**Freshwater fish biodiversity in a large Mediterranean basin (Guadalquivir River, S Spain): patterns, threats, status and conservation**

P. Sáez-Gómez & J. Prenda\*

Department of Integrative Sciences. University of Huelva. Campus universitario El Carmen. Avda. Andalucía s/n, 21071. Huelva, Spain.

\*Corresponding author: Department of Integrative Sciences. University of Huelva. Campus universitario El Carmen. Avda. Andalucía s/n, 21071. Huelva, Spain.

phone: +34 959219888

e-mail: [jprenda@uhu.es](mailto:jprenda@uhu.es)

**SUPPLEMENTARY TABLES**

**Table S1**. List of freshwater fish species sampled in each sub-basin. Species name are codified using the first letter of the genus and the two first letters of the species (see Table 3 and 4).

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Sub-basin code** | ***AAN*** | ***STR*** | ***LSC*** | ***ILE*** | ***PWI*** | ***IAL*** | ***SPY*** | ***CPA*** | ***ABO*** | ***OMY*** | ***ELU*** | ***AAL*** | ***CAU*** | ***CCA*** | ***GLO*** | ***PBI*** | ***GHO*** | ***LGI*** | ***MSA*** |
| **Left bank** | 1 |  |  | + |  | + |  |  | + |  |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  | + |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3 |  |  | + |  | + | + |  |  |  |  |  |  |  | + |  |  |  |  |  |
| 6 |  |  | + |  | + |  |  |  |  |  |  | + |  | + |  |  | + |  | + |
| 7 |  | + | + |  | + |  |  | + | + |  | + | + |  | + |  |  | + | + | + |
| 8 |  |  | + |  |  |  |  |  |  |  |  |  | + | + |  |  | + |  |  |
| 9 |  |  | + |  |  |  | + | + |  |  |  | + |  | + |  |  |  |  | + |
| 10 |  |  | + |  | + |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 11 |  |  | + |  |  |  |  | + |  | + |  |  |  |  |  |  |  |  |  |
| 12 |  |  | + |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 13 |  |  | + |  |  | + |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 17 |  | + | + |  | + | + | + | + |  | + |  |  |  | + | + |  |  |  | + |
| 18 |  |  | + |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 19 |  |  | + |  |  | + | + | + |  |  |  |  |  |  |  |  |  |  |  |
| 28 |  |  |  |  | + |  |  |  |  |  |  |  |  | + |  |  |  |  | + |
| 29 |  |  | + |  | + |  |  |  | + |  |  |  | + | + |  |  | + |  | + |
| 32 |  |  | + |  | + |  |  | + |  |  |  |  |  |  |  |  |  |  |  |
| 33 |  | + | + |  | + | + | + | + |  |  |  |  |  |  |  |  |  |  |  |
| 41 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 42 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 43 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **TOTAL LEFT** | |  | + | + |  | + | + | + | + | + | + | + | + | + | + | + |  | + | + | + |
|  | 4 |  |  | + | + | + | + |  | + |  |  |  | + |  | + |  |  | + | + | + |
|  | 14 |  |  | + |  | + | + | + | + |  |  | + |  | + | + |  |  | + | + | + |
|  | 15 |  |  | + | + | + | + |  | + |  |  | + | + | + | + |  | + |  | + | + |
|  | 16 | + |  | + |  | + | + |  | + | + |  |  |  | + | + |  |  | + | + | + |
|  | 20 |  |  | + |  | + | + | + | + |  |  |  | + |  | + |  |  | + | + | + |
|  | 21 |  | + | + | + | + | + |  | + |  |  |  | + |  | + |  |  | + | + | + |
|  | 22 |  |  | + |  | + | + |  | + |  |  |  | + | + | + |  |  | + | + | + |
|  | 23 |  |  |  |  |  |  |  | + |  |  |  |  |  | + |  |  | + |  | + |
|  | 24 |  |  | + |  | + | + |  | + |  |  |  |  |  | + |  |  | + | + | + |
|  | 25 |  |  | + |  | + | + |  | + |  |  |  | + |  | + |  |  | + | + | + |
|  | 26 |  |  | + |  | + | + | + | + |  |  |  |  | + | + |  |  | + | + | + |
|  | 27 |  |  | + |  | + | + | + |  |  |  |  |  |  | + |  |  |  |  | + |
| **Right bank** | 30 |  | + |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 31 |  | + | + |  | + | + |  | + |  | + |  |  |  |  |  |  |  |  |  |
| 34 |  |  | + |  | + | + |  | + |  |  |  |  |  | + |  |  | + | + | + |
| 35 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + |  |  |
| 36 |  |  | + |  | + | + | + |  |  |  |  | + |  | + |  |  |  | + | + |
| 37 |  |  | + |  |  | + |  | + |  |  |  |  |  |  |  |  |  |  |  |
| 38 |  |  | + |  | + | + |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 39 |  |  | + | + | + | + |  | + |  |  |  |  |  |  |  |  | + | + |  |
| 40 |  |  | + |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | + |
| 44 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 45 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 46 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **TOTAL RIGHT** | | + | + | + | + | + | + | + | + | + | + | + | + | + | + |  | + | + | + | + |
| **MAIN CHANNEL** 5 | |  | + | + |  | + | + | + |  |  | + |  | + | + | + |  |  | + |  | + |

**Table S2**. Species richness (S), number of families (F), Shannon (H’) diversity indices and species density (D = nº species per 1000 km2) for each sampled sub-basin (45 and the main channel).

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | **River** | **Reservoir** | **Native species** | | | | **Exotic species** | | | |
| **Sub-basin name** | **Code** | **Surface (km2)** | **N** | **N** | **S** | **F** | **H'** | **D** | **S** | **F** | **H'** | **D** |
| Azanaque | 1 | 56 | 1 | 0 | 3 | 2 | 0.24 | 53,57 | 0 | 0 | 0.00 | 0,00 |
| Madre Fuentes | 2 | 412 | 1 | 0 | 3 | 1 | 0.92 | 7,28 | 1 | 1 | 0.00 | 2,43 |
| Santa María | 3 | 151 | 1 | 0 | 1 | 1 | 0.00 | 6,62 | 0 | 0 | 0.00 | 0,00 |
| Corbones | 6 | 1963 | 6 | 2 | 2 | 1 | 0.10 | 1,02 | 4 | 3 | 0.17 | 2,04 |
| Genil | 7 | 8460 | 27 | 13 | 5 | 3 | 0.12 | 0,59 | 6 | 4 | 0.16 | 0,71 |
| Guadaíra | 8 | 1626 | 6 | 0 | 1 | 1 | 0.00 | 0,62 | 3 | 2 | 0.14 | 1,85 |
| Guadajoz | 9 | 2579 | 10 | 2 | 3 | 2 | 0.17 | 1,16 | 3 | 2 | 0.10 | 1,16 |
| Guadalmazán | 10 | 217 | 1 | 0 | 2 | 1 | 0.67 | 9,22 | 0 | 0 | 0.00 | 0,00 |
| Guadalbullón | 11 | 1207 | 6 | 0 | 2 | 2 | 0.02 | 1,66 | 1 | 1 | 0.00 | 0,83 |
| Guadatín | 12 | 119 | 1 | 0 | 1 | 1 | 0.00 | 8,40 | 0 | 0 | 0.00 | 0,00 |
| Salado de Arjona | 13 | 521 | 1 | 0 | 2 | 1 | 0.30 | 3,84 | 0 | 0 | 0.00 | 0,00 |
| Guadiana Menor | 17 | 7494 | 31 | 5 | 6 | 3 | 0.11 | 0,80 | 4 | 3 | 0.08 | 0,53 |
| Las Torres | 18 | 103 | 2 | 0 | 1 | 1 | 0.00 | 9,71 | 0 | 0 | 0.00 | 0,00 |
| Bedmar | 19 | 161 | 2 | 0 | 4 | 2 | 0.16 | 24,84 | 0 | 0 | 0.00 | 0,00 |
| Salado de Lebrija | 28 | 978 | 0 | 2 | 1 | 1 | 0.00 | 1,02 | 2 | 2 | 0.53 | 2,04 |
| Salado de Morón | 29 | 786 | 4 | 2 | 3 | 2 | 0.21 | 3,82 | 4 | 3 | 0.29 | 5,09 |
| Cañamares | 32 | 192 | 2 | 0 | 3 | 2 | 0.19 | 15,63 | 0 | 0 | 0.00 | 0,00 |
| Aguascebas | 33 | 111 | 1 | 0 | 6 | 3 | 1.54 | 54,05 | 0 | 0 | 0.00 | 0,00 |
| Salado de Porcuna | 41 | 859 | 1 | 0 | 0 | 0 | 0.00 | 0,00 | 0 | 0 | 0.00 | 0,00 |
| Arroyo del Salado | 42 | 85 | 1 | 0 | 0 | 0 | 0.00 | 0,00 | 0 | 0 | 0.00 | 0,00 |
| Jandulilla | 43 | 312 | 1 | 0 | 0 | 0 | 0.00 | 0,00 | 0 | 0 | 0.00 | 0,00 |
| **Total left bank** | | 27259 | 106 | 26 | 7 | 4 | 0.13 | 0,26 | 9 | 5 | 0.12 | 0,33 |
| Bembézar | 4 | 2093 | 6 | 3 | 5 | 2 | 0.47 | 2,39 | 5 | 3 | 0.44 | 2,39 |
| Guadalimar | 14 | 5441 | 23 | 6 | 5 | 2 | 0.24 | 0,92 | 6 | 4 | 0.12 | 1,10 |
| Guadalmellato | 15 | 1388 | 5 | 2 | 5 | 1 | 0.33 | 3,60 | 7 | 3 | 0.52 | 5,04 |
| Guadiamar | 16 | 1425 | 7 | 1 | 6 | 4 | 0.30 | 4,21 | 5 | 3 | 0.49 | 3,51 |
| Guadiato | 20 | 1591 | 6 | 3 | 5 | 2 | 0.09 | 3,14 | 5 | 3 | 0.45 | 3,14 |
| Huéznar | 21 | 733 | 5 | 2 | 6 | 3 | 0.44 | 8,19 | 5 | 3 | 0.27 | 6,82 |
| Jándula | 22 | 2720 | 6 | 1 | 4 | 2 | 0.15 | 1,47 | 6 | 3 | 0.17 | 2,21 |
| M. de las marismas | 23 | 1469 | 3 | 3 | 1 | 1 | 0.00 | 0,68 | 3 | 3 | 0.11 | 2,04 |
| Retortillo | 24 | 358 | 4 | 2 | 4 | 2 | 0.33 | 11,17 | 4 | 3 | 0.18 | 11,17 |
| Guadalbacar | 25 | 274 | 2 | 1 | 4 | 2 | 0.37 | 14,60 | 5 | 3 | 0.45 | 18,25 |
| Rivera de Huelva | 26 | 2079 | 7 | 9 | 5 | 2 | 0.40 | 2,41 | 5 | 3 | 0.31 | 2,41 |
| Rumblar | 27 | 740 | 3 | 2 | 4 | 1 | 0.39 | 5,41 | 2 | 2 | 0.08 | 2,70 |
| Aguasmulas | 30 | 33 | 1 | 0 | 1 | 1 | 0.00 | 30,30 | 0 | 0 | 0.00 | 0,00 |
| Borosa | 31 | 96 | 1 | 0 | 5 | 3 | 1.19 | 52,08 | 1 | 1 | 0.00 | 10,42 |
| Viar | 34 | 1884 | 4 | 1 | 4 | 2 | 0.28 | 2,12 | 4 | 3 | 0.33 | 2,12 |
| Siete Arroyos | 35 | 107 | 1 | 0 | 0 | 0 | 0.00 | 0,00 | 1 | 1 | 0.00 | 9,35 |
| Yeguas | 36 | 857 | 4 | 2 | 4 | 1 | 0.39 | 4,67 | 4 | 2 | 0.22 | 4,67 |
| Arroyo Tamujoso | 37 | 63 | 1 | 0 | 3 | 2 | 0.82 | 47,62 | 0 | 0 | 0.00 | 0,00 |
| Río de Pedro Gil | 38 | 65 | 1 | 0 | 3 | 1 | 0.84 | 46,15 | 0 | 0 | 0.00 | 0,00 |
| Arenoso | 39 | 433 | 3 | 1 | 5 | 2 | 0.35 | 11,55 | 2 | 2 | 0.15 | 4,62 |
| Martín Gonzalo | 40 | 82 | 1 | 1 | 1 | 1 | 0.00 | 12,20 | 1 | 1 | 0.00 | 12,20 |
| Corcomé | 44 | 46 | 1 | 0 | 0 | 0 | 0.00 | 0,00 | 0 | 0 | 0.00 | 0,00 |
| Escobar | 45 | 62 | 1 | 0 | 0 | 0 | 0.00 | 0,00 | 0 | 0 | 0.00 | 0,00 |
| Guadiel | 46 | 364 | 3 | 0 | 0 | 0 | 0.00 | 0,00 | 0 | 0 | 0.00 | 0,00 |
| **Total right bank** | | 23247 | 99 | 40 | 9 | 5 | 0.29 | 0,39 | 9 | 5 | 0.24 | 0,39 |
| **Main channel** | 5 | 4644 | 11 | 3 | 5 | 2 | 0.29 | 1,08 | 6 | 4 | 0.11 | 1,29 |
| **TOTAL BASIN** |  | 57439 | 216 | 69 | 9 | 5 | 0.22 | 0,16 | 10 | 5 | 0.18 | 0,17 |