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The status of the European Roller in Spain

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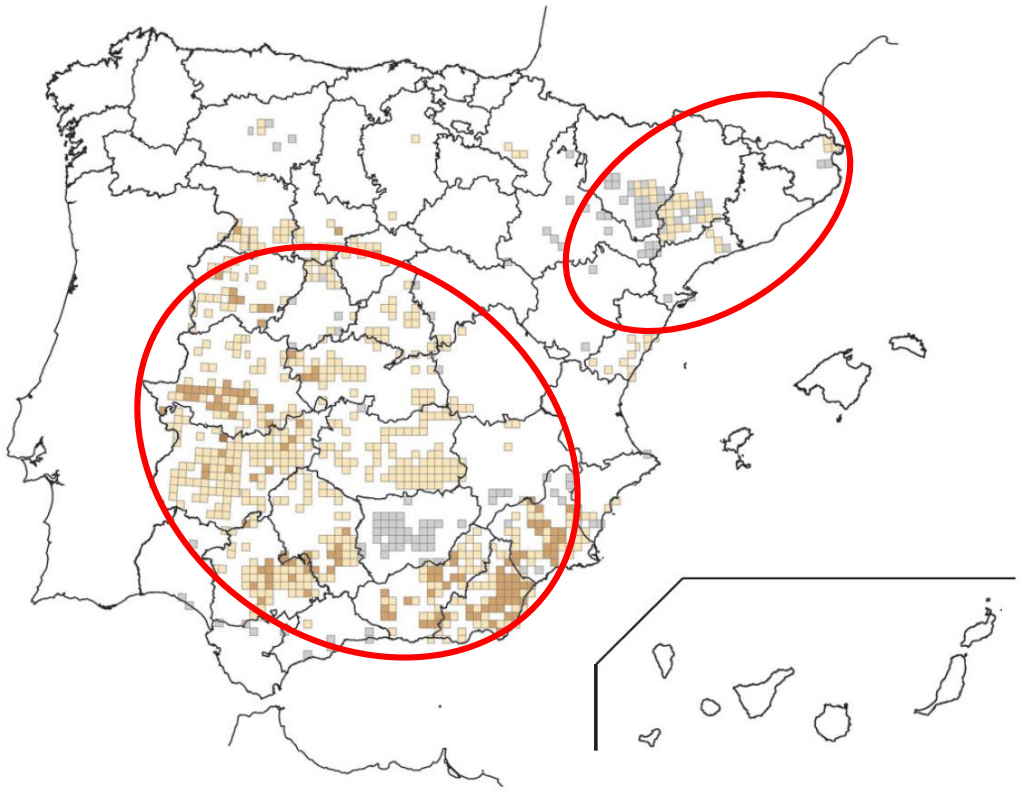
Table 1. European range states of the European Roller (BirdLife International 2008).

Range states	Breeding	Migration	Wintering
Spain	Yes	Yes	No

Months in which you can see the species in Spain					
~~January~~	~~February~~	~~March~~	April	May	June
July	August	September	October	~~November~~	~~December~~

Source: The Encyclopedia of Birds of Spain. SEO BirdLife

Roller Distribution in Spain



1-9 pp.	10-99 pp.	100-999 pp.	1.000-9.999 pp.	>9.999 pp.	Sin cuantificar
569	137	1	0	0	131

Two Sub-Populations

North East

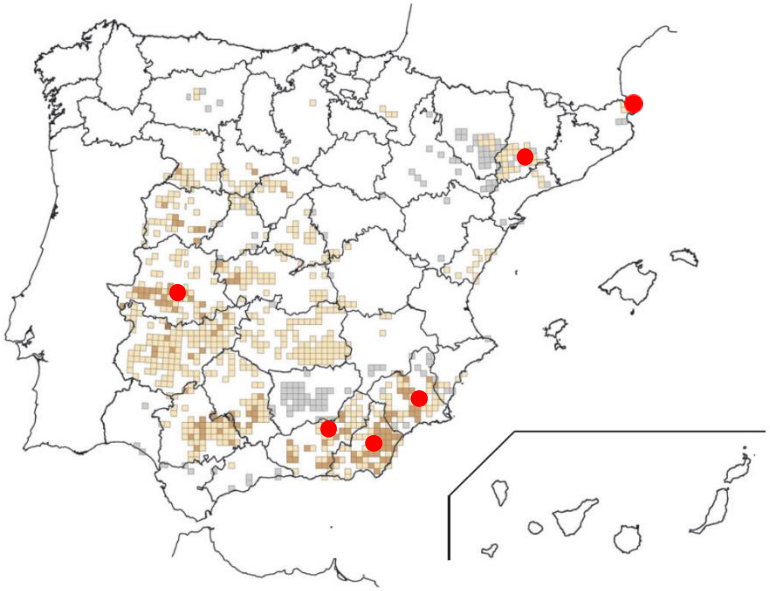
Central & South

Folch & Avilés 2003
Carrascal et al. 2006

Population size and trend between 2000-2016 in Spain

Country	Breeding pairs	Quality	Year(s) of the latest estimate	Breeding pop. trend in the last 15 years	Quality
Spain	2000-6000	M	2006	Moderate decline	P

Population size and trend by country (BirdLife International 2008). Notes: G – Good; M – Medium; P – Poor.



No accurate information about the Spanish population.

Good-quality information about several populations: Almería, Cáceres, Granada, Lleida, Empordà and Murcia.

Available, updated information about population size and trends in Spain

Population	Period	Before	After	Trend
Guadix (Granada)	2007-2014	42	58	stable
Extremadura	2008		300 – 1000	(-0.3% n.s) Uncertain
Catalonia	1996-2014	220-300	370-460	mod. increase
Murcia	2004-2016	300	< 230	decrease
Tabernas (Almería)	2005-2016	72	100	mod. increase

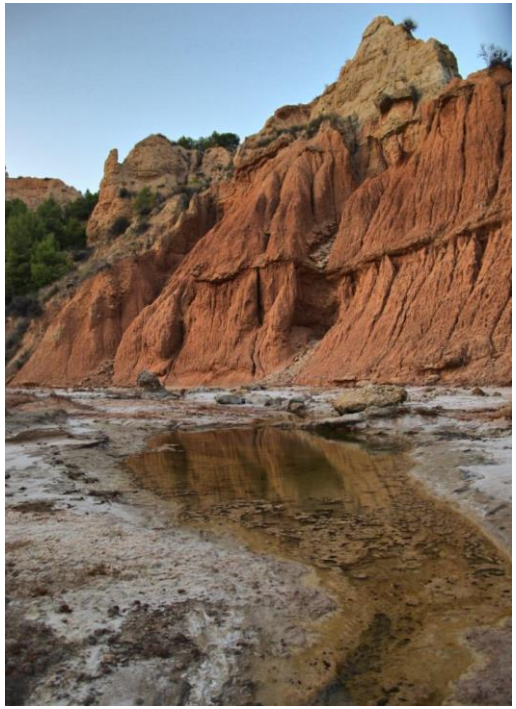
(units in number of individuals)

Parejo 2008
Prieta et al 2013
Folch 1996, 2006
Václav et al. 2011

In summary, available information suggests: Likely Stable

SPANISH BREEDING BIRDS ATLAS 2014-2017: in progress (expected publication during 2018-2019).

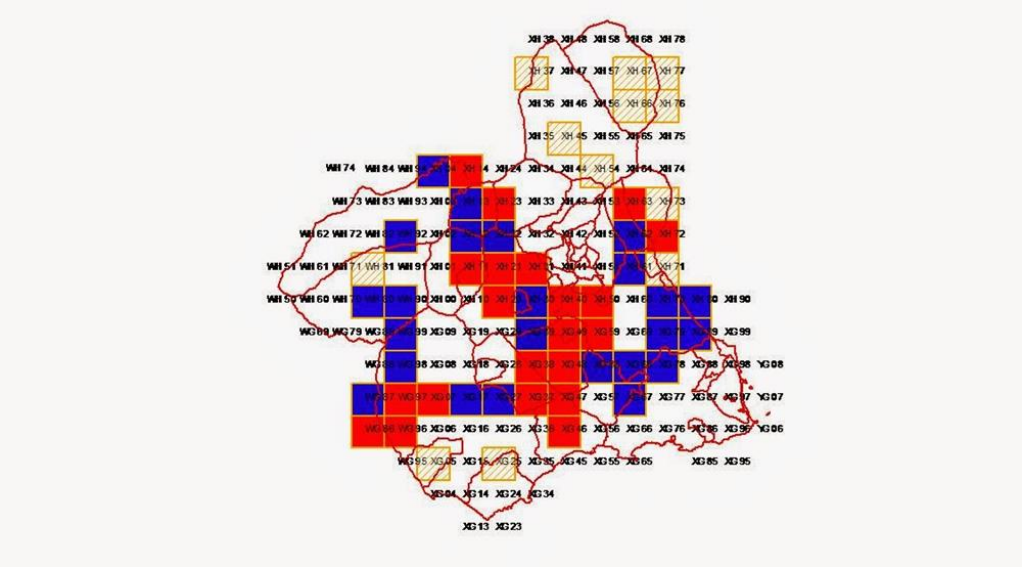
Specific information per population



Population in Murcia.

- Breeding areas associated to river valleys and ramblas.
- In the 80's of the XX century the population was at least of 600 pairs.
- Most pairs breed in natural cavities in marlaceous ridges.
- A fraction of the population also breeds in cavities in palm trees.
- Nest boxes (9-15) have been installed since 2008 and ca. 80% of them are regularly used by rollers.
- Nest box installation is a particular initiative.

Monitoring methods



Data obtained for the Atlas of Breeding Birds of Spain (2003):

Red squares: > 10 breeding pairs

Blue squares: <10 breeding pairs

Yellow squares: presence of the species but no information about abundance.

- Censuses covering the whole province, organized by a NGO and performed by volunteers.
- Monitoring of the river streams and ramblas, by splitting them in sections 4-7 km long.
- Three visits during the period 15 June-15 July.
- Location of individuals, identification of breeding behaviour and location of the nest cavity.

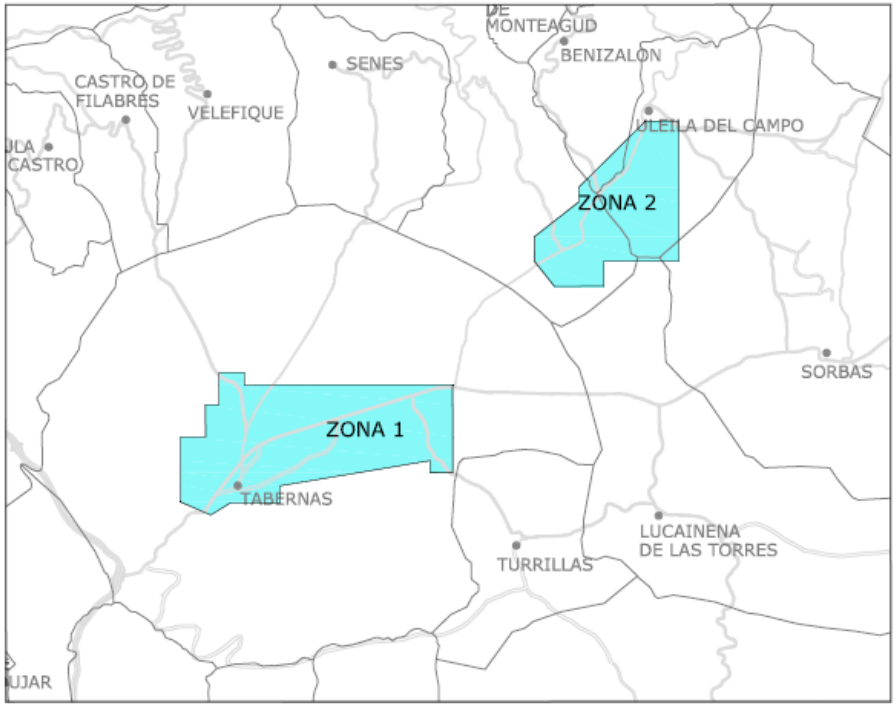
Population in Desierto de Tabernas (Almería).

- Semi-arid area where pairs used to breed in natural cavities in sandpits associated to ramblas and in human constructions.
- Nest box supplementation evidenced nest site limitation and increased the population.
- Just after nest box supplementation rollers went on using natural cavities.
- Now most rollers breed in nest boxes and pairs breeding in natural cavities are scarce.
- Both limitation of natural, suitable holes due to the decrease of key species such as the bee-eater, and other underlying factors (preference for nest boxes, habitat copying…) may account for the current situation.
- Efforts are being done to bring some pairs back to natural cavities.

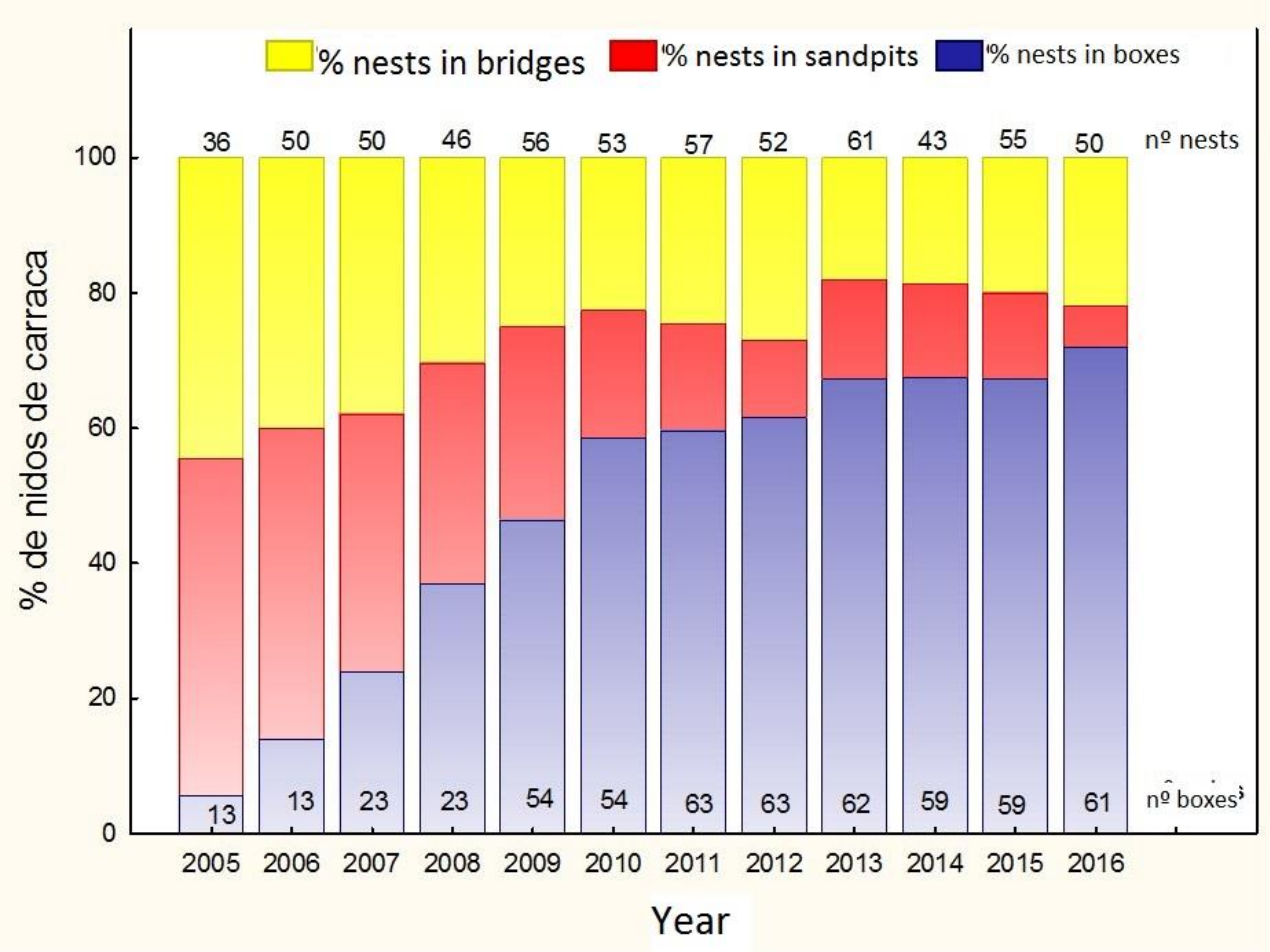
Monitoring methods

Almería:

- Intense monitoring of the breeding pairs in two main areas (1.- Tabernas, ca. 42 km^2, 2.- Uleila del Campo, ca. 25 km^2).
- Nest boxes and cavities visited weekly until detection of breeding.
- Monitoring facilitated by the limited possibilities of breeding.
- Ringing of fledglings and adult birds.



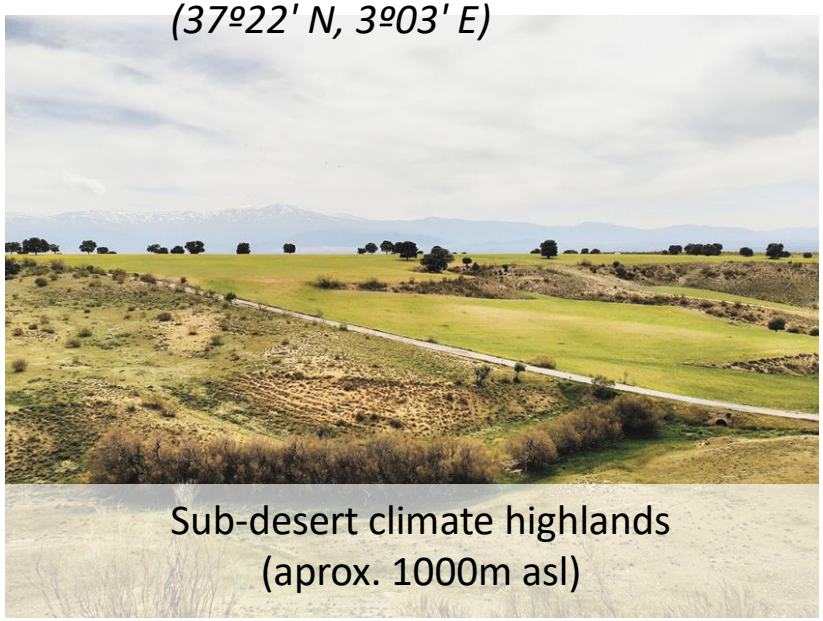
Population size and trend between 2005-2016 in Desierto de Tabernas (Almería).

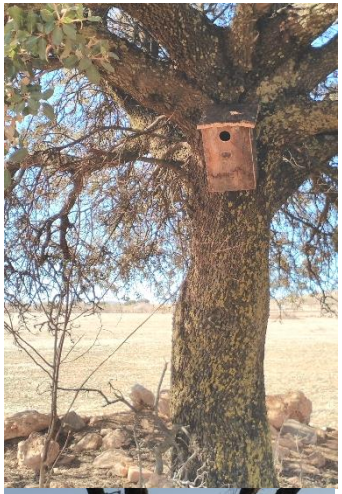


Source: F. Valera et al.

Population in Hoya de Guadix-Baza.

(37º22' N, 3º03' E)



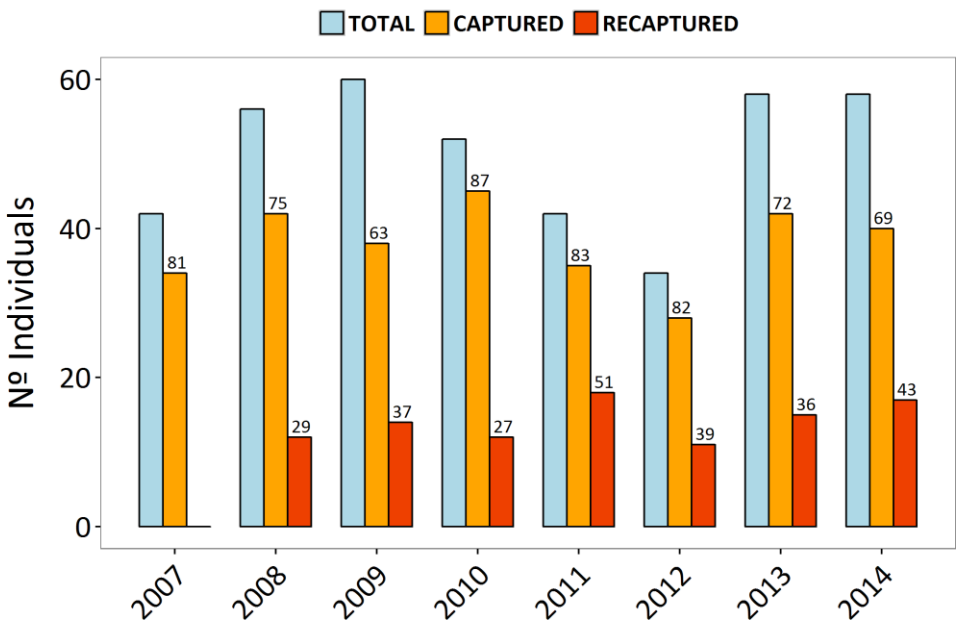


Land uses: cereal crops and almond grooves, with sparse holm oaks

249 Nest-boxes in total (varying per year)

Around 30% of ocupation (including other species such as: Scops owl, Little owl and Jackdaws)

Monitoring methods



25 nests/year

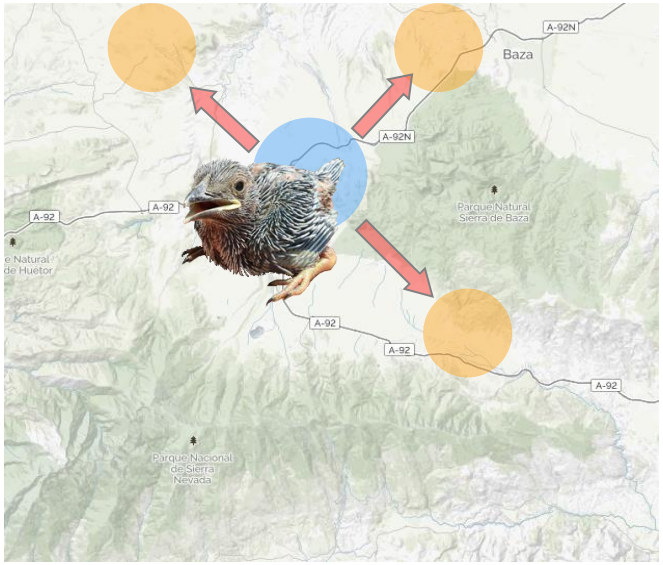
76.5 % Capture rate (captured ind./total ind.)

37.4 % Recapture rate (recap. ind/total ind.)

- Intense monitoring of the breeding pairs.
- Weekly visits until nest box occupation.
- Field observations and location of natural nests (scarce).
- Monitoring chicks growth (one visit each 5 days aprox.) and ringing.
- Capture and ringing of parents during incubation or nest provisioning.

Unknown Population Dynamics

62.6 % Renewal Rate (incorporation of new individuals) in Guadix (Granada).
Not even one case of a bird ringed in Almería and captured in Guadix or vice versa (ca. 100 km away).



Where do they come from???

In Guadix only 3.56 % Recruitment Rate: 12 cases out of 337 fledglings.
In Almería only 3.50% Recruitment Rate: 50 cases out of 1428 nestlings.

What happens with the young rollers???

Low survival? Natal dispersion to other populations?

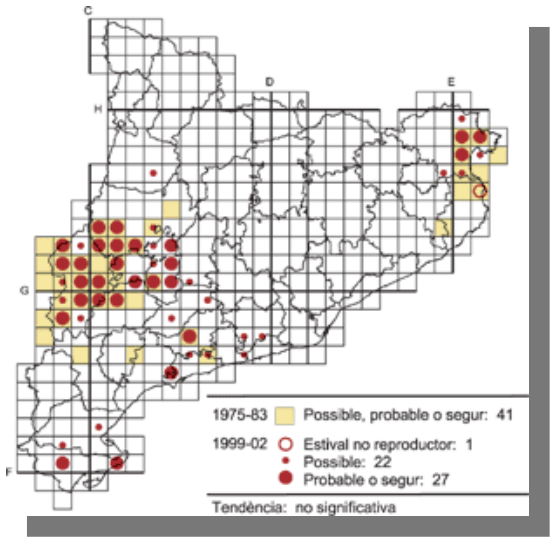
Population in Catalonia (NE Spain)

- European rollers in Catalonia breed in natural cavities in trees, old buildings, banks, sand cliffs, etc. (Folch & Gonzàlez-Prat 2002).
- Habitat transformation causes lack of natural holes.
- Nest box supplementation increased the population in some areas.
- But in a medium term, competition with jackdaws in artificial nest structures is a severe handicap for breeding success.

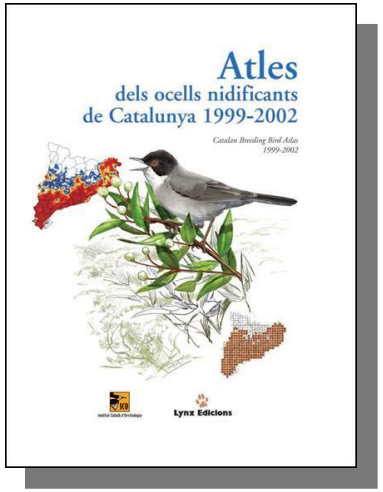
Monitoring methods

Catalonia:

- Monitoring European roller general distribution and population in Catalonia (32.000Km^2) for more than 20 years.
- Monitoring natural nest sites and nest boxes.
- Specific censuses in the two main population areas (Plana de Lleida, Empordà), with location of nest cavity and monitoring breeding success.



Folch, A. (2004)



Threats

Main threats for rollers in Spain

Threats	Guadix	Almería	Murcia	Catalonia
Habitat Transformation	Critical	High	Critical	Critical
Dependence of nest boxes	Medium	Critical		Critical
Pesticides and decrased food availability	High	High	High	High
Lack of nesting places				Medium
Drought	Medium	Medium		
Human disturbance and car collisions	Medium	Medium	Medium	Medium
Competition with jackdaws in nest boxes and other nests sites		Medium		Medium

SOLVED: Lack of nesting places in several areas

RECENT: Dependence of nest boxes

LONG-TERM: Habitat transformation

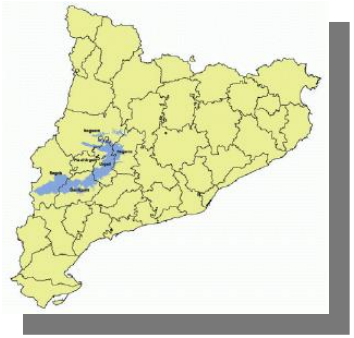
Some examples of threats for the roller:

* Habitat alteration: removal of natural vegetation and massive plantation of super-intensive olive orchards in Almería.

* Loss of natural nesting sites by decrease of the European bee-eater (an ecosystem engineer creating holes suitable for rollers) or by cutting infected palm trees.

New irrigation schemes in Catalonia:

* Intensification of traditional agricultural practises.
* Removal of natural vegetation and old tree plantations (almond trees).
* Loss of natural nesting sites by removal of trees



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Roller Conservation:

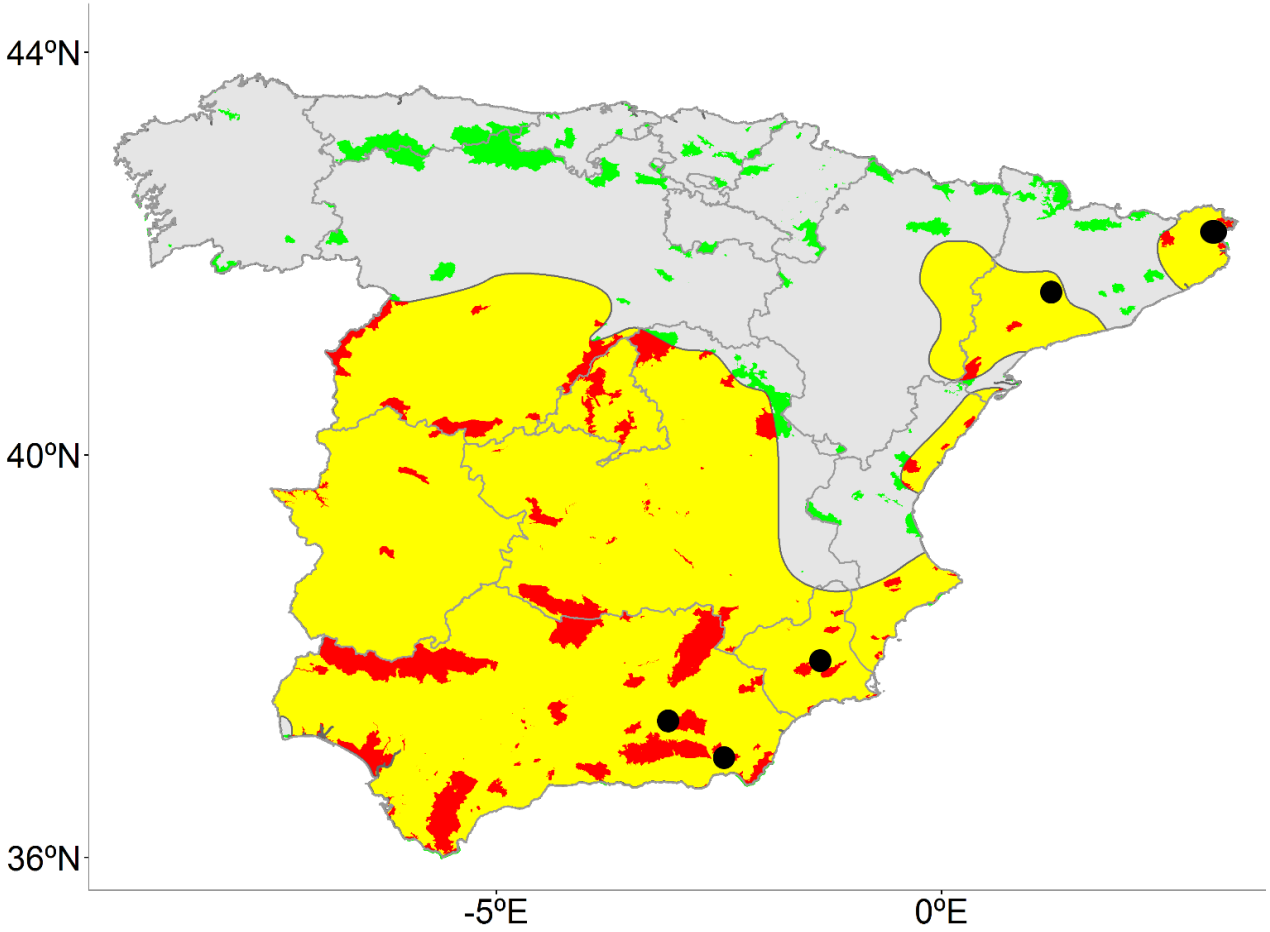
Protection Coverage and Management Actions

Changes in Spain regarding the policies and legislations relevant to the management of the species?

To our knowledge, there are no changes in policies or legislation involving roller conservation, neither direct (species management) nor indirect actions (other related species or habitat management).

Source: IUCN, MAGRAMA

Protected Areas and Roller Distribution



National & Natural Parks included within the Roller range and not included

Total Distribution Area:
311.923 km^2

Total Protected Area:
29.877 km^2

National & Natural Parks Coverage: 9.6%

Total Natura 2000 Coverage: 29.6%

Populations studied:

Coverage per Population:
Almería: 0%
Granada: 0%
Catalonia: 0,015%
Murcia: <10%

What is the main goal in Spain regarding the roller population?

To our knowledge, there is no specific program for protection of the roller population

Some suggestions specified for the roller in the Spanish Red List of Birds (2004) are:

1. Preserve the habitat discouraging land transformation from steppes to irrigated lands.
2. Create SPAs, LICs and take other agroenvironmental measures*.
3. Promote non-intensive agriculture.
4. Avoid deforestation.
5. Stop hedgerows elimination in agricultural areas.
6. Further study and monitoring the population.

*SPAs have already been created, now they should implement protection measures.

Recent conservation activities relevant to the species.

No specific conservation activities for the roller except for:
- Elected Bird of the Year in 2012 by SEO/BirdLife.
- Satellite-tracking of 11 individuals from different populations in Migra Program (Iberdrola Foundation) by SEO/BirdLife

Nonetheless, the roller can benefit from other programs and projects focused on its habitat:

- **LIFE+ project** "Conservation and Management in Special Protection Areas (SPAs) for Birds in Andalucía" LIFE08NAT/E/000068 (2010-2014). **Mainly focused** in Otis tarda. **Other target species**: Burhinus oedicnemus, Circus pygargus, Coracias garrulus, Falco naumanni, Glareola pratincola, Pterocles orientalis, Tetrax tetrax.
- **LIFE+ project** "ZEPAURBAN: Urban SPAs management for the conservation of the lesser kestrel in Extremadura" (2017-2021)

Scientific findings relevant for the species

Breeding grounds:

Factors affecting nest box selection: land transformation affects occupancy negatively (Rodríguez-Ruiz et al. 2011).

Linking preference and productivity: Nest box characteristics may affect occupancy and breeding success in opposite ways (ecological traps?). (Rodríguez-Ruiz et al. 2011).

Differences in breeding parameters (e.g. breeding date) among cavity types (Calero-Torralbo et al. 2013, Folch 2006).

Differences in microclimate among cavity types and likely consequences on the breeding biology of troglodytic birds (Amat-Valero et al. 2014).

Factors influencing the dynamics of colonization of nest sites: evidence of nest site limitation and the effect of conspecific social attraction and philopatry (Václav et al. 2011).

Effects of nest box supplementation on the nesting habits of the roller and specific proposals to encourage breeding in natural cavities (Valera et al. in prep.).

Information on parasites and parasitic load of the roller and host-parasite interactions (Václav et al. 2008, 2016).

Competition with jackdaw (*Corvus monedula*) affecting occupation of nest boxes (Folch et al. in prep.).

Non-breeding grounds:

Migratory routes, wintering grounds and stopover sites revealed in detail for the Spanish populations (Rodríguez-Ruiz et al. 2014).

Cautionary note in relation to the use of tracking devices in rollers: weight over 2.5% device-bird weight ratio affects recapture rate negatively (Rodríguez-Ruiz et al. 2016).

Poor overlap of Roller wintering distribution and protected areas (Rodríguez-Ruiz et al. in prep.) .

ISAP
Update

Completed goals and actions from the last ISAP (2008).

Goal 3: Population is stable in the long term (at least in Guadix, Lleida and Almería).

- Result 1.2. Advances in our knowledge on status, survival and trend. Necessary to get more information from other populations (e.g. from central and southwest Spain).

- Results 2.2. Number of nest-sites does not seem to limit populations when nest boxes are implemented but we ignore pros and cons of nest boxes in comparison with other (natural and artificial) nest sites.

- Results 2.3. International cooperation for the study of roller movements. But more information is still necessary.

New objectives that should be incorporated in the new ISAP.

More details about key issues of the breeding biology of rollers in the scenario they have to face:

-Pros and cons of nest boxes as a breeding site for rollers (increased parasitism, microclimate stress, changes in breeding parameters in comparison with natural breeding sites??).

-How to bring rollers back to natural nesting sites?: dependence of rollers on other bird species and management techniques.

-How to facilitate rollers' adaptation to the new agricultural situation and vice versa?

-Anticipation of impact due to rapid habitat loss (e.g. urbanization).

- We need further knowledge on population dynamics through long-term demographic studies.

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Thank you.

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