

BIRDS AND SUSTAINABLE MANAGEMENT IN MEDITERRANEAN RIPARIAN AREAS: Bird studies in the RIPIDURABLE project

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Abstract

RIPIDURABLE is an INTERREG IIC European Program involving 10 partners from Portugal, Spain, France and Greece. Scientists, technicians and local/regional authorities worked together to integrate knowledge, know-how and practice, towards a rational conservation management of riparian zones. Birds can be used to characterize ecosystems, to monitor environmental changes or to assess results of restoration measures. We have conducted field surveys in order to assess breeding bird communities associated to riparian galleries in several watercourses, including issues as the relation with natural vegetation profiles, the influence of the surrounding matrix, the evolution with time or with habitat degradation, the effects of rehabilitation measures, and/or the importance of riparian galleries as ecological corridors for birds. Surveys at different space and time scales were carried out using standardised point count methods, on 8 watercourses in Portugal and France. We focused on different aspects of riparian breeding bird community variation: along a decreasing gradient of vegetal complexity (Tagus Basin), along an upstream-downstream gradient (Allier), with different surrounding landscapes (Sado, Guadiana and Tagus Basin), with time (Alcáçovas at a 10 years interval, Allier at 16 years interval), with management status (Vidourle), with time & management status (Rhône delta at a 12 years intervals), before & after river rehabilitation (Gandum). In addition we studied the dispersal of Barn Owls from upper Tagus Estuary along riparian corridors (*Tyto* Tagus Project), and also the importance of riparian habitats of the Guadiana basin on the autumn migration of trans-Saharan birds across the Iberian Peninsula. The RIPIDURABLE project offered the opportunity for further research currently included in national programs such as the Plan Loire Grandeur Nature which allows long term studies on riparian birds. Herein we briefly present some of the preliminary results of the bird studies carried out by partners from Portugal and France.

Keywords

Birds, community, bio-assessment, restoration, monitoring, Interreg project Ripidurable

CASE STUDY 1 : *Riparian bird communities of the left margin of the Tagus Basin*

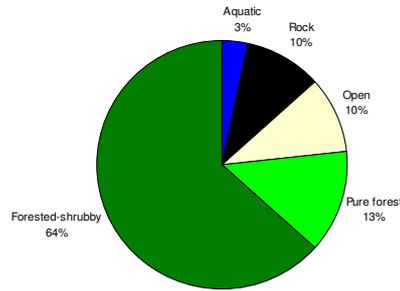
Team: Institute of Agronomy, Lisbon

Aims: Assessment of riparian bird communities; evaluation of riparian bird communities' response to decreasing gradient of vegetal complexity

Study Area & Methods: Study area included part of the left margin of the Tagus Basin. The surrounding landscape is characterized by relatively extensive 'montados', pine and eucalyptus stands with and without scrub understory. The floodplain is characterized by rice fields, other irrigated crops and pasture for livestock. Vegetation-types taken into account were willow stands, elm stands, alder stands, African tamarisk stands, giant reed stands and bramble thickets. These habitat types represent a decrease in plant community complexity (i.e. diversity and plant structure) along the Tagus Basin. 59 sample units were established along the area. A sample unit consists of 6 point counts (3 in the riverside 3 in the surrounding habitat) and 4 transects (2 in the river and 2 in the surrounding habitat). Point counts were located 250 m apart and duration of the count was 5 min; transects were 250 m

long. Bird communities were assessed in Spring, Autumn and Winter. Habitat variables were recorded.

Main Results: Forest-shrubby birds are the dominant element of the bird communities associated to the left margin of the Tagus Basin.



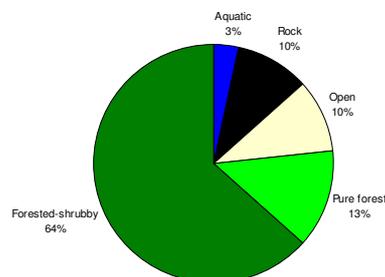
CASE STUDY 2: *The Breeding birds of the Gandum River: an assessment of the bird community prior & after river rehabilitation*

Team: LabOr, University of Évora

Aims: Assessment of the breeding bird community associated to the Gandum River prior to rehabilitation actions carried out by the Municipality of Montemor-o-Novo; monitoring the bird fauna after the implementation of those measures in order to detect species turnover.

Study Area & Methods: The river Gandum is a small tributary of the Almansor (Tagus Basin). The stretch under study (the blue line on the aerial photo) is c. 4.5 km long and runs in the outskirts of Montemor-o-Novo throughout urban areas, rural fields and Cork Oak ‘montados’. Seventeen point counts were established along the watercourse (green dots). Surveys were conducted in 2005-08 and thereafter will be done on a 2y interval.

Main Results: Forested-shrubby birds are the dominant element of the breeding bird communities associated to Gandum watercourse



CASE STUDY 3: *The Autumn migration of trans-Saharan birds across the Iberian Peninsula*

Team: LabOr, University of Évora / Institute of Agronomy

Aims: Are riparian habitats of the Guadiana basin important for migratory songbirds?

Background & Methods: Radar observations have shown that the main migration flow arches across the Iberian Peninsula and continues along the west coast of North Africa. Iberian stopover habitats should be critical for migratory songbirds, especially if located in the South-western areas of the Peninsula. Therefore we hypothesize that the Guadiana valley should be a likely corridor for migratory birds. Direct observations were carried out along the river and at control sites away from it, in late August-November 2006. The number of birds seen was extremely small (<< 1 individual per hour for most species) and most records probably involved individuals in local movements, as indicated from similar rates of birds moving up and downriver. The only exceptions were hirundines which, within our study area, were strongly associated with the Guadiana both when foraging and when engaged in medium to long-distance daily movements. Our results suggest that there is no significant migratory corridor along the lower Guadiana during summer-autumn, but hirundines were strongly associated with this river when foraging and when commuting between foraging grounds and roosts.



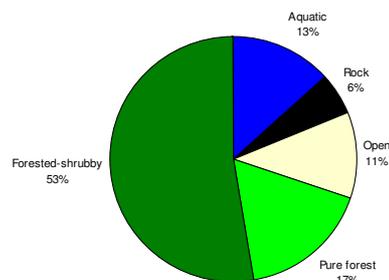
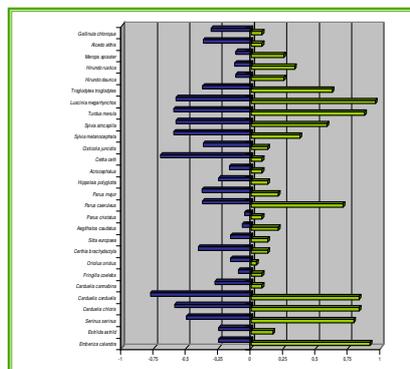
CASE STUDY 4: Assessing the breeding bird communities of the Alcáçovas Basin: looking for differences 10 years after

Team: LabOr, University of Évora

Aims: Comparison of present breeding bird communities of riparian corridors of the Alcáçovas Basin with those recorded c. 10 years ago. Evaluation of the ornithological importance of sampled river stretches (INDOR).

Study Area & Methods: The Alcáçovas Basin includes tributaries of the major Sado Basin. The landscape is characterized by ‘montados’, eucalyptus stands and extensive agricultural fields. Riparian forest communities included tree species such as ash, poplar, alder and, in temporarily inundated places, willow. Bramble thickets, tamarisk and oleander are also frequent in riversides. 26 point counts 10 min long were conducted during the breeding seasons of 2005, 2006 and 2007. In each sampling point habitat variables were recorded.

Main Results: Species associated to forest habitats are the dominant element. Aquatic and/or riparian species exhibit a negative difference between last decade (blue bars) and present (green bars). Forested-shrubby common species like the nightingale and the Blue Tit show an increase.



CASE STUDY 5 : Breeding bird communities of the River Allier (France)

Team : University of Burgundy

Aims : Assessment of riparian bird communities along the upstream-downstream gradient.

Study Area & Methods : The Allier is a very long river (450 Km) of continental France (tributary of River Loire) that supports a wide range of terrestrial and aquatic habitats both on riversides and alluvial plain. In 1991 & 1997 breeding bird communities were assessed by use of 91 IPA point counts of 20 min (average interval between sampling stations: 5 Km). In the course of **RPIDURABLE** another survey was conducted along the same sampling points in order to evaluate the stability of bird communities over time. Habitat variables were recorded in each sampling station in order to relate bird community parameters with habitat features.



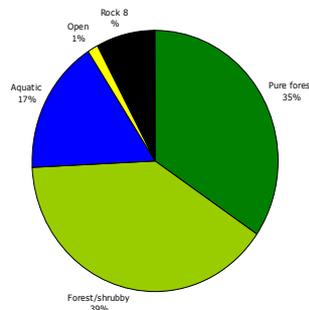
CASE STUDY 6: Breeding bird communities of the delta of River Rhone (France)

Team: University of Burgundy

Aims: Assessment of riparian bird communities along the main stream of the delta of the River Rhone and the relation of breeding communities and the quality of the riparian forest.

Study Area & Methods: The main stream of the delta of the Rhone ('Le Grand Rhône') flows for c. 40 Km throughout an alluvial forest with poplars, ashes and elms. In 1991 and 1997 breeding bird communities were assessed by use of 16 IPA point counts of 20 min (average interval between sampling stations: 1-2 Km).

In the course of **RIPIDURABLE** another survey was conducted along the same sampling points in order to evaluate (1) the stability of bird communities over time and (2) the effect of riverside management. Habitat variables were recorded in each sampling station in order to relate bird community parameters with habitat features.



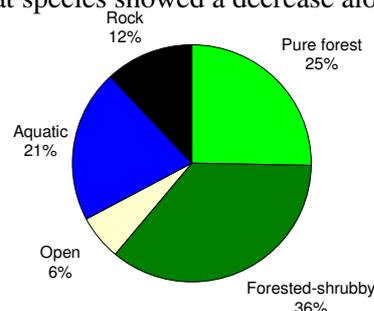
CASE STUDY 7: The breeding bird communities of the riparian habitats of River Vidourle (France)

Team: CNRS/CEFE

Aims: Assessment of riparian bird communities in a highly managed river stretch.

Study Area & Methods: The River Vidourle is a medium watercourse (c. 70 Km) located in the Languedoc-Roussillon province (Southern France) near Montpellier. The studied stretch is 25 Km long and corresponds to the downstream sector of the river. Bird censuses were conducted using the point count IPA method and 27 sampling points were surveyed in the studied sector. In each IPA the counting period was 20 min (but bird records were annotated in two 10 min periods). Habitat variables were also evaluated.

Main Results: Birds associated to forested habitats are the most important element of the Vidourle riparian breeding birds. Bird species associated to forest habitats increase with a raise in the quality of the riparian gallery. As expected, open-habitat species showed a decrease along the same gradient.



Acknowledgements

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References

- Blondel J., Ferry C. & Frochot B. (1981). Point counts with unlimited distance. *Studies in Avian Biology* 6: 414-420
- Catry, P., Campos, A., Miravent, V. & Rabaça, J.E. 2009. Do diurnal migrants follow the Guadiana River when crossing dry sectors of SW Iberia? *Airo*, 19: 27-34.
- Décamps H., Fortune M., Gazelle F. & Patou G. (1988). Historical influence of man on the riparian dynamics of a fluvial landscape. *Landscape Ecology* 1: 163-173
- Frochot B., Eybert M.C., Journaux L., Roché J. & Faivre B. (2003). Les oiseaux de la Loire: évolution sur 12 années. *Alauda* 71(2): 179-190.
- Godinho C., Rabaça J.E. & Segurado P. (2010). Breeding bird assemblages in riparian galleries of the Guadiana River basin: the effect of spatial structure and habitat variables. *Ecological Research* 25 (2): 283-294. DOI 10.1007/s11284-009-0655-9
- Hilgerloh, G. 2001. Migration patterns in the western Mediterranean Region inferred from radar observations. *Avian Ecology & Behaviour*, 7: 119-126.
- Roché J. (2008). Etude des communautés d'oiseaux nicheurs le long du Vidourle dans un secteur soumis à l'aménagement des rives (2005 – 2007). Rapport CEFE/CNRS, 45 p.
- Roché J., Faivre B. & Frochot B. (à paraître). Suivi Temporel des Oiseaux nicheurs en Rivière (programme « STORI ») : le cas de l'évolution sur 16 années (1991-2006) des communautés de l'Allier. *Alauda*.
- Rodewald A.D. & Bakermans M.H. (2006). What is the appropriate paradigm for riparian forest conservation? *Biological Conservation* 128: 193-200
- Salinas M.J., Banca G. & Romero T. (2000). Evaluating riparian vegetation in semi-arid Mediterranean watercourses in the south-eastern Iberian Peninsula. *Environmental Conservation* 27(1): 24-35



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