

[Challenges to barbel population resilience due to hydrological alteration \(Gallo et al 2014\) \[1\]](#)

This study aims to evaluate how the habitat of the Iberian barbel (*Luciobarbus bocagei*) has changed over the last nine decades in a reach of the River Duero in Toro (Zamora). The available physical habitat through different streamflows was quantified as the wetted area potentially usable by adult barbel with maximum preference (weighted usable area [WUA]). Historical time series of streamflows were used to generate a time series of habitat. Flow data were studied from 1912 to 2008, period being divided into three sub-periods. The sub-period 1912–1931 was considered as a natural regime of reference, and sub-periods 1942–1980 and 1981–2008 were altered. Data from 1931 to 1942 were missing. Uniform continuous under-threshold (UCUT) curves were developed for a set of WUA thresholds from 20% to 75% maximum WUA in the three different sub-periods. As Iberian barbel's life-history traits determine that habitat conditions become limiting during summer season, we have drawn UCUT curves using the values from July to September. In order to quantify the challenges to population resilience due to changes in habitat availability, an index of population fatigue was proposed (analogous to materials fatigue), which compares altered periods to natural one. This index was defined by the difference between the area that the UCUT curves in the altered and natural periods draw for each defined threshold and it is measured in days under thresholds. The index of population fatigue is calculated as an extension of Parasiewicz *et al.*'s (2012 [2]) concept of habitat stress days alteration, the HSDA, into an integrated HSDA (IHSDA). The greater the index value, the greater the alteration suffered. Results showed an increasing loss of habitat availability for common events related to natural conditions: 10 days for the first altered sub-period that became more evident (up to 18 days) in the last sub-period.

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[2] <http://www.tandfonline.com/doi/abs/10.1080/15715124.2014.908895#CIT0028>

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