated as the percentage of these 16 criteria properly addressed and reported in each synthesis paper. Details on quality criteria can be found in the methodology section of this WIKI.

2. IMPACTS

The main characteristics and results of the 2 synthesis papers are reported in **Table 2** with the terminology used in those papers, while **Table 3** shows the reference numbers of the synthesis papers reporting for each of the results shown in **Table 1**. Comprehensive information about the results reported in each synthesis paper, in particular about the modulation of effects by factors related to soil, climate and management practices, are provided in the **summaries of the synthesis papers** available in this WIKI.

Table 2: Main characteristics of the synthesis papers reporting effects on biodiversity. The references are ordered chronologically with the most recent publication date first.

Reference number	Population	Scale	Num. papers	Intervention	Comparator	Metric	Conclusion	Quality score
Ref1	Fallow or recently abandoned rice fields in Japan	Japan	35	Fallow or recently abandoned field (tilled or mowed once every 1–3 years)	Cultivated field (tilled, flood irrigated, rice planted, and harvested every year)	Species richness and abundance (plants, invertebrates, amphibians, fishes birds and mammals)	Fallow fields supported an equal level of biodiversity than cultivated rice fields. These results suggest rewilding will not necessarily be achieved by rice-field abandonment. Moreover, wetland species are particularly prone to being negatively affected by abandonment.	100%
Ref4	Set-aside lands in Europe and North America	Europe and North America	127	Set-aside land (<6yrs)	Conventional agriculture	Bird species richness; birds population density; plants population density; spiders population density	Land withdrawn from conventional production unequivocally enhances biodiversity in North America and Europe.	56%

¹ Synthesis research papers include either meta-analysis or systematic reviews with quantitative results. Details can be found in the methodology section of the WIKI.

² Natural fallows are fallows with bare land bearing no crops at all or land with spontaneous natural growth, which may be used as feed or ploughed in.

Table 3: Reference numbers of the synthesis papers reporting for each of the results shown in **Table 1**.

Impact	Metric	Intervention	Comparator	Statistically tested			Non-statistically tested
				Significantly positive	Significantly negative	Non-significant	
Increase biodiversity	Population density	Natural fallow	Cultivated arable land	Ref ₄			
Increase biodiversity	Species richness and abundance	Natural fallow	Cultivated arable land	Ref ₄		Ref ₁	

3. FACTORS INFLUENCING THE EFFECTS ON BIODIVERSITY

Table 4: List of factors reported to significantly affect the size and/or direction of the effects on biodiversity, according to the synthesis papers reviewed.

Factor	Reference number
Fallow area	Ref ₄
Fallow length	Ref ₄

4. KNOWLEDGE GAPS

The authors did not report knowledge gaps in the reviewed synthesis papers.

5. SYNTHESIS PAPERS INCLUDED IN THE REVIEW

Table 6: List of synthesis papers included in this review. More details can be found in the summaries of the meta-analyses.

Ref Num	Author(s)	Year	Title	Journal	DOI
Ref ₁	Koshida, C; Katayama, N	2018	Meta-analysis of the effects of rice-field abandonment on biodiversity in Japan	CONSERVATION BIOLOGY, 32(6), 1392-1402.	10.1111/cobi.13156
Ref ₄	Van Buskirk, J; Willi, Y	2004	Enhancement of farmland biodiversity within set-aside land	CONSERVATION BIOLOGY, 18(4), 987-994.	10.1111/j.1523-1739.2004.00359.x

Disclaimer: These fiches present a large amount of scientific knowledge synthesised to assess farming practices impacts on the environment, climate and productivity. The European Commission maintains this WIKI to enhance public access to information about its initiatives. Our goal is to keep this information timely and accurate. If errors are brought to our attention, we will try to correct them. However, the Commission accepts no responsibility or liability whatsoever with regard to the information on these fiches and WIKI.
