

Dear Dr. Ana S. L. Rodrigues,

Thank you very much for accepting the role of recommender for this article and for providing valuable comments that have substantially improved this work. As you suggested, we have modified our analysis which now allows us to highlight the important landscape variables for each species and compare the effect of each landscape variable with each other.

We believe that the content of our manuscript has been considerably improved as a result of these revisions, and we hope that our revised manuscript is now suitable for being recommended for PCI Ecology.

We look forward to hearing from you.

Kinds regards,

On behalf of the authors,

Pierre Mallet

Recommender's comments – Ana S. L. Rodrigues:

This manuscript has been revised by two reviewers, both of which consider this work interesting and a valuable and topical contribution to the literature, and I fully agree with them. There is however in my view a margin for improvement in terms of clarity of presentation of the context of the study, and also in the statistical analyses. I add below some comments and recommendations, which are complementary to those by the two reviewers.

I encourage the authors to consider these in a revised version of the manuscript.

We thank you for agreeing to act as a recommender for this manuscript and for providing such valuable comments. Below, we have responded to each comment. Within the manuscript, we have highlighted modifications associated with these responses in grey.

First comment: *Hypothesis tested*

The study starts by discussing declines in farmland birds, then clarifying that “Patches of semi-natural habitats, such as woodlands, grasslands and wetlands, remaining within agricultural landscapes may provide permanent habitat for wildlife and host a large part of farmland biodiversity”. So here these semi-natural habitat patches are seen as part of the farmland landscape, contributing to farmland biodiversity.

Then the study is framed in the context of the habitat compensation hypothesis (lines 72-73) which “states that species may compensate for the loss of their primary habitat by using agricultural habitats as a substitute”. In this context, the analysis and discussion treat semi-natural habitat patches (wetlands, woodlands and grasslands) as “primary habitat” and the field margins as “agricultural habitats”.

But it could be argued that the field margins are not “agricultural habitats” but simply particular types of patches of “semi-natural habitat” within an agricultural landscape – and indeed in line 71 they are presented as such.

All this to say that I am not sure that the study is actually testing the habitat compensation hypothesis (effect to the substitution of primary habitat by agricultural habitat). It seems to me that it is instead testing if field margins (particular types of semi-natural habitat) add valuable semi-natural habitat area to agricultural landscapes.

To me this seems like a very pertinent question, given that field margins fulfil functions in agricultural systems (e.g. draining ditches, hedgerows as separation between properties, grass strips as access areas) and so are much more likely to be retained in agricultural landscapes than other types of semi-natural habitat patches that could be converted to arable land. If they are valuable semi-natural habitats, they can be a win-win between agriculture and conservation.

In this light, to me one of the key conclusions of the study would be that field margins do have a habitat value for some of the species, but (for the same area) they are not as valuable as the habitat patches. For example, the effect of reed strips on reedbed birds is 0.58, compared to 0.79 for wetlands.

Response: Thank you for this comment. Indeed, our hypothesis could be framed more simply. As Scott Wilson pointed out, the original habitat compensation hypothesis is not specific to agriculture but encompasses all kinds of habitat type (Norton et al. 2000). Therefore, we rephrase the sentence lines 75-76 “The habitat compensation hypothesis states that species may compensate for the loss of their primary habitat by using alternative habitats as a substitute (Norton et al. 2000)”. This rephrasing removes any ambiguity about the status of different structures in the agricultural landscape. We then consider that semi-natural habitat patches, field margins and crop fields are all part of the agricultural landscape. In the face of the decrease of semi-natural habitat patches, consider as primary habitat, it is important to know if field margins could be used as a substitute habitat. Therefore, as Brotons et al. (2005), we evaluated whether the abundance of a species usually occurring within a given type of semi-natural habitat patches is positively correlated with the cover of a substitute habitat, after taking into account the amount of primary habitat available in the landscape.

As suggested in the third comment below, we have now analyzed the effect of each landscape variable for all species. Thank to this, we can also highlight that field margins have a habitat value for some of the species studied and compare this value to those of semi-natural habitat patches (see below and discussion).

Second comment: *Landscape context of the study*

Currently the Introduction and the Study Area section give the impression the paper is all about rice fields, with the field margins being those wide bands (>3m, to be waterproof) separating rice paddies.

It is then a surprise when we find out in lines 144-145 that the study covers different types of crops. The reader will then have made a mental image of the field margins that does not quite match the reality of the field.

I recommend that the introduction clarifies that different types of crops are cultivated in the Camargue, and also that the methods section presents a more precise definition of “field margin”. (Are they the darker lines in the map in Appendix A?)

Response: We have now clarified the landscape context of the study by changing the introduction and method sections.

In the introduction section, we clarified the field margin definition:

Lines 72-75 “Hence, in some agricultural landscapes, field margins, i.e. linear elements covered by semi-natural vegetation along the edge of crops, are the only type of semi-natural habitat left (Marshall and Moonen, 2002).”

Then, we present the main crop types cultivated in the Camargue:

Lines 104-106 “In Camargue, rice represents 48 % of the crop area and is mainly cultivated in rotation with wheat (19 %) and alfalfa (5 %).”

In Material and Methods section, Study area paragraph, we now explain why rice is not the only crop type and present the different types of field margins existing around every type of crop field lines 123-127 “This flooded crop is essential for washing out salt-rich soils and allows rotation with dry crops, mainly wheat and alfalfa. In Camargue, field margins are often wide (> 3 m) to be waterproof and keep the crop fields flooded during the rice cultivation period. Several types of vegetation can therefore co-occur within the same field margin, such as reed strips, hedgerows or grass strips.”

Darker lines in the Appendix A were the outline of some polygons and not the field margins. To avoid confusion, these lines are now removed.

Third comment: *Species' guilds*

I am not sure of the advantage of classifying a priori species into guilds, rather than letting the results speak for themselves. For example, the results for the common nightingale indicate that it has a quite different response to other species classified as a forest edge species (Fig 4).

Furthermore, like reviewer 2 I am confused as how to interpret the results in Figures 2-4: I cannot tell if a negative contribution to a positive effect means that there was a negative effect (the species' abundance declines when the area of a given landscape type increases), or just a slightly less positive effect (the abundance increases less than for other species in the guild).

For these reasons, I would recommend that rather than classifying the species into guilds a priori, the authors include all the species in the same model (with species as random effects), and then present results on the effects of each of the landscape variables on each of the species (as in Table 2, but with one species per column). The interesting analysis then being to compare for each species the effect of type of habitat vs the effects of field margin type. For example, for species for which wetland area has a positive effect: how does the effect of the area reed strips compare (also positive? similar in magnitude?); and how does the effect of hedgerow area compare (negative? similar in magnitude?).

I predict that this would give clearer results as to the species for which field margins (and which types of field margin) can work as valuable habitat than the current discussion based on guilds. For example, I suspect that the current counter-intuitive result that forest edge birds do not respond to woodland area may be an artifact of having quite different types of species within the forest edge guild (including nightingales). Instead, I would recommend defining forest edge species a posteriori, as those for which woodland area has a significant positive effect.

Response: Thank you for this comment which we found valuable to better quantify the effects at species level. We also took into account a suggestion from Dr Scott Wilson to include species as a fixed effect in order to be consistent across all species guilds. We therefore explored the relevance of the two options (including species as a random vs. fixed effect) and came to the

conclusion that it was more consistent with the focus of our analysis (individual species responses) and the characteristics of our dataset (large variability in species occurrence) to include species as a fixed effect as well as interactive terms between species and all explanatory variables lines 215-220 “We ran one linear mixed-effect model with bird abundance as the response variable, while fixed effects were species identity, the area of the three field margin types (hedgerows, grass strips and reed strips), the area of the three semi-natural habitat types (woodlands, grasslands and wetlands), crop diversity, mean crop field size and all two-way interactions between species identity and other explanatory variables. All explanatory variables were centered and scaled. Crop type and site identity were added as random effects.”

We kept guild classification only to frame the hypotheses and discuss the results. We believe that this new version of the analysis provides clearer results and improves our management recommendations.

Fourth comment: *Interaction between habitat patches and field margins*

The analysis treats each landscape variable as independent, but it is plausible that the value of field margins depends on the presence of habitat patches. For example, reed strips may be more valuable if close to wetlands. This could perhaps be tested in the model using interaction terms between each type of field margin and the corresponding habitat patch (reed strips – wetlands; hedgerows – woodland areas; grass strips – grassland areas).

This is also related to the point rightfully presented in the discussion (lines 331-333) that field margins may be unsuitable breeding habitats even if species use them (and could even be ecological traps). Worth discussing there that field margins could also be useful adjacent habitats (e.g. used for feeding but not for nesting) in which case they add value to existing patches of semi-natural habitat even if they cannot replace them.

Response: We agree that the effect of field margins may depend on the proportion of semi-natural patches (e.g. Holzschuh et al. 2009, <https://doi.org/10.1890/08-0384.1>). However, our study design was not suited to properly evaluate this interaction. Indeed, it would require sampling sites with all combinations of values for field margins and semi-natural patches amount, i.e. many wetland patches with few reed strips, many wetland patches with lots of reed strips, few wetland patches with few reed strips and few wetland patches with many reed strips (see the following figures of habitat patch areas versus field margin areas, points represent the 86 crop fields studied). In addition, the sample size might required to assess all parameters within such a complex model would be much bigger than what was feasible within this study. In the discussion, we mention that taking into account interactions between field margins and semi-natural patches would be a valuable hypothesis to further understand the value of field margins for bird conservation lines 344-349 “Finally, the value of field margins may also depend on the availability of habitat patches within the landscape. For instance, reedbeds may have a more positive effects when they are close to a large patch of wetland. Testing such interactive effects would require an adequate study design with all combinations of values for field margins and semi-natural patches, and a sampling size large enough to provide robust estimates of all parameters within associated statistical models.”

Reviewer's comments – Scott Wilson:

Overall, I thought this was an interesting and well done study showing the importance (or lack of) different types of field margin habitats on wetland, grassland and forest edge bird communities. While a number of studies have looked at the benefits of field margin habitats, this is one of the few to my knowledge that has examined how specific types of field margins benefit or negatively impact different guilds and the results will aid conservation planning for these species in this type of agricultural landscape. The writing was generally clear and succinct and the analyses well done. My suggestions are mostly around a few cases to improve clarity in the messaging and I also had a couple of minor questions on the design and analysis.

Response:

We thank you for accepting the role of reviewer for this manuscript and for providing such valuable comments. Below, we have responded to each comment. Within the manuscript, we have highlighted modifications associated with these responses in green.

Line 49-51: “local conservation priorities” is vague and could refer to a variety of initiatives. The implication based on the previous statements is more that field margins have the potential to be both beneficial or negative depending on the guild and therefore the management actions need to be tailored to whichever guilds are of conservation priority and that it may be difficult to benefit all guilds. You could more directly state it like this.

Response: Thank you for this comment. We have now corrected the sentence in line with your recommendation lines 50-52 “Therefore, it may be difficult to favor all species within a given landscape and management actions may need to be tailored to whichever species are locally associated with the highest conservation priority.”

Line 55: suggest “...have experienced a massive decline worldwide in recent decades...”

Response: Corrected lines 57-58 “Farmland bird populations have experienced a massive decline worldwide in recent decades”

Line 59: suggest “not practical” instead of “hopeless”

Response: Corrected lines 61-62 “It is therefore not practical to rely solely on the creation of protected areas to compensate for the declines in biodiversity”

Line 62: “carrying capacity” sounds a little odd to me here although I know what you mean (usually it’s used for single populations however). How about something like “...conservation efforts should also focus on increasing the capacity of agricultural landscapes to support biodiversity through the adoption of biodiversity-friendly agricultural practices and...”

Response: Corrected lines 64-65 “conservation efforts should also focus on increasing the capacity of agricultural landscapes to support biodiversity through the adoption of biodiversity-friendly agricultural practices”

Line 72: An original reference for the habitat compensation hypothesis would be useful here.

Response: Corrected lines 75-76 “The habitat compensation hypothesis states that species may compensate for the loss of their primary habitat by using alternative habitats as a substitute (Norton *et al.* 2000).”

Line 73: *Is the original hypothesis specific to agriculture? I don't believe so. This could be rephrased as something like "...species may compensate for the loss of their primary habitat by using alternate habitats, such as agriculture, as a substitute."*

Response: Right, the original hypothesis from Norton et al. (2000, <https://doi.org/10.1111/j.1600-0587.2000.tb00277.x>) encompasses all kinds of habitat type lines 75-76 "The habitat compensation hypothesis states that species may compensate for the loss of their primary habitat by using alternative habitats as a substitute (Norton *et al.* 2000)."

Line 87: *suggest "much less attention". Also, this would read better if broken into two sentences after the Elphick reference.*

Response: Corrected lines 88-90 "While the role of rice paddy landscapes for waterbirds has been largely studied, their role for terrestrial birds has received much less attention (Elphick, 2015)."

Line 101-103: *This sentence isn't clear, the second part on bird declines doesn't flow naturally from the first part of the sentence on the hydrosaline equilibrium.*

Response: Corrected. We have now rephrased this paragraph as follow lines 103-106 "Natural area occupied 58,000 ha and agricultural area 55,100 ha (Tamisier & Grillas 1994). In Camargue, rice represents 48 % of the crop area and is cultivated in rotation with wheat (19 %) and alfalfa (5 %). Within this region, bird species associated with agricultural areas have experienced the greatest rate of decline over the past 50 years (Galewski & Devictor 2016; Fraixedas *et al.* 2019)."

Line 107: *This would be better stated as "...we evaluated support for the habitat compensation hypothesis in rice paddy landscapes of Camargue by testing whether field margins act as substitute habitats for three ecological bird guilds (reedbed birds, forest edge birds and grassland birds)". Then the next sentence can be shortened to mention of the sample size.*

Response: Corrected lines 110-113 "In this paper, we tested the habitat compensation hypothesis in rice paddy landscapes of Camargue by assessing whether field margins act as substitute habitats for reedbed birds, forest edge birds and grassland birds. We conducted bird surveys in 86 crop fields in Camargue."

Line 111: *Suggest this be "Specifically, we predicted..."*

Response: Corrected line 113 "Specifically, we predicted that"

Line 139-140: *I don't think you need to have this line about hedge rows being on a different map. If you do include it, it would be good to refer to the map as it wasn't clear to me.*

Response: Hedgerow was the only field margin layer available prior the field crop field selection. Therefore, we selected crop fields along the gradient of this field margin type only. We have now rephrased this paragraph as follow to be clearer lines 143-147 "No maps of grass strip or reed strip were available prior to crop field selection. Therefore, we checked for the distribution of sampled crop fields along gradients of explanatory variables once the selection

and on-site mapping were completed. We also checked for the absence of correlation among the cover of different types of field margin and other landscape variables (see below).”

Line 140: *It's more typical to say “We checked for correlations.”*

Response: Corrected line 146 “We also checked for correlations...”

Survey design (2.2 and 2.3): *If I am understanding the survey design correctly, all variables related to the vegetation and crop covers were measured at 500m from the center of the crop field and then for that same crop field, bird surveys were done halfway along the edge of that crop field – is that correct? Unless these fields are small such that the center and edges are very close, it seems possible that the cover in a radius of detectability around the bird survey point may not align with the cover being measured from the center of the crop field. Perhaps I'm not visualizing the design properly but either way it would be good to clarify this further as it seems like the vegetation and the bird surveys could be mis-aligned in terms of what's being surveyed.*

Response: Thank you for this comment. Indeed, your description of the experimental design is correct. Fields are indeed small enough so that the whole field and its surrounding field margins are included within the 500 m buffer around the field center. We did not include birds detected outside of the crop field and its field margins. As a result, there was no risk of the radius of detectability being larger than the 500m radius within which landscape variables were quantified.

Line 214-217: *Since you are interested in individual species responses and in comparing among guilds, I would treat species as fixed effects in all cases so that you are consistent across the three guilds. Also, with random variables there is a sharing of information and so, especially for the species with less data, there will be an overall influence of the group mean for forest birds on the individual forest species responses (it may be minimal but good to be aware of and aside from that, it would be better to be consistent in how each guild is analyzed). Otherwise, I thought the data analysis looked good and was nicely described.*

Response: Thank you for suggesting these alternative models. This suggestion is also connected to a comment from Dr. Ana S. L. Rodrigues who recommended that we consider the relevance of focusing on species-level response rather than guild's response. After comparing different modelling options, we now analyse the response of all species to every landscape variable within a unique model including species as fixed effect. Please see the more detailed response to Dr. Ana S. L. Rodrigues's comment for further explanation of our rationale.

Line 257: *I know that you mention no effect of grass strips on grassland birds on lines 271-273 but I think it should be discussed here instead since it was one of the main objectives in testing field margins as substitute habitats. It seemed strange to have it included at the very end of the Results (fine to leave the influence of crop diversity and field size for the end since these were not a main objective).*

Response: The new analyses modified the results section and we now specifically address the question of field margins first.

Line 267-270: *Rather than comparing how one species responses relative to another, where there are so many possible comparisons, it may be better to summarize which species are most contributing to the effects in Figure 4a and 4b. Also, as I noted above, some of the responses for less common species may be influenced by the overall group mean and so it will be interesting to see if there are effects for more of the species if you run all models with species as fixed rather than random effects.*

Response: Given the new analyses, we have now removed these contribution analyses from the paper.

Line 300-301: *To be clear, this should read "...substitute habitats for reedbed and forest edge species respectively, in line with...". As stated it sounds like reedbed and forest edge species benefit from both reed strips and hedge rows.*

Response: Corrected and modified with the new results lines 295-298 "Our results support the hypothesis that (i) hedgerows represent a substitute habitat to forest edges for the European greenfinch; (ii) grass strips represent a substitute habitat to grasslands for corn bunting and (iii) reed strips represent a substitute habitat to wetlands for the Eurasian reed warbler."

Line 326: *Should be "the latter"*

Response: Corrected lines 320-321 "...the latter requiring wetter and larger patches of reedbeds than the Eurasian reed warbler"

Line 329-333: *Good acknowledgements here, one other point to note is that we don't lose wetlands under the idea that we can use reedbeds as a substitute. The example with bearded reedling shows that reedbed strips cannot benefit all species but it would also be difficult for reedbeds to match the area loss and heterogeneity in vegetation and other habitats that wetlands provide. The species with sufficient data in your study are capable of using these strips and your study shows that they can be substitute habitats for these species but it would be good to be clear that the results here do not imply that they are substitute habitats for communities (i.e. reed strips do not equal wetlands in general). You start to touch on this in the concluding paragraph but it could be stated more directly.*

Response: As suggest by Ana Ana S. L. Rodrigues, we now studied the compensation hypothesis at species specific level and not for the guild. One of the advantages of this new approach is to be clearer on the fact that field margins could not replace primary habitat for all the studied species nor for the entire guild.

Table 2 legend: *Should state if the confidence intervals are 95% or some other width.*

Response: Corrected lines 291-292 "The 95% confidence intervals are in brackets."

Reviewer's comments – Elena D. Concepción

General comment: *The manuscript entitled “Field margins as substitute habitat for the conservation of birds in agricultural wetlands” is a highly interesting and timely piece of work that may considerably contribute to the design of more effective and targeted conservation measures for the rice paddy region of Camargue (France). This is particularly the case in the current context of reform of the EU Common Agricultural Policy (CAP). In addition, this manuscript aims at testing the “habitat compensation hypothesis” as a biodiversity conservation strategy in an ecosystem type, i.e., wetlands with agricultural use, that remains rather unexplored so far. The study is well focused, including a straightforward development of research objectives derived from the applicability of ecological theory to conservation management that results in specific hypotheses and expectations to test in the field. The study design and statistics are appropriate and robust. Overall, the methods' section is exhaustive, clear and well explained, which guarantee the reproducibility and replicability of the study. Results are also explained in a straightforward way. And the discussion addresses the questions posed in the introduction without lucubration. I have only a few minor points that in my opinion deserve to be considered in the manuscript and that I detail as follows.*

Response:

Thank you for accepting the role of reviewer for this article and for your positive comments. Below, we have responded to each comment. Within the manuscript, we have highlighted modifications associated with these responses in blue.

Line 40: *“crop diversity” it could be a good idea to mention the main crop types in the regions, as you did with the semi-natural habitats.*

Response: As for semi-natural area, we have now added the three main crop in Camargue lines “We controlled for the area of each type of semi-natural habitat (wetlands, grasslands, and woodlands), crop diversity (rice, wheat, alfalfa, rape, and market gardening) and mean crop field size.”

Line 72: *I would add some references about the “habitat compensation hypothesis” (e.g., Gascon et al. 1999, Brotons et al. 2003?)*

Response: We agreed and added the reference of Norton et al. 2000 as follow lines 75-76 “The habitat compensation hypothesis states that species may compensate for the loss of their primary habitat by using alternative habitats as a substitute (Norton et al. 2000).”

Line 86-90: *I think this sentence is too long. I also wonder whether “whereas” is the most appropriate term. I would replace “whereas they have suffered [...]” with “despite having suffer [...]”.*

Response: Corrected, the sentence is now divided and “whereas” is replaced lines 88-93 “While the role of rice paddy landscapes for waterbirds has been largely studied, their role for terrestrial birds has received much less attention (Elphick, 2015). Considering the long-term decline of terrestrial bird populations in agricultural landscapes (Fraixedas et al., 2019), identifying conditions favoring them would be useful to improve recommendations for agri-environmental management practices in rice paddy landscapes.”

Lines 101-106: *I do not get the rationale underlying the link among these three sentences. Please, clarify.*

Response: We have now rephrased the paragraph and remove the unnecessary information about the hydrosaline equilibrium of the Camargue. We believe it now clarifies the meaning of this paragraph lines 102-109 “The Camargue (Rhône delta) is a biologically rich area listed in the Ramsar Convention and classified as a Biosphere Reserve by UNESCO (Blondel et al., 2019). Natural areas cover 58,000 ha and agricultural areas 55,100 ha (Tamisier and Grillas, 1994). In Camargue, rice represents 48 % of the crop area and is mainly cultivated in rotation with wheat (19 %) and alfalfa (5 %). Within this region, bird species associated with agricultural areas have experienced the greatest rate of decline over the past 50 years (Fraixedas et al., 2019; Galewski and Devictor, 2016). Hence, it is critical to assess whether field margins could constitute a lever for bird conservation as their restoration and management may be readily changed by farmers.”

Lines 142-145: *“We selected [...] and marked gardening).” I would locate these two sentences at the beginning of the “Study design” section, just after the first sentence when you explain that you selected 86 organic crop fields. Then, I would go into details about how you chose these fields in order to represent the landscape gradient.*

Response: We agreed and reframed the paragraph lines 135-140 “We selected 86 organic crop field (Fig. 1). All fields were organically managed in order to limit confounding effects associated with variations in the intensity of agricultural practices. We selected crop fields covered by the main crop types representative of the main agricultural production in Camargue (rice, wheat, alfalfa, rape, and market gardening). Crop fields were selected along two independent gradients of semi-natural cover and hedgerow cover using the methodology developed by Pasher et al., (2013).”

Figure 1: *Map scale?*

Response: Scale added line 149.

Lines 186-187: *Exploring how generalist or urbanophilous species responded to habitat availability (or lack of...) would be very interesting. I can see this manuscript addresses another research question (i.e., the capacity of specific margins to substitute a specific habitat for a given bird guild), but I encourage the authors to explore (in another work) whether generalist species proliferate with increasing habitat homogenization and decreasing availability of natural and semi-natural habitats. Moreover, it would be interesting to know whether generalist species take more advantage than habitat-specialist species from some types of field margins prior to promote them as conservation measures for specific (i.e., of conservation concern) bird guilds that might result counterproductive if these margins benefit more generalist species than the target specialist ones.*

In a very recent paper I co-authored (<https://www.sciencedirect.com/science/article/pii/S1470160X22005222>), we have evinced a generalized decline of specialist farmland birds and a progressive colonization of farmland habitats by non-farmland birds over the last decades in Spain. It is not my intention you to cite this work, just to point that the replacement of habitat specialists with generalist species is an

issue that should be taken into consideration when exploring potential conservation measures to favor specialist species of conservation concern.

Response: Thank you for this very interesting thought and reference. Our data could be used to answer this question and is indeed of much interest. We now address this point in the discussion lines 386-392 “Future research should explore the role of field margins for other bird species or taxonomic groups in order to strengthen land management recommendations. For instance, it may be relevant to study the role of different types of field margins for generalist species. Indeed, a recent paper has highlighted the progressive colonization of farmland habitats by generalist bird species over the last decades in Spain (Díaz et al., 2022). Taking into account the response of generalist bird species may therefore help avoiding the homogenization of bird communities within rice paddy landscapes.”

Lines 201-204: *Could you please specify how coverage was calculated? As the mean of averaged values for each surveyed taxon in each field?*

Response: The calculation of the coverage is a method to estimate the completeness of a sample. This index corresponds to the probability of occurrence of the species observed in the sample. This method was developed by Chao and Jost (2012) and uses for example in Gossner et al. (2016, <https://doi.org/10.1038/nature20575>). The formula for coverage is in the paper of Chao and Jost (2012, <https://doi.org/10.1890/11-1952.1>) equation 4a.

In our study the coverage was calculated for the 14 species studied on each of the crop fields. Therefore, 73.5% corresponds to the average coverage of all the crop fields.

In the Material and Methods section, we clarified the coverage calculation lines 203-210 “...we calculated the coverage of our sampling, which is defined as the proportion of the total number of individuals in an assemblage that belong to the species present in the sample (Chao and Jost, 2012). This index corresponds to the probability of occurrence of the species observed in the sample. The coverage was calculated by crop field for all 14 species considered within the present study. The overall coverage of our sampling was 73.5 %, which reflects no undersampling issue (Mallet et al., 2022). The coverage was calculated by crop field for all 14 species considered within the present study.”

Line 223: *Reading the R code I guess the zero-inflated parameter is associated to species identity. Is this right? I think it should be mentioned in the text.*

Response: As suggested by Dr. Ana S. L. Rodrigues, we modified our model structure. In the new approach with the species in interaction with all of the other explicative variable, we removed the zero-inflated parameter, because without it the overdispersion was still below 1.2 (Lüdecke et al. 2021, 10.21105/joss.03139).

Lines 234-236: *What does a negative estimate mean? that the species contribute less to the abundance increase but still increase its abundance? or that the species do not contribute at all and its abundance does not increase?*

Response: In fact, a negative estimate means that the species contributes less to the abundance increase than on average at guild level, but still increases its abundance. However, following the revision of the analyses, we now test the compensation hypothesis for each species and not

anymore for each guild. We therefore have removed this part of the analyses in the new version of the paper.

Lines 340-348: *The lack of effect could also be due to the narrow range of variation of this explanatory variable in your dataset, which was less than a half of the range of variation of grassland and wetland (median = 0.71 ha; 248 range: [0; 20.78]). Perhaps just there is not a wide enough gradient in woodland cover to have an effect on bird abundance.*

Response: We agreed with this hypothesis. However, due to the increased number of results from the new analyses by species, we have focused the discussion on the effects of field margins and not semi-natural habitat patches. Therefore, we do not address this point in the discussion anymore.

Lines 348-349: *Any idea about the reason for this negative effect?*

Response: We added a hypothesis to explain this negative effect, still present with the new analyse lines 352-354 “This result may be due to the fact that this type of field margin provides too few resources in terms of food and nesting sites for forest edge bird species (Shoffner et al., 2018).”

Lines 375-377: *I do not think that your results support that grass strips are a key lever to favor bird diversity. They did not have a positive effect on the abundance of any bird guild.*

Response: Indeed, this was not the case with the guild analysis. However, the species analysis supports the hypothesis that grass strips represent a substitute habitat to grasslands for corn bunting. Our results shows that grass strips even have a stronger than grassland for this species. Our results now support this statement L383-385: “Our study therefore suggests that conserving and restoring reed strips and grass strips represent a promising avenue to increase biodiversity in the agricultural landscapes of Camargue.”

Lines 377-380: *It remains unclear whether you consider hedges as a valuable measure to apply in the study area despite their negative effects on grassland birds.*

Response: According to their positive effects on the abundance of European greenfinch and their positive effects on other taxa of high conservation importance as bats, hedgerows are a valuable measure in the study area. However, hedgerow planting needs to be spatially planned in order to avoid deleterious effects on grassland birds at large scale. We reworded this section to make it clearer lines 392-401 “hedgerows are known to have negative effects on waterbirds (Tourenq et al., 2001). However, they can host a diversity of auxiliary species as well as taxa of high conservation importance in Camargue and other wetlands such as bats (Mas et al., 2021). Hedgerows have also been shown to limit the presence of greater flamingos (*Phoenicopterus roseus*), considered as a pest in rice fields (Ernoul et al., 2014). Taking into account the role of hedgerows across taxa would be particularly relevant in the context of the current action plan of replanting hedgerows carried out locally by the Regional Natural Park of the Camargue. Our results and the literature indeed suggest that replanting hedgerows must be optimized in order to limit their negative impact on grassland bird species and waterbirds associated with high conservation value.”

Lines 380-381: *Any reference about this?*

Response: Reference added lines 395-396 “Hedgerows have also been shown to limit the presence of greater flamingos (*Phoenicopterus roseus*), considered as a pest in rice fields (Ernoul *et al.* 2014).”

Lines 382-384: *Do you refer to grassland birds? Mention them explicitly.*

Response: The mention is now clear lines 400-401 “in order to limit their negative impact on grassland bird species and waterbirds associated with high conservation value.”