Thank you very much for the manuscript comments, some comments were valuable and we included it in the text but some more general, defining the habitat or weighed usable area cannot be accepted by authors in the light of current publications and environmental flow concept development. Taking from reviewer#2 point of view we should model only fish populations to obtain the e-flow calculations. Many papers however describe the habitat at various levels of biotic organization from individuals to the ecosystems.

Detailed comments to the reviewer#2 are included below:

REF#2: Please see references listed below regarding correct use of the word "habitat" and related terms. Habitat is organism-specific, and defined as the resources and conditions that enable a particular organism to occupy a particular place. It is not a term than can be applied to a community (e.g., revised manuscript, line 85) and the BMWP_PL index is not a measure of "habitat suitability" (lines 152-158).

Indeed, phrases such as "suitable habitat" (e.g., line 28) and "usable habitat" (e.g., line 205) should not be used – the words "suitable" and "usable" are redundant because if an area is not suitable or usable for an organism, it is not part of its habitat.

Authors: This phrase was deleted from the text. We have replaced the term "suitable area" to "optimal area" informing about optimal conditions for invertebrates modelled from GAM rather than of conventional habitat suitability criteria and the associated composite suitability index (CSI).

REF#2: In short, "habitat" should be removed from the manuscript because the authors do not assess the extent or quality of habitat for any particular organism.

Authors: We cannot agree with that definition. Reviewer suggest that habitat is only limited to particular population which is more multidimensional niche space than habitat. We agree that this definition can be applied at the population level and the cited papers consider the population level definitions. However how to define the habitat for communities? Habitat according to definition should be regarded at different levels: population, species, community or biomes. Definition according to The Encyclopaedia Britannica (https://www.britannica.com/science/habitat-biology): "Habitat, place where an organism or a community of organisms lives, including all living and non-living factors or conditions of the surrounding environment. A host organism inhabited by parasites is as much a habitat as a terrestrial place such as a grove of trees or an aquatic locality such as a small pond."

For example Shearer et al . (2015) defines the habitat to given invertebrate taxa not particular organisms (*KA Shearer, JW Hayes, IG Jowett & DA Olsen (2015): Habitat suitability curves for benthic macroinvertebrates from a small New Zealand river, New Zealand Journal of Marine and Freshwater Research, DOI: 10.1080/00288330.2014.988632*).

Yujun Yiet al. (2018) (in paper: *Habitat suitability evaluation of a benthic macroinvertebrate community in a shallow lake, Ecological Indicators, https://doi.org/10.1016/j.ecolind.2018.03.039*) tried to find the relations between communities and hydrological factors. Also Theodoropoulos et al. (2018) (*Christos Theodoropoulos, Aikaterini Vourka, Nikolaos Skoulikidis, Peter Rutschmann & Anastasios Stamou (2018) Evaluating the performance of habitat models for predicting the environmental flow requirements of benthic macroinvertebrates, Journal of Ecohydraulics, 3:1, 30-44, DOI: 10.1080/24705357.2018.1440360*) tried to find the habitat relations between abundance of macroinvertebrates and BM metrics, including taxonomic richness, diversity (Shannon's index) and EPT richness (Ephemeroptera, Plecoptera, Trichoptera) and habitat preferences. The number

of similar works can be multiplied. In google scholar phrases Habitat + suitability + macroinvertebrates are presented in 20 600 papers.

REF#2: Similarly, the term "Weighted Usable Area (WUA)" (e.g., line 232) is meaningless without reference to the particular organisms the area is usable for. An area that is usable for one organism is not usable for some other organisms, because different species and life-history stages have different environmental requirements. And the BMWP_PL index is not a measure of the area that is usable for any organism. Therefore, the authors should also remove reference to WUA.

Authors: According to Payne definition (PHABSIM concept)(https://www.noaa.gov/sites/default/files/legacy/document/2020/Oct/07354626138.pdf), "WUA as an index to various ecological parameters such as biomass, microhabitat area, or population size", but also macroinvertebrate abundance (Jowett 2003, Jowett IG 2003. Hydraulic constraints on habitat suitability for benthic invertebrates in gravel-bed rivers. River Research and Applications 19: 495–507.), total macroinvertebrate biomass and ASPT biomass (Kelly et al 2015) (: DJ Kelly, JW Hayes, C Allen, D West & H Hudson (2015): Evaluating habitat suitability curves for predicting variation in macroinvertebrate biomass with weighted usable area in braided rivers in New Zealand, New Zealand Journal of Marine and Freshwater Research, DOI: 10.1080/00288330.2015.1040424)

The weighted usable area is defined as the total surface area having a certain combination of hydraulic conditions, multiplied by the composite probability of use for that combination of conditions. This calculation is applied to each cell within the multidimensional matrix. We calculated this area for benthic invertebrates according to BMWP_PL variation. BMWP is not a measure of area, but the index can indicate (according to its variation) which part of the habitat is optimal for invertebrates and combining those preferences with hydraulic condition we were able to estimate total surface area in both incised and redeposited rivers.

REF#2: What the authors have done is not to assess "habitat suitability" or "weighted usable area" but rather to model the discharge that maximises the value of the BMWP_PL index. However, they have not articulated a rationale for doing so. They state that the purpose of environmental flow is to "maintain biological diversity in the river ecosystem" (lines 46-47).

Authors: This definition is not our but we included the reference of Arthington et al. 2006.

REF#2: But the concept of biodiversity is multi-scaled and multi-faceted - please see Rolls et al. (2018), referenced below, for an overview of the scales and facets of biodiversity relevant to environmental flows. Biodiversity is not equivalent to the value of a biotic index just because the index incorporates species with varied environmental preferences (lines 132-133).

If maintaining biodiversity is the goal. the authors need to justify their index choice by explaining which scale(s) and facet(s) of biodiversity the BMWP_PL index predicts, on what evidence, and why BMWP_PL is a better indicator of these scales and facets of biodiversity than alternative indices or metrics.

Authors: We have never said that biodiversity is an equivalent of a biotic index. Many biotic indices inform us about the biodiversity loss e.g. BMWP, ASPT, LIFE, family biotic index etc. But they are not measures of biodiversity. We have calculated several indices, measuring taxonomic diversity (e.g. taxonomic richness, Shannon-Wiener or alpha-Fisher), but also indices related to

environmental perturbations (ASPT, % Oligochetae, Chironomidae/Oligochatae etc.), but BMWP index was the most sensitive to any hydrological changes.

REF#2: I also note that while the authors have provided responses to my previous comments, in several cases they have not made corresponding changes to the manuscript. For example, the tautological phrase “multispecies communities” is still present (line 38),

Authors: We have deleted it from the text, however in our opinion it is not tautological phrase. In Scopus database 112 articles have in their topic multispecies communities to emphasize that they are build of many species. In contrast we may have three-two species fish communities which are not multispecies at all. The concept is that multispecies communities react differently to any kind of disturbances than species-poor communities.

REF#2: the definitions of “low low flow” and “mean low flow” (line 175) have not been incorporated,

Authors: added to the text, we thought however that these definitions are commonly known.

REF#2: the procedure for random selection of the case-study site is still not stated (line 179).

Authors: added to the text

REF#2: The authors should make changes in response to every previous comment, or else provide a reason for not making a change.

Authors: We have provided information to every reviewer comment (some in the text or as a individual response to Reviewer) .