

Public's negative perception towards wood in rivers, does it relate to recent impact of flooding?

La perception négative qu'a le grand public du bois mort en rivières est-elle plus marquée lorsque l'on a subi une inondation ?

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RÉSUMÉ

En Espagne, où les bois morts tombés dans les cours d'eau ont été systématiquement retirés des rivières pendant des décennies, les gens sont habitués aux rivières avec peu ou pas de bois mort. Des études antérieures ont indiqué que la perception négative du bois en rivières est liée au manque de connaissances de base sur l'écologie des cours d'eau ou sur la dynamique fluviale. Dans cette étude, nous émettons l'hypothèse que la fréquence des inondations a également une influence sur la perception que les gens peuvent avoir du bois mort en rivières. Pour tester cette hypothèse, nous avons interrogé, à l'aide d'un questionnaire, des groupes de personnes vivant dans différentes zones de montagne espagnoles qui ont été plus ou moins fréquemment touchées par les inondations et nous avons comparé leurs perceptions du bois en rivière. En outre, nous avons testé si la perception envers le bois de rivière diffère entre les scientifiques et le grand public. Sur la base d'une analyse en classes latentes, nous avons observé que, d'une manière générale, la fréquence des inondations n'est pas le principal facteur expliquant la perception négative du bois dans les cours d'eau. Les gens, indépendamment du temps écoulé depuis la dernière inondation, ont perçu les cours d'eau avec du bois flotté comme moins esthétiques, plus dangereux et nécessitant d'avantage d'entretien au niveau des chenaux que les cours d'eau sans bois. Il existe donc un fossé important entre la perception scientifique et publique des systèmes fluviaux naturels. Un effort est encore nécessaire en termes de sensibilisation du grand public pour combler ce fossé pour une gestion plus efficace et une restauration des systèmes fluviaux avec du bois.

ABSTRACT

In Spain, where instream wood has been systematically removed from rivers during decades, people are accustomed to rivers with minimal or no instream wood at all. Previous studies reported that the general negative perception towards wood in rivers is related to the lack of background knowledge about stream ecology or fluvial dynamics; however, we hypothesized that flood frequency has an influence on the perception of instream wood as well. To test this hypothesis, we surveyed using a questionnaire, groups of individuals living in different Spanish mountain areas which were more or less frequently affected by floods and we compared their perceptions of instream wood. In addition, we tested whether the perception towards wood differs between scientists and general public. Based on latent class cluster analysis, we observed that, in general terms, flooding frequency is not the main factor controlling instream wood perception. People, independently from time since the last flood perceived watercourses with instream wood as less aesthetically, more dangerous and with more needs to improve the channels than watercourses without wood. In contrast, we confirmed the existence of a gap between scientific and public perception of natural river systems with wood. An effort is still needed in education and policy to bridge this gap for effective management and restoration of river systems with wood.

KEYWORDS

Public perception, river management, river restoration, instream wood, riverscapes

1 INTRODUCTION

Extensive literature now exists describing the positive influence of instream wood on river ecosystems. The physical (i.e., morphological) complexity created by instream wood enhances sediment and organic matter storage and provides habitats for fish and other organisms. However, in many regions, including Spain, instream wood is still perceived as a source of hazard for navigation and flood control, and thus removed from watercourses.

The pioneer survey made in 2005 to students from several countries revealed the need for education about what constitutes a natural river in a forested context (Piégay et al., 2005). The same survey, based on riverscapes scenes with and without wood, has been used in different studies around the World with different target populations. We reviewed these studies and all the available literature about instream wood perception and concluded that differences exist depending on the background of surveyed people or the familiarity with the environment (Le Lay et al., 2008).

Due to the generalized idea that exists in Spain about the negative consequences of wood on flooding - while ignoring any positive effects - we hypothesized that flood frequency has an influence on the perception of instream wood as well. To test this hypothesis, we are presenting a follow-up of the perception study published by Piégay et al., (2005) and partially presented by Ruiz-Villanueva et al., (2015). We surveyed groups of individuals living in different Spanish mountain areas which were more or less recently affected by floods and we compared their perceptions towards instream wood. In addition, we surveyed a group of people related to the scientific community (e.g., Universities, research Institutes of different disciplines including earth sciences, engineering and others). This allowed us to test whether the perception of instream wood of this group (i.e., scientists) is different from the perception towards instream wood of general public.

2 METHODS

The perception of wood was assessed by the questionnaire presented by Piégay et al., (2005). We used the same scenes and questions, translated to Spanish and complementing the questionnaire with an additional question about river management. We did not inform the participants that the survey focused on the perception of wood, they thought that the aim of the survey was simply to evaluate the riverscapes according to aesthetics, naturalness, danger and need for improvement.

In total 720 questionnaires were distributed and from them 388 questionnaires were completes and used for further analyses. The results of these questionnaires were statistically analysed using R, SPSS and Latent Gold software, applying the latent class cluster analysis. In addition, non-parametric tests such as Mann-Whitney, Wilcoxon signed rank, Kruskal-Wallis and Pearson Chi-Square were also applied to test statistical differences between groups and correlations between the variables analysed.

3 PRELIMINARY RESULTS

Scores given by a particular group of persons were significantly different between images with wood and without wood. Respondents perceived watercourses with instream wood as less aesthetically, more dangerous and with more needs to improve the channels than watercourses without wood. The negative perception towards riverscapes with wood is slightly enhanced for respondents living in areas recently affected by floods, but differences are not significant (Figure 1).

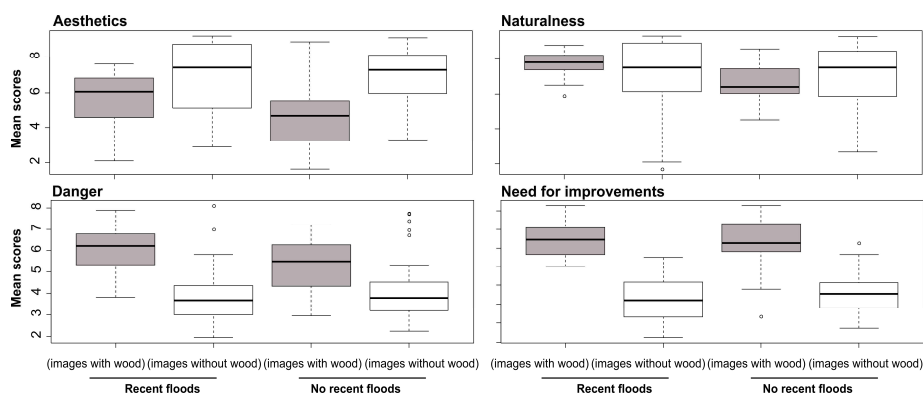


Figure 1: Boxplots of mean scores given to the different photographs of riverscapes with and without instream wood by people living in areas affected by recent floods and people living in areas not affected by floods in the recent past.

The comparison between responses and scores given by scientists and those by general public reveals also the existence of a gap between scientific and public perception of natural river systems with wood (Figure 2).

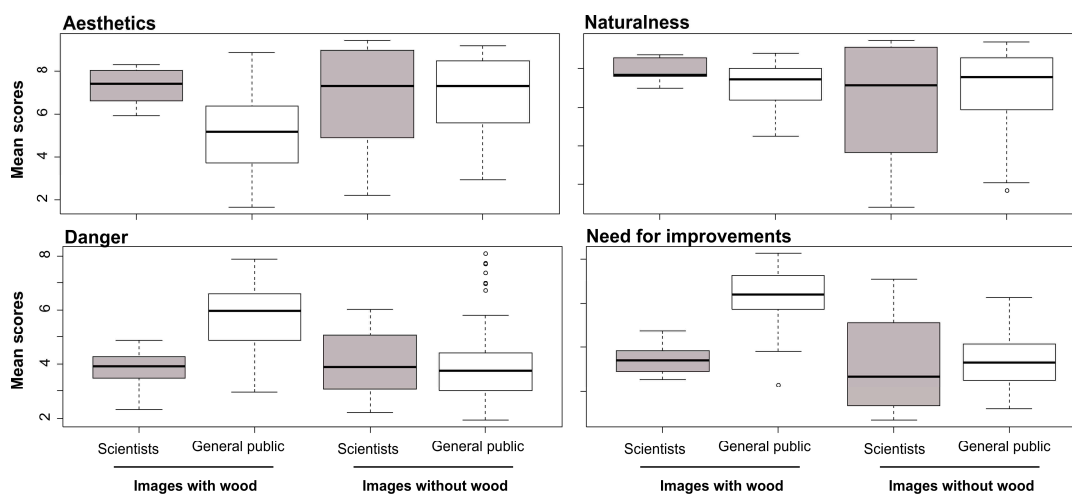


Figure 2: Boxplots of mean scores given to the different photographs of riverscapes with and without instream wood by scientists and general public (people not directly related to Universities or Research Institutions).

As we analysed different groups of populations, with different backgrounds, ages and knowledge of rivers, we are investigating potential subgroups (or clusters within our previous groups) underlying different socio-demographic and cultural factors. Moreover, we also are analysing their personal opinion regarding river management in general.

4 CONCLUSIONS

The initial hypothesis that the generally negative perception of wood in rivers is enhanced by people living in places recently affected by flooding was not confirmed by the results presented here. Therefore, other factors may also control this perception. Interestingly, differences were found among respondents from the different regions. Therefore, recent flooding experiencing is not the main factor controlling instream wood perception, but the influence of education, experience or information on the awareness of the geomorphic and ecological significance of wood in streams. This may be easily transferable to other countries. Moreover, results did confirm the gap between scientific and public perception of natural river systems with wood, highlighting the need in education and policy for effective management and restoration of river systems with wood.

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