

1   **Dataset of Passerine bird communities in a Mediterranean high**  
2   **mountain (Sierra Nevada, Spain)**

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27   Debén Duarte C, Foronda J, Galdo Fuentes P, Hernández Soto I, Lopera E, López  
28   Martínez A, López-Sanjuán R, Lozano Rubio AJ; Marín Escribano JM; Martín Jaramillo J;

29 Martos García C, Morillas Fernández D, Pulido Poyal C, Rodríguez G. Online at  
30 <http://www.gbif.es/ipt/resource?r=passerine> and  
31 <http://www.obsnev.es/noticia.html?id=7854>, version 1.0 (last updated on 2015-04-  
32 01). Resource ID: GBIF Key: <http://www.gbif.org/dataset/bb1c7420-fbb5-46e2-87ad-658081360694>

## 34 **Abstract**

35 In this data paper, we describe a dataset of passerine bird communities in Sierra  
36 Nevada, a Mediterranean high mountain located in southern Spain. The dataset  
37 includes occurrence data from bird surveys conducted in four representative  
38 ecosystem types of Sierra Nevada from 2008 to 2015. For each contact, bird species  
39 numbers as well as distance to the transect line were recorded. A total of 27847  
40 occurrence records were compiled and 55694 measurements recorded. All records  
41 belong to the order Passeriformes. A total of 16 families and 44 genera were collected.  
42 Most of the taxa of the dataset are included in the European Red List. This dataset  
43 belongs to the Sierra Nevada Global-Change Observatory (OBSNEV), a long-term  
44 research project designed to compile socio-ecological information on the major  
45 ecosystem types in order to identify the impacts of global change in this area.

## 46 **Keywords**

47 *Passerines, Sierra Nevada (Spain), global-change monitoring, Mediterranean high  
48 mountain, species composition, abundance*

## 49 **Introduction**

50 Birds are one of the most suitable organisms for assessing species vulnerability to  
51 climate change (Pacifi et al. 2015). There is scientific evidence of the impact of climate  
52 change on bird communities (Crick 2004, Pearce-Higgins and Green 2014, Pearce-  
53 Higgins et al. 2015). Most of studies supporting such impacts are based on long-term  
54 datasets (e.g. Gregory et al. 2009). Long-term datasets have been recognized as a key  
55 component for monitoring biodiversity (Magurran et al. 2010), and are considered

56 one of the major requirements to identify changes in phenology (Sanz 2002).  
57 However, long-term monitoring programs are often difficult to maintain. In this sense,  
58 reviewing old studies can help to integrate short-term studies into long-term datasets,  
59 providing a potential source of data to assess changes in ecological communities (Sanz  
60 2002, Müller et al. 2010). This is relevant for the Mediterranean region, where more  
61 bird studies as well as available long-term datasets (Sanz 2002) are needed, especially  
62 considering that predicted variations in species richness have shown sharp decreased  
63 in the southern regions of Europe (Barbet-Massin et al. 2012).

64 In this paper, we describe a dataset of passerine bird communities from Sierra  
65 Nevada, a Mediterranean high mountain region. The dataset comes from Sierra  
66 Nevada Global Change Observatory (OBSNEV), a monitoring programme designed to  
67 evaluate the potential impacts of global change in this mountain area. Monitoring  
68 methodologies of the OBSNEV include revisiting old plots to assess long-term  
69 population trends, changes in phenology, and shifts in community composition,  
70 among others parameters.

71 Studies of bird communities in the Sierra Nevada mountain region go back to the  
72 1850s, with the first published records of field observations recorded by  
73 ornithologists (Pleguezuelos 1991, Garzón 2012). A recent ornithology review in the  
74 Sierra Nevada was made by Garzón and Henares (2012). All these works include  
75 passerines, but specific studies focusing specifically on passerine bird communities on  
76 this mountain region were conducted during the 1980s (Zamora and Camacho 1984,  
77 Zamora 1987a, 1987b, 1988a, 1988b, 1990). The dataset presented here contributes  
78 knowledge concerning passerines in this area, enabling assessments of population  
79 trends (e.g. Zamora and Barea-Azcón 2015).

## 80 **Project details**

### 81 **Project title**

82 Sierra Nevada Global-Change Observatory (OBSNEV)

83 **Personnel**

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

87 **Funding**

88 Sierra Nevada Global Change Observatory is funded by the Consejería de Medio  
89 Ambiente y Ordenación del Territorio (Junta de Andalucía) through the European  
90 Union (FEDER project) and by the Spanish Government (via “Fundación  
91 Biodiversidad”, which is a Public Foundation). Some activities undertaken by the  
92 OBSNEV (data analysis, quantification of ecosystem services, harmonization of  
93 monitoring methods, integration in major cyberinfrastructures, etc.) are funded by the  
94 European Commission under different projects (FP7: EU BON; H2020: eLTER,  
95 ECOPOTENTIAL; Life: ADAPTAMED).

96 **Study area description**

97 Sierra Nevada (Andalusia, SE Spain), is a mountainous region covering more than  
98 2000 km<sup>2</sup> with an altitudinal range of between 860 m and 3482 m a.s.l. (Figure 1). The  
99 climate is Mediterranean, characterized by cold winters and hot summers, with  
100 pronounced summer drought (July-August). The annual average temperature  
101 decreases in altitude from 12–16°C below 1500 m to 0°C above 3000 m a.s.l., and the  
102 annual average precipitation is about 600 mm. Additionally, the complex orography of  
103 the mountains causes sharp climatic contrasts between the sunny, dry south-facing  
104 slopes and the shaded, wetter north-facing slopes. Annual precipitation ranges from  
105 less than 250 mm in the lowest parts of the mountain range to more than 700 mm in  
106 the summit areas. Winter precipitation is mainly in the form of snow above 2000 m  
107 a.s.l.

108 This mountain area harbours 27 habitat types from the Habitat Directive. Sierra  
109 Nevada protected area contains 78 animal species (48 breeding birds, 17 mammals, 7

110 invertebrates, 2 amphibians and 4 reptiles) and 13 plant species listed in the Annex II  
111 and/or in the Annex IV of Habitat Directive or Annex I or Annex II of Bird Directive. It  
112 is thus considered one of the most important biodiversity hotspots in the  
113 Mediterranean region (Blanca 1996, Blanca et al. 1998, Cañadas et al. 2014).

114 Sierra Nevada has several legal protections: Biosphere Reserve MAB Committee  
115 UNESCO; Special Area of conservation (Natura 2000 network); Natural Park and  
116 National Park; IBA (Important Bird Area). The area includes 61 municipalities with  
117 more than 90, 000 inhabitants. The main economic activities are agriculture, tourism,  
118 livestock raising, beekeeping, mining, and skiing (Bonet et al. 2010).

## 119 **Design description**

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

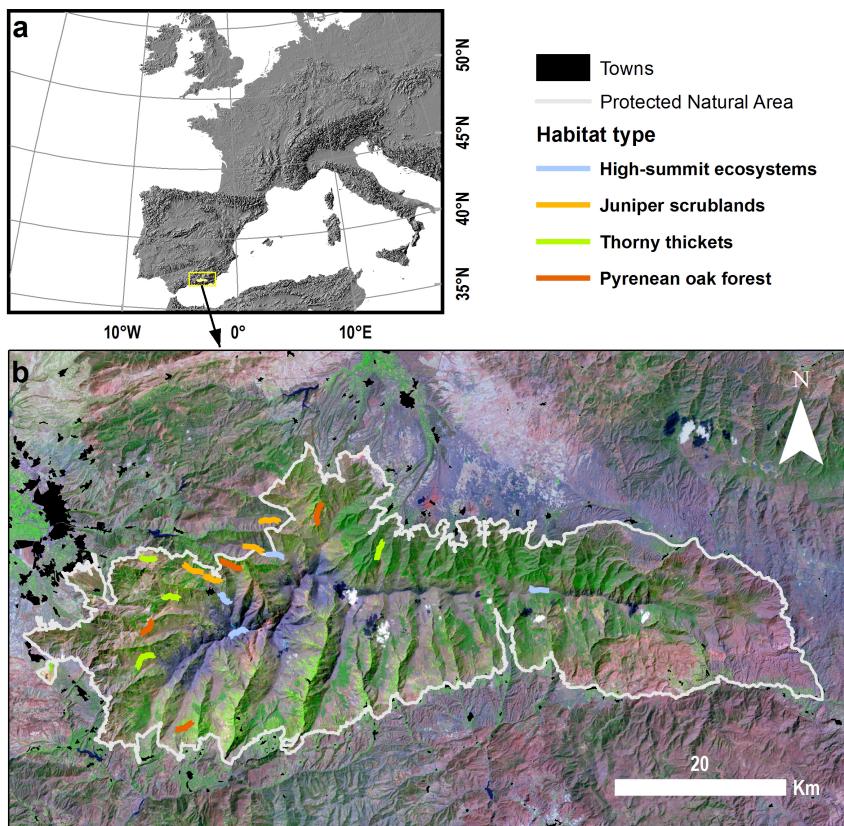
- 126 • Evaluate the functioning of ecosystems in the Sierra Nevada Nature Reserve, their  
127 natural processes and dynamics over a medium-term timescale.
- 128 • Identify population dynamics, phenological changes, and conservation issues  
129 regarding key species that could be considered indicators of ecological processes.
- 130 • Identify the impact of global change on monitored species, ecosystems, and  
131 natural resources, providing an overview of trends of change that could help  
132 foster ecosystem resilience.
- 133 • Design mechanisms to assess the effectiveness and efficiency of management  
134 activities performed in the Sierra Nevada in order to implement an adaptive  
135 management framework.

- 136     • Help to disseminate information of general interest concerning the values and  
137                 importance of Sierra Nevada.

138     The Sierra Nevada Global Change Observatory has four cornerstones:

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

149     The Sierra Nevada Global Change Observatory is linked to other national (Zamora and  
150                 Bonet 2011) and international monitoring networks: GLOCHAMORE (Global Change  
151                 in Mountain Regions) (Björnsen 2005), GLOCHAMOST (Global Change in Mountain  
152                 Sites) (Schaaf 2009), LTER-Spain (Long-Term Ecological Research), LifeWatch (Basset  
153                 and Los 2012), etc. This project is also involved in several European projects such as  
154                 MS-MONINA (FP7 project. [www.ms-monina.eu](http://www.ms-monina.eu)), EU BON (Hoffmann et al. 2014),  
155                 eLTER (H2020 project. [www.lter-europe.net/projects/eLTER](http://www.lter-europe.net/projects/eLTER)), ECOPOTENTIAL  
156                 (H2020 project. [www.ecopotential-project.eu/](http://www.ecopotential-project.eu/)) and ADAPTAMED (Life project).

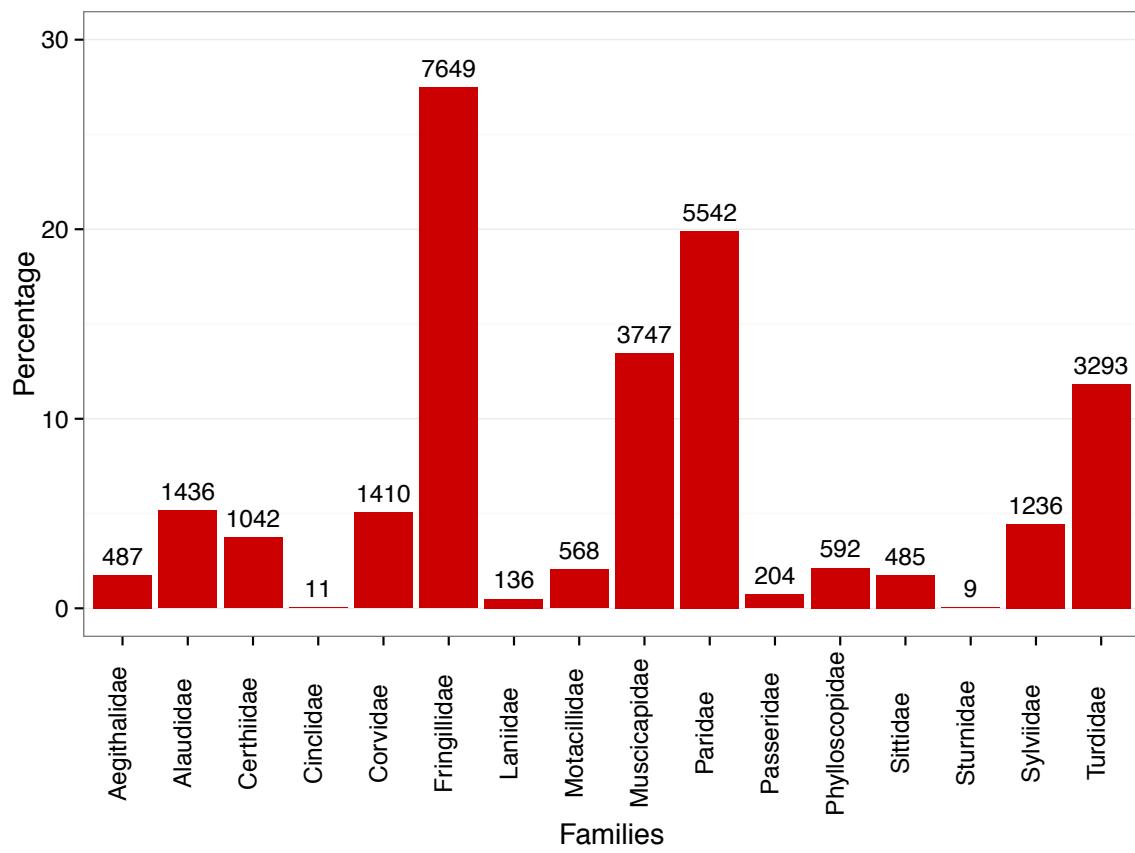


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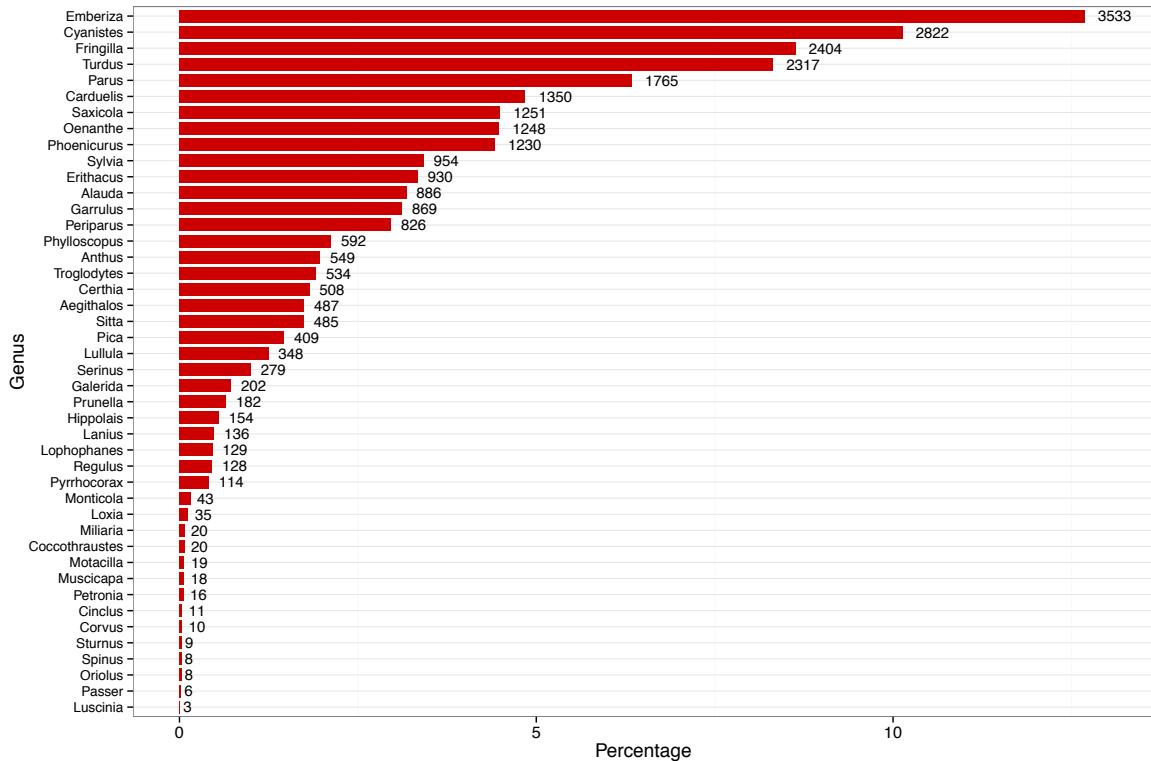
158 *Figure 1. Location of Sierra Nevada (southern Spain) (a) and distribution of transects in*  
 159 *the Protected Natural Area of Sierra Nevada (b). Transect colour according to habitat*  
 160 *type (see Methods section).*

161 **Taxonomic coverage**

162 This dataset includes a total of 27847 records of the order Passeriformes with 16  
 163 families represented (Figure 2). Nearly one third of the specimens belong to the family  
 164 Fringillidae. A total of 44 genera are represented in this collection, with *Emberiza*,  
 165 *Cyanistes*, *Turdus*, *Fringilla* and *Parus* having the highest number of records (Figure 3).  
 166 Of this dataset 70 taxa appear in the European Red List (BirdLife International 2015):  
 167 67 are categorized as Least Concern, 2 Not evaluated, and 1 taxa considered as  
 168 Vulnerable (Table 1). According to the Spanish Red List (Madroño et al. 2004), 3 taxa  
 169 of this dataset are placed under the Near Threatened category, 1 taxa as Vulnerable  
 170 and 1 as Least Concern categories, respectively (Table 1).



173 *Figure 2: Taxonomic families included in the dataset. The bars show the percentage of*  
 174 *records belonging to each family.*



175

176 *Figure 3: Distribution of records in the collection according to genus.*

## 177 Taxonomic ranks

178 **Kingdom:** *Metazoa*

179 **Phylum:** *Chordata*

180 **Subphylum:** *Craniata*

181 **Class:** *Aves*

182 **Order:** *Passeriformes*

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

186 **Genus:** *Aegithalos, Alauda, Anthus, Carduelis, Certhia, Cinclus, Coccothraustes, Corvus, Cyanistes, Emberiza, Erythacus, Fringilla, Galerida, Garrulus, Hippolais, Lanius,*

- 188 *Lophophanes, Loxia, Lullula, Luscinia, Miliaria, Monticola, Motacilla, Muscicapa,*  
189 *Oenanthe, Oriolus, Parus, Passer, Periparus, Petronia, Phoenicurus, Phylloscopus, Pica,*  
190 *Prunella, Pyrrhocorax, Regulus, Saxicola, Serinus, Sitta, Spinus, Sturnus, Sylvia,*  
191 *Troglodytes, Turdus*

Table 1. Conservation status of the species included in this dataset.

Scientific name	European Red List <sup>a</sup>	Spanish Red List <sup>b</sup>	Birds Directive <sup>c</sup>	Spanish Name <sup>d</sup>	English Name <sup>e</sup>
<i>Aegithalos caudatus</i> (Linnaeus, 1758)	LC	NE		Mito común	Long-tailed Tit
<i>Alauda arvensis</i> Linnaeus, 1758	LC	NE	IIB	Alondra común	Eurasian Skylark
<i>Anthus campestris</i> (Linnaeus, 1758)	LC	NE	I	Bisbita campestre	Tawny Pipit
<i>Anthus spinolella</i> (Linnaeus, 1758)	LC	NE		Bisbita alpino	Water Pipit
<i>Carduelis cannabina</i> (Linnaeus, 1758)	LC	NE	II	Pardillo común	Common Linnet
<i>Carduelis carduelis</i> (Linnaeus, 1758)	LC	NE		Jilguero europeo	European Goldfinch
<i>Carduelis chloris</i> (Linnaeus, 1758)	LC	NE		Verderón común	European Greenfinch
<i>Carduelis spinus</i> (Linnaeus, 1758)	LC	NE		Jilguero lúgano	Eurasian Siskin
<i>Certhia brachydactyla</i> CL Brehm, 1820	LC	NE	I	Agateador europeo	Short-toed Treecreeper
<i>Cinclus cinclus</i> (Linnaeus, 1758)	LC	NE		Mirlo acuático europeo	White-throated Dipper
<i>Coccothraustes coccothraustes</i> (Linnaeus, 1758)	LC	NE		Picogordo común	Hawfinch
<i>Corvus corax</i> Linnaeus, 1758	LC	NE		Cuervo grande	Northern Raven
<i>Corvus monedula</i> Linnaeus, 1758	LC	NE	IIB	Grajilla occidental	Western Jackdaw
<i>Cyanistes caeruleus</i> (Linnaeus, 1758)	LC	NE		Herrerallo común	Eurasian Blue Tit
<i>Emberiza cia</i> Linnaeus, 1766	LC	NE		Escribano montesino	Rock Bunting
<i>Emberiza cirlus</i> Linnaeus, 1766	LC	NE		Escribano soteño	Cirl Bunting
<i>Emberiza hortulana</i> (Linnaeus, 1758)	LC	NE	I	Escribano hortelano	Ortolan Bunting
<i>Erythacus rubecula</i> Linnaeus, 1758	LC	NE		Petirrojo europeo	European Robin
<i>Fringilla coelebs</i> Linnaeus, 1758	LC	NE	I	Pinzón vulgar	Common Chaffinch
<i>Fringilla montifringilla</i> Linnaeus, 1758	LC	NE		Pinzón real	Brambling
<i>Galerida cristata</i> Linnaeus, 1758	LC	NE		Cogujada común	Crested Lark
<i>Galerida theklae</i> (CL Brehm, 1858)	LC	NE	I	Cogujada montesina	Thekla Lark
<i>Garrulus glandarius</i> (Linnaeus, 1758)	LC	NE	IIB	Arrendajo euroasiático	Eurasian Jay
<i>Hippolais polyglotta</i> (Vieillot, 1817)	LC	NE		Zarcero políglota	Melodious Warbler
<i>Lanius meridionalis</i> Temminck, 1820	VU			Alcaudón norteño	Great Grey Shrike
<i>Lanius senator</i> Linnaeus, 1758	LC	NT		Alcaudón común	Woodchat Shrike
<i>Lophophanes cristatus</i> (Linnaeus, 1758)	LC			Herrerallo capuchino	European Crested Tit
<i>Loxia curvirostra</i> Linnaeus, 1758	LC	NE		Piquituerto común	Red Crossbill
<i>Lullula arborea</i> (Linnaeus, 1758)	LC	NE	I	Alondra Totovía	Woodlark
<i>Luscinia megarhynchos</i> CL Brehm, 1831	LC	NE		Ruisenor común	Common Nightingale
<i>Miliaria calandra</i> (Linnaeus, 1758)	LC	NE		Escribano triguero	Corn Bunting
<i>Monticola saxatilis</i> (Linnaeus, 1766)	LC	NE		Roquero rojo	Common Rock Thrush
<i>Motacilla alba</i> Linnaeus, 1758	LC	NE		Lavandera blanca	White Wagtail
<i>Motacilla cinerea</i> Tunstall, 1771	LC	NE		Lavandera cascadeña	Grey Wagtail
<i>Muscicapa striata</i> (Pallas, 1764)	LC	NE		Papamoscas gris	Spotted Flycatcher

<i>Oenanthe hispanica</i> (Linnaeus, 1758)	LC	NT		Collalba rubia	Black-eared Wheatear
<i>Oenanthe oenanthe</i> (Linnaeus, 1758)	LC	NE		Collalba gris	Northern Wheatear
<i>Oriolus oriolus</i> (Linnaeus, 1758)	LC	NE		Oropéndola europea	Eurasian Golden Oriole
<i>Parus major</i> Linnaeus, 1758	LC	NE		Carbonero común	Great Tit
<i>Passer domesticus</i> (Linnaeus, 1758)	LC	NE		Gorrión común	House Sparrow
<i>Periparus ater</i> (Linnaeus, 1758)	LC	NE	I	Carbonero garrapinos	Coal Tit
<i>Petronia petronia</i> (Linnaeus, 1766)	LC	NE		Gorrión chillón	Rock Sparrow
<i>Phoenicurus ochruros</i> (SG Gmelin, 1774)	LC	NE		Colirrojo tizón	Black Redstart
<i>Phoenicurus phoenicurus</i> (Linnaeus, 1758)	LC	VU		Colirrojo real	Common Redstart
<i>Phylloscopus bonelli</i> (Vieillot, 1819)	LC	NE		Mosquitero papialbo	Western Bonelli's Warbler
<i>Phylloscopus collybita</i> (Vieillot, 1817)	LC	NE		Mosquitero común	Common Chiffchaff
<i>Pica pica</i> (Linnaeus, 1758)	LC	NE	IIB	Urraca común	Eurasian Magpie
<i>Prunella collaris</i> (Scopoli, 1769)	LC	NE		Acentor alpino	Alpine Accentor
<i>Prunella modularis</i> (Linnaeus, 1758)	LC	NE		Acentor común	Dunnock
<i>Pyrhocorax pyrrhocorax</i> (Linnaeus, 1758)	LC	NT	I	Chova piquirroja	Red-billed Chough
<i>Regulus ignicapillus</i> (Temminck, 1820)	LC	NE		Reyezuelo listado	Common Firecrest
<i>Saxicola rubetra</i> (Linnaeus, 1758)	LC	NE		Tarabilla norteña	Whinchat
<i>Saxicola rubicola</i> (Linnaeus, 1766)	LC	NE		Tarabilla común	African Stonechat
<i>Serinus citrinella</i> (Pallas, 1764)	LC	NE		Verderón serrano	Citril Finch
<i>Serinus serinus</i> (Linnaeus, 1766)	LC	NE		Serín Verdecillo	European Serin
<i>Sitta europaea</i> Linnaeus, 1758	LC	NE		Trepador azul	Eurasian Nuthatch
<i>Sturnus unicolor</i> Temminck, 1820	LC	NE		Estornino negro	Spotless Starling
<i>Sylvia atricapilla</i> (Linnaeus, 1758)	LC	NE		Curruga capirotada	Eurasian Blackcap
<i>Sylvia cantillans</i> (Pallas, 1764)	LC	NE		Curruga carrasqueña	Subalpine Warbler
<i>Sylvia communis</i> Latham, 1787	LC	NE		Curruga zarcera	Common Whitethroat
<i>Sylvia conspicillata</i> Temminck, 1820	LC	LC		Curruga tomillera	Spectacled Warbler
<i>Sylvia melanocephala</i> (Gmelin, 1789)	LC	NE		Curruga cabecinegra	Sardinian Warbler
<i>Sylvia undata</i> (Boddaert, 1783)	NT	NE	I	Curruga rabilarga	Dartford Warbler
<i>Troglodytes troglodytes</i> (Linnaeus, 1758)	LC	NE	I	Chochín común	Eurasian Wren
<i>Turdus iliacus</i> Linnaeus, 1758	NT	NE	IIB	Zorzal alirrojo	Redwing
<i>Turdus merula</i> Linnaeus, 1758	LC	NE	IIB	Mirlo común	Common Blackbird
<i>Turdus philomelos</i> CL Brehm, 1831	LC	NE	IIB	Zorzal común	Song Thrush
<i>Turdus pilaris</i> Linnaeus, 1758	LC	NE	IIB	Zorzal real	Fieldfare
<i>Turdus torquatus</i> Linnaeus, 1758	LC	NE		Mirlo capiblanco	Ring Ouzel
<i>Turdus viscivorus</i> Linnaeus, 1758	LC	NE	IIB	Zorzal charlo	Mistle Thrush

<sup>a</sup> European Red List of Birds (BirdLife International 2015). <sup>b</sup> Red Book of the birds of Spain (Madroño et al. 2004). <sup>c</sup> Species included in the Birds Directive Annexes (EC 1979) <sup>d</sup> Spanish common names (Gutiérrez et al. 2012, De Juana et al. 2004, 2005, 2007, 2009a, 2009b, 2010a, 2010b). <sup>e</sup> English common names (Gill and Donsker 2015). LC: Least Concern; NE: Not Evaluated; NT: Near Threatened; VU: Vulnerable.

193 **Spatial coverage**

194 **Bounding box for covered area**

195 36°52'12"N and 37°15'36"N Latitude; 3°41'24"W and 2°33'36"W Longitude

196 **Temporal coverage**

197 Observations in the collection included in this data paper date from March 2008 to

198 April 2015 (Figure 4).



199

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

203

204 **Collection name**

205 Dataset of Passerine bird communities in a Mediterranean high mountain (Sierra  
206 Nevada, Spain)

207 **Collection identifier**

208 <http://www.gbif.es/ipt/resource?r=passerine>

209 **Methods**

210 **Study extent description**

211 This dataset covers four representative habitats within the Sierra Nevada mountain  
212 range: Pyrenean oak forest , thorny thickets on the edge of the forest, common juniper  
213 and Spanish juniper scrublands, and high-summit ecosystems. These ecosystems were  
214 selected based on criteria of singularity and ecological functionality in the context of  
215 Sierra Nevada (Barea-Azcón et al. 2012, 2014) and can be described as follows:

216 - Pyrenean oak forest: Mediterranean woodland composed mainly of relict *Quercus*  
217 *pyrenaica* and some dominant scrubland species (i.e. *Berberis hispanica*, *Prunus*  
218 *ramburii*, *Rosa canina*, *Crataegus monogyna* and *Adenocarpus decorticans*). These  
219 forests show strong evidence of past management that has determined their current  
220 structure and diversity. This management is based on mainly charcoal production,  
221 pastureland creation, and wood harvesting until the 1950s, so that the current trees  
222 are mostly resprouts of individuals 60 to 70 years old. The target localities ( $n=4$ ) are  
223 located at an average elevation of 1650 m a.s.l. (1600-1750 m a.s.l.) and are  
224 distributed in the southern, western, northern, and eastern slopes of Sierra Nevada,  
225 reflecting all the ecological conditions of the Pyrenean oak forest in the study area  
226 (Pérez-Luque et al. 2013).

227 -Thorny scrubs: Typical areas dominated by thorny thickets on the edge of the forest  
228 or as result of recent colonization of abandoned arable lands. *Berberis hispanica*,  
229 *Prunus ramburii*, *Rosa canina*, *Crataegus monogyna* are dominant but accompanied by

230 other species such as *Lonicera arborea* or even *Sorbus* spp. This open habitat is very  
231 important for breeding birds in the study area and also for winter-visiting species due  
232 to a great production of fruits from the end of the summer to the beginning of winter.  
233 Transects ( $n=4$ ) in this habitat are located between 1450 and 2060 m a.s.l. (average:  
234 1790 m a.s.l.).

235 -Common juniper and Spanish juniper scrublands: vegetation in these localities is  
236 composed mainly of common juniper (*Juniperus communis*), Spanish juniper  
237 (*Juniperus sabina*). *Cytisus galianoi* and *Genista baetica* are also important species in  
238 these ecosystems. These scrublands rarely exceed 60 cm in height and appear  
239 intermingled with rocks and stony ground. Transects ( $n=4$ ) located in this ecosystems  
240 cover an elevational range from 2000 to 2300 m a.s.l. (average: 2150 m a.s.l.).

241 -High-summit ecosystems: composed by typical Alpine landscape. These ecosystems  
242 are characterized by rocky outcrops that originated from glacial activity, pastureland,  
243 small snow beds, and glacial lagoons. The four transects representing this  
244 Mediterranean high-mountain habitat span an elevational gradient from 2280 to 3100  
245 m a.s.l., with an average elevation of 2580 m a.s.l.

## 246 **Sampling description**

247 The sampling procedure was the line-transect method (Verner 1985), with a  
248 bandwidth of 100 m, with 50 m on each side of the line (Barea-Azcón et al. 2014). A  
249 total of 16 transects were sampled with lengths of 1.9 to 3 km (Table 2). Sight and  
250 sound records within the sample area were considered contacts. All transects were  
251 sampled in the early morning, under appropriate climatic conditions. The observer  
252 walked at a constant speed of 2 to 4 km/h. Transects are repeated at least once per  
253 month, snow cover permitting. This implies that the sites located at the higher  
254 elevations were sampled only from late spring to early autumn.

255

256

<i>Transect name</i>	<i>Length (m)</i>	<i>Habitat type</i>	<i>Longitude</i>	<i>Latitude</i>	<i>Province</i>	<i>Municipality</i>	<i>Elevation</i>
Robledal de Cáñar	2556	Pyrenean oak Forest	-3.4292	36.9532	Granada	Cáñar	1736
Robledal de Dílar	2553		-3.4779	37.0582	Granada	Dílar	1605
Cortijo del Hornillo	3044		-3.3680	37.1246	Granada	Güejar Sierra	1585
Dehesa del Camarate	2805		-3.2537	37.1797	Granada	Lugros	1575
Dehesa del Río Dúrcal	3292	Thorny thickets	-3.4825	37.0255	Granada	Dúrcal	2033
Collado de Matas Verdes	2237		-3.4470	37.0909	Granada	Monachil	1918
El Purche	1944		-3.4780	37.1311	Granada	Monachil	1453
Lanteira	2515		-3.1725	37.1409	Granada	Lanteira	1794
Collado del Sabinar	2745	Juniper scrublands	-3.4184	37.1199	Granada	Güejar Sierra	2036
Campos de Otero	2264		-3.3930	37.1100	Granada	Güejar Sierra	2143
Loma Papeles	2539		-3.3401	37.1434	Granada	Güejar Sierra	2113
Dehesa de las Hoyas	2436		-3.3173	37.1724	Granada	Güejar Sierra	2074
Laguna Seca	2530	High-summit ecosystems	-2.9615	37.0992	Granada	Huéneja	2295
Aguas Verdes	2431		-3.3589	37.0540	Granada	Capileira	3149
Hoya Mora	2046		-3.3771	37.0896	Granada	Güejar Sierra	2407
Papeles alto	2309		-3.3098	37.1357	Granada	Güejar Sierra	2420

258 *Table 2. Information about transects sampled to collect data included in this dataset.*259 **Method step description**

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

- 265 • Bird Count: number of individuals recorded by the observer within transect (see  
 266 *Sampling description*)
- 267 • Distance: distance of the contact (bird) from transect line. The distance was  
 268 estimated by eye.

269 The occurrence and measurement data were accommodated to fulfil the Darwin Core  
 270 Standard (Wieczorek et al. 2009, 2012). We used Darwin Core Archive Validator tool  
 271 (<http://tools.gbif.org/dwca-validator/>) to check whether the dataset met Darwin Core  
 272 specifications. The Integrated Publishing Toolkit (IPT v2.0.5) (Robertson et al. 2014)

273 of the Spanish node of the Global Biodiversity Information Facility (GBIF)  
274 (<http://www.gbif.es/ipt>) was used both to upload the Darwin Core Archive and to fill  
275 out the metadata.

276 The Darwin Core elements for the occurrence data included in the dataset were:  
277 occurrenceId, modified, language, basisOfRecord, institutionCode, collectionCode,  
278 catalogNumber, scientificName, kingdom, phylum, class, order, family, genus,  
279 specificEpithet, scientificNameAuthorship, continent, country, countryCode,  
280 stateProvince, county, locality, minimumElevationInMeters,  
281 maximumElevationInMeters, decimalLongitude, decimalLatitude,  
282 coordinateUncertaintyinMeters, geodeticDatum, recordedBy, day, month, year,  
283 EventDate.

284 For the measurement data, the Darwin Core elements included were: occurrenceId,  
285 measurementID, measurementType, measurementValue, measurementAccuracy,  
286 measurementUnit, measurementDeterminedDate, measurementDeterminedBy,  
287 measurementMethod.

## 288 **Quality control description**

289 The sampling transects were georeferenced using a hand held GPS device (WGS 84  
290 Datum) with an accuracy of  $\pm 5$  m. We also used colour digital orthophotographs  
291 provided by the Andalusian Cartography Institute and GIS (ArcGIS 9.2; ESRI, Redlands,  
292 California, USA) to verify that the geographical coordinates of the transects were  
293 correct (Chapman and Wieczorek 2006).

294 For the identification of the specimens, several fields guides were used (De Juana and  
295 Varela 2000, Jonsson 2001). The scientific names were checked with database of the  
296 IOC World Bird List (v 5.52) (Gill and Donkster 2015). We also used the R package  
297 taxize (Chamberlain and Szocs 2013, Chamberlain et al. 2014) to verify the  
298 taxonomical classification.

299 In addition, we performed validation procedures (Chapman 2005a, 2005b)  
300 (geographic coordinate format, coordinates within country/provincial boundaries,

301 absence of ASCII anomalous characters in the dataset) with DARWIN\_TEST (v3.2)  
302 software (Ortega-Maqueda and Pando 2008).

### 303 **Dataset description**

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

306 **Character encoding:** UTF-8

307 **Format name:** Darwin Core Archive format

308 **Format version:** 1.0

309 **Distribution:** <http://www.gbif.es/ipt/resource?r=passerine>

310 **Publication date of data:** 2015-10-08

311 **Language:** English

312 **Licenses of use:** This “*Dataset of Passerine bird communities in a Mediterranean high*  
313 *mountain (Sierra Nevada, Spain)*” is licensed under and made available under the  
314 Creative Commons Attribution Non Commercial (CC-BY-NC) 4.0 License  
315 <http://creativecommons.org/licenses/by-nc/4.0/legalcode>

316 **Metadata language:** English

317 **Date of metadata creation:** 2015-10-08

318 **Hierarchy level:** Dataset

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331

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