# Dataset of Passerine bird communities in a mediterranean high mountain (Sierra Nevada, Spain)

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Academic editor:

**Citation**:

**Resource citation**:

iEcolab, University of Granada-Andalusian Environmental Center (Andalusian Institute for Earth System Research) (2015) Passerine bird communities in a high mountain (Sierra Nevada, Spain). :red\_circle: XXXXX data records. Contributed by University of Granada, OBSNEV, Agencia de Medio Ambiente y Agua de Andalucía, Archila Gallegos F, Arias Navarro A, Barea-Azcón JM, Bueno de la Rosa V; Cobos L; Contreras Parody F, Debén Duarte C, Foronda J, Galdo Fuentes P, Hernández Soto I, Lopera E, López Martinez A, López-Sanjuán R, Lozano Rubio AJ; Marín Escribano JM; Martín Jaramillo J; Martos García C, Morillas Fernández D, Rodríguez G. Online at :red\_circle: http://www.gbif. es:8080/ipt/resource.do?r=borreguiles and :red\_circle: http://obsnev.es/noticia.html?id=7839, version 1.0 (:red\_circle: last updated on 2014-10-10). Resource ID: GBIF Key: :red\_circle: http://www.gbif.org/dataset/ff7d3d4a-6c31-4876-8339-a1794f7d0316

## Abstract

## Keywords

Aves, Passerine birds, Sierra Nevada (Spain), global change monitoring, mediterranean high-mountain, occurrences, abundance,

## Introduction

Birds are the most analysed taxa to assess vulnerability of species to climate change (Pacifi et al. 2015). There are scientific evidences of the effects of global change on bird communities (Crick 2004, Pearce-Higgins and Green 2014, Pearce-Higgins et al. 2015). Most of studies supporting those impacts are based on long-term datasets (e.g. Gregory et al. 2009). Long-term datasets have been recognized as a key component for monitoring biodiversity (Magurran et al 2010), and are considered one of the major requirements for the identificación of changes in phenology (Sanz 2002). However, it is often difficult to maintain long-term monitoring programs. In this sense re-sampling old studies can help to integrate short-term researches into long-term datasets and would provide a potential source of data to assess changes in ecological communities (Sanz 2002, Müller et al. 2010). This is relevant for Mediterranean region where there are the need both for more bird studies and making available long-term datasets (Sanz 2002), specially considering that predicted variations in species richness showed large decreased in the southern regions of Europe (Barbet-Massin et al. 2012).

In this paper we provide a dataset of passerine bird communities from Sierra Nevada, a mediterranean high mountain region. The dataset comes from Sierra Nevada Global Change Observatory (OBSNEV), a monitoring scheme designed to evaluate the potential impacts of global change in this mountain area. Monitoring methodologies of the OBSNEV include re-visiting old plots to assess long-term populations trends, changes in phenology, shifts in community composition among others.

Studies of bird communities in Sierra Nevada mountain region go back to the 1850s, with the first published records of field observations recorded by ornithologists (Pleguezuelos 1991; Garzón-Gutierrez 2012). A recent review of ornithology in the Sierra Nevada was accomplished by Garzón-Gutiérrez (2012). All those works include passerine birds, but specific studies focusing specifically on Passerine birds communities on this mountain region were carried out during the early 1980s (Zamora and Camacho 1984, Zamora 1987a, 1987b, 1988a, 1988b, 1990). The dataset presented here contributes to increase the knowledge of Passerine birds in this mountain area and allows to carry out assessment of populations trends (e.g. Zamora and Barea 2015).

## Project details

### Project title

Sierra Nevada Global-Change Observatory (OBSNEV)

### Personnel

Regino Jesús Zamora Rodríguez (Scientific Coordinator, Principal Investigator, University of Granada); Francisco Javier Sánchez Gutiérrez (Director of the Sierra Nevada National Park and Natural Park).

### Funding

Sierra Nevada Global Change Observatory is funded by Andalusian Regional Government (via Environmental Protection Agency) and by the Spanish Government (via “Fundación Biodiversidad”, which is a Public Foundation).

### Study area description

Sierra Nevada (Andalusia, SE Spain), is a mountainous region with an altitudinal range between 860 m and 3482 m a.s.l. covering more than 2000 km2 (Figure 1). The climate is Mediterranean, characterized by cold winters and hot summers, with pronounced summer drought (July-August). The annual average temperature decreases in altitude from 12–16°C below 1500 m to 0°C above 3000 m a.s.l., and the annual average precipitation is about 600 mm. Additionally, the complex orography of the mountains causes strong climatic contrasts between the sunny, dry south-facing slopes and the shaded, wetter north-facing slopes. Annual precipitation ranges from less than 250 mm in the lowest parts of the mountain range to more than 700 mm in the summit areas. Winter precipitation is mainly in the form of snow above 2000 m of altitude.

This mountain area comprises 27 habitat types from the habitat directive. It contains 31 animal species (20 birds, 5 mammals, 4 invertebrates, 2 amphibians and reptiles) and 20 plant species listed in the Annex I and II of habitat and bird directives. It is thus considered one of the most important biodiversity hotspots in the Mediterranean region (Blanca 1996, Blanca et al. 1998, Cañadas et al. 2014).

Sierra Nevada has several legal protections: Biosphere Reserve MAB Committee UNESCO; Special Protection Area and Site of Community Importance (Natura 2000 network); and National Park. The area includes 61 municipalities with more than 90, 000 inhabitants. The main economic activities are agriculture, tourism, cattle raising, beekeeping, mining, and skiing (Bonet el al. 2010).

Figure 1

Figure 1

*Figure 1. Location of Sierra Nevada (southern Spain) (a) and boundaries of the National and Natural Parks. Red lines indicates location of sampled transects* :white\_check\_mark: LOLA --> Ajustar tamaño del mapa. Transectos en color segun tres categorias de transectos :red\_circle: ANTONIO --> Check this. The ArcGis project where I got the final map is in geoinfo/mapa\_localiza.mxd. The map is /figures/mapa\_location\_final.jpg.

### Design description

Sierra Nevada Global Change Observatory (OBSNEV) (Bonet et al. 2011) is a long-term research project which is being undertaken at Sierra Nevada Biosphere Reserve (SE Spain). It is intended to compile the information necessary for identifying as early as possible the impacts of global change, in order to design management mechanisms to minimize these impacts and adapt the system to new scenarios (Aspizua et al. 2010, Bonet el al. 2010). The general objectives are to:

* Evaluate the functioning of ecosystems in the Sierra Nevada Nature Reserve, their natural processes and dynamics over a medium-term timescale.
* Identify population dynamics, phenological changes, and conservation issues regarding key species that could be considered indicators of ecological processes.
* Identify the impact of global change on monitored species, ecosystems, and natural resources, providing an overview of trends of change that could help foster ecosystem resilience.
* Design mechanisms to assess the effectiveness and efficiency of management activities performed in the Sierra Nevada in order to implement an adaptive management framework.
* Help to disseminate information of general interest concerning the values and importance of Sierra Nevada.

The Sierra Nevada Global Change Observatory has four cornerstones:

* A monitoring program with 40 methodologies that collect information on ecosystem functioning (Aspizua et al. 2012; 2014).
* An information system to store and manage all the information gathered (http://obsnev.es/linaria.html - Pérez-Pérez et al. 2012; Free access upon registration).
* A plan to promote adaptive management of natural resources using the data amassed through the monitoring programme.
* An outreach programme to disseminate all the available information to potential users (see News Portal of the project at http://obsnev.es and the wiki of the project at http://wiki.obsnev.es, Pérez-Luque et al. 2012)

The Sierra Nevada Global Change Observatory is linked to other national (Zamora and Bonet 2011) and international monitoring networks: GLOCHAMORE (Global Change in Mountain Regions) (Björnsen 2005), GLOCHAMOST (Global Change in Mountain Sites) (Schaaf 2009), LTER-Spain (Long-Term Ecological Research). This project is also involved in several European projects like MS-MONINA (FP7 project. www.ms-monina.eu) or EU BON (Hoffmann et al. 2014).

## Taxonomic coverage

This dataset includes a total of 28437 records of the order Passeriformes. There are 16 families represented in this dataset (Figure 2). Nearly one third of the specimens belong to the family Fringillidae. A total of 44 genus are represented in this collection, with *Emberiza*, *Cyanistes*, *Turdus*, *Fringilla* and *Parus* having the highest number of records (Figure 3). :red\_circle: Include info about treathened and reference Table 1; :red\_circle: preguntar a Lola

Figure 2

Figure 2

*Figure 2: Taxonomic distribution of accepted species of Passeriformes per family from the Database of ........ The families are ordered by total number of records.*

Figure 3

Figure 3

*Figure 3: Taxonomic distribution of accepted species of Passeriformes per genus from the Database of ........ The genus are ordered by total number of records*

### Taxonomic ranks

**Kingdom**: *Metazoa*

**Phylum**: *Chordata*

**Subphylum**: *Craniata*

**Class**: *Aves*

**Order**: *Passeriformes*

**Family**: *Aegithalidae, Alaudidae, Certhiidae, Cinclidae, Corvidae, Fringillidae, Laniidae, Motacillidae, Muscicapidae, Paridae, Passeridae, Phylloscopidae, Sittidae, Sturnidae, Sylviidae, Turdidae*

**Genus**: *Aegithalos, Alauda, Anthus, Carduelis, Certhia, Cinclus, Coccothraustes, Corvus, Cyanistes, Emberiza, Erithacus, Fringilla, Galerida, Garrulus, Hippolais, Lanius, Lophophanes, Loxia, Lullula, Luscinia, Miliaria, Monticola, Motacilla, Muscicapa, Oenanthe, Oriolus, Parus, Passer, Periparus, Petronia, Phoenicurus, Phylloscopus, Pica, Prunella, Pyrrhocorax, Regulus, Saxicola, Serinus, Sitta, Spinus, Sturnus, Sylvia, Troglodytes, Turdus*

### Common names

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Scientific name | Spanish Red List | Birds Directive | Bern | Bonn | IUCN Red List Category (Europe) |
| Aegithalos caudatus Linnaeus, 1758 | NE |  | III |  | LC |
| Alauda arvensis Linnaeus, 1758 | NE |  | III |  | LC |
| Anthus campestris Linnaeus, 1758 | NE |  | III |  | LC |
| Anthus spinoletta Linnaeus, 1758 | NE |  |  |  | LC |
| Carduelis cannabina Linnaeus, 1758 | NE | II |  |  | LC |
| Carduelis carduelis Linnaeus, 1758 | NE | I | III | II | LC |
| Carduelis chloris Linnaeus, 1758 | NE |  | III |  | LC |
| Carduelis spinus Linnaeus, 1758 | NE | I | III |  | LC |
| Certhia brachydactyla Brehm, CL, 1820 | NE |  | III |  | LC |
| Cinclus cinclus Linnaeus, 1758 | NE |  | III |  | LC |
| Coccothraustes coccothraustes Linnaeus, 1758 | NE |  | III |  | LC |
| Corvus corax Linnaeus, 1758 | NE | I | III |  | LC |
| Corvus monedula Linnaeus, 1758 | NE |  | III |  | LC |
| Cyanistes caeruleus Linnaeus, 1758 | NE |  | III | II | LC |
| Emberiza cia Linnaeus, 1766 | NE |  | III | II | LC |
| Emberiza cirlus Linnaeus, 1766 | NE |  | III | II | LC |
| Emberiza hortulana Linnaeus, 1758 | NE |  | III |  | LC |
| Erithacus rubecula Linnaeus, 1758 | NE |  | III |  | LC |
| Fringilla coelebs Linnaeus, 1758 | NE |  | III | II | LC |
| Fringilla montifringilla Linnaeus, 1758 | NE |  | III | II | LC |
| Galerida cristata Linnaeus, 1758 | NE |  | III | II | LC |
| Galerida theklae Brehm, AE, 1857 | NE | I | III | II | LC |
| Garrulus glandarius Linnaeus, 1758 | NE |  | III | II | LC |
| Hippolais polyglotta Vieillot, 1817 | NE |  | III | II | LC |
| Lanius excubitor Linnaeus, 1758 |  | I | III |  | VU |
| Lanius senator Linnaeus, 1758 | NT |  | III |  | LC |
| Lophophanes cristatus Linnaeus, 1758 |  |  | III |  | LC |
| Loxia curvirostra Linnaeus, 1758 | NE |  | III |  | LC |
| Lullula arborea Linnaeus, 1758 | NE |  | III |  | LC |
| Luscinia megarhynchos Brehm, CL, 1831 | NE | I | III | II | LC |
| Miliaria calandra Linnaeus, 1758 | NE |  |  |  | LC |
| Monticola saxatilis Linnaeus, 1766 | NE | II |  |  | LC |
| Motacilla alba Linnaeus, 1758 | NE |  |  |  | LC |
| Motacilla cinerea Tunstall, 1771 | NE |  |  |  | LC |
| Muscicapa striata Pallas, 1764 | NE |  | III |  | LC |
| Oenanthe hispanica Linnaeus, 1758 | NT |  | III |  | LC |
| Oenanthe oenanthe Linnaeus, 1758 | NE |  | III |  | LC |
| Oriolus oriolus Linnaeus, 1758 | NE |  | III |  | LC |
| Parus major Linnaeus, 1758 | NE |  | III |  | LC |
| Passer domesticus Linnaeus, 1758 | NE |  | III | II | LC |
| Periparus ater Linnaeus, 1758 | NE |  | III | II | LC |
| Petronia petronia Linnaeus, 1766 | NE |  | III |  | LC |
| Phoenicurus ochruros Gmelin, SG, 1774 | NE |  | III |  | LC |
| Phoenicurus phoenicurus Linnaeus, 1758 | VU |  | III | II | LC |
| Phylloscopus bonelli Vieillot, 1819 | NE |  | III | II | LC |
| Phylloscopus collybita Vieillot, 1817 | NE |  | III |  | LC |
| Pica pica Linnaeus, 1758 | NE | I,II,III |  |  | LC |
| Prunella collaris Scopoli, 1769 | NE |  | III |  | LC |
| Prunella modularis Linnaeus, 1758 | NE | II,III | III |  | LC |
| Pyrrhocorax pyrrhocorax Linnaeus, 1758 | NT |  | III | II | LC |
| Regulus ignicapillus Temminck, 1820 | NE | I | III |  | LC |
| Saxicola rubetra Linnaeus, 1758 | NE |  | III |  | LC |
| Saxicola torquata Linnaeus, 1766 | NE |  | III |  | LC |
| Serinus citrinella Pallas, 1764 | NE | I | III |  | LC |
| Serinus serinus Linnaeus, 1766 | NE |  | III |  | LC |
| Sitta europaea Linnaeus, 1758 | NE |  | III |  | LC |
| Sturnus unicolor Temminck, 1820 | NE |  | III | II | LC |
| Sylvia atricapilla Linnaeus, 1758 | NE |  | III | II | LC |
| Sylvia cantillans Pallas, 1764 | NE |  | III |  | LC |
| Sylvia communis Latham, 1787 | NE |  | III | II | LC |
| Sylvia conspicillata Temminck, 1820 | LC\* |  | III | II | LC |
| Sylvia melanocephala Gmelin, JF, 1789 | NE | II | III |  | LC |
| Sylvia undata Boddaert, 1783 | NE |  | III |  | NT |
| Troglodytes troglodytes Linnaeus, 1758 | NE | II |  |  | LC |
| Turdus iliacus Linnaeus, 1758 | NE |  | III |  | NT |
| Turdus merula Linnaeus, 1758 | NE |  | III |  | LC |
| Turdus philomelos Brehm, CL, 1831 | NE |  | III | II | LC |
| Turdus pilaris Linnaeus, 1758 | NE | II | III | II | LC |
| Turdus torquatus Linnaeus, 1758 | NE | II | III | II | LC |
| Turdus viscivorus Linnaeus, 1758 | NE | II | III | II | LC |

red\_circle: ANTONIO. Check this. He quitado la columna de nombres comunes en castellano y en inglés. No estoy segura de si tenía que quitarla, miré el data paper de Phenology y vi que el nombre común no se incluía en la tabla, por eso las he quitado. Si estas columnas son necesarias están en la tabla `/data/taxa\_list\_STATUS\_passer.csv". El nombre de la especie hay que ponerlo en curvisa, pero no se cómo, lo siento.

*Table 1*: scientific name, Status on the Spanish Red List, Birds Directive, Bern, Bonn.

^a 2010 Red List of Spanish vascular flora (Madroño et al. 2004).

^b Species included in the Birds Directive Annexes (EC 1979).

^c Bern: Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention).

## Spatial coverage

### Bounding box for covered area

## Temporal coverage

Observations in the collection included in this datapaer date from November 2007 to April 2015 (Figure 4).

Figure 4

Figure 4

*Figure 4: Temporal coverage of the dataset. For each taxon (y-axis) the temporal coverage is showed including a point. Point size is proportional to monthly records of each taxon.*

## Collection name

Dataset of Passerine bird communities in a mediterranean high mountain (Sierra Nevada, Spain)

## Collection identifier

:red\_circle: http://www.gbif.es:8080/ipt/resource.do?r=borreguiles

## Methods

### Study extent description

This dataset covers three representative habitats within Sierra Nevada mountain range: forest (Pyrenean oak stands); shrub (thorny thickets on the edge of the forest as well as common juniper and Spanish juniper areas) and summit environments. These ecosystems were selected based on criteria of singularity and ecological functionality in the context of Sierra Nevada (Barea-Azcón et al. 2014, 2014).

:red\_circle: Include information about the three types of sampled ecosystem (like the description done in Zamora and Barea-Azcon 2015) :red\_circle: JMBA task

### Sampling description

Sampling procedure was the line-transect method (Verner, 1985), with a bandwidth of 50 m, 25 m on each side of the line (Barea-Azcón et al 2012, 2014). A total of 16 transect were sampled with lengths ranged from 1.9 to 3 km (Table 2). Sight and sound records within the sample area were accepted as contacts. All transects were sampled in the early morning, under appropriate climatic conditions. The observer walks at a constant speed of 2 to 4 km/h.

:red\_circle: cybertraker or Open Data Kit

Field data were recorded by a PDA-based system. For this purpose forms were created with Open Data Kit software (http://opendatakit.org) (Anokwa et al. 2009, Hartung et al. 2010). A video with an example of the sequence created to recorded field data is available at https://www.youtube.com/watch?v=tFyG2SvaNvA.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Location | Lenght | Habitat | Longitude | Latitude | Town | Elevation |
| Robledal de Cáñar | 2557 | Forest | -3.42922 | 36.95329 | Cáñar | 1736 |
| Dehesa del Río Dúrcal | 3292 | Shrub | -3.48255 | 37.02552 | Dúrcal | 2033 |
| Robledal de Dílar | 2554 | Forest | -3.47799 | 37.05824 | Dílar | 1605 |
| Collado de Matas Verdes | 2238 | Shrub | -3.44707 | 37.09091 | Monachil | 1918 |
| El Purche | 1945 | Shrub | -3.47801 | 37.13117 | Monachil | 1453 |
| Collado del Sabinar | 2746 | Shrub | -3.41848 | 37.11996 | Güejar Sierra | 2036 |
| Campos de Otero | 2264 | Shrub | -3.39304 | 37.11 | Güejar Sierra | 2143 |
| Cortijo del Hornillo | 3044 | Forest | -3.36806 | 37.12467 | Güejar Sierra | 1585 |
| Loma Papeles | 2539 | Shrub | -3.34016 | 37.14345 | Güejar Sierra | 2113 |
| Dehesa de las Hoyas | 2437 | Shrub | -3.31736 | 37.17243 | Güejar Sierra | 2074 |
| Dehesa del Camarate | 2805 | Forest | -3.25376 | 37.17975 | Lugros | 1575 |
| Lanteira | 2516 | Shrub | -3.17254 | 37.14091 | Lanteira | 1794 |
| Laguna Seca | 2531 | Summit | -2.96153 | 37.09921 | Huéneja | 2295 |
| Aguas Verdes | 2432 | Summit | -3.35893 | 37.05405 | Capileira | 3149 |
| Hoya Mora | 2047 | Summit | -3.37719 | 37.08962 | Güejar Sierra | 2407 |
| Papeles alto | 2310 | Summit | -3.30981 | 37.13571 | Güejar Sierra | 2420 |

*Table 2*: information about the transects of our study.

### Method step description

All data were stored in a normalized database and incorporated into the Information System of Sierra Nevada Global-Change Observatory. Taxonomic and spatial validations were made on this database (see Quality-control description). A custom-made SQL view of the database was performed to gather occurrence data and other variables associated with occurrence data, specifically:

* Birds Count: Number of individual recorded by the observer within transect (see *Sampling description*)
* Distance: Distance of the contact (bird) to transect line. The distance is estimated by eye.

The occurrence and measurement data were accommodated to fulfill the Darwin Core Standard (Wieczorek et al. 2009, 2012). We used Darwin Core Archive Validator tool (http://tools.gbif.org/dwca-validator/) to check whether the dataset meets Darwin Core specifications. The Integrated Publishing Toolkit (IPT v2.0.5) (Robertson et al. 2014) of the Spanish node of the Global Biodiversity Information Facility (GBIF) (http://www.gbif.es:8080/ipt) was used both to upload the Darwin Core Archive and to fill out the metadata.

The Darwin Core elements for the occurrence data included in the dataset are: :red\_circle: occurrenceId, modified, language, basisOfRecord, institutionCode, collectionCode, catalogNumber, scientificName, kingdom, phylum, class, order, family, genus, specificEpithet, scientificNameAuthorship, continent, country, countryCode, stateProvince, county, locality, minimumElevationInMeters, maximumElevationInMeters, decimalLongitude, decimalLatitude, coordinateUncertaintyinMeters, geodeticDatum, recordedBy, DayCollected, MonthCollected, YearCollected, EventDate.

For the measurement data, the Darwin Core elements included are: measurementID, measurementType, measurementValue, measurementAccuracy, measurementUnit, measurementDeterminedDate, measurementDeterminedBy, measurementMethod.

### Quality control description

The sampling transects were georeferenced using a Garmin eTrex Legend GPS (WGS 84 Datum) with an accuracy of ±5 m. We also used colour digital orthophotographs provided by the Andalusian Cartography Institute and GIS (ArcGIS 9.2; ESRI, Redlands, California, USA) to verify that the geographical coordinates of the transect were correct (Chapman and Wieczorek 2006).

For the identification of the specimes several fields guides were used (:red\_circle: Preguntar.; Del Hoyo Handbook of the birds of the worl ¿que volumenes?; Garzón-Gutierrez and Henares, 2012). The scientific names were checked with database of the IOC World Bird List (v 5.52) (Gill and Donkster 2015). We also used the R package taxize (Chamberlian and Szocs 2013, Chamberlain et al. 2014) to verify the taxonomical classification.

We also performed validation procedures (Chapman 2005a, 2005b) (geopraphic coordinate format, coordinates within country/provincial boundaries, absence of ASCII anomalous characters in the dataset) with DARWIN\_TEST (v3.2) software (Ortega-Maqueda and Pando 2008).

## Dataset description

**Object name**: Darwin Core Archive Dataset of Passerine bird communities in a mediterranean high mountain (Sierra Nevada, Spain)

**Character encoding**: UTF-8

**Format name**: Darwin Core Archive format

**Format version**: 1.0

**Distribution**: :red\_circle: url

**Publication date of data**: :red\_circle: 2015-??

**Language**: English

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**Metadata language**: English

**Date of metadata creation**: 2015-05-10

**Hierarchy level**: Dataset

## Acknowledgements

## References