



Threats to European Roller (*Coracias garrulus*) migratory hot-spots in Cyprus

31 March 2018

This report was prepared by BirdLife Cyprus as part of the cooperative action with MME/ Birdlife Hungary towards the realisation of research actions under the LIFE+ project LIFE13/NAT/HU/000081 “Conservation of the European Roller (*Coracias garrulus*) in the Carpathian Basin” (hereinafter: ROLLERLIFE project). The research is a joint effort of birds of bird experts of ROLLERLIFE project and BirdLife Cyprus, with a total duration from June 2015 to March 2018.



Under the terms of a relevant agreement between MME and BirdLife Cyprus (signed in January 2014) the specific tasks for BirdLife Cyprus for the period 2015-2018, were as follows:

- (1) Localize and survey of migratory hotspots of migrating European rollers from 2015 to 2017.
- (2) Identify threats of migratory hotspots in a technical document in English with a summary also in English by 31.03.2018.
- (3) Raising public awareness and organize *in situ* actions, if required.

Report prepared by BirdLife Cyprus Monitoring and Research Coordinator Christina Ieronymidou.

Identification of threats to migratory hot-spots for European Roller (*Coracias garrulus*) in Cyprus and development of conservation plan for key sites

Summary

Based on relevant publications and research and also on an examination of records from systematic and non-systematic records of *Coracias garrulus* over the period 1994-2017, three areas in Cyprus can be identified as ‘hot-spots’ where the species occurs in significant numbers on migration and a further ten areas can be identified as ‘hot-spots’ where the species occurs in significant numbers during the breeding season. All thirteen of these sites were identified as Important Bird Areas for *C. garrulus* in Cyprus by BirdLife International and eleven of them have been designated as Natura 2000 sites. However, management plans for the designated Natura 2000 sites are still in the process of being approved and enforced, so there is at present a ‘management gap’ for these key European Roller sites.

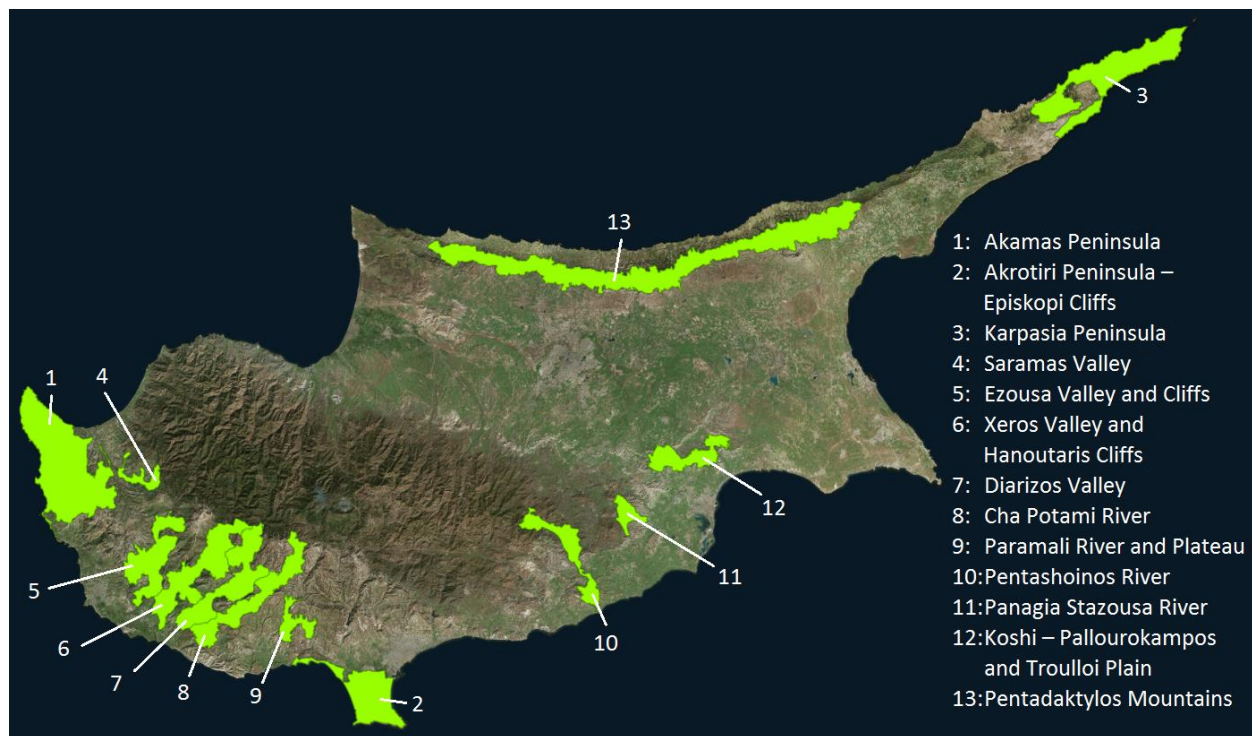
The principal threats to the key migration sites for European Roller relate to development pressure, as well as illegal killing of birds. Threats to other key sites include agricultural intensification and/or abandonment, inappropriate siting of windfarms and modification of natural riverine ecosystems. The main tool missing in the protection of the European Roller on migration in Cyprus is the approval and implementation of management plans for these key IBA sites, with sufficient funding to ensure effective conservation actions to address threats and protect habitats on the ground.

Key sites for European Roller migration in Cyprus

Based on relevant publications and research (Flint & Stewart 1992¹, Bannerman 1958²) and also on an examination of systematic and non-systematic records of *Coracias garrulus* over the period 1994-2017, three areas in Cyprus can be identified as ‘hot-spots’ where the species occurs in significant numbers on migration. A further ten areas can be identified as ‘hot-spots’ where the species occurs in significant numbers during the breeding season.

All thirteen sites were identified as Important Bird Areas for *C. garrulus* in the 2014 BirdLife Cyprus IBA inventory³. Below is the relevant extract from the 2014 IBA report, detailing the site names, criteria met for *C. garrulus* and population estimates for each site. Of these sites, the Akrotiri Peninsula, Akamas Peninsula and Karpasia Peninsula are consistently the most important for European Roller migration.

Map of key European Roller sites in Cyprus (IBA sites)



¹ Flint, P.R & Stewart P.F. (1992) The Birds of Cyprus, an annotated check-list. BOU Check-list no.6 (2nd Edition). British Ornithologists' Union, Tring, UK

² Bannerman, D.A. & Bannerman W.M. (1958). Birds of Cyprus. Oliver and Boyd. Edinburgh

³ Hellicar, M.A., Anastasi, V., Beton, D. & Snape, R (2014) *Important Bird Areas of Cyprus*. BirdLife Cyprus, Nicosia, Cyprus.

Threats to European Roller (*Coracias garrulus*) migratory hot-spots in Cyprus – BirdLife Cyprus for ROLLERLIFE project

1.08. *Coracias garrulus* (European Roller)

IBA criteria met: A1, C1, C6, B2							
Qualifying sites	Criterion	Threshold to meet criterion		Population estimate			
				Min	Max	Unit	Season
Akamas Peninsula and Agia Aikaterini - Agia Paraskevi Gorges	A1/C1	30 i or 10 p	M, B	200	800	i	M
	C6/B2	Top 5 breeding sites		80	300	p	B
Karpasia Peninsula - Kleides Islands	A1/C1	30 i or 10 p	M, B	250	1000	i	M
	C6/B2	Top 5 breeding sites		30	120	p	B
Xeros Valley and Hanoutaris Cliffs	A1/C1	30 i or 10 p	M, B	30	100	p	B
	C6/B2	Top 5 breeding sites					
Diarizos Valley	A1/C1	30 i or 10 p	M, B	20	80	p	B
	C6/B2	Top 5 breeding sites					
Ezousa Valley and Cliffs	A1/C1	30 i or 10 p	M, B	20	80	p	B
	C6/B2	Top 5 breeding sites					
Pentadaktylos Mountains	A1/C1	30 i or 10 p	M, B	20	80	p	B
Cha Potami River	A1/C1	30i or 10 p	M, B	15	50	p	B
Pentashoinos River	A1/C1	30 i or 10 p	M, B	10	40	p	B
Koshi - Palliourokamos and Troulloi Plain	A1/C1	30 i or 10 p	M, B	10	50	p	B
Paramali River and Plateau	A1/C1	30 i or 10 p	M, B	10	40	p	B
Saramas Valley	A1/C1	30 i or 10 p	M, B	10	40	p	B
Panagia Stazousa River	A1/C1	30 i or 10 p	M, B	10	30	p	B
Akrotiri Peninsula - Episkopi Cliffs	A1/C1	30 i or 10 p	M, B	250	1000	i	M

Analysis of threats to key European Roller migration sites in Cyprus

All but two of the thirteen sites listed above have been classified as SPAs (Natura 2000 sites for birds) by the Cyprus government or by the British Sovereign Base (SBA) Administration, in the case of the *Akrotiri Peninsula* IBA, which largely lies within the Akrotiri SBA in Cyprus. SPA-equivalent sites are classified in the SBAs under the SBA Administration's Protection and Management of Wildlife Ordinance (26/2007) which broadly mirrors the Republic of Cyprus law 152(I)/2003, implementing the provisions of the Birds Directive.

For those IBAs that are designated as SPAs, the SPA coverage is on average 79% of the IBA area, ranging from 55% in *Akamas Peninsula and Agia Aikaterini – Agia Paraskevi Gorges* to 100% in *Panagia Stazousa River* and *Saramas Valley*. The part of the *Akrotiri Peninsula* IBA that is beyond the SBA and within government control has not been classified as an SPA, resulting in only 60% coverage. The two undesignated IBAs are *Karpasia Peninsula – Kleides Islands* and

Pentadaktylos Mountains which are within the area currently beyond Cyprus government control, north of the island's dividing line.

The three key migration 'hot-spots' for European Roller have the lowest protected area coverage. Furthermore, although management plans for the designated Natura 2000 sites have been drawn up, there is at present a 'management gap' for all the key European Roller sites, as the management plans have yet to be approved or implemented.

The main threats to each of the key European Roller sites can be summarised as follows:

Site (IBA)	Main threats
Akamas Peninsula and Agia Aikaterini – Agia Paraskevi Gorges	<ol style="list-style-type: none"> 1. The greatest threats to the site are direct habitat loss, habitat degradation and fragmentation as a result of pressure for development including tourism, isolated housing, road infrastructures and quarries. 2. Birds at the site are increasingly subject to pressure and disturbance from recreating activities like uncontrolled camping and off-road driving, often in the form of tourist excursions in 4-wheel drive vehicles or quad bikes. 3. Land use changes such as abandonment of agriculture or changes in grazing regimes and overgrazing pose threats. 4. Pressure for land use change from agriculture to energy production developments and specifically the construction of solar parks also exists. 5. Fire and fire prevention practices, the latter linked to direct habitat fragmentation as a result of the creation and maintenance of fire breaks, is also a threat to the site. This infrastructure significantly increases access, including for poachers, and increases the accidental fire risk. 6. Increased access and accidental fire risk are also linked to the high density of the road network within the site. 7. Illegal shooting, illegal bird trapping with mist nets and limesticks pose potential threats. 8. Training of hunting dogs can be an issue during the breeding season. 9. Other threats to birds at the site include dumping of rubbish.
Akrotiri Peninsula and Episkopi Cliffs	<ol style="list-style-type: none"> 10. The greatest threat to the birds at the site is direct habitat loss, habitat degradation and fragmentation as a result of pressure for development including tourism, golf, military and road infrastructures, antenna installations and other developments. 11. Illegal shooting and illegal bird trapping with mist nets and limesticks poses a potential threat.

Site (IBA)	Main threats
	<ul style="list-style-type: none"> 12. Disturbance by visitors can be an issue, linked to the ease of access to the IBA site. 13. Illegal training of hunting dogs is a problem in the area. 14. Spraying of insecticides for mosquito control at wetlands within the IBA is also a potential threat to birds at the site. 15. The extensive antenna installations and supporting guy wires set between Phassouri reed-beds and the Salt Lake pose a serious collision risk for migrating and also breeding birds.
Karpasia Peninsula – Kleides Islands	<ul style="list-style-type: none"> 1. The site is in relatively good condition, with little interference from human activity in the majority of its extent. 2. Direct habitat loss, habitat degradation and fragmentation as a result of pressure for development including tourism development and road infrastructures is a threat to the site. 3. In addition, and linked to the increasing tourism development, the site is threatened by increasing recreation activities. 4. Agricultural practice is currently non-intensive, but management provisions are needed to keep it thus, while grazing pressure at the site is in need of assessment and management. 5. Corvid shooting in the spring may pose a threat to migrating European Rollers. 6. The site is in an area of Cyprus where the <i>acquis communautaire</i> according to Protocol 10 of the Accession Treaty of Cyprus does not currently apply, and thus SPA designation is not currently possible. However the site has been proposed as potential Natura 2000 sites ‘Karpasia Peninsula’ and ‘South Karpasia’ identified as part of a EuropeAid funded Project (Project EuropeAid/125695/C/SER/CY/7 Technical Assistance for Management and Protection of Potential Natura 2000 Sites in the Northern Part of Cyprus, 2008-2011)
Xeros Valley and Hannoutaris Cliffs	<ul style="list-style-type: none"> 1. The greatest threat to the site is the modification of the natural riverine ecosystem caused by alterations to the river bed as well as the building of dams. Excessive abstraction of water is also an issue. 2. Land use changes such as abandonment of agriculture or changes in grazing regimes also pose threats to the birds at the site. 3. Direct habitat loss, habitat degradation and fragmentation as a result of pressure for development especially for isolated housing, roads infrastructure and renewable energy

Site (IBA)	Main threats
	<p>developments, more specifically solar parks, present additional threats.</p> <ol style="list-style-type: none"> 4. Illegal shooting and illegal bird trapping with mist nets and limesticks pose potential threats. 5. Grazing pressure at the site is in need of assessment and management.
Diarizos Valley	<ol style="list-style-type: none"> 1. The greatest threat the site faces is the modification of the natural riverine ecosystem caused by alterations to the river flow and the river bed, including pressure for the creation of dams. 2. Land use change like the abandonment of agriculture is also a threat to birds at the site. 3. Direct habitat loss, habitat degradation and fragmentation as a result of pressure for development, including isolated housing and road infrastructure are threats to the site. 4. Disturbance as a result of the high density of the road network within the site can be an issue. This infrastructure significantly increases access, including for poachers. 5. Spraying of insecticides in streams and pools and the use of agricultural pesticides and poisons in general are also potential threats to birds at the site. 6. Grazing pressure at the site is in need of assessment and management. 7. Training of hunting dogs can be an issue during the breeding season.
Ezousa Valley and Cliffs	<ol style="list-style-type: none"> 1. The greatest threats to the site are direct habitat loss, habitat degradation and fragmentation as a result of pressure for development including isolated housing, tourism and road infrastructure. A large golf course with the accompanying residential development and roads is already in place at the site and pressures exist for its expansion. Proposals exist for the construction of a motorway across the site, which would pose a threat to birds, causing disturbance, direct habitat loss and serious fragmentation. 2. Land use change caused by the abandonment of agriculture as well as the change of land use from agriculture to energy production developments, specifically the construction of solar parks, posing an additional threat to birds at the site. 3. Disturbance as a result of the high density of the road network within the site can be an issue. This infrastructure significantly increases access, including for poachers.

Site (IBA)	Main threats
	<ol style="list-style-type: none"> 4. Another great threat to birds at the site is the modification of the natural riverine ecosystem caused by alterations to the river bed, as well as excessive abstraction of water. 5. Training of hunting dogs can be an issue during the breeding season. 6. Spraying of insecticides in streams and pools is also a potential threat to birds at the site as it the use of agricultural pesticides and poison in general.
Pentadaktylos Mountains	<ol style="list-style-type: none"> 1. The site is in relatively good condition, with little interference from human activity in the majority of its extent. 2. The greatest threat to the site is the operation of quarries, in terms both of habitat loss and disturbance caused. 3. Illegal shooting poses a potential threat. 4. Military exercises occasionally taking place at the site could cause disturbance to birds. 5. The site is in an area of Cyprus where the <i>acquis communautaire</i> according to Protocol 10 of the Accession Treaty of Cyprus does not currently apply, and thus SPA designation is not currently possible. However, the site has been proposed as a potential Natura 2000 site 'Keryneia Mountains (Pentadaktylos)' identified as part of a EuropeAid funded Project (Project EuropeAid/125695/C/SER/CY/7 Technical Assistance for Management and Protection of Potential Natura 2000 Sites in the Northern Part of Cyprus, 2008-2011)
Cha Potami River	<ol style="list-style-type: none"> 1. The greatest threats to the site are direct habitat loss, habitat degradation and fragmentation as a result of pressure for development, including isolated housing, tourism and road infrastructure. Two large golf courses with the accompanying residential development and roads are already in place at the southern end of the site, with approval given for their expansion. 2. Energy production is a major threat for the site, specifically the construction of a large wind farm inside the site, which poses a direct bird mortality threat. 3. Expansion of road infrastructure causes direct habitat loss and fragmentation and provides easy access to many parts of the site, significantly increasing access including for poachers and increases the accidental fire risk. 4. Land use change caused by the abandonment of agriculture poses an additional threat to birds at the site.

Site (IBA)	Main threats
	<ol style="list-style-type: none"> 5. Another great threat to birds is the modification of the natural riverine ecosystem caused by alterations to the river bed including the illegal construction of a dam. Excessive abstraction of water is also an issue. 6. Spraying of insecticides in streams and pools is also a potential threat as is the use of agricultural pesticides and poison in general at the site. 7. Grazing at the site is in need of assessment and management. 8. Training of hunting dogs can be an issue during the breeding season.
Pentashoinos River	<ol style="list-style-type: none"> 1. The greatest threat to the site is illegal shooting and illegal bird trapping with mist nets and limesticks. 2. Training of hunting dogs can be an issue during the breeding season. 3. Pressure for energy production and more specifically proposals for the construction of a wind farm in or adjacent to the site poses a direct bird mortality threat. 4. Intensification of agriculture with increased monocultures, fertiliser and pesticide use, and loss of landscape features is an important threat. 5. Modification of the natural riverine ecosystem caused by alterations to the river bed and excessive abstraction of water are additional issues. 6. Direct habitat loss, habitat degradation and fragmentation as a result of pressure for development including isolated housing are additional threats to the site.
Koshi – Pallourokampos and Troulloi Plain	<ol style="list-style-type: none"> 1. The greatest threat to the site is the intensification of agriculture with increased monocultures, fertiliser and pesticide use, and loss of landscape features. 2. Direct habitat loss, habitat degradation and fragmentation as a result of pressure for development, especially isolated housing, road infrastructure and quarrying developments are additional threats. 3. Development of renewables and specifically solar parks and windfarms as well as the construction of high voltage power lines are additional threats to the site. 4. Illegal shooting and illegal bird trapping with mist nets and limesticks pose potential threats. 5. Drought is another potential threat. 6. Training of hunting dogs can be an issue during the breeding season.

Site (IBA)	Main threats
Paramali River and Plateau	<ol style="list-style-type: none"> 1. The site is in relatively good condition, with little interference from human activity in the majority of its extent. 2. Habitat degradation and fragmentation as a result of pressure for development for tourism, including two golf courses with the accompanying residential development and roads. 3. The operation of a quarry within the site also poses a threat to birds in terms of both habitat loss and disturbance caused. 4. Illegal shooting and illegal bird trapping with mist nets and limesticks poses a potential threat and training of hunting dogs can be an issue during the breeding season.
Saramas Valley	<ol style="list-style-type: none"> 1. The site is in relatively good condition, with little interference from human activity in the majority of its extent. 2. The greatest threats to the site are direct habitat loss, habitat degradation and fragmentation as a result of pressure for development, especially isolated housing, road infrastructure and quarrying developments. 3. Training of hunting dogs can be an issue during the breeding season. 4. Grazing pressure and agricultural practices at the site are in need of assessment and management. 5. Excessive abstraction of water is also an issue.
Panagia Stazousa River	<ol style="list-style-type: none"> 1. The site is in a relatively good condition, with little interference from human activity in the majority of its extent. 2. Direct habitat loss, habitat degradation and fragmentation as a result of pressure for development including isolated housing and road infrastructure are threats to the site. 3. The greatest threat to the site is renewable energy development and specifically the construction of two wind farms which pose a direct bird mortality threat. 4. An additional threat the site faces is fire and fire prevention practices, the latter linked to direct habitat fragmentation as a result of the creating and maintenance of fire breaks. This infrastructure significantly increases access, including for poachers, and increases the accidental fire risk. 5. Spraying of insecticides in streams and pools is also a potential threat to birds at the site as is the use of agricultural pesticides and poison in general at the site. 6. Training of hunting dogs can be an issue during the breeding season.

Overall, the threats to the key migration sites for European Roller relate to habitat loss through development pressure and illegal bird killing (whether by trapping with lime sticks or mist nets or with guns). Threats to other key sites include agricultural intensification and/or abandonment, inappropriate siting of windfarms and modification of natural riverine ecosystems, including water abstraction and alteration of the river bed.

The main tool missing in the protection of the European Roller on migration in Cyprus is the approval and implementation of management plans for the key IBA sites, with sufficient funding to ensure effective conservation actions to address threats and protect habitats on the ground.

Proposed developments within key sites need to be addressed through faithful implementation of Appropriate Assessment procedure as provided for under the EU Habitats Directive [92/43/EEC], to ensure no negative impacts on European Rollers or other qualifying species.

To ensure high quality habitat for roosting and foraging, the mosaic of low-intensity agriculture must be maintained. Specifically, intensification and abandonment of low-intensity agricultural practices, including grazing regimes and heavy pesticide use, are halted through the appropriate application and development of measures under the Rural Development Programme (RDP) and strict enforcement of Cross Compliance rules for payment under the Common Agricultural Policy. Furthermore, it is critical that any proposed development, including isolated housing, road infrastructures, golf resorts, dam construction, etc., adjacent to or neighbouring the SPA, must be strictly assessed under the statute of Appropriate Assessment, according to articles 6 and 7 of the EU Habitats Directive 92/43/EEC. The illegal killing threats need to be addressed through increased patrolling and stricter enforcement of anti-poaching legislation and possibly through better siting and expansion of 'no hunting' areas. Specific threats such as the antenna farm at Akrotiri need to be addressed through targeted mitigation action.

Account of actions undertaken under the ROLLERLIFE project by BirdLife Cyprus during period 2015 to 2017

Localization and survey of migratory hotspots and identification of threats

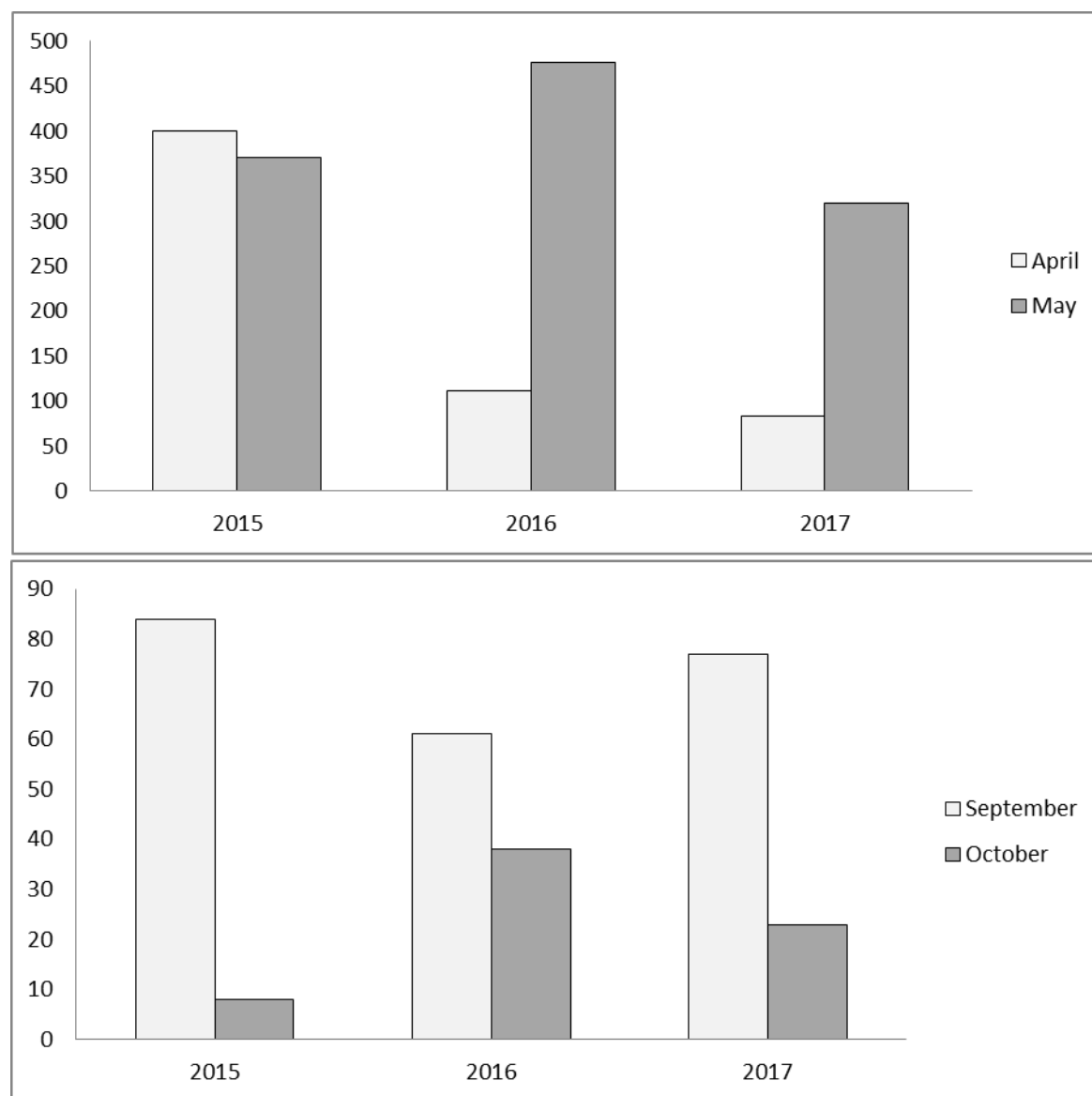
One of the project aims was for BirdLife Cyprus to follow up on the locations of European Rollers satellite tagged under the ROLLERLIFE project. However, no satellite tagged birds from the project passed through Cyprus, so, unfortunately, the opportunity to assess threats on-the-ground did not arise.

Though the European Roller is recorded at many sites on migration and during the breeding season through Cyprus, an examination of historical records shows clearly that the species is more numerous in certain areas. The key sites were identified and localised through the Cyprus IBA project (2011-2012) and presented in the 2014 BirdLife Cyprus IBA inventory, as detailed above. During the spring of 2015 and the autumns of 2015, 2016 and 2017 a team of volunteer surveyors carried out counts at the most important bird migration sites in Cyprus south of the dividing line, including Akrotiri Peninsula, which is a key migration 'hot-spot' for European Rollers.

During the autumn migratory bird surveys, observers were stationed at convenient look-out points at the survey sites, but were also encouraged to try other observation points – particularly for Akrotiri, which is an extensive site. Observations took place between 8am and 1pm, but were extended until 3pm if bird passage was still in evidence at 1pm. The choice of observation times and duration was made on the basis of migrating bird monitoring records from previous years and advice from local experts. European Rollers and all other migrating birds were recorded, along with notes about their behaviour, and flight height and direction. The time of observation was noted. Observers also noted weather conditions (such as wind direction and visibility) at the start, mid-point and end of their watch.

During the spring and autumn migratory periods of 2015, a total of 862 European Rollers were recorded during the migratory bird surveys and in non-standardised (birdwatching) sightings. Of these, 770 Rollers were recorded during spring and 92 during autumn. During 2016, a total of 686 Rollers were recorded, of which 587 were recorded during spring and 99 during autumn. During 2017, 502 Rollers were recorded, of which 402 were recorded during spring and 100 during autumn. See figure below for monthly breakdown.

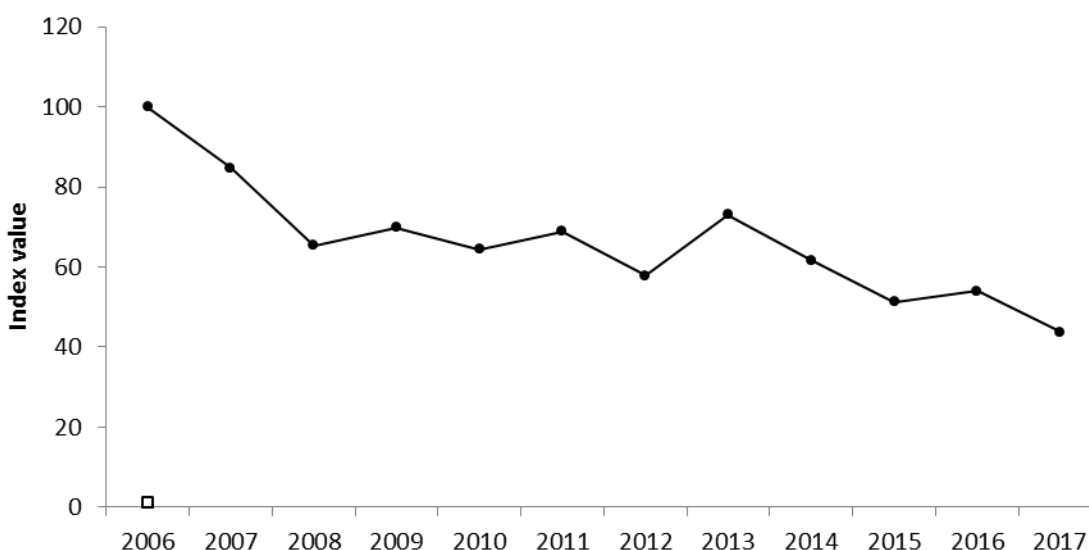
The number of European Rollers recorded in Cyprus during the spring (top) and autumn (bottom) migration periods of 2015-2017.



During the breeding season, dedicated European Roller surveys were also carried out during 2015, 2016 and 2017. The European Roller survey focuses on the key sites for the species and comprises of driven line transects of about 10km in length. Surveyors drive slowly (maximum speed of 20km per hour) along the transect, stopping every 2km to observe and listen carefully for 5 minutes for European Rollers. Any Rollers seen in between point count stops are also recorded.

During the European Roller surveys of 2015, 101 Rollers were recorded during 20 surveys, and in 2016 152 Rollers were recorded during 22 surveys. In 2017, 9 surveys were carried out and 46 birds were recorded. Although the numbers of breeding Rollers recorded in 2017 appear to be consistent with the number of surveys carried out in that year, with respect to the average number of birds per survey in 2015 and 2016, there appears to be an overall decreasing trend for the species. This can be seen both in the results of the annual Common Bird Monitoring Scheme (see figure below) and in the number of birds reported in non-standardised (birdwatching) sightings (see above).

European Roller population index, derived from analysis of Common Bird Monitoring Scheme data using the software TRIM, showing a moderate decline.



Payments to BirdLife Cyprus under the cooperation agreement

The agreement between MME and BirdLife Cyprus was that part of the grant received by MME from the EU LIFE fund would be transferred in two parts to BirdLife Cyprus, the second part being due following the receipt of the current technical report, in accordance with the financial plan for the joint research effort in Cyprus, detailed below:

Cost categories (gross amounts)	by 30.06.2015	by 31.03.2018	Total
Professional staff	€ 1250	€ 2500	€ 3750
Local transportation - vehicle costs during the field survey and/or stakeholder meetings and accommodation in the field	€ 1750	€ 3500	€ 5250
Other costs, services			
Overheads (6%)	€ 168	€ 332	€ 500
TOTAL	€ 3168	€ 6332	€ 9500

The table below details the actual expenditure under the ROLLERLIFE project by BirdLife Cyprus between 01.06.2015 and 31.03.2018:

Cost categories	BY 31/03/2018
Professional staff	€ 3748
Local transportation - vehicle costs during the field survey and/or stakeholder meetings and accommodation in the field	€ 4800
Overheads (6%)	€ 500
TOTAL	€ 9048