

# THE CONSERVATION STATUS AND DISTRIBUTION OF THE BREEDING BIRDS OF PREY OF NORTH AFRICA

J.R. Garrido, C. Numa, V. Barrios, A. Qninba, A. Riad, O. Haitham, H.B. Hasnaoui, S. Buirzayqah, A. Onrubia, A. Fellous-Djardini, M. Saheb, K. Rousselon, S.I. Cherkaoui, I. Essetti, M. Noaman, M. Radi, F. Cuzin, A. Irizi, G. Monchaux, N. Hamdi, F. Monti, P. Bergier, R. Ouni, K. Etayeb, M.A. Chokri, H. Azafzaf, P. Gyenge, A. Si Bachir and B. Bakass



NORTH  
AFRICA



The IUCN Red List of Threatened Species™ – Regional Assessment

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Cover photo: In North Africa the Egyptian vulture (*Neophron percnopterus*) breeds throughout North Africa from Morocco to Egypt and is considered Endangered because of the serious decline in its numbers due mainly to poisoning. ©Tarek Nagah  
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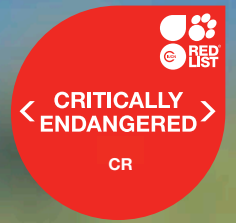
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In North Africa the bearded vulture (*Gypaetus barbatus*) only breeds in Morocco and Egypt and is considered Critically Endangered because of its small and isolated population. © Justo Martín Martín



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# Foreword

North Africa is a region rich in natural and cultural heritage, characterised by high levels of species diversity and endemism. The IUCN Centre for Mediterranean Cooperation (IUCN-Med) works to leverage its knowledge, standards and tools to influence policy and to support action in the Mediterranean region, particularly where these measures are undertaken by IUCN Members. Better knowledge about biodiversity, including threats and conservation measures, will help drive action. In that context, Regional Red Lists are an important tool for scientifically assessing and communicating the status of species. They provide comprehensive information about the situation of biodiversity in the region and are an important practical mechanism for implementing national and regional strategies for biodiversity conservation under the Convention on Biological Diversity. The Red List in North Africa will help to contribute to the post-2020 global biodiversity framework, in particular to those targets which call for the prevention of extinction of known threatened species and improvement of their conservation status. Mediterranean Red List assessments are carried out in partnership with organisations and individuals around the region and will help to deliver these various targets.

Birds of prey are key organisms for ecosystem functioning, providing several environmental services vital to human well-being, such as rodent pest control, removal of dead animal remains through scavenging, and wealth generation through ecotourism. Furthermore, they are fundamental elements in the food web as apex predators and scavengers, which make them good indicators of ecosystem's health. They are thus species that can be used as flagships to encourage the protection and proper management of the territory in which they live. However, they are also a group highly impacted by human activities due to competition for game prey and livestock, especially in the case of larger species such as the great eagles. For this reason they are often persecuted and their populations in many cases have come close to extinction. This report presents a review of the conservation status of 36 species of birds of prey that breed in North Africa by experts from across the region. Since its creation in 2001, IUCN-Med's main role has been to assess the regional conservation status of selected taxonomic groups. The Red List of North African Birds of Prey is the 14<sup>th</sup> publication in the series. The assessment shows that almost half of the species that currently breed are threatened with extinction in the region, with three species even recently becoming extinct. Unfortunately, the factors driving these declines are still in place. Direct and indirect persecution, poisoning by pesticides and rodenticides, and collision with and electrocution on power lines are direct mortality factors. But without doubt, the main threat to North African raptors is the increase and spread of the human population, which has resulted in habitat destruction and disturbance, especially of forests. This Red List is further evidence that efforts to halt biodiversity loss in the region need a major boost in the coming years to safeguard our natural capital for future generations.

**Antonio Troya**

Director

IUCN Centre for Mediterranean Cooperation

# Executive summary

## Aim

This report summarises the results of a review of the conservation status of the 36 species of birds of prey that are considered to breed in North Africa according to the IUCN Red List Categories and Criteria. It identifies those species that are threatened with extinction at the regional level to guide appropriate conservation actions for improving their status.

## Scope

All birds of prey having current or historic breeding populations in North African countries (Morocco, Algeria, Tunisia, Libya and Egypt)

## Conservation status assessment

The conservation status of species was assessed using the IUCN Red List Categories and Criteria 3.1 (IUCN Species Survival Commission, 2001). The assessments followed the guidelines for application of the Categories and Criteria at regional levels 4.0 (IUCN Species Survival Commission, 2003). They were compiled by a network of 34 regional experts, reviewed during a workshop held in Tunis (Tunisia) in February 2020 and followed up through correspondence until completion.

## North African birds of prey

There are 46 species of birds of prey within the assessment region. Of these, 10 species were excluded from this study as their distribution in the region is marginal, wintering or passage. The conservation status of the remaining 36 species was assessed and analysed. There are no species endemic to North Africa, though there are two (5.5%) possibly near-endemic species (defined as having  $\geq 70\%$  of their global range in the region): the Pharaoh eagle-owl *Bubo ascalaphus* and the sooty falcon *Falco concolor*. All species are typically from the Palearctic, but there are five breeding species (13.9%) with an Afrotropical origin, all of which very rare.

## Results

Overall, 12 of the 36 breeding raptors evaluated are threatened in North Africa. Four species are classified as Near Threatened (NT), three species are assessed as Regionally Extinct (dark chanting-goshawk *Melierax me-tabates*, cinereous vulture *Aegypius monachus* and Spanish imperial eagle *Aquila adalberti*) and 17 species as Least Concern.

The current main threats to North African birds of prey are illegal killing, illegal trade, poisoning, and death because of human infrastructure such as power lines, which are reducing breeding populations. Another important threat is the use of pesticides and rodenticides in agriculture, which can have a negative impact on breeding success, reduce prey density and lead to secondary poisoning by consumption of contaminated corpses. In addition, loss of forest habitats, agroecosystems and wetlands due to the growth and spread of the human population is another major threat to raptors in the North African region, in one way or another potentially affecting most or possibly almost all of the species present there.

There is a significant lack of information on distribution, population size and trends, as well as threats, with 42 % of species with unknown population trends. There is an urgent need for collaborative research and monitoring, especially on the size and distribution of breeding populations and the specific impact of threats on them.

This assessment can be considered a baseline for developing conservation actions and monitoring breeding and dispersing populations in order to understand their conservation status and to determine, protect and manage potential breeding sites and key dispersal areas.

## Conclusions and recommendations

Despite their importance as predators and scavengers and their key role in food web dynamics, the breeding populations of birds of prey in North Africa are poorly known. Current information gaps regarding population status, trends and geographical distribution reflect how little we know about them. However, this regional assessment has revealed that 48.5% of breeding raptors in North Africa are threatened, due to illegal killing, accidents involving power lines and wind farms, and habitat loss. It means that failure to act soon could result in the collapse of the regional populations of birds of prey, particularly vultures, all species of which are threatened. Threatened species are concentrated in the northernmost part of Maghreb, from Morocco to Algeria, but also in Gebel Elba, the southern Nile valley and southern Sinai in Egypt. Despite the current lack of data, the results of this assessment show that without urgent conservation actions the region could face a mass extinction of birds of prey, which could destabilise ecosystems, as key scavenging and predatory species disappear.

Recommended conservation actions to improve species status include:

- Initiating monitoring of breeding populations in the various countries, because only regular counts provide reliable data for monitoring bird of prey populations;
- Revising national and international legislation to protect the threatened species identified in this assessment;
- Drawing up species action plans for threatened species;
- Developing legislation and mitigation actions to avoid mortality due to collision with and electrocution on power lines;
- Developing strategies against illegal killing and trade, ensuring the continuation of regional cooperation among experts and starting new cooperation initiatives with experts from countries where information is scarce, so that this assessment can be updated as new information becomes available;
- Raising awareness about the importance of birds of prey in maintaining healthy ecosystems.

## Key messages

- Birds of prey are key organisms for the functioning of North African ecosystems, as they provide important ecosystem services such as rodent pest control and removal of dead animal remains, and play a wealth-generation role through ecotourism.
- Information about the conservation status of these populations in North African countries is very limited, and 42 % of species have unknown population trends. There is an urgent need for collaborative research and monitoring, especially on the size and distribution of breeding populations and the specific impact of threats on them.
- Birds of prey are impacted by illegal killing and trade, habitat loss and degradation, and energy infrastructures such as power lines and wind farms. Coordinated strategies need to be developed and implemented to reduce these impacts on raptor populations.

# Résumé exécutif

## Objectif

Ce rapport résume les résultats d'une évaluation de l'état de conservation de 36 espèces d'oiseaux de proie nicheurs en Afrique du Nord, selon les catégories et critères de la Liste rouge de l'UICN. Il identifie les espèces menacées d'extinction au niveau régional afin de guider les mesures de conservation appropriées pour améliorer leur statut.

## Cadre d'étude

Tous les oiseaux de proie ayant des populations nicheuses actuellement ou historiquement dans les pays d'Afrique du Nord (Maroc, Algérie, Tunisie, Libye et Egypte).

## Évaluation de l'état de conservation

L'état de conservation des espèces a été évalué à l'aide des catégories et critères de la Liste rouge de l'UICN (Commission de survie des espèces de l'UICN, 2001). Les évaluations ont suivi les lignes directrices pour l'application des catégories et critères à l'échelle régionale (Commission de survie des espèces de l'UICN, 2003). Les résultats ont été compilés par un réseau de 34 experts régionaux, qui ont procédé aux évaluations lors d'un atelier tenu à Tunis (Tunisie) en février 2020 et ont par la suite assuré son suivi par correspondance jusqu'à sa finalisation.

## Oiseaux de proie d'Afrique du Nord

Il y a 46 espèces d'oiseaux de proie dans la région évaluée. Parmi celles-ci, 10 espèces ont été exclues de cette étude car leur répartition dans la région sont migratrices de passage ou hivernantes. L'état de conservation des 36 autres espèces a été évalué et analysé. Cet échantillon ne présente pas d'espèce endémique à l'Afrique du Nord, bien que deux parmi les 36 (5,5 %) soient potentiellement des espèces quasi endémiques (c.a.d. définies comme ayant >70% de leur aire de répartition mondiale dans la région concernée); le Grand-duc ascalaphe *Bubo ascalaphus* et le Faucon concolore *Falco concolor*. La plupart des espèces proviennent du Paléarctique, mais cinq des 36 étudiées (13,9%) sont des espèces nidificatrices rares d'origine afrotropicale.

## Résultats

Au total, 12 des 36 rapaces nicheurs évalués sont menacés en Afrique du Nord. Quatre espèces sont classées comme quasi menacées (NT), trois espèces ont été évaluées comme étant éteintes au niveau régional (Autour sombre *Melierax metabates*, Vautour moine *Aegyptius monachus* et Aigle ibérique *Aquila adalberti*) et 17 espèces ont un statut de préoccupation mineure.

Les principales menaces actuelles pour les oiseaux de proie d'Afrique du Nord sont l'abattage et le commerce illégaux, l'empoisonnement et les infrastructures humaines telles que les lignes électriques qui sont sources de collision et d'électrocution, et réduisent les populations reproductrices. Une autre menace importante est l'utilisation de pesticides et de rodenticides dans l'agriculture, qui peut avoir un impact négatif sur le succès de reproduction, réduire la densité des proies et conduire à un empoisonnement secondaire par la consommation de cadavres contaminés. En outre, les pertes d'habitats forestiers, d'agroécosystèmes et de zones humides associées à la croissance et propagation de la population humaine peuvent également être considérées comme une autre grande menace pour les rapaces de la région de l'Afrique du Nord. D'une manière ou d'une autre, ces facteurs peuvent potentiellement affecter la plupart, voire la quasi-totalité, des espèces présentes dans la région.

Il y a un manque important d'information sur l'aire de répartition, la taille et la tendance des populations ainsi que sur les menaces ; les tendances en matière de population étant inconnues pour 42 % des espèces. Il existe un besoin urgent de collaborer dans le domaine de la recherche et du suivi, en particulier sur la taille et la répartition des populations reproductrices et sur l'impact spécifique que peuvent avoir les menaces.

Cette évaluation peut être utilisée comme référence à partir de laquelle développer des actions de conservation et surveiller la reproduction et dispersion des populations, afin de comprendre l'état de conservation et de déterminer, protéger et gérer les sites de reproduction potentiels et les principales zones de dispersion.

## Conclusions et recommandations

Malgré leur importance en tant que prédateurs et charognards, et leur rôle clé dans la chaîne alimentaire, les populations nicheuses d'oiseaux de proie sont mal connues en Afrique du Nord. Les lacunes actuelles en matière d'information sur l'état de la population, les tendances et la répartition géographique, reflètent le peu de connaissances à leur sujet. Et pourtant, l'évaluation régionale des rapaces nicheurs a révélé que 48,5 % des rapaces nicheurs en Afrique du Nord sont menacés en raison d'abattages illégaux, de collision avec des lignes électriques et éoliennes, et de la perte d'habitat. Cela signifie que le fait de ne pas agir rapidement pourrait entraîner l'effondrement des populations régionales d'oiseaux de proie, en particulier dans le cas des vautours (dont toutes les espèces sont menacées). Les espèces menacées sont concentrées dans la partie la plus septentrionale du Maghreb, du Maroc à l'Algérie, mais aussi à Gebel Elba, dans le sud de la vallée du Nil et au sud du Sinaï en Egypte. Malgré le manque actuel de données, les résultats de cette évaluation montrent que sans des mesures de conservation urgentes, la région pourrait faire face à l'extinction massive d'oiseaux de proie, ce qui pourrait déstabiliser les écosystèmes à mesure que les principales espèces prédatrices disparaissent.

Les mesures de conservation recommandées pour améliorer l'état des espèces comprennent :

- La mise en place d'un suivi des populations nicheuses dans les différents pays. Seuls les comptages réguliers fournissent des données fiables pour surveiller les populations d'oiseaux de proie.
- Réviser la législation nationale et internationale pour protéger les espèces menacées identifiées dans cette évaluation.
- L'élaboration de plans d'action pour les espèces menacées.
- L'élaboration d'une législation et de mesures d'atténuation pour éviter la mortalité due aux collisions et à l'électrocution par les lignes électriques.
- Développer des stratégies contre l'abattage et le commerce illégaux, assurer la continuité de la coopération régionale entre les experts et commencer une nouvelle coopération avec des experts de pays où il reste un manque d'information afin que cette évaluation puisse être mise à jour au fur et à mesure que de nouvelles informations seront disponibles.
- Sensibiliser le public à l'importance des oiseaux de proie dans le maintien d'écosystèmes sains.

## Messages clés

- Les oiseaux de proie sont des organismes clés pour le fonctionnement des écosystèmes nord-africains, car ils fournissent d'importants services écosystémiques tels que la lutte contre les rongeurs nuisibles, l'élimination des cadavres d'animaux et le rôle de génération de richesse grâce à l'écotourisme.
- L'information sur l'état de conservation dans les pays d'Afrique du Nord est très limitée, avec 42 % des espèces dont les tendances des populations sont inconnues. Il existe un besoin urgent de recherche collaborative et de surveillance, en particulier sur la taille et la répartition des populations reproductrices et l'impact spécifique des menaces sur elles.
- Les oiseaux de proie sont touchés par l'abattage et le commerce illégaux, la perte et la dégradation de leur habitat et les infrastructures énergétiques telles que les lignes électriques et les parcs éoliens. Il est nécessaire de développer et de mettre en œuvre des stratégies coordonnées pour réduire ces impacts sur les populations de rapaces.

# موجز تنفيذي

## الهدف

ويوجز هذا التقرير نتائج مراجعة حالة حفظ 36 نوعاً من الطيور الجارحة التي تتكاثر في شمال أفريقيا وفقاً لفئات ومعايير القائمة الحمراء للاتحاد الدولي لحماية الطبيعة. وهو يحدد تلك الأنواع المهددة بالإنقراض على المستوى الإقليمي لتوجيه أعمال الصون المناسبة لتحسين حالتها.

## النطاق

جميع الطيور الجارحة التي لديها مجاميع تكاثر حالية أو تاريخية في بلدان شمال أفريقيا (المغرب، والجزائر، وتونس، وليبيا، ومصر).

## تقييم حالة الصون

تم تقييم حالة صون الأنواع باستخدام فئات ومعايير القائمة الحمراء للاتحاد الدولي لحماية الطبيعة 3.1 (مفوضية بقاء الأنواع في الاتحاد الدولي لحماية الطبيعة، 2001). واتبعت التقييمات المبادئ التوجيهية لتطبيق الفئات والمعايير على المستويات الإقليمية 4.0 (مفوضية بقاء الأنواع في الاتحاد الدولي لحماية الطبيعة، 2003). وقد تم تجميعها بواسطة شبكة من 34 خبيراً إقليمياً، وتم مراجعتها خلال ورشة عمل عقدت في تونس العاصمة (تونس) في فبراير/شباط 2020 وتم متابعتها عبر المراسلات حتى الانتهاء.

## طيور شمال أفريقيا الجارحة

هناك 46 نوع من الطيور الجارحة داخل إقليم التقييم. ومن بين هذه الأنواع، تم استبعاد 10 أنواع من هذه الدراسة حيث أن توزيعها في الإقليم هامشي، أو شتائي، أو مروري. وجرى تقييم وتحليل حالة صون الأنواع الـ 36 المتبقية. ولا توجد أنواع متوطنة في شمال أفريقيا، على الرغم من وجود نوعين (5.5%) من الأنواع المحتملة أن تكون شبه متوطنة (التي تعرّف على أنها تضم  $\leq 70\%$  من نطاقها العالمي في الإقليم): البوم الفرعوني (الاسم العلمي: *Bubo ascalaphus*) وصقر الغروب (الاسم العلمي: *Falco concolor*). وكل الأنواع هي عادة من المنطقة القطبية الشمالية القديمة، ولكن هناك خمسة أنواع تتكاثر (13.9%) أصلها من الإقليم المداري الإفريقي، وجميعها نادرة للغاية.

## النتائج

هناك إجمالاً 12 من بين 36 طيراً جارحاً متكاثراً تم تقييمه، مهدد بالإنقراض في شمال أفريقيا. وهناك أربعة أنواع مصنفة على أنها شبه مهددة بالإنقراض (NT)، وثلاثة أنواع تم تقييمها على أنها منقرضة إقليمياً (باشق حزين الترتيل (الاسم العلمي: *Melierax metabates*)، والنسر الرمادي (الاسم العلمي: *Aegypius monachus*)، ومملكة العقبان الإسبانية (الاسم العلمي: *Aquila adalberti*)، و17 نوعاً على أنها غير مهددة.

والتهديدات الرئيسية الحالية لطيور شمال أفريقيا الجارحة هي القتل غير المشروع، والإتجار غير المشروع، والتسميم، والموت بسبب البنية التحتية البشرية مثل خطوط الكهرباء، التي تخفض من مجاميع التكاثر. وثمة خطر هام آخر يتمثل في استخدام مبيدات الآفات ومبيدات القوارض في الزراعة، مما يمكن أن يكون له أثر سلبي على نجاح التكاثر، والحد من كثافة الجوارح، ويؤدي إلى تسميم ثانوي من خلال استهلاك الجثث الملوثة. وبالإضافة إلى ذلك، فإن فقدان موائل الغابات، والنظم الإيكولوجية الزراعية، والأراضي الرطبة بسبب نمو السكان وانتشارهم يشكل تهديداً رئيسياً آخر

للطيور الجارحة في إقليم شمال أفريقيا، ويمكن أن يؤثر بطريقة أو بأخرى على معظم الأنواع الموجودة هناك أو ربما كلها تقريباً.

وهناك نقص كبير في المعلومات عن التوزيع، وحجم المجموع والاتجاهات، فضلاً عن التهديدات، مع 42% من الأنواع ذات مجموع غير معروف الاتجاهات. وهناك حاجة ملحة إلى إجراء بحوث ورصد تعاونية، لا سيما بشأن حجم وتوزيع مجاميع التكاثر وأثر التهديدات المحدد عليها.

ويمكن اعتبار هذا التقييم بمثابة خط أساس لوضع أعمال الصون ورصد التكاثر وتشتيت المجاميع من أجل فهم حالة الصون الخاصة بهم وتحديد مواقع التكاثر المحتملة ومناطق الانتشار الرئيسية وحمايتها وإدارتها.

## الاستنتاجات والتوصيات

على الرغم من أهميتها كمفترسة وأكلة جيف ودورها الرئيسي في ديناميات الشبكة الغذائية، فإن مجاميع التكاثر للطيور الجارحة في شمال أفريقيا غير معروفة بشكل كاف. وتعكس الفجوات الحالية في المعلومات المتعلقة بحالة المجاميع، والاتجاهات، والتوزيع الجغرافي، مدى قلة معرفتنا بها. بيد أن هذا التقييم الإقليمي كشف أن 48.5% من الطيور الجارحة المتكاثرة في شمال أفريقيا مهددة بالإنقراض، بسبب القتل غير المشروع، والحوادث المتعلقة بخطوط الكهرباء ومزارع الرياح، وفقدان موائل الغابات. وهذا يعني أن عدم التصرف بسرعة قد يؤدي إلى انهيار المجاميع الإقليمية للطيور الجارحة، وخاصة النسور، والتي جميعها أنواع مهددة بالإنقراض. وتتركز الأنواع المهددة بالإنقراض في الجزء الشمالي من المغرب العربي، من المغرب إلى الجزائر، ولكن أيضاً في جبل علبة، ووادي النيل الجنوبي وجنوب سيناء في مصر. وبالرغم من نقص البيانات حالياً، إلا أن نتائج هذا التقييم تظهر أنه بدون أعمال الصون العاجلة يمكن للإقليم أن يواجه انقراضاً جماعياً للطيور الجارحة، والتي قد تزعزع النظم الإيكولوجية مع اختفاء الأنواع المفترسة وأكلة الجيف.

وتشمل أعمال الصون الموصى بها لتحسين حالة الأنواع ما يلي:

- ← الشروع في رصد مجاميع التكاثر في مختلف البلدان، وذلك لأن العد المنتظم هو فقط الذي يوفر بيانات موثوقة لرصد مجاميع الطيور الجارحة؛
- ← تنقيح التشريعات الوطنية والدولية لحماية الأنواع المهددة بالإنقراض والمحددة في هذا التقييم؛
- ← وضع خطط عمل للأنواع المهددة بالإنقراض؛
- ← وضع تشريعات وإجراءات تخفيف لتجنب الوفيات الناجمة عن الاصطدام بخطوط الكهرباء والصدمات الكهربائية منها؛
- ← وضع استراتيجيات لمكافحة القتل والإتجار غير المشروعين، وضمان استمرار التعاون الإقليمي بين الخبراء، والشروع في مبادرات تعاون جديدة مع خبراء من بلدان شحيحة المعلومات، كي يمكن تحديث هذا التقييم بتوافر معلومات جديدة.
- ← رفع الوعي بأهمية الطيور الجارحة في الحفاظ على النظم الإيكولوجية الصحية.

## الرسائل الرئيسية

- إن الطيور الجارحة هي كائنات أساسية لعمل النظم الإيكولوجية في شمال إفريقيا، حيث توفر خدمات النظام الإيكولوجي المهمة مثل مكافحة آفات القوارض وإزالة بقايا الحيوانات النافقة، وتلعب دوراً في توليد الثروة عبر السياحة الإيكولوجية.
- إن المعلومات حول حالة صون هذه المجاميع في بلدان شمال أفريقيا محدودة للغاية، كما أن 42% من الأنواع ذات مجاميع غير معروفة الاتجاهات. وهناك حاجة ملحة إلى إجراء بحوث ورصد تعاونية، لا سيما بشأن حجم وتوزيع مجاميع التكاثر والأثر المحدد للتهديدات عليها.
- تتأثر الطيور الجارحة بالقتل والإتجار غير المشروعين، وفقدان موائل الغابات وتدهورها، والبنى التحتية للطاقة مثل خطوط الكهرباء ومزارع الرياح. ويجب تطوير الاستراتيجيات المنسقة وتنفيذها للتخفيف من هذه التأثيرات على مجاميع الطيور الجارحة.

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The Long-legged buzzard has a large range and an abundant breeding population throughout North Africa. The population trend is not known, but the population is not believed to be decreasing rapidly enough to approach the thresholds for a threatened category. It is evaluated as Least Concern. © Daniel Burón



The golden eagle (*Aquila chrysaetos*) is a widespread species in North Africa breeding from Morocco to Egypt. Although its population is small, it is not considered to be declining and it is assessed as Least Concern. © Jose Rafael Garrido



LEAST CONCERN >  
LC



Pharaoh eagle-owl is abundant and widespread in North Africa. It is not thought to warrant listing as threatened under any criterion. Therefore, it is evaluated as Least Concern. © Íñigo Fajardo



LEAST CONCERN >  
LC



# 1. Introduction

This report comprises a summary of the regional conservation status of breeding birds of prey in North Africa. The IUCN Centre for Mediterranean Cooperation, in collaboration with the IUCN Species Programme and a key group of regional experts, presents the overall results and findings of the regional Red List assessment.

The objective of this report is to provide the baseline status of this group of birds in the region. It includes information about their distribution and natural history, and highlights those species that have been found to be of greatest conservation concern. It also reveals that very little or no information is available for a large number of species, for which more research and awareness is urgently needed. It is envisaged that the information contained within this report will facilitate the development of priority research, conservation and management actions for the region.

## 1.1 The assessment region

The assessment region covers the whole of northern Africa bordering the Mediterranean Sea (Figure 1). The five countries of North Africa (Algeria, Egypt, Libya, Morocco and Tunisia) cover a total area of 5,275 million km<sup>2</sup>. Their total human population was estimated at about 156 million in 2012 and is expected to reach 184 million by 2025 (IUCN-Med 2016).

While these countries show considerable diversity in their environments, they share many similarities and face similar problems and challenges in the use and conservation of their natural resources.

North Africa is home to great marine and terrestrial biological diversity associated with its geomorphological variability and the diversity of its flora and fauna. The region's ecosystems and landscapes are also remarkably diverse. Much of this territory has for centuries been subject to increasing human use of resources, particularly in the coastal areas.

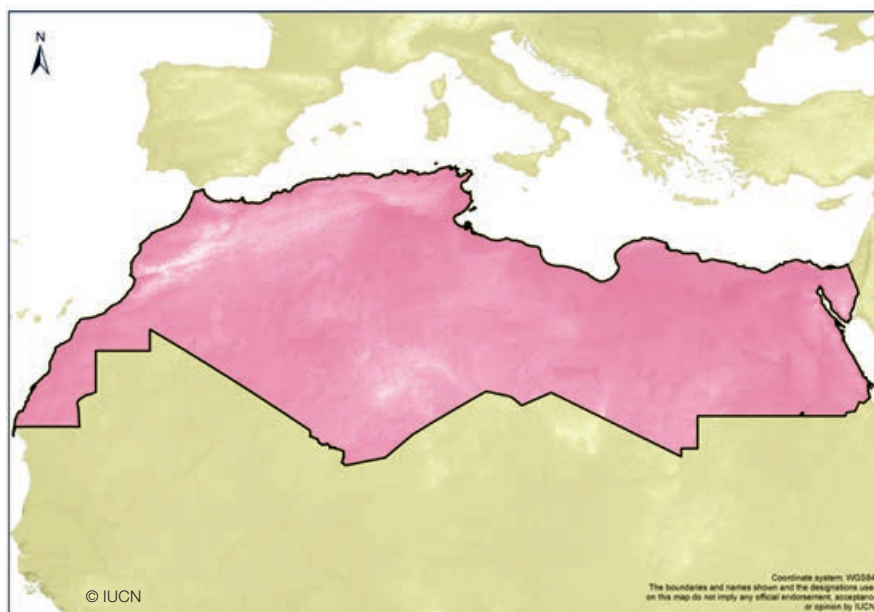


Figure 1. The North Africa region as defined in the current report. Map based on FAO GAUL.



A great diversity of landscapes such as desert and forest ecosystems are present in North Africa. Northern Sahara desert (left, © Jose Rafael Garrido) and northern Moroccan forest (right, © Daniel Burón), Morocco.

The North African Region lies in the Western Palearctic biogeographic realm and borders the Afrotropical realm to the south, which is reflected in the existence of elements of the tropical flora and fauna along its borders. It is a hot spot of endemism for both fauna and flora. Moreover, many species considered threatened at international level or that have disappeared in other parts of the world are still present.

Although many types of ecosystems exist in the region, a large part of it is made up of arid or sub-arid zones with large areas of desert. The arid conditions to which much of North Africa is subjected accentuate the vulnerability of the region's species and ecosystems, despite the adaptations to aridity shown by many animal and plant species. The region's ecosystems may be grouped into the following main categories:

- Arid and sub-arid ecosystems
- Steppe ecosystems
- Forest ecosystems
- Wetland ecosystems
- Marine ecosystems

**Arid and sub-arid ecosystems** exist in all five countries; they are located mainly in the southern part of the region, but they also exist in some of its Mediterranean coastal zones. Although their natural productivity is relatively low, the arid and sub-arid zones of the region are home to a wide diversity of fauna and flora with a high degree of vulnerability and they are particularly sensitive to human impacts. **Steppe ecosystems**, although widespread in the region, exist mainly in Algeria, Morocco and Tunisia, where they often form a transition between hyper-arid or Saharan and humid and sub-humid environments. **Forest ecosystems** are present in all the North African countries apart from Egypt. In Morocco, Algeria and Tunisia, mountain and/or forest areas cover appreciable areas of the territory and are the site of diversified human activities, with great dependence on natural resources and often relatively low standards of living and little basic infrastructure development. A large part of the **wetlands** of North Africa consists of artificial environments created by damming rivers during the last 50 years; however, there are also natural wetlands, many of which are of international importance and play a significant social and economic role at local and national level. As in many other regions, North Africa's wetlands are subject to great pressures, most of which are caused by human activities either in the wetlands themselves or in their catchment basins. **Marine ecosystems** constitute a significant component of the biodiversity of North African countries. All these countries face onto the Mediterranean Sea; furthermore, Morocco and Egypt have long coastlines not only on the Mediterranean but also on the Atlantic in the case of Morocco (2,500 km) and on the Red Sea in the case of Egypt (1,500 km).



Afrotropical elements can be found in the south of the assessment region, such as *Acacia* forests. ©Daniel Burón

Bonelli's eagle (*Aquila fasciata*) is the most common large eagle in North Africa and is assessed as Least Concern (LC). © Íñigo Fajardo



LEAST  
CONCERN



LC



In addition to these common, widespread ecosystems, other types such as oases, mangroves, caves, etc. also exist in North Africa; they are hot spots of biodiversity even though they are limited in terms of the areas they cover.

While providing services that greatly contribute to the economic and social well-being of the populations, ecosystems in North Africa have for decades been overexploited and subject to other unsustainable forms of natural resource use and management. As a result, the status of ecosystems in the region is often reported as critical by specialists and national organisations (IUCN-Med, 2016).

The economy of the North African countries is greatly dependent on natural resources, and most of the active population is employed in activities that are linked to the primary sector, such as agriculture and stock raising. For a long time, the agriculture sector has been neglected in the development programmes of certain countries in the region, although this sector could drive growth and development. Agriculture is currently not very productive and has weak competitiveness in world trade. Rural people do not have easy access to loans and cannot handle natural hazards, including those resulting from climate change. Certain forms of natural resource use have led to overexploitation, as in the case of water resources and some stocks of living marine resources. The sustainability of such use can only be guaranteed through approaches that enable the declines to be reversed.

## 1.2 Raptors of North Africa

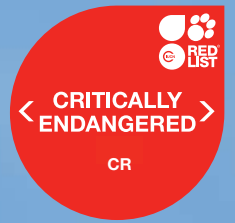
There are 46 species of birds of prey within the assessment region. Ten of these species have marginal, wintering or passage distributions in the region. The remaining 36 species are breeding birds of prey belonging to three orders: Accipitriformes (22 species), Falconiformes (seven species) and Strigiformes (seven species) (Table 1).

**Table 1. Total number of breeding raptor species occurring in the North African region**

Order	Family	Number of species
Accipitriformes	Accipitridae	21
	Pandionidae	1
Falconiformes	Falconidae	7
Strigiformes	Strigidae	6
	Tytonidae	1
<b>Total</b>		<b>36</b>

There are no species endemic to North Africa, although there are two possibly near-endemic species (defined as having  $\geq 70\%$  of their global range in the region): the Pharaoh eagle-owl *Bubo ascalaphus* and the sooty falcon *Falco concolor*.

Many of the breeding species (16, 44.4%) are typically from the Palaearctic: 10 Accipitriformes (Spanish imperial eagle *Aquila adalberti*, Bonelli's eagle *Aquila fasciata*, short-toed snake-eagle *Circaetus gallicus*, western marsh-harrier *Circus aeruginosus*, Montagu's harrier *Circus pygargus*, red kite *Milvus milvus*, griffon vulture *Gyps fulvus*, cinereous vulture *Aegypius monachus*, northern goshawk *Accipiter gentilis*, and Eurasian sparrowhawk *Accipiter nisus*), three Falconiformes (lesser kestrel *Falco naumanni*, Eleonora's falcon *Falco eleonora*, and Eurasian hobby *Falco subbuteo*) and three Strigiformes (northern long-eared owl *Asio otus*, Eurasian scops-owl *Otus scops*, and tawny owl *Strix aluco*).



The tawny eagle (*Aquila rapax*) is one of the five Afrotropical breeding raptors in North Africa. It is classified as Critically Endangered (CR) because it only breeds in Algeria in very small numbers. © Andres de la Cruz



The osprey breeds on the western coast of Algeria and the eastern Mediterranean coast of Morocco and along the Red Sea coast and South Sinai in Egypt. It is assessed as Endangered (EN). Together with Eleonora's falcon (*Falco eleonorae*), it is one of the two raptors breeding on coastal cliffs in North Africa. © Rafa Benjumea



There are also five breeding species (13.9%) of Afrotropical origin, which are very rare: the tawny eagle *Aquila rapax*, lappet-faced vulture *Torgos tracheliotos*, marsh owl *Asio capensis*, Rüppell's vulture *Gyps rueppelli* and dark chanting-goshawk *Melierax metabates*.

The remaining 15 species (41.7%) have a wider global distribution. The osprey and Eleonora's falcon are the only two breeding species (5.5%) found exclusively on marine cliffs, while the rest (34 species, 94.5%) are distributed mainly inland.

The long-legged buzzard *Buteo rufinus* deserves a special mention, since its subspecies *Buteo rufinus cistenis* is a common, widespread resident in North Africa, but recent studies have found that its taxonomy is not clear and it is closer to *Buteo buteo* than to *Buteo rufinus* (Jowers et al., 2019). It has been suggested it should be called the North African buzzard instead of the long-legged buzzard because of the importance of North Africa in its geographical distribution (Jowers et al., 2019; MaghrebOrnitho, 2019a).

## 1.3 Objectives of the assessment

This assessment has two main objectives:

- To contribute to regional conservation planning by providing a baseline dataset describing the conservation status and distribution of North African birds of prey, and
- To develop a network of regional experts to support future assessments and update the information on these species.

The assessment provides two main direct outputs:

- A report on the status of the breeding raptors of the North African region, including a comprehensive species list of all North African birds of prey, a Red List assessment of all the species, an identification of the main threats to each species and recommendations for the future conservation of the species and their habitats.
- A database that provides a baseline for monitoring the status of the breeding birds of prey of North Africa. The data presented in this report provides a snapshot based on the knowledge available at the time of the assessment.

The database will continue to be updated and made freely available. IUCN will ensure that these data are disseminated widely to relevant decision makers, NGOs and scientists to inform the implementation of conservation actions on the ground.

## 2. Assessment methodology

### 2.1 The IUCN Red List of Threatened Species™

The IUCN Red List of Threatened Species™ (IUCN Red List) is widely recognised as the most comprehensive, scientifically based source of information on the global conservation status of plant and animal species. IUCN Red List Categories and Criteria are applied to individual taxon assessments (which contain information on aspects such as ecology and life history, distribution, habitat, threats, current population trends and conservation measures), to determine their relative threat of extinction. Threatened species are listed as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU). Taxa that are either close to meeting the threatened thresholds or would be threatened were it not for ongoing conservation programmes, are classified as Near Threatened (NT). Taxa evaluated as having a relatively low risk of extinction are classified as Least Concern (LC). Also highlighted within the IUCN Red List are taxa that cannot be evaluated due to insufficient knowledge, and which have therefore been assessed as Data Deficient (DD). This category does not necessarily mean that the species is not threatened, only that its risk of extinction cannot be assessed from current data (IUCN 2012a).

Additionally, when regional or national assessments are conducted, the IUCN Red List Regional Guidelines (IUCN 2012b) are applied, and two additional categories are used: Regionally Extinct (RE) and Not Applicable (NA) (see Figure 2).

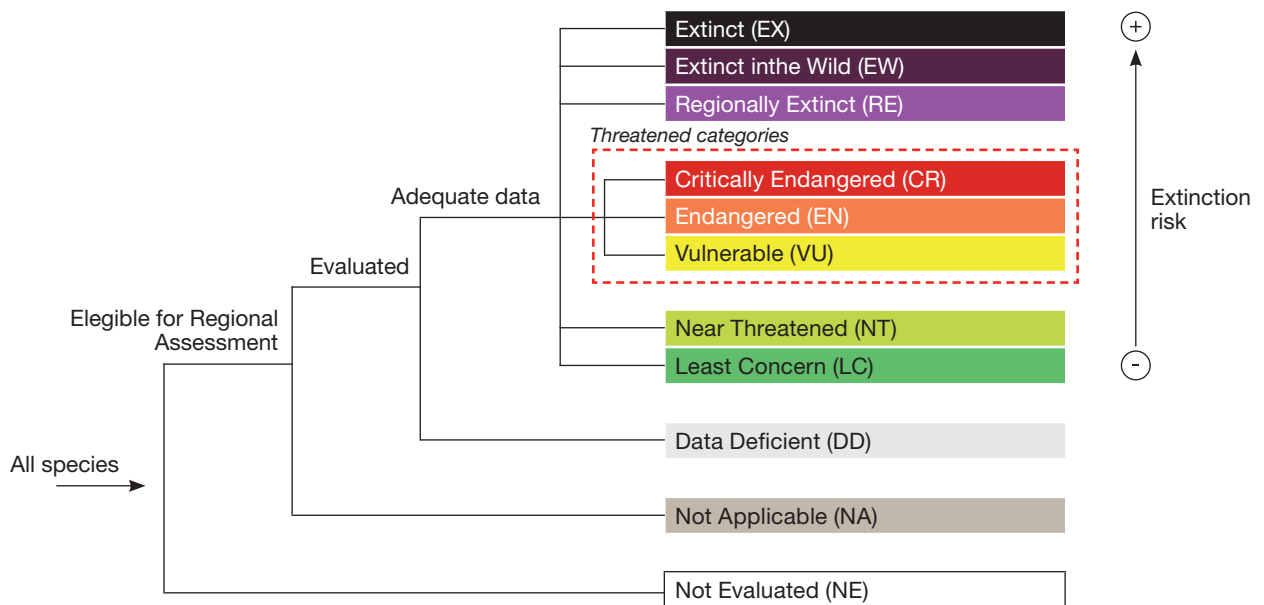


Figure 2. IUCN Red List Categories at the regional level (IUCN 2012b). For a description of each of the global IUCN Red List Categories go to: <http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria>.

## 2.2. The IUCN Red List of North African Raptors

The extinction risk of a species can be assessed at a global, regional, or national level. A taxon can be in different categories in the Global Red List and a Regional Red List. For instance, a species which is common worldwide and listed as Least Concern **LC** in the Global Red List could face a high level of threat and meet the criteria of a threatened category, for example Endangered **EN**, in a particular region. To avoid an over- or underestimation of the regional extinction risk of a species, the guidelines for application of IUCN Red List Criteria at regional level (IUCN 2012b) should be applied.

Therefore, the present regional assessment examines the regional conservation status of all raptors species breeding in the North African region. The status of each species has been assessed according to the IUCN Red List Categories and Criteria (IUCN 2012a) and the Guidelines for Application of IUCN Red List criteria at Regional Levels (IUCN 2012b).

## 2.3. Geographical scope

The assessment covers the entire territory of the countries of the North Africa region that border the Mediterranean Sea: Morocco, Algeria, Tunisia, Libya and Egypt (Figure 1).

## 2.4 Taxonomical scope

This regional assessment evaluates a total of 46 native North African species of raptors. The scope of the North Africa assessment covers only native breeding raptor species confirmed in the region, including those breeders that have become Regionally Extinct in the last 100 years: the dark chanting-goshawk, cinereous vulture and Spanish imperial eagle (Chapter 6). The last two of these species could re-colonise North Africa in the near future due to population growth in the northern Mediterranean. The list also includes 10 species that are considered Not Applicable for regional assessment because their occurrence in the region is marginal or uncertain, there are no recent confirmed records or they are only wintering or migrant species (Chapter 7).

Non-native species that may have established breeding populations as a result of escapes, deliberate introductions or arrival on ships were not individually assessed as part of this project, in accordance with the guidelines of the IUCN Standards and Petitions Committee (2019).

Rüppell's vulture deserves a special mention. The species was originally distributed in savanna in the Sahel, Ethiopia and Somalia, but it seems to have been extending its range into the North African region in the last 10 years because of global change and habitat degradation in its breeding areas in the southern Sahel (Chapter 6).

The black kite has been assessed as including the subspecies *Milvus migrans aegyptius* (yellow-billed kite), which has very recently been treated as a separate species on the global Red List (BirdLife International, 2020a); therefore, in future assessments it will be assessed separately.



Rüppell's vulture (*Gyps rueppelli*) is one of the five Afrotropical raptors breeding in North Africa. It was originally distributed in the Sahel and eastern Africa, but it seems to be colonising North Africa. It is classified as Critically Endangered (CR).  
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## 2.5 Preliminary assessments and review process

A provisional species list of raptors breeding in the region was compiled in 2019 by the experts of BirdLife International and IUCN-Med. Information on habitats and ecology, distribution, threats, conservation measures, etc. was sourced and collated for all the native breeding raptors occurring in the North African region. All the available relevant information on each species was input into the IUCN species database (Species Information Service–SIS). Spatial data were sourced to produce species distribution maps.

Key distribution and status information and population estimates were obtained from the IUCN Red List of Threatened Species (IUCN, 2020) and more than 100 literature references, of which the following should be highlighted: *The birds of Egypt* (Goodman and Meininger, 1989), *Oiseaux d'Algérie–Birds of Algeria* (Isenmann and Moali, 2000), *The birds of Morocco: an annotated checklist* (Thévenot et al., 2003), *Oiseaux de Tunisie–Birds of Tunisia* (Isenmann et al., 2005), *Oiseaux de Libye–Birds of Libya* (Isenmann et al., 2016), *Oiseaux du Sahara Atlantique Marocain* (Bergier et al., 2017), *African Raptors* (Clark and Davies, 2018), *The OSME Region List of Bird Taxa, Part A: Non-passerines. Version 5.1: July 2019* (OSME, 2019) and *eBird: An online database of bird distribution and abundance [web application]* (eBird, 2020).

The species information was then reviewed at a regional workshop held in Tunisia in February 2020, where each species' assessment was evaluated by regional and international experts to ensure that the information presented was complete and correct, and that the Red List category had been applied correctly.



Expert participants at the North African breeding raptors Red List workshop, February 2020, Tunisia. © IUCN-Med

IUCN Red List assessments for 46 native species of raptors present in North Africa were reviewed and validated during the Tunisia workshop by the best regional experts. The status of each species was assessed according to the IUCN basic Red Listing procedures and documents, including the *IUCN Red List categories and criteria* (IUCN, 2012a) and the *Guidelines for application of IUCN Red List criteria at regional and national levels* (IUCN, 2012b). Following the workshop, the assessments were reviewed and supplementary information added from recent publications where appropriate; any remaining issues were resolved through communication with workshop participants.

## 2.6. Assessment review process

Experts from North African countries as well as on some raptor species were then asked to review the species summary reports using a peer-review methodology. Their comments, together with any additional up-to-date information, were included in the assessments.

Supported by relevant data sources and the scientific literature, these final regional assessments are therefore the outcome of information exchange and agreement among the numerous North African raptor specialists involved and their networks of informed colleagues.

## 3. Assessment results

### 3.1. Conservation status of North African raptors

A full list of the breeding raptor species of North Africa, their regional IUCN Red List status and criteria, and a rationale is given in Table 2 and Chapters 6 and 7. The list also includes 10 species that were considered Not Applicable for regional assessment (see 2.4). The numbers and proportions of species in the various IUCN Red List Categories are presented in Table 3.

Altogether, 12 species (33.3%) fall into one of the three categories (Critically Endangered, Endangered and Vulnerable) which are collectively regarded as 'threatened'. Seven are Critically Endangered **CR** (one of them Possibly Regionally Extinct), four species are Endangered **EN** and one Vulnerable **VU**. A further four species are listed as Near Threatened **NT** and 17 as Least Concern **LC**. Three species (Dark Chanting-goshawk, Cinereous Vulture and Spanish Imperial Eagle) are Regionally Extinct. Each species classed as threatened (Critically Endangered, Endangered and Vulnerable), Near Threatened and Regionally Extinct has an explanatory sheet in Chapter 6.

**Table 2. Breeding birds of prey of North Africa and their Red List Status. Species considered Not Applicable (NA) for regional assessment have also been included. (PRE = Possibly Regionally Extinct).**

FAMILY	Common name	Binomial	taxonomic authority	Category
ACCIPITRIDAE	Cinereous vulture	<i>Aegypius monachus</i>	(Linnaeus, 1766)	RE
ACCIPITRIDAE	Spanish imperial eagle	<i>Aquila adalberti</i>	Brehm, 1861	RE
ACCIPITRIDAE	Dark chanting goshawk	<i>Melierax metabates</i>	Heuglin, 1861	RE
ACCIPITRIDAE	Northern goshawk	<i>Accipiter gentilis</i>	(Linnaeus, 1758)	CR
ACCIPITRIDAE	Tawny eagle	<i>Aquila rapax</i>	(Temminck, 1828)	CR
ACCIPITRIDAE	Bearded vulture	<i>Gypaetus barbatus</i>	(Linnaeus, 1758)	CR
ACCIPITRIDAE	Rüppell's vulture	<i>Gyps rueppelli</i>	(Brehm, 1852)	CR
ACCIPITRIDAE	Red kite	<i>Milvus milvus</i>	(Linnaeus, 1758)	CR
ACCIPITRIDAE	Lappet-faced vulture	<i>Torgos tracheliotos</i>	(Forster, 1791)	CR
STRIGIDAE	Marsh owl	<i>Asio capensis</i>	(Smith, 1834)	CR
ACCIPITRIDAE	Montagu's harrier	<i>Circus pygargus</i>	(Linnaeus, 1758)	EN
ACCIPITRIDAE	Egyptian vulture	<i>Neophron percnopterus</i>	(Linnaeus, 1758)	EN
PANDIONIDAE	Osprey	<i>Pandion haliaetus</i>	(Linnaeus, 1758)	EN
ACCIPITRIDAE	Griffon vulture	<i>Gyps fulvus</i>	(Hablizl, 1783)	VU
FALCONIDAE	Eurasian hobby	<i>Falco subbuteo</i>	Linnaeus, 1758	VU
ACCIPITRIDAE	Short-toed snake-eagle	<i>Circaetus gallicus</i>	(Gmelin, 1788)	NT
ACCIPITRIDAE	Western marsh harrier	<i>Circus aeruginosus</i>	(Linnaeus, 1758)	NT
FALCONIDAE	Sooty falcon	<i>Falco concolor</i>	Temminck, 1825	NT
FALCONIDAE	Eleonora's falcon	<i>Falco eleonorae</i>	Géné, 1839	NT
ACCIPITRIDAE	Eurasian sparrowhawk	<i>Accipiter nisus</i>	(Linnaeus, 1758)	LC

FAMILY	Common name	Binomial	taxonomic_authority	Category
ACCIPITRIDAE	Golden eagle	<i>Aquila chrysaetos</i>	(Linnaeus, 1758)	LC
ACCIPITRIDAE	Bonelli's eagle	<i>Aquila fasciata</i>	(Vieillot, 1822)	LC
ACCIPITRIDAE	Long-legged buzzard	<i>Buteo rufinus</i>	(Cretzschmar, 1827)	LC
ACCIPITRIDAE	Black-winged kite	<i>Elanus caeruleus</i>	(Desfontaines, 1789)	LC
ACCIPITRIDAE	Booted eagle	<i>Hieraetus pennatus</i>	(Gmelin, 1788)	LC
ACCIPITRIDAE	Black kite	<i>Milvus migrans</i>	(Boddaert, 1783)	LC
FALCONIDAE	Lanner falcon	<i>Falco biarmicus</i>	Temminck, 1825	LC
FALCONIDAE	Lesser kestrel	<i>Falco naumanni</i>	Fleischer, 1818	LC
FALCONIDAE	Peregrine falcon	<i>Falco peregrinus</i>	Tunstall, 1771	LC
FALCONIDAE	Common kestrel	<i>Falco tinnunculus</i>	Linnaeus, 1758	LC
STRIGIDAE	Northern long-eared owl	<i>Asio otus</i>	(Linnaeus, 1758)	LC
STRIGIDAE	Little owl	<i>Athene noctua</i>	(Scopoli, 1769)	LC
STRIGIDAE	Pharaoh eagle-owl	<i>Bubo ascalaphus</i>	Savigny, 1809	LC
STRIGIDAE	Common scops-owl	<i>Otus scops</i>	(Linnaeus, 1758)	LC
STRIGIDAE	Tawny owl	<i>Strix aluco</i>	Linnaeus, 1758	LC
TYTONIDAE	Barn owl	<i>Tyto alba</i>	(Scopoli, 1769)	LC
ACCIPITRIDAE	Eurasian buzzard	<i>Buteo buteo</i>	(Linnaeus, 1758)	NA
ACCIPITRIDAE	Hen harrier	<i>Circus cyaneus</i>	(Linnaeus, 1766)	NA
ACCIPITRIDAE	Lesser spotted eagle	<i>Clanga pomarina</i>	(Brehm, 1831)	NA
ACCIPITRIDAE	White-tailed eagle	<i>Haliaeetus albicilla</i>	(Linnaeus, 1758)	NA
ACCIPITRIDAE	European honey buzzard	<i>Pernis apivorus</i>	(Linnaeus, 1758)	NA
FALCONIDAE	Saker falcon	<i>Falco cherrug</i>	Gray, 1834	NA
FALCONIDAE	Merlin	<i>Falco columbarius</i>	Linnaeus, 1758	NA
FALCONIDAE	Red-footed falcon	<i>Falco tinnunculus</i>	Linnaeus, 1766	NA
STRIGIDAE	Short-eared owl	<i>Asio flammeus</i>	(Pontoppidan, 1763)	NA
STRIGIDAE	Eurasian eagle-owl	<i>Bubo bubo</i>	(Linnaeus, 1758)	NA

Table 3. Summary of the Red List status of breeding species of raptors in the North African region. The percentage in each category is given in parentheses.

IUCN Red List categories	Species (%)
Regionally Extinct (RE)	3 (8.3%)
Critically Endangered (CR) Possibly Regionally Extinct	1 (2.7%)
Critically Endangered (CR)	6 (16.7%)
Endangered (EN)	4 (11.1%)
Vulnerable (VU)	1 (2.8%)
Near Threatened (NT)	4 (11.1%)
Least Concern (LC)	17 (47.2%)
<b>Total number of species assessed</b>	<b>36</b>

The order Accipitriformes (eagles and vultures) is the most threatened group (45.5% of species), followed by Falconiformes (falcons and kestrels) (14.3%) and Strigiformes (owls) (14.3%).

Table 4. Regional Red List status by taxonomic order.

Order	Number of species	RE	CR	EN	VU	NT	LC	% Threatened
Accipitriformes	22	3	6	3	1	2	7	45.5
Falconiformes	7	0	0	1	0	2	4	14.3
Strigiformes	7	0	1	0	0	0	6	14.3
<b>Total number of breeding raptors assessed</b>	<b>36</b>	<b>3</b>	<b>7</b>	<b>4</b>	<b>1</b>	<b>4</b>	<b>17</b>	<b>33.5</b>

It is significant that the population trend of many species (15 of the 36 assessed species) is unknown (Figure 3). Ten species (30.3% of extant breeding species) show declining trends, all of which are threatened, and only eight (24.4%) show increasing or stable trends (Figure 3).

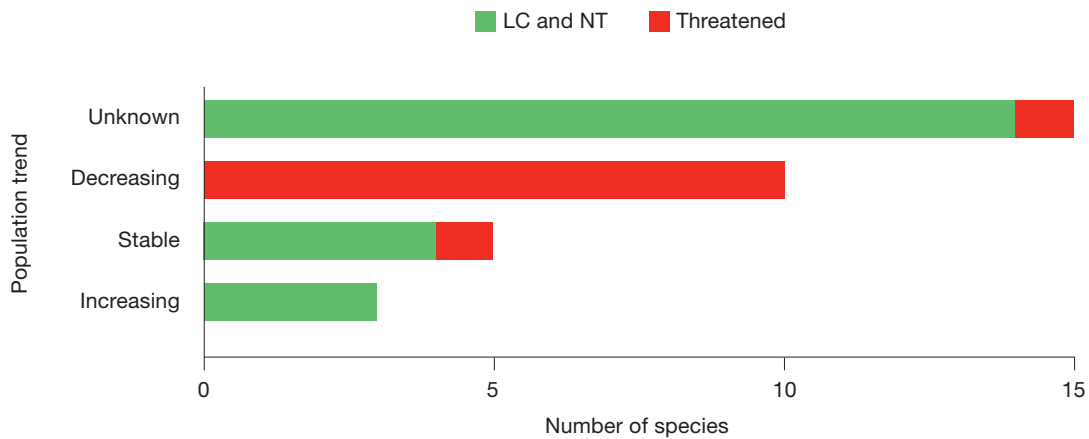


Figure 3. Population trends of birds of prey currently breeding in North African. Source data: IUCN Red List



The Spanish imperial eagle (*Aquila adalberti*) is Regionally Extinct in North Africa, but with the increase of breeding subpopulations in Spain a growing number of young eagles like this one have been visiting Morocco and even staying until breeding age. © Daniel Burón



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## 3.2. Regionally Extinct species

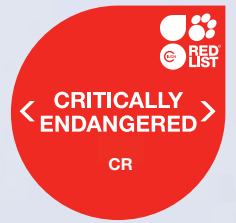
Three species assessed in this report are Regionally Extinct as breeders, representing 8.3% of the native breeding raptors of North Africa (Tables 2 and 3, Chapter 6). They are the cinereous vulture, Spanish imperial eagle and dark chanting-goshawk, and are thought to have become Regionally Extinct in the last century. The first two species are highly likely to recolonise Morocco because of the increasing Iberian subpopulations nearby, but management measures to mitigate the impact of threats such as electrocution and disturbance need to be implemented, and a possible translocation programme, reintroducing birds from the nearest healthy Iberian populations, could be considered (IUCN/SSC, 2013).

The cinereous vulture and the Spanish imperial eagle were at the southern edge of their breeding range in North Africa, especially in Morocco, and were never very abundant. These breeding populations are likely to have survived because of immigration from the larger Spanish populations, but their decline during the 20<sup>th</sup> century due to human persecution was too strong. Unintended poisoning, even resulting from Moroccan government measures, was the main reason for the extirpation of raptors, including Spanish imperial eagles and cinereous vultures, in the 20<sup>th</sup> century, but currently the most important threats are shooting, hunting, and habitat destruction and disturbance, especially in forests, due to the increase and spread of the human population.

Despite this, populations of both species are increasing in Europe, especially in Spain, and an increasing number of immature individuals are visiting Morocco (Del Moral, 2017; Morandini et al., 2019) and staying until breeding age (Godino et al., 2016; García and Garrido, 2017, 2019). The Spanish imperial eagle is a regular non-breeding visitor to Morocco and Algeria, with few wintering areas in Morocco, mainly in the south but also in the east of the country (Morandini et al., 2019). There are five main temporary settlement areas in Morocco (Kenifra, Mamora, Low Draa, Missouri and the western coast of Atlantic Sahara) and one in western Algeria around Tindouf (García and Garrido, 2020). Therefore, there is potential for the re-establishment of a Moroccan breeding population if the main threats (electrocution, low density of prey, and human persecution and disturbance) can be mitigated.

The dark chanting-goshawk is a widespread resident raptor occurring over large areas of sub-Saharan Africa, which used to have isolated subpopulations of the endemic subspecies *M. m. theresae* in south-western Morocco. The original breeding range of the dark chanting-goshawk in North Africa included the argan forests of the Souss Valley and adjacent Anti-Atlas foothills of Morocco (Vernon et al., 2005), but now it is Regionally Extinct here with the last nesting record in 1979 (Heinze and Krott, 1979). The species was at the northern edge of its range in North Africa and was never very abundant here: it was already considered rare by Lynes (1925). In more recent years there have been only four sightings in the region of Souss but none since 2007, although it has been actively searched for many times by many experienced ornithologists (Fareh et al., 2016), which indicates that this species has definitely become extinct in Morocco. The species was extirpated due to changes of land use in the Souss region (P. Bergier, 2020 pers. comm.).

What these three species have in common is that they nest in trees and are extremely sensitive to forest destruction and human disturbance due to the intensity of human use, resulting in the abandonment of breeding territories.



The most threatened species in North Africa is the red kite (*Milvus milvus*), which is listed as Critically Endangered (Possibly Regionally Extinct). © Daniel Burón

### 3.3. Threatened species

Twelve species assessed in this report are threatened (33.3%), as they belong to one of the three IUCN threat categories (Critically Endangered, Endangered and Vulnerable) (Tables 2 and 3, Chapter 6).

The most threatened species is the red kite, which is listed as Critically Endangered (Possibly Regionally Extinct) because, after a decline in its breeding population since the end of 20<sup>th</sup> century due to poisoning, there has been no evidence of breeding since 2004. Because it nests in trees, it is affected by forest destruction and human disturbance due to the intensity of human use, resulting in the abandonment of breeding territories. Another current limiting factor to the breeding population is climate change, because Morocco is at the southern limit of the species' distribution and its breeding populations are moving to cooler northern areas.

There are six other Critically Endangered species: three vultures (bearded, lappet-faced and Rüppell's), northern goshawk, tawny eagle and marsh owl. All have small breeding populations.

The bearded vulture bred in Morocco, Algeria, Tunisia and Egypt in the past, but now the species is believed to have only two small subpopulations of fewer than 30 mature individuals in the High Atlas of Morocco and in Egypt, which have dramatically declined in recent decades because of human persecution. The lappet-faced vulture has a small population in Egypt estimated at 20–40 mature individuals, which is declining because of poisoning and human disturbance. It is extinct in Morocco, Algeria, Tunisia and Libya. The breeding population of Rüppell's vulture is very small (less than 20 mature individuals in Algeria), and it seems to have colonised North Africa in the last 10 years. This could be assumed to be the beginning of a range displacement process

from the southern Sahel towards the southern Mediterranean region. Climate change and habitat degradation in its original breeding areas have been proposed as the main causes (Kemp et al., 2020). The species is globally assessed as Critically Endangered (BirdLife International, 2020b) and so it requires urgent conservation measures including a better understanding of the factors influencing changes in its distribution.

The northern goshawk also has a small population, with fewer than 40 mature individuals distributed in only one subpopulation in northern Morocco. It has been in continuous decline in recent decades due to forest destruction, human disturbance and nest robbery. The breeding population of tawny eagles is declining and numbers fewer than 40 mature individuals in a single subpopulation in northern Algeria, because of poaching, hunting, unintended poisoning, habitat destruction (especially of forests) and disturbance, due to an increase in the human population. Finally, the marsh owl has a small and declining population estimated at 100–200 mature individuals in one subpopulation in Morocco because of the drainage and degradation of marshlands, its main suitable habitat.

Significantly, three of these CR species are also tree-nesting: the lappet-faced vulture, northern goshawk and tawny eagle.

Four additional species are listed as Endangered: osprey, Egyptian vulture, Montagu's harrier and Eurasian hobby. The osprey has a small population in the northern Maghreb and along the Red Sea coast (< 150 mature individuals), without any likelihood of immigration from nearby breeding sites in the Mediterranean region and with ongoing major threats (human disturbance from fishing and tourism, power lines and windfarm development). The Egyptian vulture still has a significant breeding population (750 pairs) from Morocco to Egypt, with three separate subpopulations: a Maghreb subpopulation, including Mediterranean breeding populations in Morocco, northern Algeria, Tunisia and northern Libya; a desert subpopulation in south-eastern Algeria and Libya, which is more closely related to the Afrotropical population than to the Mediterranean one; and an Egyptian subpopulation, isolated from the Mediterranean and desert subpopulations and more closely related to the Arabian subpopulation. However, the species has declined by 50–79% over three generations (53 years) due mainly to poisoning, except in Algeria. Montagu's harrier occurs on the north-western coast and plains of eastern Morocco and north-western Algeria, with a small population of less than 105 breeding pairs that is declining because of the conversion of its habitat to agricultural land. The Eurasian hobby is a local tree-nesting breeder in forests in the northern half of the Maghreb, with an estimated 1,000–2,000 mature individuals, but all in one declining subpopulation threatened by degradation of open wooded areas.

One native breeding raptor species is listed as Vulnerable in the region: the griffon vulture, which currently breeds only in Algeria although an increasing number of individuals are immigrating from Europe to North Africa. This species is extinct in Egypt, Tunisia and Morocco due to human persecution and the decline of wild ungulates as food.



Though Eleonora's falcon (*Falco eleonora*) has a growing breeding population in North Africa, it is restricted to a few islands and cliffs in Morocco, Algeria and Tunisia and is highly dependent on conservation actions, especially access restrictions to breeding colonies; it is listed as Near Threatened. © Daniel Burón

### 3.4. Near Threatened species

Overall, four species were assessed as Near Threatened (NT) (Tables 2 and 3, Chapter 6), reflecting concern that they are close to qualifying for a threatened category and could do so in the near future. It is essential that these species are monitored closely and, where possible, management action should be taken to avoid them becoming listed as threatened in the future. One of them is a near-endemic species (with  $\geq 70\%$  of its global range in the region), the sooty falcon, which occurs sparsely in Libya and Egypt. It has suffered from the collection of nestlings for falconry, and illegal killing may also affect the remaining population.

The short-toed snake eagle occurs over a wide range in three subpopulations, with 98% of individuals in the Maghreb subpopulation. The loss of nesting sites due to logging (it nests in trees) as well as disturbance seem to be the main threats. The western marsh-harrier has a wide range in marshes and reedbed wetlands in the northern Maghreb, in a single subpopulation. Potential threats include wetland desiccation and drainage.

Lastly, Eleonora's falcon currently has a growing breeding population of more than 2,200 pairs, but they are restricted to 10 islands and cliff sites in Morocco, Algeria and Tunisia, some of them highly dependent on conservation actions, especially access restrictions to breeding colonies, and the population could decrease drastically if these actions were to stop.

### 3.5. Least Concern species

There are 17 native breeding raptor species (47.2%) listed as Least Concern (LC) in North Africa (Tables 2 and 3, Chapter 7); they are not considered to be under any known major threat of extinction in the foreseeable future. Many of these species are generally abundant and/or relatively widespread. Some of them may still benefit from conservation management action, however, even though they are listed as LC.

Among the most common species, the nominal subspecies of black kite *Milvus migrans migrans* is a common breeding migrant in north-western Africa, and is assessed as Least Concern, but the subspecies *Milvus migrans aegyptius* (Yellow-billed Kite) is a scarce breeding resident in the Nile Valley and parts of the Nile Delta in Egypt and has a very small population (150 mature individuals in one subpopulation), which is considered to be gradually declining due to habitat degradation for agriculture and development. This subspecies has very recently been treated as a separate species on the global Red List (BirdLife International, 2020a), and so any future regional Red Lists should assess these subspecies separately, and it is likely that the yellow-billed kite will be classed as regionally threatened.

### 3.6. Patterns of species richness

The North African breeding birds of prey assessed show a non-homogeneous geographical distribution. Most species are distributed in the forests and steppes of the northern Maghreb, mainly from Morocco to Tunisia but also in north-eastern Libya, coinciding with the area of greatest Mediterranean influence and the southern limit of distribution for most of the Western Palaearctic species (Figure 4). It is also the area most densely populated by humans. Only Bonelli's eagle and Eleonora's falcon are found further south in Morocco. Bonelli's eagle is the most abundant large eagle in North Africa, and it is a characteristic raptor of Mediterranean environments. It is well established in the Maghreb, including the northern Sahara, with a few pairs breeding in the eastern Red Sea mountains and southern Sinai in Egypt. Eleonora's falcon breeds in colonies on islands around the Mediterranean Sea and along the north-west coast of Africa in the middle of Morocco.

Other important areas are located in the Sahara desert, including the Ahaggar mountains and Tassili n'Ajjer plateau in southern Algeria; the Tibesti mountains, granite mountains and oasis of Kufra in south-eastern Libya; and the Nile delta and valley, Sinai–Red Sea mountains and Gebel Elba in Egypt.

The spatial distribution of threatened birds of prey species has a similar pattern (Figure 5), with most of the threatened species concentrated in the northernmost part of the Maghreb, in particular the Tingitana Peninsula in Morocco and the Mediterranean forests of Algeria, but also in Gebel Elba, the southern Nile Valley and southern Sinai in Egypt. Other areas with some threatened species occur along the coast from the Atlantic Sahara in Morocco to the Red Sea coast in Egypt, the whole Nile valley and some desert areas between Algeria and Morocco, southern Algeria and south-eastern Libya.

It should be noted that the North Africa region hosts five species of breeding vultures (lappet-faced, bearded, Egyptian, griffon and Rüppell's), all of them threatened at regional level, with very small populations in all countries except Algeria. This country has the last breeding population of the tawny eagle, the only breeding populations of the griffon and Rüppell's vultures in the region and an apparently large population of Egyptian vultures, suggesting that it could act as a source of individuals for these three species to recolonise the region.

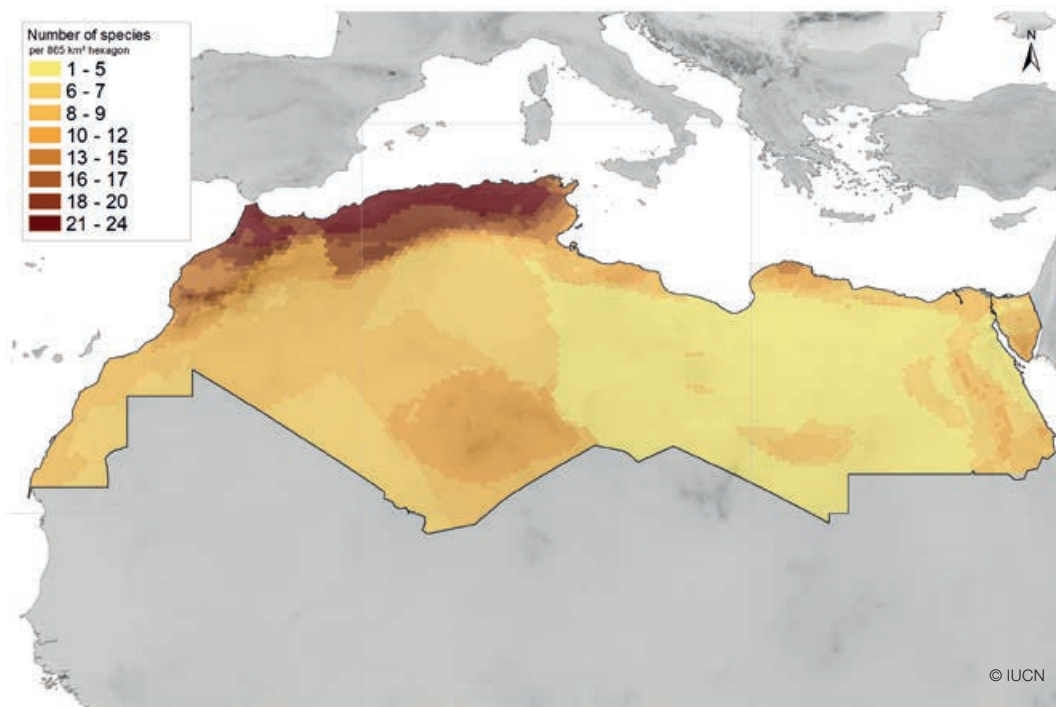


Figure 4. Species richness of breeding raptors of North Africa. Map based on the data collected by the authors.

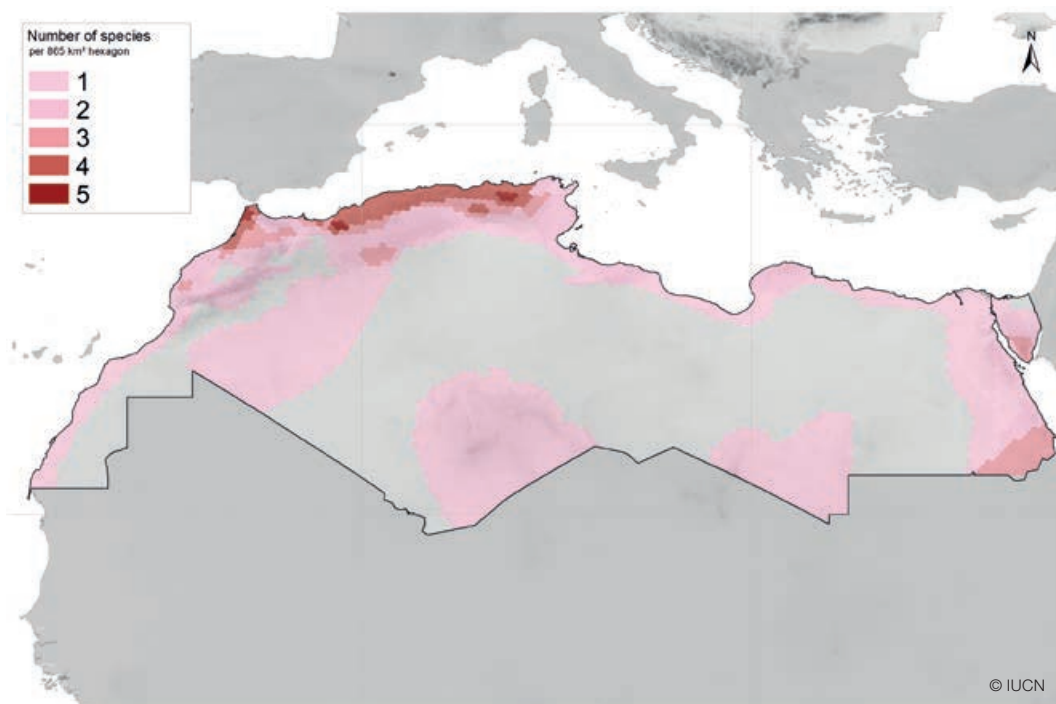


Figure 5. Species richness of threatened breeding raptors of North Africa. Map based on the data collected by the authors.

### 3.7. Major threats to raptors in North Africa

A summary of the major threats to breeding raptors in North Africa, according to the IUCN Threats Classification Scheme, is presented in Figure 6.

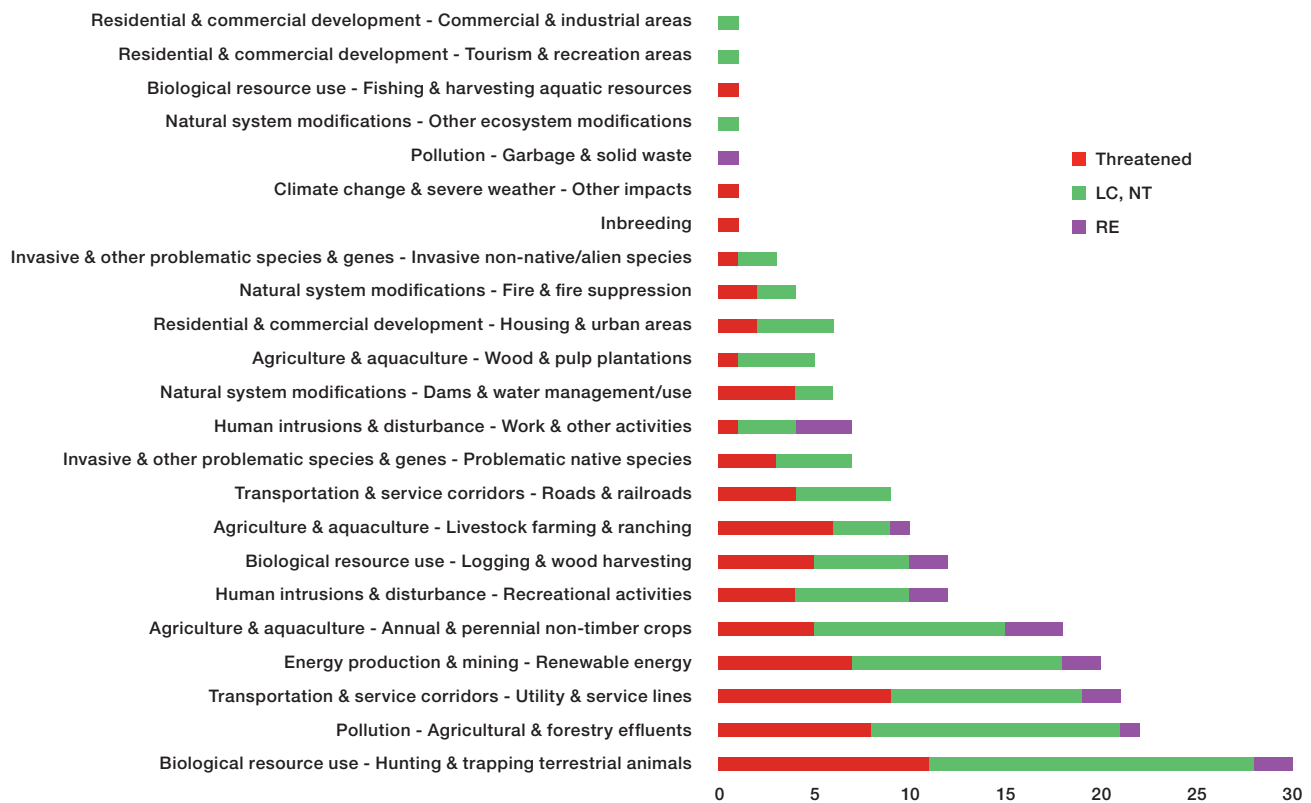


Figure 6. Summary of threats to all native species assessed in the North African region.

The whole region of North Africa faces the problem of raptor poaching for illegal trade (Emile et al., 2014; Brochet et al., 2016; MaghrebOrnitho, 2020). This is important for hawks and especially falcons, particularly sooty, lanner and peregrine falcons, some of which are trapped for falconry (Brochet et al., 2016) and traded in international and local markets. There is also evidence of illegal trade in all owl species in North Africa (Brochet et al., 2016), but these can be considered anecdotal events (Red List Review Workshop Tunisia, 2020).

Illegal killing by poaching and shooting is a major threat confirmed at least for large eagles in Morocco and Libya (Karim Rousselon, pers. comm., 2019; S. Buirzayqah, pers. comm., 2020).

Vultures and other scavenger raptors such as the Spanish imperial eagle, tawny eagle and red kite were extirpated from huge areas of North Africa in the 20<sup>th</sup> century because of their scavenging habits. They were often unintended victims of poisons used for predator control by farmers (Garrido et al., 2014; Andevski, 2017; Botha et al., 2017). Algeria appears to be the only country where this threat did not affect breeding populations, so it is where the greatest diversity of birds of prey exists and it is the last refuge for many of the species, especially the Egyptian vulture and tawny eagle.

Another important threat is the use of pesticides and rodenticides in agriculture, which can have a negative impact on breeding success, reduce prey density and cause secondary poisoning through consumption of





**Poisoning could be limiting recovery of threatened populations of scavengers species such as Egyptian vultures *Neophron percnopterus*, listed as EN in North Africa. © Íñigo Fajardo**

poisoned corpses. Internationally banned organochlorine pesticides are locally available, poisoning animals and polluting soils and water (Garrido et al. 2014). Cases of poisoning at rubbish dumps have been found in some scavenger species. Nevertheless, these places are key feeding habitats when they are properly managed (JMM and Associates, 2015). Additionally, veterinary application of the non-steroidal anti-inflammatory drug diclofenac, which has caused the near-extinction of several *Gyps* vultures in India, may have a negative impact on vulture species in this region too.

Habitat destruction and disturbance, especially of forests due to the use of wood as fuel for cooking and heating and the felling of large trees to clear land for crops and livestock are also an important threat. This especially affects raptors that nest in trees and may lead them to abandon their breeding territories (Stuart and Collar, 1988; Garrido et al., 2005; Vernon et al., 2005; Fellous, 2017; Tellería et al., 2019). This could be the reason why Bonelli's and golden eagles have apparently stopped nesting in trees in Morocco (Cuzin, 2019). The conversion of grasslands to agricultural land is the main threat to Montagu's harrier and the marsh owl. These species are also affected by disturbance from farmers and pastoralists, and from birders in the case of the marsh owl. Finally, vultures and other scavenger species can be affected by food scarcity. Though livestock is very abundant, local traditions such as burying domestic ungulate carcasses decrease food resources for these species, especially in Morocco (Garrido et al., 2014; Allaoui and Cherkaoui, 2018).

The expansion of the electric power network during the last 50 years has caused an increase in electrocutions on power lines (Garrido, 2019) (Box 1). Electrocutions have been identified as a major threat in Morocco (Godino et al., 2016; UICN and DEF, 2020) and Algeria (Abdelguerfi and Ramdane, 2003), but it must be common across

the rest of North Africa as well, due to the lack of policies to retrofit power lines. This threat affects breeding and wintering populations of eagles, falcons, long-legged buzzards, vultures and owls (Godino et al., 2016; IUCN and DEF, 2020). Dangerous power lines may also limit the possibility of re-colonisation by Spanish imperial eagles (Morandini et al., 2019) and the survival of red kites (Radi et al., 2020) in Morocco.

Collisions with vehicles cause mortality to most owls, kites and long-legged buzzards when they approach roads to feed on roadkill.

Additionally, almost all species of diurnal breeding raptors are highly vulnerable to wind farm developments. The increasing number of massive wind energy projects in the migratory corridors of northern Morocco, Tunisia and Egypt could pose a huge threat to migrant and dispersing threatened species such as Spanish imperial eagles, griffon, cinereous, Egyptian and Rüppell's vultures, Montagu's harriers, red kites and Eurasian hobbies. Similarly, the conversion of large eagles' feeding habitats to solar farms may also be an important potential threat.

Genetic erosion through inbreeding is a significant threat to the bearded vulture, tawny eagle, northern goshawk and marsh owl.

## BOX 1

### THE IMPACT OF POWER LINES ON BIRDS OF PREY

Although there is no estimate of bird mortality in North Africa, accidents involving raptors and electric power lines are among the main causes of non-natural mortality for many species and in some cases the greatest problem facing their conservation (Martín-Martín et al., 2019).

A well-documented recent case concerns a raptor electrocution black spot in south-western Morocco (Amezian et al., 2015; Godino et al., 2016). A total of 70 electrocuted birds, including many young individuals, belonging to 7 different species were found during the inspection of 403 pylons: 4 white storks (*Ciconia ciconia*), 4 Spanish imperial eagles, 5 golden eagles, 40 Bonelli's eagles, 12 long-legged buzzards, 4 lanner falcons and 1 Pharaoh eagle-owl. Other areas with high rates of raptor electrocution have since been found in various parts of the country, indicating that the problem is very widespread and is likely to be just as serious in other areas of North Africa. The data collected on the impact of power lines on birds, in particular raptors, revealed that power lines are a significant threat for several Regionally Extinct and threatened species, such as the Spanish imperial eagle and the griffon, Egyptian and Rüppell's vultures (Chapter 6).

Power lines may therefore be limiting the survival and population recovery of threatened species such as red kites and vultures, and they may also be reducing the chances of the Spanish imperial eagle recolonising Morocco. Governments, companies, financial institutions and other stakeholders must ensure that existing and planned energy infrastructure that is harmful to birds is identified and subject to urgent remediation. A practical guide to the identification and prevention of dangerous power lines for birds in the Maghreb region (Martín Martín et al., 2019) is freely available through the IUCN library system.

To improve bird habitats and minimise or eliminate deaths of priority bird species from these causes, the Safe Flyways project (<https://mava-foundation.org/oaps/reducing-mortality-of-migratory-birds-and-vultures/>) operates in the Mediterranean region developing research to support action and influence policies and strategies, raising awareness amongst stakeholders about priority issues, developing the capacity of local authorities and civil society to play an active role at national level, advocating the establishment of national policies and legislation, and implementing local activities to minimise threats in the most problematic localities.

## 4. Conservation actions

Landscapes of natural and agricultural habitats in the North African region are facing major losses of birds of prey due to illegal killing, illegal trade, mortality caused by human infrastructures and poisoning, and habitat loss especially of forests and wetlands.

Some conservation measures are in place for either species or ecosystems (Chapter 6), but they need to be reinforced and effectively implemented to preserve and recover raptor populations. Their protection status varies from one country to another, and there is an urgent need to implement conservation actions.

### 4.1. International instruments potentially relevant to the conservation and management of North African birds of prey

North African countries are signatories to a number of important treaties, conventions, agreements and regional instruments aimed at conserving biodiversity. The following are the most relevant to the conservation and management of birds of prey. Currently, all birds of prey are legally protected and listed in the appendices of international conventions (Table 5). More efforts are therefore needed to implement them more effectively.

**CITES** – the Convention on International Trade in Endangered Species of Wild Fauna and Flora is an international agreement between governments that aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival. The species covered by CITES are listed in [three Appendices](#), according to the degree of protection they need. CITES is legally binding on the Parties and provides a framework to be respected by each Party, which must adopt its own domestic legislation to ensure that CITES is implemented at the national level. The five North African countries are signatory parties of this Convention.

**Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention or CMS)**- **CMS** is an environmental treaty of the United Nations which brings together the States through which migratory animals pass, the Range States, and lays the legal foundation for internationally coordinated conservation measures throughout a migratory range. Migratory species threatened with extinction are listed in Appendix I to the Convention. CMS Parties strive towards strictly protecting these animals, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger them. Migratory species that need or would significantly benefit from international co-operation are listed in Appendix II to the Convention. For this reason, the Convention encourages the Range States to conclude global or regional agreements.

**CMS Memorandum of Understanding on the Conservation of Migratory Birds of Prey in Africa and Eurasia (Raptors MOU)**, is one of several instruments operating under the CMS. It aims to promote internationally coordinated actions to achieve and maintain the favourable conservation status of migratory birds of prey throughout their range in the African-Eurasian region, and to reverse their decline when and where appropriate.

**Multi-species Action Plan to Conserve African-Eurasian Vultures**, adopted by CMS parties in 2017, it provides a strategic conservation plan covering the geographic ranges (128 states) of all 15 species of migratory African-Eurasian ("Old World") vultures and promoting concerted, collaborative and coordinated international actions to save vultures species from further decline and extinction.



The growth of electrification in North Africa has increased the number of dangerous power lines for raptors resulting in deaths by collision with wires and, especially, electrocution on poles. Bonelli's Eagle electrocuted in Morocco. © Íñigo Fajardo

**CMS Task Forces** In response to serious problems with far-reaching international consequences and potentially severe impacts on the conservation of migratory species, the Convention has established Task Forces in conjunction with regular partners and other stakeholders. Two of them are tasked with reducing some of the main threats to birds of prey in North Africa:

- The Intergovernmental Task Force on Illegal Killing, Taking and Trade of Migratory Birds (MIKT) is intended to facilitate international cooperation and the implementation of existing guidelines and action plans for the eradication of illegal killing, trapping and trade of wild birds. All the countries of North Africa are members of this Task Force and responsible for the implementation of the agreed plans in their territories.
- The Energy Task Force is a multi-stakeholder initiative which works towards reconciling renewable energy developments with conservation of migratory species by avoiding and minimising the negative impacts of energy developments on migratory species. Only two North African countries, Morocco and Egypt, are members of the Task Force. Given the known impacts of energy infrastructure on birds of prey, it would be advisable for the other North African countries to join as members and work to apply best practices to avoid bird collisions with and electrocutions on power lines and collisions with wind farms.

Table 5. Legal protection of birds of prey at international level in North Africa.

	Common name	Scientific name	IUCN Red List Category at the Global level	IUCN Red List Category at the north African level	CMS Appendices	CITES Appendices
Falcons and kestrels	Lanner falcon	<i>Falco biarmicus</i>	LC (2016)	LC	II	II
	Sooty falcon	<i>Falco concolor</i>	VU (2017)	NT	II	II
	Eleonora's falcon	<i>Falco eleonorae</i>	LC (2016)	NT	II	II
	Lesser kestrel	<i>Falco naumanni</i>	LC (2018)	LC	II	I, II
	Peregrine falcon	<i>Falco peregrinus</i>	LC (2016)	LC	I	II
	Eurasian hobby	<i>Falco subbuteo</i>	LC (2016)	VU	II	II
	Common kestrel	<i>Falco tinnunculus</i>	LC (2016)	LC	II	II
Vultures	Cinereous vulture	<i>Aegypius monachus</i>	NT (2018)	RE	II	II
	Bearded vulture	<i>Gypaetus barbatus</i>	NT (2016)	CR	II	II
	Griffon vulture	<i>Gyps fulvus</i>	LC (2016)	VU	II	II
	Rüppell's vulture	<i>Gyps rueppelli</i>	CR (2016)	CR	II	I, II
	Egyptian vulture	<i>Neophron percnopterus</i>	EN (2019)	EN	II	I
	Lappet-faced vulture	<i>Torgos tracheliotos</i>	EN (2016)	CR	II	I, II
Eagles, hawks, harriers, kites and buzzards	Northern goshawk	<i>Accipiter gentilis</i>	LC (2016)	CR	II	II
	Eurasian sparrowhawk	<i>Accipiter nisus</i>	LC (2016)	LC	II	II
	Spanish imperial eagle	<i>Aquila adalberti</i>	VU (2019)	RE	I	I, II
	Golden eagle	<i>Aquila chrysaetos</i>	LC (2016)	LC	II	II
	Bonelli's eagle	<i>Aquila fasciata</i>	LC (2016)	LC	II	-
	Tawny eagle	<i>Aquila rapax</i>	VU (2018)	CR	II	II
	Long-legged buzzard	<i>Buteo rufinus</i>	LC (2016)	LC	II	II
	Short-toed snake eagle	<i>Circaetus gallicus</i>	LC (2016)	NT	II	II
	Western marsh-harrier	<i>Circus aeruginosus</i>	LC (2016)	NT	II	II
	Montagu's harrier	<i>Circus pygargus</i>	LC (2016)	EN	II	II
	Black-winged kite	<i>Elanus caeruleus</i>	LC (2019)	LC	II	-
	Booted eagle	<i>Hieraaetus pennatus</i>	LC (2016)	LC	II	II
	Dark chanting-goshawk	<i>Melierax metabates</i>	LC (2016)	RE	II	-
	Black kite	<i>Milvus migrans</i>	LC (2020)	LC	II	II
	Red kite	<i>Milvus milvus</i>	LC (2020)	CR (Possibly Regionally Extinct)	II	II
	Osprey	<i>Pandion haliaetus</i>	LC (2016)	EN	II	II
Owls	Marsh owl	<i>Asio capensis</i>	LC (2016)	CR	II	-
	Northern long-eared owl	<i>Asio otus</i>	LC (2018)	LC	II	-
	Little owl	<i>Athene noctua</i>	LC (2018)	LC	II	-
	Pharaoh eagle-owl	<i>Bubo ascalaphus</i>	LC (2016)	LC	II	-
	Common scops-owl	<i>Otus scops</i>	LC (2019)	LC	II	-
	Tawny owl	<i>Strix aluco</i>	LC (2016)	LC	II	-
	Barn owl	<i>Tyto alba</i>	LC (2016)	LC	II	-



## 5. Conclusions and recommendations

This report represents the first regional IUCN Red List assessment of the breeding birds of prey in North Africa. Thirty-six of the 46 species occurring in the North African countries have breeding populations in the region, but 12 of them are threatened with extinction and 3 are considered extinct in the region. Threatened species are concentrated in the northernmost part of the Maghreb, in particular the Tingitana Peninsula in Morocco and the Mediterranean forests of Algeria, and in the Gebel Elba mountains, southern Nile Valley and southern Sinai in Egypt. There is a significant lack of data on population status and trends for most of the species, highlighting the need to regard census programmes as priorities for research and funding.

The outputs of this assessment can be used to inform conservation measures for individual species and suites of species. They can also be applied at the regional scale to assist governments and organisations, such as IUCN, in identifying important sites for conservation, including Key Biodiversity Areas, at national or regional scales.

To improve the conservation status of north African raptors urgent conservation measures are needed. In particular:

- Breeding and wintering populations of raptors, especially of threatened species, need to be surveyed and monitored to determine, protect and manage existing and potential breeding areas. Only regular counts can provide the data required to follow up raptor populations in detail.
- Satellite tracking of birds of prey should be carried out to locate key breeding, dispersal and wintering areas and to identify causes of unnatural mortality and other threats in order to reduce them.
- National and international legislation should be fully implemented and revised to protect the threatened species identified in this assessment and their habitats.
- Species/habitat action plans should be drawn up for the most threatened species to enable their populations to recover to the point where they can be downlisted in the regional Red List.



- The strong regional cooperation between experts must continue and new cooperation efforts must be initiated with experts from countries where information is scarce, so that the work carried out to produce this first evaluation of the conservation status of native North African raptors can be updated as new information becomes available.
- Links between IUCN and its partners and decision and policy makers must be maintained and strengthened, and the data must be made freely available to all individuals and organisations.
- Important nesting areas need to be identified and protected and human disturbance around nest sites must be avoided, especially in the case of tree-breeding species. Appropriate management of woodlands should maintain old trees, prevent fires and mitigate the impact of road construction.
- Wide-scale habitat conservation measures are required, including the maintenance of low-intensity farming with the preservation of hedges and careful management of pesticides. Any unavoidable afforestation or deforestation should occur outside the breeding season and should only result in partial, not total, habitat change.
- Raptors need to be effectively protected in breeding and wintering areas with a plentiful supply of food (which often includes the carrion of domestic animals). The provision of feeding stations would be beneficial for vultures, tawny eagles and red kites, particularly when food is scarce. Selection of areas and intervention methods should be included in the species action plans and protocols must be followed to ensure the safety and survival of the birds.
- Reintroduction and population reinforcement programmes could be used to restore Regionally Extinct and threatened species, if they are properly planned and focus on reducing threats.
- Dangerous electricity pylons should be retrofitted to avoid electrocutions and dangerous lines should be marked to avoid collisions. Priority areas for power line mitigation work should be identified and measures to reduce mortality put in place in line with current best practice (see Box 1).
- A strategy to combat poisoning, poaching, shooting and illegal trade should be developed and implemented enforced, including stronger legislation and its enforcement, systematic monitoring at national scale, staff and police training, effective restrictions on access to and use of toxic substances, collection of information and promotion of experience-sharing between countries facing similar issues.

# 6. Regionally Extinct, Threatened and Near Threatened species assessment sheets

## Cinereous vulture, *Aegypius monachus* - (Linnaeus, 1766)

POPULATION SIZE

AOO

EOO

TREND

### NORTH AFRICA REGIONAL ASSESSMENT: REGIONALLY EXTINCT (RE)

This species is listed as Regionally Extinct in North Africa because there is no evidence of breeding for the last 80 years. However, movements of Spanish birds through Morocco every year indicate it could recolonise Morocco due to an increase in the Iberian population, as long as management measures are adopted to mitigate the impact of threats such as electrocution and disturbance. A possible reintroduction programme should also be considered.

### DISTRIBUTION

The original breeding range of the species included Morocco and Egypt, but it was extirpated during the 20<sup>th</sup> century and now it is a rare migrant to Morocco and north-eastern Egypt (mainly dispersing juveniles) (Raw, 1921; Goodman and Meininger, 1989; Andevski, 2017; Andevski et al., 2017; Clark and Davies, 2018). The species probably bred until the 1930s in northern Morocco (southern Tangier, Central Plateau and Middle Atlas) (Thévenot et al., 2003) and in the Nile Valley in Egypt (Goodman and Meininger, 1989). It was also sighted in Algeria in the 19<sup>th</sup> century but it could have been confused with the lappet-faced vulture (Isenmann and Moali, 2000). The species was at the southern edge of its range in North Africa and it was never very abundant. Vagrant individuals coming from Europe have been sighted in Tunisia (Isenmann et al., 2005), passing through Algeria (Andevski et al., 2017) and even into Mauritania and Mali (GREFA, 2020; F. Lörcher pers. comm.). It is a regular non-breeding visitor in Morocco, passing on to more southern countries (MaghrebOrnitho, 2018c).



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Extant & Vagrant (passage)

Distribution range of the Cinereous vulture, *Aegypius monachus* - (Linnaeus, 1766) in North Africa. Source: The IUCN Red List of the breeding birds of prey of North Africa.



## POPULATION

The North African population of the species is likely to have survived because of immigration from the larger Spanish population, but its decline during the 20<sup>th</sup> century was too strong. Nowadays, populations are increasing in Europe, especially in Spain, where there are at least 2,550 breeding pairs (Del Moral, 2017), and since 2003 individuals have been regularly recorded crossing the Strait of Gibraltar – mainly juveniles (El Khamlichi, 2016, 2017; MagrhebOrnitho, 2017, 2018a), but also older birds (MagrhebOrnitho, 2018b). Therefore, there is a potential for the re-establishment of a Moroccan breeding population if threats disappear.

## HABITATS AND ECOLOGY

The cinereous vulture used to breed in trees at low altitudes in North Africa (Thévenot et al., 2003; Clark and Davies, 2018) in sparsely inhabited forested areas similar to its Iberian habitats. The species is a partial migrant (Bildstein, 2006), and sedentary in some areas, but many individuals winter south of the breeding range and there is a considerable degree of nomadism. In Europe, the adults are mostly sedentary while the juvenile birds disperse over larger areas (Andevski, 2017). Currently, a few birds – probably only a few dozen annually – visit Morocco and reach as far south as West Africa (MaghrebOrnitho, 2018c). Their diet consists mainly of medium-sized or large mammal carcasses, although snakes and insects have been recorded as food items. Live prey is rarely taken.

## THREATS

As with other scavenger species, widespread accidental poisoning, largely with strychnine used by many farmers for predator control, and more recently with carbofuran, has contributed significantly to declines (Garrido et al., 2014; Andevski, 2017; Botha et al., 2017). Internationally banned organochlorine pesticides, still locally available, are used to kill wildlife and they pollute the environment (Mundy et al., 1992; Garrido et al., 2014; Andevski, 2017). There are fears that veterinary application of the non-steroidal anti-inflammatory drug diclofenac, which has caused the near-extinction of several *Gyps* vultures in India, may have a negative impact on *Aegypius monachus* (Inskipp et al., 2016).

Food availability for the species is decreasing due to the almost complete absence of wild ungulates, which is caused by the increase and spread of the human population and by habitat change (Garrido et al., 2014; Andevski, 2017). Additionally, although livestock are very abundant, local traditions such as burying domestic ungulate carcasses decrease food availability for scavengers, especially in Morocco (Garrido et al., 2014; Allaoui and Cherckaoui, 2018). Felling trees to clear land for agriculture and disturbance due to the intensive use of forests for timber extraction pose a particular threat to tree-nesting raptors (such as the cinereous vulture) and can lead them to abandon their breeding territories (Margalida et al., 2011). In the Middle East, Andevski (2017) indicates other threats: poisoning at dump sites because of the lack of waste management, hunting, poaching and collisions with wind turbines and power lines. Another threat is likely to be electrocution on energy infrastructure as in other areas of its range (Shimelis et al., 2005).

## CONSERVATION

**Conservation actions in place:** CITES Appendix II, CMS Appendix II. Included in a multi-species action plan for African–Eurasian vultures (Botha et al., 2017). There are some initiatives to build feeding stations, rescue and release sick and injured wild individuals, and tag vultures (including attaching GPS loggers) in Morocco (R. El Khamlichi, pers. comm., 2019; K. Rousselon, pers. comm., 2020).

**Conservation actions needed:** Non-intensive livestock management systems should be maintained to ensure a food supply; feeding stations could be beneficial when food is scarce. Reintroduction has been successful in parts of its range (Botha et al., 2017). Effectively managed open landfill sites could be key feeding habitats (JMM and Associates, 2015). The ban on poisoned carcasses should be enforced and the leaving of dead animals encouraged. Surveys of the migrant European population should be conducted to determine, protect, and manage potential breeding sites and the key dispersal area. Diclofenac and other harmful NSAIDs should be controlled. Legislation regulating the trade in pesticides used to poison meat baits should be strengthened and enforced.

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 Reviewer(s): Monti, F. & Numa, C. / Contributor(s): Gyenge, P., BirdLife International, El Khamlichi, R. & Lörcher, F.  
 Date: 2020–09–07



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## Spanish imperial eagle, *Aquila adalberti* - Brehm, 1861

POPULATION SIZE

AOO

EOO

TREND

### NORTH AFRICA REGIONAL ASSESSMENT: REGIONALLY EXTINCT (RE)

This species qualifies as Regionally Extinct because there is no evidence of breeding over the last 30 years. However, it could recolonise Morocco either naturally through an increase in the Iberian population or via a possible reintroduction programme, provided that management measures are adopted to mitigate the impact of threats such as electrocution and disturbance.

### DISTRIBUTION

Most of the population of this eagle breeds in Spain, with a small but increasing population in Portugal. The original breeding range of the species included the Iberian Peninsula, northern Morocco and Algeria. The species bred in northern Morocco (Tangier Peninsula, northern Rharb, Mamora Forest, Zaër, Western Middle Atlas and Rif) until the first half of the 20<sup>th</sup> century, with only three breeding records later in 1977, 1991 and 1995 in the Rif Mountains (Fouarge, 1992; Thévenot et al., 2003). It was also cited as a breeder in Algeria in the 19<sup>th</sup> century (Isenmann and Moali, 2000). The species was sighted in the second half of 20<sup>th</sup> century in western and northern Algeria and Libya (Isenmann and Moali, 2000; Isenmann et al., 2016; Morandini et al., 2019). The species was at the southern edge of its range in North Africa, and survived here thanks to immigrants from the larger Spanish population (Ferrer, 2001), although it was never very abundant in this region (Tellería et al., 2019). The species is a regular non-breeding visitor in Morocco and Algeria and frequents a few wintering areas in Morocco, mainly in the south but also in the east of the country (Morandini et al., 2019). There are five main temporary settlement areas in Morocco (Kenifra, Mamora, Low Draa, Missouri and Western Coast of Atlantic Sahara) and one in western Algeria around Tindouf (Spanish Imperial Eagle Action Plan of Junta de Andalucía, pers. comm.).

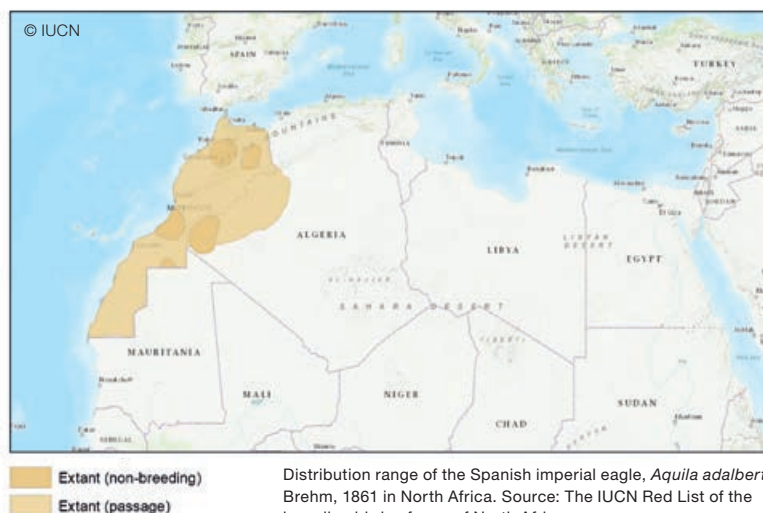
## POPULATION

The North African population is likely to have survived because of immigration from the larger Spanish population, until it declined during the 20<sup>th</sup> century due to human persecution (Ferrer, 2001). In Algeria, even when it was breeding in the 19<sup>th</sup> century, it was already considered very rare and was dependent on immigration from populations outside the country. When the Iberian population almost went extinct in the 20<sup>th</sup> century, very few individuals crossed to Africa, but the growth in the Spanish population in the last 15 years has resulted in an increasing number of birds crossing to Morocco (Garrido, 2019; Morandini et al., 2019). Young Spanish imperial eagles have been visiting Morocco since 2000 and wintering in the Guelmin/Tan-Tan region because of the high periodic abundance of prey, such as fat sand rats (*Psammomys obesus*) (Bergier et al., 2017; Garrido, 2019). Several dozen juveniles are observed each year crossing the Strait of Gibraltar and this number is increasing (A. Onrubia, pers. comm.). In 2016–19, tagged Spanish imperial eagles with GPS–GSM transmitters from southern Spain moved throughout Morocco, including the north, the Middle and High Atlas, the Anti-Atlas, the Atlantic coast, the Sahara and the eastern provinces, and even into western Algeria and Mauritania (Morandini et al., 2016, 2019; García and Garrido, 2017, 2019; Spanish Imperial Eagle Action Plan of Junta de Andalucía, pers. comm.). Although most of the eagles returned to Spain in less than a year, there are data showing individuals staying in Morocco for two and three years, until breeding age (Godino et al., 2016; García and Garrido, 2017, 2019). As a result of the population increase in Andalusia and the Iberian Peninsula an increasing number of immature Spanish imperial eagles are visiting Morocco, so there is a chance that a Moroccan breeding population may become re-established (Morandini et al., 2019).

## HABITATS AND ECOLOGY

This species used to breed in large, tall trees in forested plains and hills in North Africa, including in open cork oak woodlands surrounding lowland marshes (Thévenot et al., 2003). These sparsely populated Mediterranean forests were similar to the species' current Iberian habitat. In Spain, tree height and distance from human activities are the most important variables that explain nest site selection (Bisson et al., 2002), but many recently colonised territories are located in human-modified habitats, especially farmlands with high rabbit abundance (González and Oria, 2004; Castaño, 2005; González et al., 2006; Margalida et al., 2007; García and Garrido, 2019).

Breeding birds are sedentary, but immature birds are nomadic, dispersing in Morocco and Algeria through open feeding areas (Moroccan Sahara, eastern Morocco, forest hunting reserves in western Morocco, and the Parc Culturel de l'Atlas Saharien in eastern Algeria) where eagles find sufficient prey, including fat sand rats, Barbary ground squirrels, partridges and large lizards (Morandini et al., 2016, 2019; Fellous, 2017; García and Garrido, 2017, 2019). There are several main temporary settlement areas in Morocco and Algeria (Morandini et al., 2019). The small number of settlement events in North Africa may be due to the difficulty of finding optimal food patches because of the absence of the eagles' usual prey (rabbits) and the irregularity of possible alternative prey, such as small rodents of arid zones that have demographic explosions associated with periods of seasonal rains (Morandini et al., 2019; Spanish Imperial Eagle Action Plan of Junta de Andalucía, pers. comm.). This irregular, seasonal distribution of alternative prey may have led the birds to disperse over greater areas to find food and to move longer distances during exploratory forays, resulting in greater dispersion in their temporary settlements in North Africa (Morandini et al., 2019).



## THREATS

The re-establishment of the species in Morocco can only be successful if the threats to its survival (electrocution, prey scarcity and human persecution and disturbance) are reduced not only in potential breeding areas but also in dispersal and settlement areas, such as protected hunting reserves in northern Morocco and the areas found by Morandini et al. (2019). In south-western Morocco, a 24 km power line is the main known black spot for non-natural mortality of raptors in the Maghreb, killing Spanish imperial eagles dispersing from Spain (Godino et al., 2016). Another power line in south-eastern Morocco also kills dozens of raptors annually, including one Spanish imperial eagle from southern Spain (UICN and DEF, 2020; Garrido and García, 2017). Another eagle was electrocuted in the north-east of the country in 2019 (Spanish Imperial Eagle Action Plan of Junta de Andalucía, pers. comm.). Electrocution is an important threat because the electrification of Morocco has been progressing in the last 30 years without measures to protect birds perching on poles. This problem could limit the chances of the Spanish Imperial Eagle recolonising Morocco (Morandini et al., 2019). Collisions with power infrastructure may also be a significant mortality factor, as in other areas of the world, but the lack of survey and monitoring programmes makes it difficult to assess this threat.

Unintended poisoning, even resulting from Moroccan government measures, was the main reason for the extirpation of raptors, including Spanish imperial eagles, in the 20<sup>th</sup> century. The poison was introduced into the environment to target livestock predators such as jackals, wolves, feral dogs or leopards. However, this threat seems to be less important today (Garrido et al., 2014). In Morocco tagging of large eagles (Spanish imperial, golden and Bonelli's eagles) with GPS loggers is showing they are being shot and hunted (K. Rousselon, pers. obs.). The increase and spread of the human population has also led to habitat destruction and disturbance (Stuart and Collar, 1988; Garrido et al., 2005; Vernon et al., 2005; Fellous, 2017; Tellería et al., 2019), especially in forests due to the use of wood as fuel for cooking and heating and the felling of large trees to clear land for crops and livestock. Forest destruction and human disturbance due to intense human use especially threatens tree-nesting raptors like the Spanish imperial eagle, leading them to abandon their breeding territories. Human population growth caused a decline of wild ungulates and other prey because these animals were hunted to feed people. Other anthropogenic threats are fragmentation of habitats due to the increase of road networks, buildings, dams, power lines, etc. (BirdLife International, 2018a). Similarly, the increasing number of massive wind energy projects in northern Morocco could kill Spanish imperial eagles crossing the Strait of Gibraltar.

## CONSERVATION

**Conservation actions in place:** CITES Appendix I. CMS Appendices I and II. There are some initiatives to rescue and release sick and injured wild individuals and to tag eagles (including attaching GPS loggers) in Morocco (K. Rousselon, pers. comm., 2019).

**Conservation actions needed:** Efforts are needed to increase awareness about biodiversity conservation. Actions to reduce mortality, particularly from electrocution, should include establishing priority areas for power line mitigation work, modifying dangerous power lines, and avoiding the construction of wind farms in key areas for the species. Additionally, new power lines should be constructed using only safe designs, and similar legislation should be in place for fixing existing dangerous power lines. Also a species reintroduction programme could accelerate any eventual successful recolonisation. Finally, surveys are required of the Iberian dispersing population to determine, protect and manage potential breeding sites and the key dispersal area.

Assessor(s): Garrido López, J.R., Bergier, P., Rousselon, K., Cherkaoui, I., Etayeb, K., Buirzayqah, S. & Fellous-Djardini, A.

Reviewer(s): Monti, F. & Numa, C.

Contributor(s): Gyenge, P., Onrubia, A., Haitham, O., BirdLife International & Spanish Imperial Eagle Action Plan of Junta de Andalucía.

Date: 2020-09-07



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## Dark chanting-goshawk, *Melierax metabates* - Heuglin, 1861

POPULATION SIZE

AOO

EOO

TREND

### NORTH AFRICA REGIONAL ASSESSMENT: REGIONALLY EXTINCT (RE)

This species qualifies as Regionally Extinct in North Africa because there has been no evidence of its presence in North Africa since 2007 (its last breeding attempt having been in 1979), even though it has been actively searched for many times by many experienced ornithologists.

### DISTRIBUTION

The dark chanting-goshawk is a widespread resident raptor occurring over large areas of sub-Saharan Africa, which had isolated populations of the endemic subspecies *M. m. theresae* in south-west Morocco. The original breeding range of the species in North Africa included Morocco, restricted to the argan forests of the Souss Valley and adjacent Anti-Atlas foothills (Vernon et al., 2005), but now it is extinct here with the last nesting data from 1979 (Heinze and Krott, 1979). The species was at the northern edge of its range in North Africa.

### POPULATION

The total population was estimated at a few dozen pairs in the 1980s (Thévenot et al., 1985), but the last record of nesting individuals was one pair at a nest with young in an abandoned olive grove in 1979 (Heinze and Krott, 1979). The species was never very abundant in North Africa and was already considered rare by Lynes (1925). In more recent years there have been only four sightings in the region of Souss, but none since 2007, although it has

been actively searched for many times by many experienced ornithologists (Fareh et al., 2016), which indicates that this species has definitely become extinct in Morocco. The species was extirpated due to changes in land use in the Souss region (P. Bergier, pers. obs.).

### **HABITATS AND ECOLOGY**

This species mostly occupied argan woodland, but also old olive groves, thornbush, palm and orange groves in Morocco (Thévenot et al., 2003). Outside this region the species persists, and it takes a wide variety of prey, especially lizards but also snakes, birds, mammals and insects (Clark and Davies, 2018). Adult pairs are territorial and build stick nests in the crowns of the trees. They usually raise only one young, although often two eggs are laid (Clark and Davies, 2018).

### **THREATS**

The growth and spread of the human population has resulted in habitat destruction and disturbance, especially in argan forests because of the use of wood as fuel for cooking and heating, and the felling of large trees to clear land for agriculture (Bergier, 1987; Vernon et al., 2005). Intense human use of forests especially threatens tree-nesting raptors like the dark chanting-goshawk, leading them to abandon their breeding territories. The human impact includes the increase in herds of goats, which climb on argan trees and must disturb breeding birds (A. Qninba, pers. comm.).

### **CONSERVATION**

**Conservation actions in place:** CITES Appendix II.

**Conservation actions proposed:** There is a low likelihood that the species will naturally recolonise its former range in North Africa, but argan forest first needs to be protected to prevent further extinctions in this habitat. A future reintroduction programme with southern dark chanting-goshawks could be attempted after the feasibility of such a programme in Morocco has been assessed.

Assessor(s): Bergier, P., Rousselon, K., Cherkaoui, I., Monti, F. & Garrido López, J.R.

Reviewer(s): Numa, C. & Qninba, A.

Contributor(s): Gyenge, P., Bakass, B., BirdLife International & Qninba, A. Date: 2020-09-08



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## Northern goshawk, *Accipiter gentilis* - (Linnaeus, 1758)

POPULATION SIZE	AOO	EOO	TREND
40 mature individuals	-	2,200 km <sup>2</sup>	↓

### NORTH AFRICA REGIONAL ASSESSMENT: CRITICALLY ENDANGERED (CR) C2a(i,ii); D (IUCN version 3.1)

In North Africa this species has a small population size, with fewer than 40 mature individuals distributed in only one subpopulation. Sighting records from Morocco between 1985 and 2020 show the population in the region has potentially been in continuous decline for the last 21 years (3 generations). Threats such as forest destruction, human disturbance and nest robbery are still ongoing and have a major impact on nest abandonment. The species is listed as Critically Endangered (CR C2a(i,ii); D) based on the small number of mature individuals, the distribution in a single subpopulation and the low probability of immigration from other subpopulations.

### DISTRIBUTION

The northern goshawk is predominantly a wintering bird from Europe, and North Africa marks the southern limit of its distribution. An increasing population has been observed in Europe but it is a very rare and local breeder in northern Morocco, where its distribution has been reduced drastically since the 1980s (Thévenot et al., 2003; Clark and Davies, 2018; Cuzin, 2019). Currently, the species seems to be confined to the Tangier region, in reforestation forests of pines and *Eucalyptus* (Cuzin, 2019), but it used to inhabit forests up to ca. 2,000 m, mainly of oak (*Quercus suber* and *Q. faginea*) in the Rif (Maes, 1978), but it has nested in *Pinus halepensis* and mixed Atlas Cedar and oak forests in the Middle Atlas (Go-South, 2016). It is possible that breeding still occurs in northern Algeria and Tunisia (Isenmann and Moali, 2000; Isenmann et al., 2005; Azafzaf et al., 2015), but there have been no recent observations. Migrant and wintering birds visit Egypt, along the River Nile and in the Red Sea Mountains (Clark and Davies, 2018), and eastern Libya (Isenmann et al., 2016; S. Buirzayqah, pers. obs.).

## POPULATION

Thévenot et al. (2003) estimated no more than 100 breeding pairs in Morocco in 1985, but Cuzin (2019) only found 6 breeding pairs. It is suspected there are no more than 30 mature individuals, but further validation of this estimate is needed. No data on the breeding population is available for Algeria and Tunisia, but the species is suspected to breed there but probably in smaller numbers than in Morocco. It is therefore calculated that the North African population could be around 20 breeding pairs (40 mature individuals). Under the assumption that the rate of decline in Algeria and Tunisia is similar to Morocco and has been constant over time since 1985, it is suspected that population decline in the last 21 years (3 generation lengths) has been around 69%.

## HABITATS AND ECOLOGY

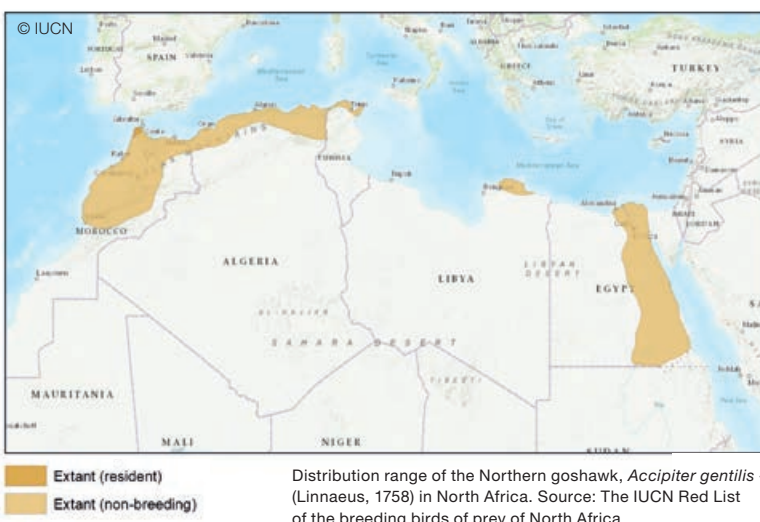
The species occurs in wooded hills and mountains, with wintering birds occurring in a variety of wooded habitats near open areas (Clark and Davies, 2018). The species' optimal habitat appears to be areas of farmland interspersed with mature forest, such that afforestation has improved its status across parts of its global range (del Hoyo et al., 1994). Soaring flight is used frequently (Snow and Perrins, 1998); and northern goshawks can be seen singly or in pairs (Ferguson-Lees and Christie, 2001). In Libya, the species is observed from October to April (S. Buirzayqah, pers. obs.), while sightings during the migration period in Tunisia come from March to May (H. Azafzaf, pers. obs.). Individuals prey on small to large birds and mammals (del Hoyo et al., 1994; Clark and Davies, 2018).

Northern goshawks build nests high in tall trees, usually in extensive forests (Clark and Davies, 2018), and breed from February to June (Thévenot et al., 2003). They used to breed in oak (*Quercus suber* and *Q. faginea*) forests in the Moroccan Rif (Maes, 1978) and in *Pinus halepensis* and mixed Atlas Cedar and oak forests in the Middle Atlas, also in Morocco (Go-South, 2016), but today it only uses pine and *Eucalyptus* forests (Cuzin, 2019). Two nests found by Maes (1978) were placed 10–12 m above the ground in *Quercus faginea*. Usually only three eggs are laid in Morocco (Maes, 1978; Go-south, 2016).

## THREATS

The increase and spread of the human population is causing habitat destruction and disturbance especially in forests because of the use of wood as fuel for cooking and heating; felling trees to clear land for crops and pasture is an additional threat factor (Bergier, 1987; Stuart and Collar, 1988; Garrido et al., 2005; Vernon et al., 2005; Cherkaoui et al., 2009). Forest destruction and human disturbance due to intense human use especially threatens tree-nesting raptors like the northern goshawk (Cuzin, 2019), leading them to abandon their breeding territories. Habitat fragmentation results from forest fires and road construction as well.

Persecution continues to be a threat, as well as nest robbery for falconry (Orta and Marks, 2014; Brochet et al., 2016; Moroccan Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat). The species is also highly vulnerable to the impacts of wind farm developments (STRIX, 2012). The recent development of power lines is also a threat (Cuzin, 2019).



## CONSERVATION

**Conservation and research actions in place:** CITES Appendix II. CMS Appendix II. In Morocco, the species is included in the preparation of a raptor conservation strategy (<https://www.iucn.org/news/mediterranean/202001/first-steps-towards-a-moroccan-strategy-raptor-conservation-iucns-guidance>).



**Conservation and research actions needed:** Wide-scale habitat conservation measures are required, including the maintenance of low-intensity farming with the preservation of hedges and a reduction in pesticide use. Appropriate management of woodlands should maintain old trees, prevent fires and limit road construction. Any unavoidable afforestation or deforestation should occur outside the breeding season and should only result in partial habitat change. Population monitoring should be conducted to provide data about the population size and trend and to determine, protect and manage breeding sites and key migration areas. In view of the multiple threats, monitoring of the North African population is crucial to track how it is being affected. Research is also needed on the impact of certain specific threats (e.g. trade), and can be used to help develop an action plan. More broadly, awareness of biodiversity conservation should be increased.

Assessor(s): Rousselon, K., Cherkaoui, I., Bergier, P., Azafzaf, H., Haitham, O., Chokri, M.A., Buirzayqah, S., Riad, A. & Monti, F.

Reviewer(s): Garrido López, J.R. & Qninba, A.

Contributor(s): Gyenge, P., Bakass, B. & BirdLife International

Date: 2020-09-07



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## Tawny eagle, *Aquila rapax* - (Temminck, 1828)

POPULATION SIZE	AOO	EOO	TREND
40 mature individuals	-	191,148 km <sup>2</sup>	↓

### NORTH AFRICA REGIONAL ASSESSMENT: CRITICALLY ENDANGERED (CR) C2a(i,ii); D (IUCN version 3.1)

In North Africa, the tawny eagle has a small and declining population estimated to number less than 40 mature individuals in one subpopulation. There is no evidence of immigration from other breeding populations. Furthermore, the species is also threatened in sub-Saharan countries. For these reasons the species is listed as Critically Endangered under criterion C2a(i,ii) and D.

### DISTRIBUTION

The tawny eagle is a widespread raptor occurring over large areas of sub-Saharan Africa, with an isolated subpopulation in North Africa. The original breeding range of the species in this region included Morocco, northern Algeria and Tunisia. The species bred throughout Morocco, from the Tangier Peninsula to the Sahara through Souss and the western Middle Atlas, until the first half of the 20<sup>th</sup> century (Thévenot et al., 2003; F. Cuzin, pers. obs.). Since then, there have been only a small number of breeding records in Souss in 1980, 1981, 1990 and 1992 (Thévenot et al., 2003). The latest sightings are confined to a region ranging from northern Agadir to Tan Tan, in lowland areas, hills and low mountains (less than 1,200 m.) (F. Cuzin, pers. obs.). The last nine mentions of the species (out of 29 received) accepted by the CHM (Morocco Rare Birds Approval Committee) are from 2006, at the Oued Massa estuary and in the Tan Tan region (northern Moroccan Sahara).

Since then, all the reported observations of this species have been rejected: in every case a photograph revealed the bird to be a Spanish imperial eagle, since the two species are easy to confuse because of their similarities, at least at juvenile age (F. Cuzin, pers. obs.). The last known nests were in argan trees in open areas of the Souss,

western High Atlas and Anti-Atlas in 1992 (Thévenot et al., 2003). In the Souss area, the species was extirpated due to rapid destruction of the argan forest (Bergier, 1987; Cherkaoui et al., 2009).

In Algeria, the species used to be common but the last known breeding pair was recorded in 1990 (Isenmann and Moali, 2000). However, there were a few more recent sightings in northern Algeria in 2018, and the species might still be breeding in some isolated places, including the Monts des Ksour in the Parc Culturel de l'Atlas Saharien, where it has been sighted a few times, and recently in the Oum El Bouari (north-eastern Algeria) where pictures were taken by Harzallah in 2018 and published in a magazine (*per* A. Fellous-Djardini and M. Saheb). In Tunisia, the population was apparently extirpated during the first half of the 20<sup>th</sup> century and there have been no records since 1988 (Isenmann et al., 2005; eBird, 2020). Finally, there is some evidence of vagrant individuals from sub-Saharan populations in the Moroccan Sahara (MaghrebOrnitho, 2018d) and in Egypt, most recently in May 2015 (OSME, 2019; A. Riad, pers. obs.).

## POPULATION

Thévenot et al. (2003) and El Agbani and Qninba (2011) estimated there were a few dozen breeding pairs in Morocco, but Bergier et al. (2017) and F. Cuzin (pers. comm.) suggested that the species could be extinct, except maybe in the Atlantic Sahara. Due to the lack of recent breeding observations it can be assumed that the species is nearly extinct in the country (with less than 10 breeding pairs) (*per* F. Cuzin). In Algeria, there have been very few sightings of the species, though some of them are quite recent from 2017 and 2018 (Fellous, 2017; MaghrebOrnitho, 2018d). Although there are no monitoring data for this species, it is inferred that the country might host up to 10 breeding pairs (A. Fellous-Djardini, pers. obs.). Therefore, the overall population size for North Africa is thought to be a maximum of 20 breeding pairs or 40 mature individuals (F. Cuzin, A. Fellous-Djardini, P. Bergier, pers. obs.).

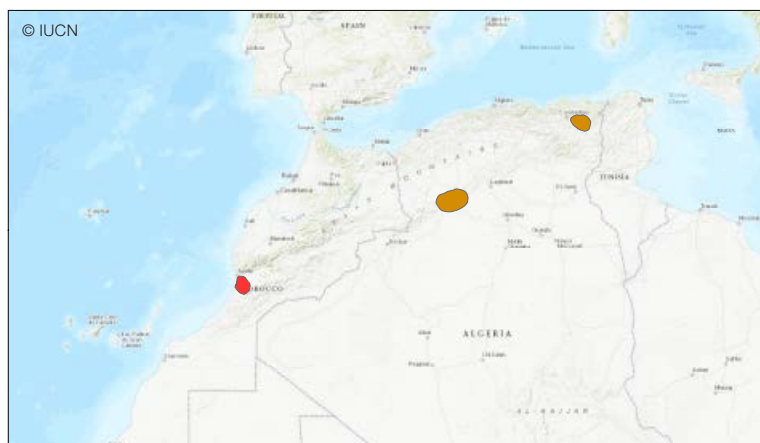
## HABITATS AND ECOLOGY

The tawny eagle is resident and occurs in discrete populations. It is sedentary, although individuals are nomadic and will occasionally wander long distances, especially juveniles (F. Cuzin, pers. obs.). It breeds in forested areas in North Africa.

It occupies dry, open habitats from sea level to 1,200 m in North Africa (F. Cuzin, pers. obs.). In Morocco, the species occurs (or used to occur) in lowlands, hills and low mountains with argan forests and steppe vegetation in semi-desert areas (Thévenot et al., 2003), while in Algeria it occurred in lowland forest (Isenmann and Moali, 2000). It avoids dense forest, true deserts and high mountains (Clark and Davies, 2018). In Algeria, individuals have been observed in an oasis, close to a village with palm trees, cultivated Atlas mastic trees (*Pistacia atlantica*), relict forests of *Juniperus phoenicea* and cliffs in the surroundings (A. Fellous-Djardini, pers. obs.).

The species has a wide prey base ranging from insects to large mammals and birds. It also regularly consumes carrion and robs other raptors of their prey (Ferguson-Lees and Christie, 2001; Clark and Davies, 2018).

Nesting occurs on large stick nests at the tops of tall, isolated trees. The breeding season in Africa lasts from February/March to August in the north (Ferguson-Lees and Christie, 2001; Thévenot et al., 2003).



■ Extant (resident)  
■ Possibly Extinct

Distribution range of the Tawny eagle, *Aquila rapax* - (Temminck, 1828) in North Africa. Source: The IUCN Red List of the breeding birds of prey of North Africa.

## THREATS

The species' population plummeted in North Africa during the 20<sup>th</sup> century because of generalised poaching, hunting and especially unintended poisoning (originally targeting livestock predators such as jackals, wolves, feral dogs or leopards), although today this threat seems less important in Morocco (Garrido et al., 2014; Garrido, 2019; Cuzin, 2019). Its scavenging behaviour makes it vulnerable to farmers that use poisons for predator control (F. Cuzin, pers. comm.). The increase and spread of the human population has also caused habitat destruction and disturbance (Bergier, 1987; Stuart and Collar, 1988; Garrido et al., 2005; Vernon et al., 2005; Cherkaoui et al. 2009; Fellous, 2017; BirdLife International, 2018a; Tellería et al. 2019), especially in forests because of the use of wood as fuel for cooking and heating and the felling of large trees to clear land for crops and livestock. Destruction and disturbance due to the intense human use of forests are a particular threat to tree-nesting raptors like the tawny eagle, leading it to abandon its breeding territories, especially in Morocco, where its habitat in the Lower Plains has been greatly altered, particularly due to the considerable areas covered by intensive crops, often in greenhouses (F. Cuzin, pers. comm.). Other anthropogenic threats are the fragmentation of habitats due to urban development, expansion of road networks (in Algeria), and construction of dams and power lines, which could also prevent recolonisation in areas where the species has disappeared (A. Fellous-Djardini, F. Cuzin, pers. comm.). Food availability seems not to be an issue for the species in North Africa as suitable prey are still present in large parts of the region.

## CONSERVATION

**Conservation and research actions in place:** CITES Appendix II. CMS Appendix II. In Morocco, the species is included in the preparation of a raptor conservation strategy (<https://www.iucn.org/news/mediterranean/202001/first-steps-towards-a-moroccan-strategy-raptor-conservation-iucns-guidance>). An initiative to identify and correct dangerous power lines has also started in Morocco with the collaboration of governmental bodies and NGOs (Godino et al., 2016; Martín Martín et al., 2019).

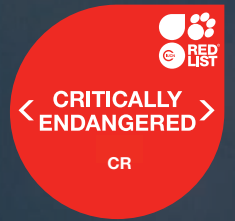
**Conservation and research actions needed:** The presence of the species needs to be confirmed in Morocco and Algeria. A Conservation Action Plan should be developed, including a feasibility analysis for a reintroduction programme. Bird-friendly structures should be installed on power lines to prevent electrocution and collisions. Greater control over the use of pesticides and poisons is needed. Systematic monitoring of the species should be increased, as should the restoration and protection of its habitat. The suitability of a reintroduction programme in Morocco should also be assessed.

Assessor(s): Fellous-Djardini, A., Cuzin, F., Saheb, M., Bergier, P., Benmammar Hasnaoui, H., Radi, M., Noaman, M., Essetti, I., Onrubia, A. & Riad, A.

Reviewer(s): Garrido López, J.R. & Qninba, A.

Contributor(s): Gyenge, P., Bakass, B. & BirdLife International

Date: 2020-09-07



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## Bearded vulture, *Gypaetus barbatus* - (Linnaeus, 1758)

POPULATION SIZE	AOO	EOO	TREND
16-28 mat. ind.	-	34,000 km <sup>2</sup> ↓	↓

### NORTH AFRICA REGIONAL ASSESSMENT: CRITICALLY ENDANGERED (CR) A2ace+4ace; C2a(i); D (IUCN version 3.1)

The bearded vulture is a rare breeding resident in North Africa with an extremely small population, which has dramatically declined in recent decades. The total number of mature individuals is suspected to be only 16–28 and the largest subpopulation numbers 20 or fewer mature individuals. Therefore, the species is listed as Critically Endangered A2ace+4ace; C2a(i); D in North Africa.

### DISTRIBUTION

The original breeding range of the bearded vulture in North Africa included Morocco, Algeria, Tunisia and Egypt (Goodman and Meininger, 1989; Isenmann and Moali, 2000; Thévenot et al., 2003; Isenmann et al., 2005), but now the species is believed to breed only in the Moroccan High Atlas between 2,500 and 4,000 m and in Egypt (F. Cuzin, P. Bergier, H. Benmammar, A. Riad, pers. obs.). Its range has been contracting since the 20<sup>th</sup> century because of human action: in Morocco, the bearded vulture was extirpated during the 1970s in the Rif, Central Plateau, Anti-Atlas, Middle Atlas, eastern Morocco around Figuig, and Sahara (Thévenot et al., 2003; Bergier et al., 2017; Allaoui and Cherkaoui, 2018; Cuzin and Rousselon, 2018). In Algeria it once occurred throughout the north-western mountains (Isenmann and Moali, 2000) and adult birds were observed in Theniet El Had National Park until 2014 (Djardini et al., 2014), but since then it has only been seen in Batna and at Mount Chelia in Babar (A. Si Bachir, pers. comm.); these may have been individuals dispersing from the Moroccan population (they can disperse several hundred kilometres from their breeding areas; Botha et al., 2017), so the species is possibly extinct in Algeria. In Tunisia the species survived in the southern mountains until the 1930s but it is now extinct

(Isenmann et al., 2005). The last sightings were made in 1975 by Paul Geroudet at Djebel Terozza in southern Tunisia. In Egypt, a few breeding pairs survive in the Sinai–Red Sea Mountains (Goodman and Meininger, 1989; Habib, 2016a; Andevski, 2017; Botha et al., 2017).

## POPULATION

In Morocco there are currently 6–10 pairs (Cherkaoui, 2005; Cuzin and Rousselon, 2018; Cuzin, 2019), which is significantly fewer than the previous estimates of 100 pairs in the 1980s and 50 pairs at the beginning of the 21<sup>st</sup> century (Thévenot et al., 2003). Abdelgurefi and Ramdane (2003) estimated not more than 20 breeding pairs in Algeria with a rapid decline since the previous estimate of 30 pairs (Isenmann and Moali, 2000), and today there are very few sightings from the country (A. Si Bachir, pers. comm.) and no sign of breeding. However, more intensive surveys would be needed in the country to confirm the species' status. In Egypt, 2–4 breeding pairs have been estimated, while about 16 pairs were estimated during the 20<sup>th</sup> century (Goodman and Meininger, 1989). Therefore, the overall minimum breeding population size for North Africa is estimated to be 8–14 breeding pairs or 16–28 mature individuals.

## HABITATS AND ECOLOGY

This species occupies remote, mountainous areas with precipitous terrain usually above 1,000 m, particularly in areas where there are herds of wild ungulates, sheep and goats (Ferguson-Lees and Christie, 2001). In Morocco, it is currently found between 2,000 and 4,000 m, especially above 2,500 m (Cuzin, 2019). In Algeria, it occurs above 1,300 m. It is resident where it occurs, but it has vast home ranges and juveniles will wander much more widely than adults (Ferguson-Lees and Christie, 2001). While the species can be extremely philopatric, individuals are not very territorial.

In North Africa it is almost entirely dependent on carcasses of livestock (either domestic or feral) due to the rarity of wild ungulates across much of its range (Cuzin, 2019). The species will forage over vast distances (up to 700 km in one day has been recorded) using a soaring mode of flight (BirdLife International, 2020c). As scavengers, bearded vultures consume prey remains left by predators or other scavengers; 70% of the biomass of their diet is bones, 25% soft tissue and 5% skin (Botha et al., 2017), and its primary food is the marrow and bone from small to large bones (Clark and Davies, 2018).

Bones too big to be swallowed whole are dropped onto a rocky surface from 20–70 m height, and the fragments and marrow are collected afterwards (Boudoint, 1976). Tortoises are generally treated in the same way as bones (Clark and Davies, 2018) and this has been documented in Algeria. Only during the period when they are raising young do they need to consume soft tissue (Botha et al., 2017).

The species is typically monogamous, but polyandrous trios have been documented (Botha et al., 2017; F. Cuzin, pers. obs.). Nesting occurs in January, and fledging at the beginning of July. Individuals construct large nests (on average 1 m in diameter), composed of branches and lined with animal remains such as skin and wool, as well as

dung and occasionally also rubbish (BirdLife International, 2020c). Nests are located on remote overhung cliff ledges or in caves and will be re-used over the years (Ferguson-Lees and Christie, 2001), although some pairs may have more than one nest. Clutches consist of 1–2 eggs, but in cases where two eggs are laid, obligate 'cainism' occurs in which the older sibling kills the younger (Thaler and Pechlaner, 1980).

Both parents take part in nest building, nest defence, incubation, brooding and feeding of chicks (Orta et al., 2020a).



Distribution range of the Bearded vulture, *Gypaetus barbatus* - (Linnaeus, 1758) in North Africa. Source: The IUCN Red List of the breeding birds of prey of North Africa.

## THREATS

As with other scavenger species, widespread accidental poisoning, largely with strychnine used by many farmers for predator control, and more recently with carbofuran, has contributed significantly to bearded vulture decline and local extinctions in Morocco (Garrido et al., 2014; Cuzin et al., 2009; Cuzin, 2019), at least until the 1980s (F. Cuzin, pers. obs.), and it is still a major threat (Moroccan Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat).

Cuzin et al. (2009) also found that the decline of the breeding population in Morocco might be due to illegal shooting in the past, and the species is still persecuted by shepherds in Toubkal National Park (Moroccan Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat), probably because they sometimes confuse the species with the golden eagle (*Aquila chrysaetos*), a predator of small livestock (Cuzin, 2019). Nevertheless, poisoning was not a major threat in Algeria, where there was neither direct persecution in the 20<sup>th</sup> century nor widespread poisoning campaigns. Although there have been cases of raptor poisoning in the country, none of them is documented as involving this species (A. Fellous-Djardini, H. Benmammar, pers. obs.). Poisoning is not a threat in Egypt either, although hunting and poaching are (Andevski, 2017).

Abdelguerfi and Ramdane (2003) point out that the worrying situation in Algeria is due to changes in livestock-rearing practices that reduce food availability and disturb breeding birds, especially in Djurdjura National Park. The decline of wild ungulates (resulting in food scarcity) and habitat loss are also significant threats in Egypt (Andevski, 2017). Disturbance by human activities is also a major threat in Egypt (Andevski, 2017) and Morocco, where Cuzin et al. (2009) discovered that the decline in the breeding population might be due in part to general disturbance by shepherds and rock climbers (a very localised threat today in Taghia, High Atlas), by military activities (helicopter flights) and by "heli-skiing" in the Toubkal National Park (Moroccan Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat).

Collision with power lines is considered a risk in Egypt (Andevski, 2017), but not in breeding areas at high altitude in Morocco and Algeria, where there are no power lines. However, it could be important for dispersing young bearded vultures (Moroccan Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat). Finally, this small, isolated population could experience a reduction in genetic diversity over time, which could influence breeding success and the long-term survival of such populations unless they are carefully managed.

## CONSERVATION

**Conservation actions in place:** CMS Appendix II. CITES Appendix II.

Multi-species action plan for African–Eurasian vultures (Botha et al., 2017). In Morocco, the species is included in the preparation of a raptor conservation strategy (<https://www.iucn.org/news/mediterranean/202001/first-steps-towards-a-moroccan-strategy-raptor-conservation-iucns-guidance>) and in a national population monitoring programme (IUCN and DEF, 2020). In Morocco, besides data collection, various local awareness-raising activities have been carried out in conjunction with Spanish Cooperation, GEF Project, Fundación Gypaetus, and Fundación Global Nature (Cuzin et al., 2009). A workshop to develop an “Action Plan for the Conservation of the Bearded Vulture (*Gypaetus barbatus*) in Morocco” was organised by the management of the Toubkal National Park at Imlil, High Atlas, on 21–22 October 2015.

**Conservation actions needed:** Non-intensive livestock management systems should be maintained to ensure a food supply. The provision of feeding stations is also beneficial, particularly when food is scarce in winter. Effective protection in areas with a plentiful supply of food (which often includes carcasses of domestic animals) has been shown to lead to impressive population recoveries, and reintroduction has been successful in parts of its range. Disturbance in and around nesting areas should be reduced, and the impacts of power lines should be mitigated in the species' range. Additionally, the threat of persecution should be countered by means of law enforcement and awareness-raising activities. Finally, coordinated surveys are required to monitor the species' population trend, as well as to produce a Population Viability Analysis, to investigate the specific impact of certain threats, and to come up with best practice guidelines for conservation actions.

Assessor(s): Cuzin, F., Riad, A., Benmammar Hasnaoui, H., Fellous-Djardini, A., Bergier, P., Radi, M., Saheb, M., Essetti, I., Noaman, M. & Onrubia, A. / Reviewer(s): Garrido López, J.R. & Barrios, V. / Contributor(s): Gyenge, P., BirdLife International & Si Bachir, A.

Date: 2020–09–10



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## Rüppell's vulture, *Gyps rueppelli* - (Brehm, 1852)

POPULATION SIZE	AOO	EOO	TREND
20 mature individuals	-	2,386 km <sup>2</sup>	?

### NORTH AFRICA REGIONAL ASSESSMENT: CRITICALLY ENDANGERED (CR) D (IUCN version 3.1)

This species appears to have been colonising the North African region in the last 10 years. The population size in Algeria is estimated at 20 mature individuals. It occurs in an area occupied by a close relative, the griffon vulture (*Gyps fulvus*), but at the moment there are no records of hybridisation between the two species in the area. The species could be listed as Not Applicable in North Africa, but given that it is listed globally as Critically Endangered and its expansion to Algeria could be the beginning of a colonisation process caused by global climate change or habitat degradation in its breeding range in the southern Sahel, the species is listed here as Critically Endangered under criterion D. Further research should be conducted to ascertain its actual breeding numbers and population trend and the importance of the North African population for the global conservation of the species.

### DISTRIBUTION

In North Africa it used to be considered a casual visitor or vagrant in Morocco, Algeria, Tunisia and Egypt (Goodman and Meininger, 1989; Clark and Davies, 2018). However, in the last 15 years, the species has been recorded far away from its breeding colonies, and has reached the Iberian Peninsula via Morocco and the Strait of Gibraltar with migrating *Gyps fulvus* (Botha et al., 2017). Ramírez et al. (2011) suggested that these movements could represent a range expansion, with the species becoming established as a breeding species in Europe, where there are records of adult Rüppell's vultures in breeding colonies of griffon vultures in the Iberian Peninsula and exhibiting breeding behaviour. Recently, Rüppell's vultures have been sighted showing breeding behaviour in griffon vulture colonies in Andalusia, southern Spain (Elgorriaga et al., 2020), where the species is now considered



resident (CAGPDS, 2019). In this context, the species has been sighted frequently in Morocco, especially near the Strait of Gibraltar during migration (El Khamlichi, 2016), where about 50 individuals were observed during the spring migration in 2020 (R. El Khamlichi, pers. comm.). It has also been seen in the Sahara (Díaz-Portero et al., 2014; Bergier et al., 2017). In line with these data, Ramírez (2012) suggests that the species should not be considered a casual visitor or vagrant but to have regular non-breeding populations in both Morocco and Spain. Immatures also migrate with griffon vultures through Morocco and Algeria (Botha et al., 2017).

Rüppell's vultures may also be breeding in *G. fulvus* colonies in Algeria now. Although the species was considered extinct in Algeria by Botha et al. (2017), J. M. Thiollay (in litt., 2016, per BirdLife International, 2020b) indicates that there are some very small breeding populations in the country. Moreover, according to Si Bachir and Abderahmani Said, in 2012, two juveniles captured from the nest in the Aurès Mountains (near Babar) were given to the Belezma National Park. One of them died and the other is still in the park. Since 2014 park staff have confirmed the presence of adult Rüppell's vultures in the area and local shepherds say that the species has been seen there for some years (M. Saheb, pers. obs.).

## POPULATION

There are no population estimates for the species. The number of breeding individuals is likely to be extremely small, with probably fewer than 10 breeding pairs in north-eastern Algeria (M. Saheb, pers. obs.). Appropriate monitoring is necessary to accurately determine its population size.

## HABITATS AND ECOLOGY

This species frequents open areas of woodland, grasslands and montane regions, and it is gregarious, congregating at carrion, soaring together in flocks and breeding mainly in colonies on cliff faces and escarpments at a broad range of elevations, and sometimes in trees far from cliffs in West Africa. It locates food entirely by sight, subsisting almost entirely on carrion (Clark and Davies, 2018). It follows other vultures and migrant game or stock herds to locate much of its food (Del Hoyo et al., 1994). The species is considered an irruptive and local migrant by Bildstein (2006). Movements across the Strait of Gibraltar to Europe are in the company of migrant griffon vultures (Botha et al., 2017).

## THREATS

The species faces similar threats to griffon vultures, due to similar habitats, behaviour and potential breeding distribution. It is almost entirely dependent on livestock carcasses due to the almost complete absence of wild ungulates (Ferguson-Lees and Christie, 2001; Abdelguerfi and Ramdane, 2003; Garrido et al., 2014; Orta et al., 2020b; Andevski, 2017). Therefore, its scavenging behaviour makes it vulnerable to farmers that use poisons for predator control in Morocco, but poisoning does not seem to be a problem in Algeria. It is sensitive to mortality due to collision and electrocution on power lines, as has been found in southern Spain (I. Fajardo, pers. comm.), and at least one electrocuted vulture has been found in Morocco (Monchaux, 2018). It may be highly vulnerable to the effects of potential wind energy developments (six Rüppell's vultures died because of that in Spain; I. Fajardo, pers. comm.), so the increasing number of massive wind energy projects in north Morocco could be a significant threat to the population migrating across the Strait of Gibraltar.



Distribution range of the Rüppell's vulture, *Rüppell's vulture* - (Brehm, 1852) in North Africa. Source: The IUCN Red List of the breeding birds of prey of North Africa.

The entire North African region faces the problem of poaching to supply the illegal trade in raptors (Emile et al., 2014; Brochet et al., 2016; Andevski, 2017; Botha et al., 2017), which also specifically affects Rüppell's vulture at least locally in Morocco (MaghrebOrnitho, 2014). Additionally, in Morocco, Rüppell's vultures have been found drowned in artificial ponds where they go to drink or bathe during the summer months (R. El Khamlichi, pers. obs., 2020). Lastly, this small, isolated population could experience a reduction in genetic diversity in the long term because of inbreeding and also hybridisation with griffon vultures. Interbreeding behaviour has been observed in Spain (Ramírez et al., 2011) and could influence breeding success and the long-term survival of such populations unless they are carefully managed.

## CONSERVATION

**Conservation actions in place:** CMS Appendix II. CITES Appendix II. Bern Convention Appendix II. There is a Multi-species Action Plan for the conservation of African–Eurasian vultures (Botha et al., 2017). In Morocco, the species is included in a national population monitoring programme (UICN and DEF, 2020). An initiative to identify and correct dangerous power lines has also started in Morocco with the collaboration of governmental bodies and NGOs (Godino et al., 2016; Martín Martín et al., 2019). There are also initiatives to rescue and release sick and injured wild individuals and to tag eagles (including attaching GPS loggers) in Morocco (MaghrebOrnitho, 2018b). In northern Morocco a feeding station and a rehabilitation centre have been set up, where individuals are captured and marked with wing tags and GPS loggers (R. El Khamlichi, pers. comm., 2019).

**Conservation actions needed:** There is only a small breeding population in Algeria, so it is important to try to conserve it because of the species' global Red List status (see BirdLife International, 2020b). Effective protection of breeding sites and areas with a plentiful supply of food (which often includes carcasses of domestic animals) is therefore necessary. The provision of feeding stations is also beneficial, particularly when food is scarce. The ban on poisoned carcasses should be enforced and the leaving of dead animals encouraged. The construction of wind farms in key areas for the species should be avoided, and where they are already built, wind farm staff should be trained in bird monitoring. In addition, the population should be surveyed to determine, protect and manage potential breeding sites and key dispersal areas. Finally, and more broadly, awareness of biodiversity conservation should be increased.

Assessor(s): Garrido López, J.R., Saheb, M., Fellous-Djardini, A., Cuzin, F., Radi, M., Essetti, I., Onrubia, A. & Noaman, M.

Reviewer(s): Botha, A. & Fajardo, I.

Contributor(s): Gyenge, P., BirdLife International, Thiollay, J.-M., Said, A., Si Bachir, A., El Khamlichi, R. & Fajardo, I.

Date: 2020–09–08



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## Red kite, *Milvus milvus* - (Linnaeus, 1758)

POPULATION SIZE	AOO	EOO	TREND
0 mat. ind.	-	-	↓

### NORTH AFRICA REGIONAL ASSESSMENT: CRITICALLY ENDANGERED (POSSIBLY REGIONALLY EXTINCT) (CR) A2ace; C2a(i,ii); D (IUCN version 3.1)

This species used to breed in North Africa. After a decline in the breeding population in the late 20<sup>th</sup> century, there has been no evidence of breeding since 2004. The nearest populations in southern Europe are also declining, including wintering populations, so the likelihood of immigration is shrinking. Although poisoning may have reduced populations considerably in the 20<sup>th</sup> century, climate change may now be a limiting factor for the breeding population at the southern edge of the species' distribution. The species is listed as Critically Endangered (Possibly Regionally Extinct) under criteria A2ace; C2a(i,ii); D, but with further survey efforts the species could well be reassessed as Regionally Extinct in the future.

### DISTRIBUTION

The red kite is endemic to the Western Palearctic and more than 95% of its population is found in Europe (Mougeot et al., 2011). It used to be a rare resident in northern Morocco and locally in coastal Algeria and Tunisia, but it became extinct as a breeding species probably during the first few years of the 21<sup>st</sup> century, and now it is a rare migrant wintering especially in Morocco and with some sightings in Algeria and Tunisia (Isenmann and Moali, 2000; Thévenot et al., 2003; Isenmann et al., 2005; El Agbani and Qninba, 2011; Radi et. al., 2020). The species occurred in Morocco (Rif, Middle Atlas, plains and hills of eastern Morocco and Mamora forest) (Thévenot et al., 2003), but there have been no successful breeding attempts since 2004 (Cherkaoui, 2004). More recent sightings of an adult during the breeding season in Aguelmam Afernourrir (Middle Atlas) in late May – early June 2013

could be considered the last breeding attempt (I. Cherkaoui, pers. obs.). It also bred commonly in Algeria in the early years of the 20<sup>th</sup> century (Whitaker, 1905), but there have been no more recent breeding records (Isenmann and Moali, 2000) and in Tunisia there have been no records of breeding pairs since the 1970s (Isenmann et al., 2005). The sparsely populated Mediterranean forests where the species used to breed in Morocco were similar to its Iberian habitat.

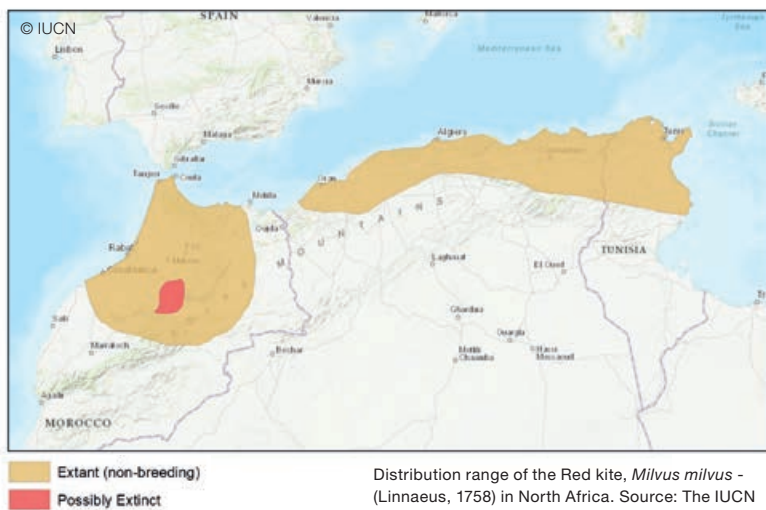
According to Mougeot et al. (2011), North African countries can be considered the current southern limit of the species' distribution. Its range seems to be retreating northward due to climate change (Huntley et al., 2007) with local extinctions also occurring in southern Spain (Molina, 2015) and declining numbers of resident breeding birds in Iberia and France, and of migrants wintering in Spain (BirdLife International, 2018b). The North African population is likely to have survived because of immigration from the larger Spanish population, but with the decline in this Iberian population during the 20<sup>th</sup> century further immigration is now unlikely to occur. Additionally, the majority of the global population used to winter in Spain and North Africa, but increasingly birds are remaining in their northern European breeding grounds because of climate change (Huntley et al., 2007; BirdLife International, 2018b).

Therefore, wintering red kites are also declining in North Africa, although they are still sighted in this region (Thévenot et al., 2003; Isenmann and Moali, 2000; Isenmann et al., 2005; eBird, 2020; Radi et al., 2020), even in the Moroccan Sahara (Bergier et al., 2017), Egypt (Goodman and Meininger, 1989) and even as vagrants in Libya (Isenmann et al., 2016). Wintering red kites in Morocco are associated with feeding at rubbish dumps, which could be the reason for their remaining in the region (JMM and Associates, 2015), but it is also a major threat because of the risk of electrocution on power lines close to landfills (Radi et al., 2020).

## POPULATION

The red kite is extinct as a breeding species in Algeria and Tunisia (Isenmann and Moali, 2000; Isenmann et al., 2005). The species occurred in Morocco but there have been no successful breeding attempts since 2004 when one breeding pair was found nesting in a cedar tree in the Middle Atlas, with 2 chicks (Cherkaoui, 2004). Recent sightings of an adult during the breeding season in Aguelmam Aferrourrir (Middle Atlas) in late May – early June 2013 could be considered the last known breeding attempt (I. Cherkaoui, pers. obs.). Therefore, it is likely that the species is extinct as a breeding species in North Africa, but further surveying is required to confirm this. If a hitherto unknown population does persist in North Africa, wide-ranging ongoing threats such as climate change make it likely that it will be declining.

The North African population probably survived because of immigration from the larger Spanish population, but the decline in this Iberian population during the 20<sup>th</sup> century due to widespread accidental poisoning (Aebischer, 2009; Garrido et al., 2014) and climate change (Huntley et al., 2007; BirdLife International, 2018b) has made further immigration unlikely.



## HABITATS AND ECOLOGY

The species occurs in open woodland and adjacent open areas (Clark and Davies, 2018). In winter, it also occupies farmland without trees, wasteland, scrub and wetlands (BirdLife International, 2018b) and also rubbish dumps and slaughterhouses (Clark and Davies, 2018; Radi et al., 2020). In Morocco the species bred in sparsely populated Mediterranean broadleaf woodlands and forests mixed with farmland and pasture, similar to its Iberian habitat (Thévenot et al., 2003; Cherkaoui, 2004). Red kites are less gregarious than black kites, though small groups will gather at abundant food sources (Clark and Davies, 2018) especially in winter.

Most birds in Europe are migratory, wintering mainly in southern France and Iberia, but some travel across to Africa (Radi et al., 2020). The autumn crossing from Europe takes place between mid-August and late November and the spring crossing extends from late February to the end of May (Thévenot et al., 2003). Birds are usually seen singly or in pairs, but sometimes form small flocks, possibly family groups, when on migration (Ferguson-Lees and Christie, 2001). Red kites consume a wide spectrum of food (carrion, organic rubbish, small mammals, birds, reptiles, amphibians, insects and fish species) by predation, scavenging and piracy (Mougeot et al., 2011; Clark and Davies, 2018).

They build their own nests or use old nests made by other species (buzzards or corvids) in trees. The nest is constructed with dead twigs, is typically 30–50 cm wide, and lined with dry (not green) vegetation and other materials (wool, paper, plastic, rags). Each pair has several (two to five) nests and usually reuses the same nest sites in consecutive seasons, but will sometimes change nest site after a breeding failure (Mougeot et al., 2011). One to three eggs are laid between March and April (Mougeot et al., 2011; Clark and Davies, 2018). In Morocco, fledglings have been observed in May and June (Thévenot et al., 2003).

## THREATS

As with other scavenger species, widespread accidental poisoning, largely with strychnine used by many farmers for predator control, and more recently with carbofuran, has contributed significantly to red kite decline (Aebischer, 2009; Garrido et al., 2014). Internationally banned organochlorine pesticides are still locally available and kill wildlife and pollute the environment (Garrido et al., 2014). Indirect poisoning from pesticides and secondary poisoning from the consumption of rodents poisoned by rodenticides spread on farmland to control vole plagues threatens the species particularly in its wintering ranges in France and Spain and possibly in North Africa, where it is driving rapid population declines (Aebischer, 2009). There is a strong correlation between rapid declines and those populations that winter in Spain (Carter, 2007), which will be the source of the kites that winter in North Africa.

The decline of livestock grazing and the intensification of farming leading to chemical pollution, homogenisation of landscapes and ecological impoverishment also threaten the species (Knott et al., 2009). Destruction and disturbance because of the intense human use of forests to extract wood as fuel for cooking and heating and because of the felling of large trees to clear land for agriculture especially threatens tree-nesting raptors like red kites, leading them to abandon their breeding territories. Wind turbines are also a potentially serious future threat (Mammen et al., 2009) so the increasing number of massive wind energy projects in northern Morocco could pose a huge threat to the population migrating across the Strait of Gibraltar. Other threats include electrocution on and collision with power lines (Mionnet, 2007; Radi et al., 2020), hunting and trapping (Mionnet, 2007), roadkill, deforestation, and possibly competition with the generally more successful black kite (*Milvus migrans*) (Ferguson-Lees et al., 2001; Cardiel and Viñuela, 2007; Mammen, 2007). Climate change seems to be shifting optimal breeding areas northwards (Huntley et al., 2007), so survival on the southern edge of their range (i.e. North Africa) will become harder.

## CONSERVATION

**Conservation actions in place:** CMS Appendix II. CITES Appendix II. An initiative to identify and correct dangerous power lines has started in Morocco with the collaboration of governmental bodies and NGOs (Godino et al., 2016; Martín Martín et al., 2019).

**Conservation actions needed:** A conservation Action Plan is required, including a feasibility analysis for a reintroduction programme and the suitability of providing supplementary feeding stations. Bird-friendly structures should be installed on power lines to prevent electrocution and collisions. Greater control over the use of pesticides and poisons is needed. Populations should be monitored to determine, protect and manage potential breeding and wintering areas. Such research can also survey for any potential breeding activity. Actions to increase awareness of biodiversity conservation are required, as well as training for law enforcers. A management plan should be developed for open landfill sites as key feeding habitats for red kites and other raptors in North Africa. It is also important to work with landowners to protect habitats and prevent any potential persecution.



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## Lappet-faced vulture, *Torgos tracheliotos* - (Forster, 1791)

POPULATION SIZE	AOO	EOO	TREND
20-40 mat. ind.	-	100,336 km <sup>2</sup> ↓	↓

### NORTH AFRICA REGIONAL ASSESSMENT: CRITICALLY ENDANGERED (CR) C2a(i,ii); D (IUCN version 3.1)

In North Africa, the species has a small and declining population of 20–40 estimated mature individuals in a single subpopulation in Egypt. It is extinct in Morocco, Algeria, Tunisia and Libya. The species is listed as Critically Endangered under criterion C2a(i,ii); D.

### DISTRIBUTION

The species has a wide distribution in Africa, from West Africa across the Sahel to East Africa and further south (Botha et al., 2017), but with significant population declines throughout its range in Africa and the Middle East (Shimelis et al., 2005). It is rare in North Africa.

Currently it breeds only at Wadi el-Gemal National Park, Wadi El-Kharit and Umm El Abbas in southern Egypt (Goodman and Meiningner, 1989; Hapid, 2016b; Clark and Davies, 2018; OSME, 2019), although in the early 20<sup>th</sup> century it was the most abundant vulture in the country occurring from the western desert in the Qattara depression to eastern Sinai and the south (Nicoll, 1919; Meinerzhagen, 1930). In the 20<sup>th</sup> century it bred in Libya (in the southern Sahara in 1998: Massa, 1999; Isenmann et al., 2016 ), Tunisia (until 1950 in the eastern Sahara: Isenmann et al., 2005), Algeria (maybe until the 1960s in the western Sahara: Isenmann and Moali, 2000) and Morocco (until the 1950s in the Atlantic Sahara: Bergier, 1987; Thévenot et al., 2003; Bergier et al., 2017). Previously, in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, it used to breed in non-desert habitats in the Central Plateau and Middle Atlas in Morocco (Thévenot et al., 2003) and Algeria (Isenmann and Moali, 2000). It has also disappeared from northern Niger and northern Mali (Thiollay, 2006) so any recolonisation of Algeria from these countries does

not seem to be possible soon. However, it could still be breeding in Mauritania (Botha et al., 2017). Vagrants are also occasionally recorded in Algeria, Libya and Morocco (Botha et al., 2017). There is passage migration of lappet-faced vultures through Sinai and Nile Valley according to eBird (2020), probably from the Arabian Peninsula.

## POPULATION

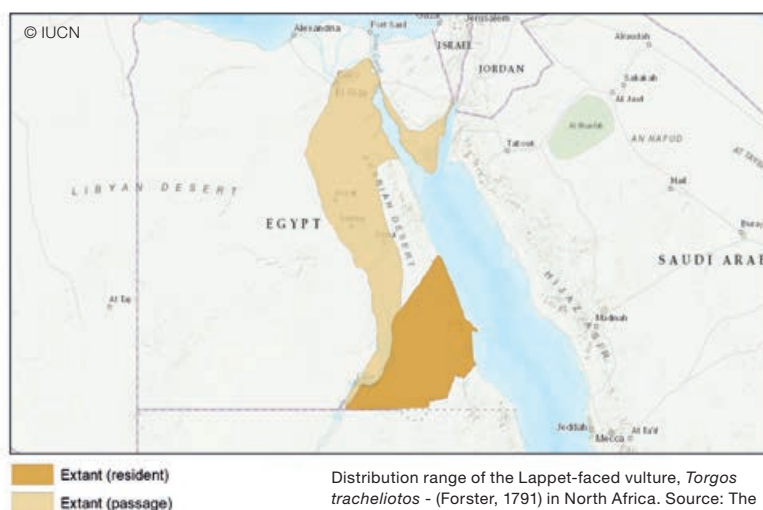
Data from Shimelis et al. (2005) and Habid (2016b) suggest that the Egyptian subpopulation (the only one remaining in North Africa) consists only of 10–20 breeding pairs. This gives a total population of 20–40 mature individuals, although further surveys are required given the current trends for this species across the world and the apparently severe declines in the Middle East (Botha et al., 2017).

## HABITATS AND ECOLOGY

This species inhabits open habitats usually with scattered trees (Clark and Davies, 2018) such as savanna-like forests with *Acacia* (Thévenot et al., 2003). It ranges widely when foraging (BirdLife International, 2020) and is mainly a scavenger, feeding predominantly on any large carcass or its remains (Mundy, 1982; Mundy et al., 1992). Lappet-faced vultures gather at carcasses with other vultures, which they dominate, and they steal prey from other raptors and can also take live prey, including fish and terrapin eggs (Clark and Davies, 2018). They build solitary nests (containing just one egg) on cliffs and in *Acacia* trees in Egypt (Habid, 2016); the species' distribution is sometimes limited by that of *Acacia* trees (Boshoff et al., 1997). Lappet-faced vultures do not breed until they are at least six years old, and then fledge ca. 0.4 young/pair/year (Mundy et al., 1992); ringing studies have revealed a very low return rate (Simmons and Bridgeford, 1997). The species' minimum home range has been suggested to be 8 km<sup>2</sup>, expanding to 15 km<sup>2</sup> in some habitats (Shimelis et al., 2005), but now 80–150 km<sup>2</sup> may be more appropriate (BirdLife International, 2020d).

## THREATS

As with other scavenger species in North Africa, widespread accidental poisoning, largely with strychnine used by many farmers for predator control, and more recently with carbofuran, has contributed significantly to lappet-faced vulture decline and local extinctions (Garrido et al., 2014; Andevski, 2017; Botha et al., 2017). Food availability for the species is decreasing due to the almost complete absence of wild ungulates, which is caused by the increase and spread of the human population and habitat alteration, at least in the Maghreb (Garrido et al., 2014; Andevski, 2017). Habitat alteration through tree-felling and overgrazing leading to food scarcity is also an important threat to the only breeding population in Egypt (Aspinall, 1996; Rondeau and Thiollay, 2004; Andevski, 2017; A. Riad, O. Haitham, pers. obs.). It has also been impacted during the breeding season by human disturbance near nests in desert areas, where low tree densities mean that homes are often built under or near trees used by this species for breeding, contributing to the abandonment of nesting sites (Botha et al. 2017). Another threat could be electrocution or collisions on energy infrastructure, as in other areas of its range (Shimelis et al., 2005). The potential introduction and use of the non-steroidal anti-inflammatory drug diclofenac, which is fatal to *Gyps* spp. when ingested by birds feeding on livestock carcasses, may become a threat to the species in the region as well. Lastly, in Egypt, direct trophy hunting and predation by feral dogs cause direct mortality (A. Riad, O. Haitham, pers. obs.).



## CONSERVATION

**Conservation actions in place:** CITES Appendix II. CMS Appendix I and II. The species was put forward as a candidate for the CITES Review of Significant Trade in 2004 (BirdLife International, 2020d). It is included in a multi-species action plan for African–Eurasian vultures (Botha et al., 2017). In 2008, feeding stations were set up at Shalatin in southern Egypt, following the decline of vultures in the area (BirdLife International, 2020d).

**Conservation actions needed:** Coordinated surveys and monitoring should be instigated throughout its range to clarify population size and rates of decline, beginning with a census of the Egyptian population, including use of satellite tracking; further ecological research is also needed. Awareness campaigns should be initiated aimed at farmers (livestock grazers), local communities, developers and ecotourists to reduce mortality from persecution and disturbance. Actions to reduce mortality from electrocution and collisions on power lines are desirable, including education campaigns, establishing priority areas for power line mitigation works and retrofitting dangerous power lines. The provision of feeding stations is also beneficial, particularly when food is scarce. The laws protecting existing nature reserves in Egypt should be enforced so as to maintain an adequate area of legally protected habitat, and lobbying to outlaw the sale of diclofenac for veterinary purposes could be useful, in addition to the establishment of legal protection for the species in range states. Finally, populations of feral dogs should be controlled to avoid direct predation.

Assessor(s): Riad, A., Haitham, O. & Garrido López, J.R.

Reviewer(s): Numa, C. & Barrios, V.

Contributor(s): Gyenge, P. & BirdLife International

Date: 2020–09–08





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## Marsh owl, *Asio capensis* - (Smith, 1834)

POPULATION SIZE	AOO	EOO	TREND
100-200 mat. ind.	56-100 km <sup>2</sup>	9,698 km <sup>2</sup>	↓

### NORTH AFRICA REGIONAL ASSESSMENT: CRITICALLY ENDANGERED (CR) C2a(ii) (IUCN version 3.1)

This species has a small and declining population in North Africa estimated at 100–200 mature individuals in a single subpopulation. Based on historical localities, it is estimated that its extent of occurrence (EOO) has been reduced by 50 to 70% in the last 22 years as a consequence of the elimination and degradation of marshlands, its main suitable habitat. Its area of occupancy (AOO) is estimated to be less than 100 km<sup>2</sup> and its EOO 9,698 km<sup>2</sup>.

Recent observations indicate the species could be colonising new habitats, but more research is needed to increase knowledge of its current distribution, ecological requirements and population status. However, based on the small and declining population, the species is listed as Critically Endangered under criterion C2a(ii).

### DISTRIBUTION

This is a widespread Afrotropical owl occurring over large areas of sub-Saharan Africa, with isolated populations of the endemic subspecies *A. c. ssp. tingitanus* in North Africa. The Marsh Owl currently occurs in Morocco, though it formerly also bred in Algeria (Thévenot et al., 2003; Isenmann and Moali, 2000).

In Morocco, the species used to be found from Tangier to Essaouira and Fez, but currently it occurs on the plains and hills of northern and central parts of the Atlantic coast, between Tangier and Essaouira and inland around Meknès, where it almost exclusively inhabits marsh vegetation in coastal wetlands (Bergier and Thévenot, 1991; Thévenot et al., 2003). To date, five breeding localities have been identified: the wetlands of Merja Zerga, Lower Loukkos, Sidi-Boughaba and the Tahaddart estuary (MaghrebOrnitho, 2014b, 2018e), and an unknown forest habitat in the Mamora Forest, which could be a newly colonised site (Hanane and Cherkaoui, 2014).

## POPULATION

In the late 19<sup>th</sup> century, marsh owls were considered common in Morocco (Reid 1885), but the population has undergone a considerable decline since the end of the 19<sup>th</sup> century (Hanane and Cherkaoui, 2014), and especially since the 1970s in most areas, due to the increase in the human population and the resulting modification, disturbance and destruction of wetlands (Bergier and Thévenot, 1991; Thévenot et al., 2003). By 1991, the population in Morocco was estimated at 50–140 breeding pairs (Bergier and Thévenot, 1991), a number which was repeated by El Agbani and Qninba (2011). However, Qninba et al. (2008) found a decline of 40% from the 1980s to 2008 in the second most important location in Morocco, Lower Loukkos. Thus, if the decline is assumed to be the same across the country, and considering the threats that wetlands are facing (Franchimont and Saadaoui, 2001; Sayad, 2007; MaghrebOrnitho, 2012), the breeding population in the country may be estimated to be around 50–100 breeding pairs (100–200 mature individuals).

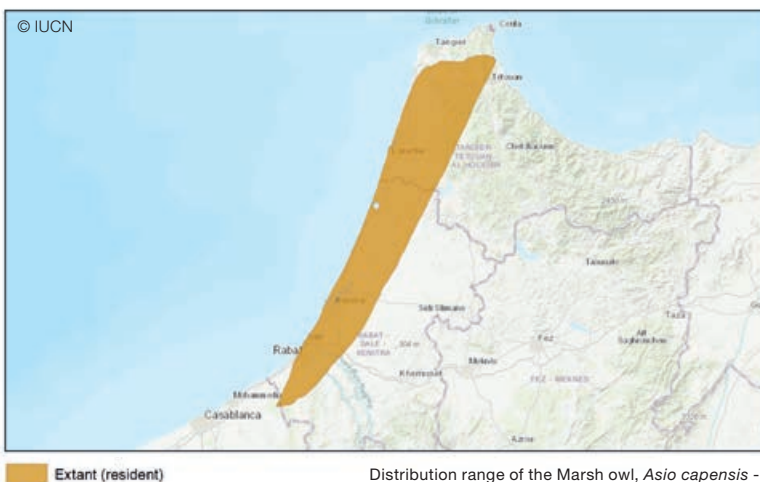
## HABITATS AND ECOLOGY

The typical habitat of the species in Morocco is permanent wetlands surrounded by well-developed marsh vegetation (Bergier and Thévenot, 1991), especially in coastal wetlands (Thévenot et al., 2003), but also in cereal fields (El Agbani and Qninba, 2011), rice fields (K. Rousselon, pers. obs., 2019) and forest habitats (Hanane and Cherkaoui, 2014). The breeding season in the area lasts from the end of February to the end of May (Thévenot et al., 2003). The marsh owl nests on the ground or, exceptionally, in trees in old corvid nests, and lays an average clutch of 3.22 eggs with a hatching rate of 78%; with young birds recorded from April to June (Bergier and Thévenot, 1991).

The species' diet varies from one site to another and includes micromammals and invertebrates, but in largely unspoilt wetlands it consists mainly of insects (Bergier and Thévenot, 1991). The species is mainly sedentary but some birds disperse over long distances (Bergier and Thévenot, 1991), even as far as Spain (De Juana and García, 2015). The habitat of the recent breeding record from the Mamora forest consists of dense *Quercus suber* forest with tall *Chamaerops humilis* and *Cistus* sp. shrubland (Hanane and Cherkaoui, 2014).

## THREATS

The marsh owl is very vulnerable to habitat loss resulting from drainage of marshland (due to the increasing human population and the expansion of agriculture) and to disturbance by farmers, pastoralists and especially birders at their main breeding sites (Bergier and Thévenot, 1991; Franchimont and Saadaoui, 2001; Thévenot et al., 2003; Sayad, 2007; MaghrebOrnitho, 2012). Nests are vulnerable to fires (Olsen, 1999), which have occurred a few times at breeding sites (MaghrebOrnitho, 2012), as well as vandalism, such that very few broods succeed at the species' best breeding site in Morocco (A. Qninba, pers. comm., 2020). Increasing populations of wild boars may also be having a negative impact on breeding success (I. Cherkaoui, pers. comm., 2020).



Distribution range of the Marsh owl, *Asio capensis* - (Smith, 1834) in North Africa. Source: The IUCN Red List of the breeding birds of prey of North Africa.

Rodenticides used on farmland may also be adversely affecting the population but there are no available data (K. Rousselon, pers. comm., 2020). Marsh owls are also killed by traffic (Bergier and Thévenot, 1991; MaghrebOrnitho, 2014b). Finally, all owl species are illegally traded in North Africa (Brochet et al., 2016), and in Moroccan popular belief, all nocturnal birds of prey are used for magic rituals. Overall, this small, isolated population could suffer a reduction in genetic diversity over time, which could influence breeding success and the long-term survival of the population unless the sites are carefully managed.

## CONSERVATION

**Conservation and research actions in place:** CITES Appendix II.

**Conservation and research actions needed:** A Conservation Action Plan must be developed to conserve and restore breeding locations, including a population and habitat viability assessment and prospection to find new populations. Strict and effective protection of all known breeding sites is required, and the destruction of wetland vegetation for agricultural purposes or by fire must be prevented. Local ornithological guides should be trained to avoid disturbing the breeding and wintering population, and best practice guidelines for birdwatching should be established, including a ban during the breeding season. Populations should be monitored to determine, protect and manage key breeding, wintering and dispersal sites. Road signage should be installed in areas of high traffic collision risk (e.g. near breeding sites) alerting drivers to the presence of marsh owls and warning them to reduce speed. Research is needed into the feasibility of a captive breeding programme to reinforce existing populations and to reintroduce individuals to suitable localities where the species has become extinct.

Assessor(s): Cherkaoui, I., Rousselon, K. & Monti, F.

Reviewer(s): Garrido López, J.R. & Qninba, A.

Contributor(s): Gyenge, P., Bakass, B., BirdLife International & Qninba, A.

Date: 2020-09-08



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## Montagu's harrier, *Circus pygargus* (Linnaeus, 1758)

POPULATION SIZE	AOO	EOO	TREND
210 mat. ind.	-	170,180 km <sup>2</sup>	↓

### NORTH AFRICA REGIONAL ASSESSMENT: ENDANGERED (EN) C2a(i); D (IUCN version 3.1)

This species has declined in North Africa, with only ca. 100 pairs remaining in Morocco and no more than five pairs in Algeria, while in Tunisia there have been no breeding records for 20 years. Therefore, the population size in North Africa is approximately 210 mature individuals. The species could potentially be listed as Critically Endangered under criterion C2a(ii), as based on these figures >90% of the population may be in the Moroccan subpopulation. However, with the ongoing decline in the country it is uncertain whether this is definitely the case and so the species is tentatively assessed as Endangered under criteria C2a(i); D.

### DISTRIBUTION

Montagu's harrier is a rare, local, summer breeding resident in north-west Africa: in the Rharb, at the Moulouya estuary and possibly at Oualidia in Morocco and in north-western Algeria (Thévenot et al., 2003; Isenmann et al., 2005; Clark and Davies, 2018). It used to breed in north-eastern Tunisia (Isenmann and Moali, 2000) but there has been no record of breeding in the last 20 years (M. Chokri and H. Azafzaf, pers. obs.). It is a common passage migrant from Eurasia in all North African countries (Clark and Davies, 2018).

### POPULATION

In the late 20<sup>th</sup> century, the population in Morocco was estimated at 500 breeding pairs, but numbers have declined markedly to ca. 100 breeding pairs (Bergier, 1987; Thévenot et al., 2003; I. Cherkaoui, pers. obs.).

There has been only one recent breeding record in Algeria, a breeding pair observed at Dayet El Fed, and the population in this country is unlikely to be more than five breeding pairs (H. Benmammar, pers. obs.). In Tunisia, there have been no breeding records in the last 20 years (M. A. Chokri and H. Azafzaf, pers. obs.). Therefore, the breeding population in North Africa can be estimated at ca. 105 breeding pairs (210 mature individuals).

North Africa is the southern limit of the species' range, so the North African population probably survived due to immigration from the larger Spanish population, but this too has suffered a major decline in the last decade (Arroyo, 2017) due to conversion of its habitat to intensive agricultural land (Ferguson-Lees and Christie, 2001; Bergier, 1987; Orta et al., 2020d).

## HABITATS AND ECOLOGY

The species occurs in open grasslands, cereal fields, upland plateaux, wetlands and marshes in coastal regions (Thévenot et al., 2003; Clark and Davies, 2018). It nests in tall vegetation on the ground. The nest is a small, narrow platform, 20–40 cm wide, made of grass stems or thin twigs. Clutches normally consist of three to five eggs (Orta et al., 2020d). In North Africa, the breeding season lasts from early April to early June (Thévenot et al., 2003).

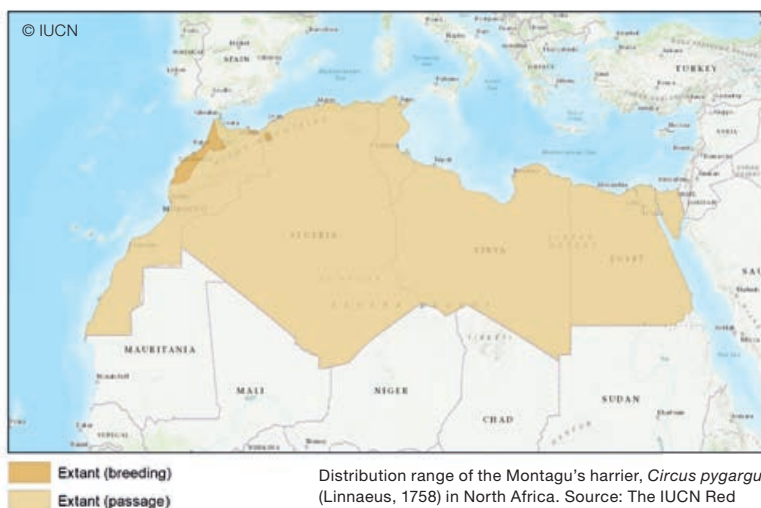
It is a migratory species, wintering in sub-Saharan Africa (Ferguson-Lees and Christie, 2001; Orta et al., 2020d). It leaves its breeding grounds from the end of July until mid-October and begins its return in March and April (Snow and Perrins, 1998; Thévenot et al., 2003; Orta et al., 2020d). This is a loop migration, with birds passing further to the west in autumn (García and Arroyo, 1998). Birds tend to migrate on broad fronts, but there are concentrations in Gibraltar and along the Rift Valley (Ferguson-Lees and Christie, 2001; Orta et al., 2020d). Nevertheless, they will readily migrate over expanses of water (Brown et al., 1982).

Birds tend to hunt alone, although they do gather at high prey concentrations and will roost in groups of often more than 50 individuals, sometimes communally with *Circus macrourus* and *C. aeruginosus* (Ferguson-Lees and Christie, 2001). They mainly feed on small mammals, birds, reptiles, sometimes insects (particularly in winter) and occasionally birds' eggs (Clark and Davies, 2018).

## THREATS

In the past, the use of organochlorine pesticides seemed to cause a decline in Europe (Ferguson-Lees and Christie, 2001), which could still be happening at least in Morocco (Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat). The species is currently in decline owing to the conversion of its habitat to agricultural land, an environment in which crop gathering by combine harvesters causes frequent breeding failure (Orta et al., 2020d; Moroccan Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat). Intensification of agriculture increases this threat (Ferguson-Lees and Christie, 2001). It is commensal with some forms of agriculture, and therefore changes in these practices could make it potentially vulnerable by depleting the supply of small birds and mammals for it to prey on (Ferguson-Lees and Christie, 2001; Orta et al., 2020d). It is highly vulnerable to the impacts of wind energy developments (STRIX, 2012), so the increasing number of massive wind energy projects in northern Morocco could be a major threat to individuals migrating across the Strait of Gibraltar.

In Morocco, nests are systematically destroyed on farmland (Thévenot et al., 2003; I. Cherkaoui, pers. obs., Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat) and shooting has been documented (MaghrebOrnitho, 2018g). Additionally, in



Merja Zerga, rush burning and vandalism can destroy nests (I. Cherkaoui, pers. obs., Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat), and very few broods now succeed at the species' best breeding site in Morocco (A. Qninba, pers. comm.).

Lastly, as a consequence of global climate change, harvests are taking place earlier, coinciding with nesting times, and chicks may be killed by the harvesting machines.

## CONSERVATION

**Conservation actions in place:** CITES Appendix II and CMS Appendix II. In Morocco, the species is included in the preparation of a raptor conservation strategy (<https://www.iucn.org/news/mediterranean/202001/first-steps-towards-a-moroccan-strategy-raptor-conservation-iucns-guidance>).

**Conservation actions needed:** Tall vegetation should not be removed during the breeding season due to the high rates of chick mortality when it is harvested on agricultural land. Key management practices that include moving nestlings to safe places during harvesting, and leaving areas around nests unharvested should be implemented (Orta et al., 2020d). Removed chicks can also be reintroduced in other suitable areas. Mediterranean populations are highly dependent on these measures owing to high nest-failure rates in the absence of intervention (Orta et al., 2020d). Where possible, strict and effective protection of breeding sites should occur, and more broadly there should be an effort to increase awareness of biodiversity conservation. In addition, research on migration routes and on the location and structure of stopover sites and wintering quarters of the species would assist the development of conservation measures (Trierweiler, 2010). A population and habitat viability assessment should be produced in addition to a management plan and conservation action plan; and the populations should be monitored to determine, protect and manage key breeding, wintering and dispersal sites.

Assessor(s): Cherkaoui, I., Azafzaf, H., Chokri, M.A., Benmammar Hasnaoui, H., Monti, F. & Garrido López, J.R.

Reviewer(s): Numa, C. & Qninba, A.

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Date: 2020-09-07



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## Egyptian vulture, *Neophron percnopterus* - (Linnaeus, 1758)

POPULATION SIZE	AOO	EOO	TREND
1,500 mat. ind.	↓	6,300,621 km <sup>2</sup>	↓

### NORTH AFRICA REGIONAL ASSESSMENT: ENDANGERED (EN) A4bcde (IUCN version 3.1)

The resident population of Egyptian vultures is suspected to be around 1,500 mature individuals, although further validation of this estimate is needed. Most of the available data come from Morocco, where there has been an estimated population decline of at least 98% in the last 40 years (2.2 generations). However, the population size in Algeria and Tunisia seems stable, while little information is available from Libya and Egypt. Based on the available data it is likely that the ongoing decline in the species in this region is in the range of 50–79% over three generations (ca. 53 years). Therefore, it is assessed as Endangered under criterion A4bcde.

### DISTRIBUTION

The species is uncommon to rare and a local summer breeder in North Africa, mainly along the Mediterranean coast from Morocco to Egypt (Clark and Davies, 2018). Apart from in Algeria, the species' population has declined throughout its range in North Africa, mainly because of indirect poisoning, as has happened throughout its global distribution area (Botha et al., 2017). In Morocco it currently seems to survive only in the Middle Atlas and Tazekka National Park, since it was extirpated in the rest of the country during the 20<sup>th</sup> century, mainly by poisoning (Thévenot et al., 2003; Amezian and El Khamlichi, 2016; Cuzin, 2019; IUCN and DEF, 2020). However, it may still occur in unsurveyed areas which need more field work (Cuzin, 2019), and a possible breeding pair has recently been located in Missouri in eastern Morocco, but this still needs confirmation (IUCN and DEF, 2020). In Algeria the Egyptian vulture appears to breed from the coast southward to the Saharan Atlas and beyond (Isenmann and Moali, 2000), with a large resident population in the south-east (Clark and Davies, 2018; Buij et al., 2017); the

country has the largest population in the Maghreb (North African Birds, 2014a). It also occurs in north-western Tunisia (Isenmann et al., 2005), northern and south-eastern Libya (Isenmann et al., 2016) and south-western Egypt (Aswan, Shalateen, and Wadi El-Gemal National Park), as well as in the Sinai Peninsula, although it is extinct in the western desert of Egypt and the Nile Valley (Goodman and Meininger, 1989; Buij et al., 2017; Habib, 2016c).

A large part of the Eurasian breeding population passes through the Strait of Gibraltar and the Red Sea Flyway on migration to its wintering sites in Africa (Phipps et al., 2019), but some individuals also pass through Cap Bon and the Tunisian coast (Isenmann et al., 2005; M. Amezian, pers. obs.). European and North African Egyptian vultures winter in the Sahel region of Africa (Botha et al., 2017), with a few migrants potentially wintering in Egypt (Goodman and Meininger, 1989). Three separate subpopulations can be distinguished: the Maghreb subpopulation, including Mediterranean breeding populations in Morocco, northern Algeria, Tunisia and northern Libya; the Desert subpopulation in south-eastern Algeria and Libya, which is more closely related to the Afrotropical population than to the Mediterranean; and the Egyptian subpopulation, isolated from the Mediterranean and Desert subpopulations and more closely related to the Arabian subpopulation of the species.

## POPULATION

The North African population can be estimated at more than 750 breeding pairs or 1,500 mature individuals. There are ca. 20 pairs in Morocco (M. Amezian and R. El Khamlichi, pers. obs.; Cuzin, 2019; IUCN and DEF, 2020), which is significantly less than the previous estimate of 500–1,000 pairs in the 1980s (Thévenot et al., 2003). There are around 500 breeding pairs in Algeria, where they are more frequent in the south and less abundant in the western part of the country (M. Saheb, A. Fellous-Djardini, pers. obs.). There are 100–150 pairs in Tunisia, where the population seems stable (I. Essetti, pers. obs.). And there are fewer than 20 pairs in Egypt, with only two in Sinai (A. Riad, pers. obs.). There are no available population estimates from Libya, although the species has not been seen since 2010 in the Cyrenaica region, where it is suspected to have disappeared, but this information is difficult to verify (K. Etaleb, pers. obs.). More than 4,000 individuals have been observed on migration across the Strait of Gibraltar (A. Onrubia, pers. obs.). Based on these data, the ongoing decline in the species in this region is likely to be 50–79% over three generations (ca. 53 years).

## HABITATS AND ECOLOGY

The species occurs in a variety of habitats, from Mediterranean woodlands to arid areas, but also near human habitation, especially rubbish dumps and cultivation (Clark and Davies, 2018). In Morocco it is currently observed in cultivated plateaux and wooded environments, where there are gorges with cliffs at moderate altitude (400 to 1,400 m) (Cuzin, 2019). This species typically nests on ledges or in caves on cliffs (Thévenot et al., 2003). Egyptian vultures usually build nests with sticks but also use artificial materials and they raise one or two chicks, rarely three (Clark and Davies, 2018; H. Benmammar, pers. obs.). Cases of polyandry have been reported in Europe (Perennou et al., 1987; Tella, 1993).



■ Extant (breeding)  
■ Extant (passage)

Distribution range of the Egyptian vulture, *Neophron percnopterus* - (Linnaeus, 1758) in North Africa. Source: The IUCN Red List of the breeding birds of prey of North Africa.

According to Clark and Davies (2018) it is primarily a scavenger, though it is less dependent on large carcasses, on which it can feed only after other large vultures have eaten. It can also capture live prey such as turtles and insects, and it will feed on birds' eggs and on organic remains at rubbish dumps and slaughterhouses. In Algeria, groups of Egyptian vultures are present at all rubbish dumps, along with common ravens (*Corvus corax*) and black kites (*Milvus migrans*) (A. Fellous-Djardini, M. Saheb, pers. obs.), whereas in Egypt, it occurs in



areas with low human population density (A. Riad, pers. obs.). The species is usually solitary, but vultures congregate at feeding and roosting sites (Ceballos and Donázar, 1990; Amezian and El Khamlichi, 2016).

The majority of individuals from northern breeding populations are long-distance migrants that overwinter in sub-Saharan Africa, with juveniles often remaining in the winter range for more than a year after their first migration (López-López et al., 2014; Oppel et al., 2015; Buechley et al., 2018). A few migrants presumably winter in Egypt (Goodman and Meininger, 1989).

Communal night roosts of non-breeding birds are formed, usually on cliffs, but also occasionally in trees (Ceballos and Donázar, 1990; Clark and Davies, 2018). In North Africa, only one communal roost has been found in the Middle Atlas breeding area in Morocco (Amezian and El Khamlichi, 2016) and two in Ain Mlila (Mount Kef Nsser) in Algeria (M. Saheb, pers. obs.).

## THREATS

In Morocco the species may have suffered unintentional poisoning leading to the extirpation of the species from most of the country in the 20<sup>th</sup> century (Thévenot et al., 2003; Bergier et al., 2017), and it can still be a threat locally today (Amezian and El Kalimchi, 2016; Cuzin, 2019; Moroccan Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat). Poisoning is also a potential threat in Libya (Isenmann et al., 2016). In Tunisia, some very local cases of poisoning have been observed and this threat must be properly evaluated (M. Petretto, pers. comm., M. Amezian, pers. obs.). However, it does not seem to be a conservation problem in Algeria and Egypt, according to local experts. Due to its diet, the species might also be susceptible to poisoning when feeding at landfills (Cuzin, 2019) but these could actually be key feeding habitats if properly managed (JMM and Associates, 2015). The increasing use of agricultural pesticides across the species' habitat also constitutes a potential threat, as it can cause secondary poisoning through consumption of poisoned corpses (Cuzin, 2019).

Amezian and El Khamlichi (2016) found that there is pressure from dealers in vulture parts that are used in 'traditional' medicine in the Middle Atlas in Morocco, and illegal trade has been mentioned for Tunisia (North African Birds, 2014b); however, this seems not to be common at present, and it is not a threat in Algeria, Libya or Egypt. Collision with and electrocution by power lines is a further threat (Andevski, 2017; Botha et al., 2017; AMFCR, 2018; IUCN and DEF, 2020; Moroccan Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat), and the species is highly vulnerable to the effects of wind energy developments (STRIX, 2012; Andevski, 2017), so the increasing number of massive wind energy projects in northern Morocco could be a major threat to migrants crossing the Strait of Gibraltar, and the future wind farm near Taza could affect the Moroccan breeding population in Tazekka National Park. The ongoing hydroelectric project in the Gorges of Sebou is also being built next to the only known breeding site in Morocco (Moroccan Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat; Red List review workshop Tunisia, 2020). Other potential threats are disturbance, hunting and poaching (North African Birds, 2014b; Andevski, 2017; MaghrebOrnitho, 2018f; Cuzin, 2019; Moroccan Strategy for Conservation of Birds of Prey Workshop, Rabat). In contrast, there do not seem to be any major threats to the largest breeding population in Algeria, or in Libya and Egypt.

## CONSERVATION

**Conservation actions in place:** CMS Appendix I. CITES Appendix II. It is included in a multi-species action plan for African–Eurasian vultures (Botha et al., 2017). In Morocco, the species is included in the preparation of a raptor conservation strategy (<https://www.iucn.org/news/mediterranean/202001/first-steps-towards-a-moroccan-strategy-raptor-conservation-iucns-guidance>) and in a national population monitoring programme (IUCN and DEF, 2020). An initiative to identify and correct dangerous power lines has also started in Morocco with the collaboration of governmental bodies and NGOs (Godino et al., 2016; Martín Martín et al., 2019). There are some initiatives to rescue and release sick and injured wild individuals and to tag vultures (including attaching GPS loggers) in Morocco (AMFCR, 2018). In northern Morocco a vulture restaurant and a rehabilitation centre are in operation (R. El Khamlichi, pers. comm., 2020). In Algeria, the Tlemcen National Park has developed an action plan for the species, which was implemented in 2017–19 (H. Benmammar, pers. comm., 2020).

**Conservation actions needed:** Efforts to increase awareness of biodiversity conservation and to build local capacity should be conducted in countries along the migration flyways and in the breeding and wintering areas. All known breeding sites in Morocco should be conserved, and the construction of energy infrastructure in key areas for the species should be avoided. The ban on poisoned carcasses should be enforced and the leaving of dead animals encouraged, while open landfill sites can become key feeding habitats for Egyptian vultures if properly managed. Indeed, further supplementary feeding stations should be set up. Work is needed to halt the illegal taking of vultures for traditional medicine in Morocco and for illegal trade throughout the species' range.

Finally, surveys of the population should be conducted to determine, protect and manage potential breeding sites and key dispersal areas, including migration corridors in the western and eastern flyways. Such work could also more accurately estimate the size of the population and identify the specific impacts of certain threats.

Assessor(s): Benmammar Hasnaoui, H., Fellous-Djardini, A., Essetti, I., Saheb, M., Haitham, O., Buirzayqah, S., Riad, A., Noaman, M., Etayeb, K., Cuzin, F., Bergier, P., Radi, M., Onrubia, A. & Amezian, M.

Reviewer(s): Garrido López, J.R. & Qninba, A.

Contributor(s): Gyenge, P., BirdLife International, El Khamlichi, R. & Petretto, M.

Date: 2020-05-17



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## Osprey, *Pandion haliaetus* - (Linnaeus, 1758)

POPULATION SIZE	AOO	EOO	TREND
130-146 mat. ind.	-	6,895,719 km <sup>2</sup>	=

### NORTH AFRICA REGIONAL ASSESSMENT: ENDANGERED (EN) D (IUCN version 3.1)

While in central and northern Europe the osprey breeds in large numbers, few relict breeding nuclei remain in the Mediterranean, particularly in North Africa. Although the population is suspected to be stable, the probability of immigration of individuals from nearby breeding sites in the Mediterranean region is low. Moreover, the main threats are ongoing and some may even be expected to increase in the future (e.g. human disturbance due to fishing and tourism, power lines and windfarm development). The population size of this species is very small (<150 mature individuals) and so it is assessed as Endangered under criterion D.

### DISTRIBUTION

From west to east, the species is present in Morocco, Algeria and Egypt. In Morocco it breeds in the Al Hoceima National Park (Monti et al., 2013). Here, two unused nests were found near Jebha, 30 km from Cala Iris, outside the protected area. Also in Morocco, in the Chafarinas Islands, the last breeding pair was recorded in 2012 (Monti et al., 2013; Siverio et al., 2018). In Algeria, it is present on the Mediterranean coast at Oran (Monti, 2012) and possibly on the east coast of the country near El Kala. Many wintering birds are observed in Tunisia but the species has not nested there since 1953 (Isenmann et al., 2005; Monti, 2012). In Egypt, it breeds only on the Red Sea coast and South Sinai (Habib, 2019a). Although there are no detailed studies available, the ospreys breeding in North Africa seem to behave as year-round residents or doing short inter-breeding movements. The great majority of Mediterranean ospreys winter within the Mediterranean basin including North African coastal wetlands, but there are records of trans-Saharan migration, indicating that at least a few individuals from the Mediterranean region winter in sub-Saharan Africa, as their conspecifics from northern Europe commonly do (Monti et al., 2018).

## POPULATION

In Algeria the population size is estimated at 30–34 mature individuals, based on the number of breeding pairs counted in 1989–1993 (Boukhalfa, 1990; Thibault et al., 1996; Monti, 2012). In Morocco, there may be 10–15 breeding pairs or 20–30 mature individuals (producing 8–12 chicks per year) (Monti, 2012; Monti et al., 2013), but a census performed in 2019 indicated there were about 16 active nests (AGIR, 2018; H. Nibani, pers. obs.). Reports indicate the Moroccan population decreased by 35.7% between 1990 and 2013 (Monti et al., 2013), but the population trend seems to have been stable since then. In Egypt, 80 mature individuals (40 active nests) were counted on islands in the Red Sea in 2013–15 (Habib, 2019a). Therefore, the total population size for North Africa is estimated to be between 130 and 146 mature individuals.

## HABITATS AND ECOLOGY

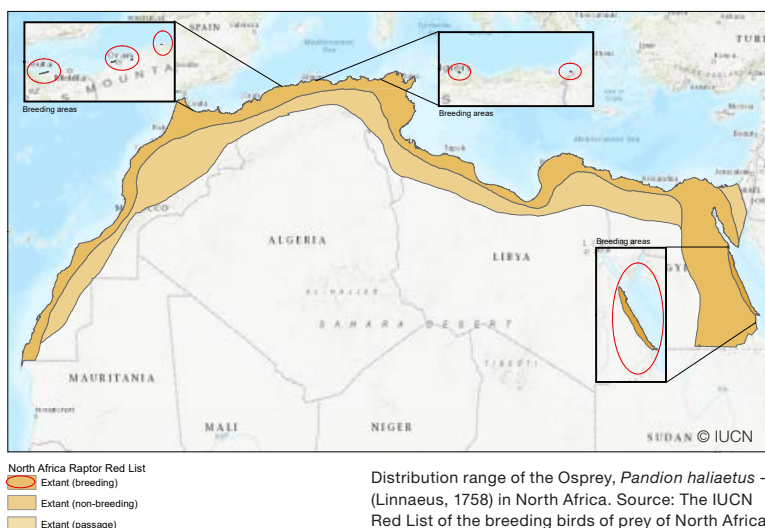
Ospreys tend to be opportunistic, adapting their behaviour to the location and the water bodies available, with fishing opportunities probably being the most important requirement. In marine environments, its diet consists almost entirely of live epipelagic fishes (e.g. *Liza* spp., *Diplodus* spp.) (Poole, 2020). At times, individuals will frequent estuaries, marshes and other coastal waters as well as lakes and pools inland. During migration, any kind of water body where fishing may be possible (with medium-sized fish no deeper than one metre below the surface) can be used. The species is generally intolerant of disturbance, especially when the source of the disturbance is directed toward the nest (Monti et al., 2018), but in some cases it has locally adapted to intense human activity (Bai et al., 2009).

Nesting sites in the Mediterranean are rocky cliffs close to marine or brackish water fishing environments (Monti et al., 2013). The nest is a large collection of sticks and flotsam, lined with grasses and moss where available, usually wedged high (up to 30 m above the ground) in an exposed tree or sometimes on cliffs. The breeding season lasts from early March to July, with egg laying from early March to early April (Thévenot et al., 2003); clutches consist of from one to four eggs. In Egypt pairs start courtship and nest building from the first week of December in the south to the first week of January in the north. Fledglings appear from late March to late April (Habib, 2017).

In North Africa, the species is mostly resident with some individuals moving short distances outside the breeding season. Migratory movements to the Sahel may also occur (F. Monti, pers. obs.).

## THREATS

In Morocco, detrimental fishing activities such as trawling and dynamite fishing are the main cause of both direct and indirect disturbance for the species in the Al Hoceima National Park (H. Nibani, pers. obs.; Moroccan Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat). Given the species' piscivorous diet, these fishing activities can reduce the availability of food in the long term by disturbing fish breeding grounds and depleting fish stocks. However, dynamite fishing is currently decreasing (H. Nibani, pers. obs.), although copper sulphate fishing (targeting octopus) is potentially an additional indirect threat.



The presence of humans can unsettle ospreys, leading them to repeatedly switch between nest sites (AGIR, 2028; H. Nibani, pers. obs.; Moroccan Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat) and potentially resulting in failed breeding attempts (Monti et al., 2013). Scuba spearfishing near breeding sites and tourism activities involving motor boats seem to be increasing in the Al Hoceima National Park (H. Nibani, pers. obs.). Deaths of ospreys by electrocution have been also recorded in Morocco (R. El Khamlichi, pers. comm.; UICN and DEF, 2020).

## CONSERVATION

**Conservation actions in place:** CMS Appendix II. Barcelona convention: Annex II. CITES Annex II. In Morocco, the species is included in the preparation of a raptor conservation strategy (<https://www.inationalucn.org/news/mediterranean/202001/first-steps-towards-a-moroccan-strategy-raptor-conservation-iucns-guidance>) and a national population monitoring programme (UICN and DEF, 2020). An initiative to identify and correct dangerous power lines has also started in Morocco with the collaboration of governmental

**Conservation and research/monitoring actions needed:** Awareness raising and education campaigns will be important for this species' conservation. Disturbance during the breeding season can be reduced by establishing protective zones 200–300 m wide around nests (Monti et al., 2018a). This, along with nest wardening, rebuilding of damaged nests and the provision of artificial nests in safe locations where necessary, should improve breeding success. The spread of pollutants should be reduced. Fish-farms visited by migrating birds should use equipment to scare birds away and prevent access to fish stocks in order to avoid accidental entanglement (for example, overhead lines instead of nets laid on the water surface could be an effective measure for reducing osprey mortality).

Actions are needed to reduce mortality, particularly from collisions and electrocution; they should include the modification of dangerous power lines. It would also be beneficial to maintain an adequate area of legally protected habitat and improve the level of protection at sensitive sites in North Africa. In the short term, current legislation to reduce illegal hunting, including in areas that do not have formal protected status, should be reinforced; breeding sites should be protected and disturbance avoided or limited (Monti et al., 2018a); regional recovery plans should be developed and implemented; and reintroduction and population reinforcement programmes, only if necessary, should take into consideration the genetic structure and migratory strategies of potential source populations, selecting those that are most similar to the North African population (Monti et al., 2018b).

Research is recommended to fill gaps in our knowledge of the population status in some regions, trends and the threats facing the North African population of the species, in particular in Algeria. It is also recommended to monitor demographic parameters such as the number of birds, and annual estimates of breeding and their hatching and fledging success.

Assessor(s): Monti, F., Nibani, H. & Cherkaoui, I.

Reviewer(s): Garrido López, J.R. & Numa, C.

Contributor(s): Rousselon, K., Etayeb, K., Riad, S., Haitham, O., Chokri, M.A., Gyenge, P., Benmammar Hasnaoui, H., BirdLife International & El Khamlichi, R.

Date: 2020–09–08



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## Griffon vulture, *Gyps fulvus* (Hablizl, 1783)

POPULATION SIZE	AOO	EOO	TREND
400 mat. ind.	↓	249,924 km <sup>2</sup> ↓	↓

### NORTH AFRICA REGIONAL ASSESSMENT: VULNERABLE (VU) C2a(ii) (IUCN version 3.1)

The North African population of the species is suspected to consist of around 400 mature individuals in one subpopulation. There is an observed ongoing decline of mature individuals due to the extirpation of breeding populations in Egypt, Tunisia and Morocco. The species qualifies as Endangered according to criterion C2a(ii), but due to the increasing immigration of mature individuals from Europe and the fact that it may breed in Morocco in the near future, the species is adjusted down one category and listed as Vulnerable C2a(ii).

### DISTRIBUTION

In North Africa, this species is uncommon and resident only in northern Algeria (MaghrebOrnitho, 2014c; Clark and Davies, 2018). It is in Sidi Reghis Forests at Oum El Bouaghi province (Rebbah et al., 2019), the Parc National du Djurdjura, Parc National Chrea, Massif de l'Ouarsenis in Tell Atlas, Massif des Aurès, Parc National Belezma, Gorges du Rhummel and Mt Souk Ahras Mountains (M. Saheb, A. Fellous-Djardini, H. Benmammar, pers. obs., 2020). It is also present in the Massif des Babors, and an individual has been observed in the Parc National du Tlemcen (H. Benmammar, pers. obs.). It has also been observed as a breeding species in the Parc Culturel de l'Atlas Saharien, at Mount Ksour (Fellous, 2017).

The griffon vulture has never bred in Libya. In Morocco, it used to breed in the east, the Middle Atlas, the Central Plateau, the High Atlas, the western Anti-Atlas and the Saharan Atlas (Bergier, 1987; Thévenot et al., 2003), but in the 21<sup>st</sup> century there has been no active breeding in the country (Garrido et al., 2005; Hajib, 2005; IUCN and DEF, 2020). Similarly, it formerly bred in north-eastern and southern Tunisia (Isenmann et al., 2005), and it used

to breed in eastern Egypt (Andevski, 2017), but more recent information confirms the species no longer breeds in the country (A. Riad, pers. obs.).

Immatures, mainly juveniles, migrate from Eurasia through Morocco, Algeria and Egypt to sub-Saharan Africa to winter, and some vultures seem to winter in the southern Moroccan Sahara and eastern Egypt (Clark and Davies, 2018).

## POPULATION

The Algerian population was estimated at 126 breeding pairs in Kabylia and Constantinois by Benmammar (2012). More recent data show a wider distribution (North African Birds, 2015; Sahnoune, 2016; Bara and Khiter, 2017; Rebbah et al., 2019). The population in Algeria (and North Africa) can be conservatively estimated at around 200 breeding pairs or 400 mature individuals.

## HABITATS AND ECOLOGY

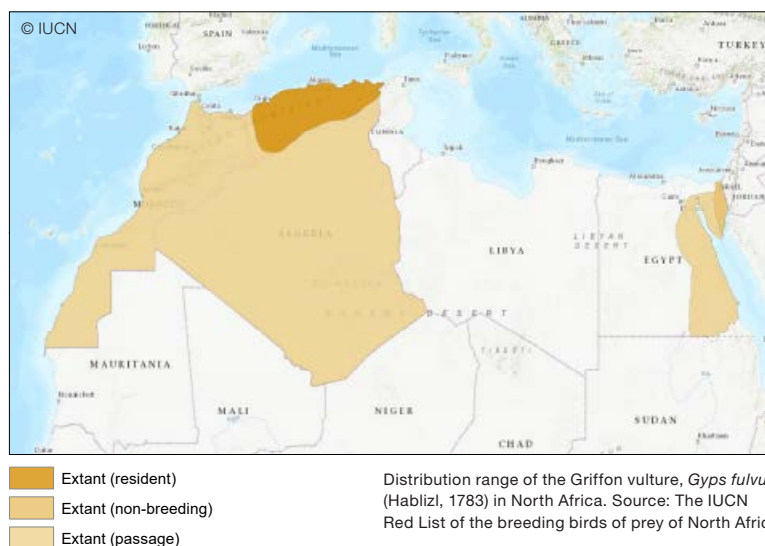
Breeding adults are largely sedentary, but most juveniles are migratory or nomadic, overwintering in sub-Saharan Africa, but also in eastern Egypt (Botha et al., 2017; Clark and Davies, 2018). Migrating birds congregate in some specific locations, such as Gibraltar and Suez (Botha et al., 2017). The species relies heavily on soaring flight, and has been shown to fly at altitudes of 10,000 m and higher, and it needs thermals because it prefers gliding and soaring over active flight, to save energy (in Botha et al., 2017). The species roosts and nests on large cliffs and soars over surrounding open countryside from mountains to semi-deserts in search of food, occurring from sea level up to 2,500 m (Botha et al., 2017).

The nest is usually built on a rocky outcrop, with sheltered ledges or small caves preferred (del Hoyo et al., 1994). It is a thin, fairly small platform of branches, sometimes stolen from other large raptors. A single egg is laid (Orta et al., 2020e). It feeds almost exclusively on carcasses of medium-sized and large domestic and wild animals, often in large numbers, although there are a few records in Spain of birds approaching live but injured or weak sheep or cattle (Botha et al., 2017). Rubbish dumps can be good feeding sites, but they may also have detrimental effects through the consumption of inappropriately disposed of poisoned animals and the impact of human infrastructure nearby (JMM and Associates, 2015).

## THREATS

The griffon vulture was extirpated in Morocco in the 20<sup>th</sup> century because, through their scavenging habits, individuals became unintended victims of poisoning for predator control by farmers (Garrido et al., 2014; Andevski, 2017; Botha et al., 2017). In Morocco, such poisoning was even conducted by the government until the end of the 20<sup>th</sup> century (Garrido et al., 2014; F. Cuzin, pers. obs.). Internationally banned organochlorine pesticides are still locally available and kill wildlife and pollute the environment (Garrido et al., 2014), and poisoning is still considered a threat (Moroccan Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat). However, poisoning does not seem to be a problem in Algeria.

The griffon vulture is susceptible to mortality due to collisions with and electrocution on power lines (Andevski, 2017; Botha et al., 2017; Moroccan Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat), though it had disappeared from Morocco before the large-scale electrification of rural areas began. Nevertheless, this may become a significant



threat to resident and migrant populations if the power line network increases within its range, and griffon vulture deaths on power lines have been reported in south-eastern Morocco near Missour (IUCN and DEF, 2020). The species is also highly vulnerable to the effects of wind energy developments (STRIX, 2012; Andevski, 2017), so the increasing number of massive wind energy projects in northern Morocco could be a huge threat to migrants crossing the Strait of Gibraltar (Moroccan Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat). Also in Morocco, every year dozens of migrant vultures are found drowned in artificial ponds where they go to drink or bathe during the summer months (R. El Khamlichi, pers. comm.).

Additionally, although livestock is very abundant, local traditions such as burying domestic ungulate carcasses decrease food availability for scavengers, especially in Morocco (Garrido et al., 2014; Allaoui and Cherckaoui, 2018); in Algeria carcasses should also be buried, but they normally are not (A. Fellous-Djardini, M. Saheb, pers. obs.). There is also a widespread problem across North Africa of poaching to supply the illegal trade in raptors and raptor body parts (Emile et al., 2014; Brochet et al., 2016), which is known to impact the griffon vulture (Garrido et al., 2014; Andevski, 2017; Botha et al., 2017; MaghrebOrnitho, 2020; A. Fellous-Djardini, M. Saheb, pers. obs., Moroccan Strategy for Conservation of Birds of Prey Workshop, 2020, Rabat). In Tunisia the major causes of extinction are not known, but the last small population was exploited in the past for European collections.

## CONSERVATION

**Conservation actions in place:** CMS Appendix II. CITES Appendix II. It is included in a multi-species action plan for African–Eurasian vultures (Botha et al., 2017). In Morocco, the species is included in the preparation of a raptor conservation strategy (<https://www.iucn.org/news/mediterranean/202001/first-steps-towards-a-moroccan-strategy-raptor-conservation-iucns-guidance>) and in a national population monitoring programme (IUCN and DEF, 2020). An initiative to identify and correct dangerous power lines has also started in Morocco with the collaboration of governmental bodies and NGOs (Godino et al., 2016; Martín Martín et al., 2019). There are some initiatives to rescue and release sick and injured wild individuals, and to tag them (including attaching GPS loggers) in Morocco (AMFCR, 2018). In northern Morocco a vulture restaurant and a rehabilitation centre have been set up, whose work includes capturing and marking individuals with wing tags and GPS loggers (R. El Khamlichi, pers. comm.).

**Conservation actions needed:** There is only a single small breeding population in Algeria, so it is important to try to restore the breeding population in the species' former range. Effective protection in areas with a plentiful supply of food (which often includes the carcasses of domestic animals), has been shown to result in impressive population recoveries in other areas, and reintroduction has been successful in parts of its range (del Hoyo et al., 1994); such measures could be implemented in Morocco, Tunisia and Egypt if threats are controlled. The provision of feeding stations is also beneficial, particularly when food is scarce. The ban on poisoned carcasses should be enforced and the leaving of dead animals encouraged. The griffon vulture population should be surveyed to determine, protect and manage potential breeding sites and key dispersal areas. The construction of wind farms in key areas for the species should be avoided, and where they have already been built staff should be trained in bird monitoring. Artificial ponds in breeding, migratory and wintering areas should be adapted to prevent vultures drowning while drinking or bathing. Finally, and more broadly, awareness of biodiversity conservation needs to be increased amongst local people.

Assessor(s): Garrido López, J.R., Benmammar Hasnaoui, H., Fellous-Djardini, A., Cuzin, F., Essetti, I., Noaman, M., Onrubia, A., Radi, M., Riad, A. & Saheb, M.

Reviewer(s): Numa, C. & Barrios, V.

Contributor(s): Gyenge, P., BirdLife International & El Khamlichi, R.

Date: 2020–09–08





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## Eurasian hobby, *Falco subbuteo* - Linnaeus, 1758

POPULATION SIZE	AOO	EOO	TREND
1,000-2,000 mat. ind.	-	641,006 km <sup>2</sup>	↓

### NORTH AFRICA REGIONAL ASSESSMENT: ENDANGERED (EN) C2a(ii)

The Eurasian hobby is an uncommon local migrant, breeding in forests in the northern half of Morocco, most likely with a continuous distribution into northern Algeria and across to western Tunisia. The resident population has been estimated at 1,000–2,000 mature individuals in a single subpopulation, but further validation of this estimate is needed. Ongoing population decline is inferred from the observed degradation of open wooded areas, its main suitable habitat, and the small number of sightings in recent road censuses in Morocco. For these reasons the species is listed as Endangered under criterion C2a(ii).

### DISTRIBUTION

This uncommon local migrant breeds in forests in the northern half of Morocco up to 2,000 m asl (Thévenot et al., 2003), most likely with a continuous distribution in forests through northern Algeria (Isenmann and Moali, 2000; Sahnoune, 2016; Fellous, 2017) to western Tunisia (Isenmann et al., 2005). It bred in Libya in 1923, but there have been no breeding observations since then (Isenmann et al., 2016). The entire breeding population in Europe and North Africa winters in the Sahel zone and in eastern and southern Africa, passing through all the North African countries on the way (Isenmann and Moali, 2000; Thévenot et al., 2003; Isenmann et al., 2005, 2016; Clark and Davies, 2018).

## POPULATION

In the late 20<sup>th</sup> century, the breeding population was estimated at between 500 and 1,000 breeding pairs in Morocco (Thévenot et al., 2003), with 50 breeding pairs in Tunisia at the beginning of the 21<sup>st</sup> century (Isenmann et al., 2005), although further validation of this estimate is needed. Recent road surveys (2015–2017) during raptor breeding seasons throughout Morocco suggest the species could actually be at a low density in Morocco, with only one individual seen in 500 km (A. Onrubia, pers. obs., 2015–17). Therefore the figure of 500–1,000 pairs may now be an overestimate. There are no data from Algeria.

Considering the unknown breeding population in Algeria, the North African population may be estimated at no less than 500–1,000 breeding pairs (1,000–2,000 mature individuals). Ongoing population decline is inferred to be occurring in the species' range, given the observed degradation of open wooded areas, its main suitable habitat, and sightings in recent road censuses in Morocco.

## HABITATS AND ECOLOGY

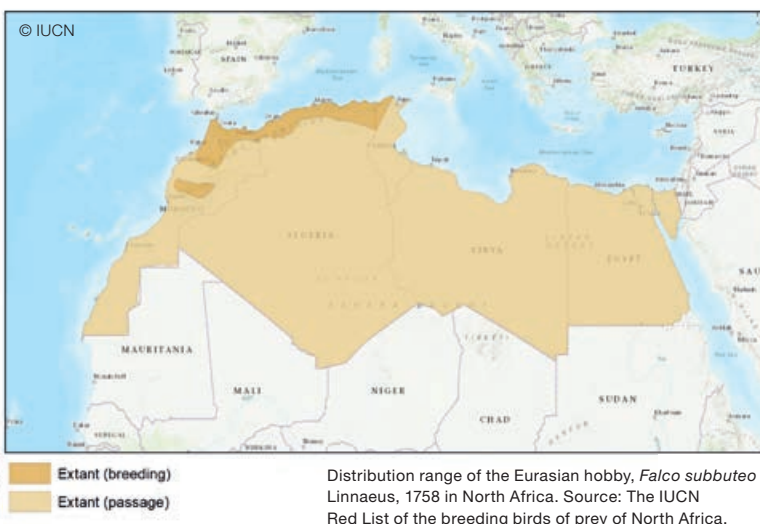
Most individuals of the species are migratory. European and North African birds mainly winter south of Sahara (Clark and Davies, 2018). Autumnal migration occurs from late July to November, peaking in late September and early October. Spring migrants are sighted in mid-February, and passage lasts until early June, with the majority appearing between mid-April and early May (Isenmann and Moali, 2000; Thévenot et al., 2003; Isenmann et al., 2005, 2016; Strandberg et al., 2009). The species migrates along broad fronts and usually does not concentrate at narrow sea crossings as do many other migratory raptors (Snow and Perrins, 1998; Strandberg et al., 2009; Orta et al., 2020c). Birds are usually seen singly, in pairs or family groups, even on migration, with larger groups being rare except at rich winter feeding sites and wintering communal roosts, where it usually joins other small falcons (Ferguson-Lees and Christie, 2001; Clark and Davies, 2018). Individuals hunt mainly birds and flying insects, but also bats, small mammals and reptiles, and they are often more active at dawn and dusk (Clark and Davies, 2018). They also kleptoparasitise other small raptors by stealing their prey (Clark and Davies, 2018).

Eurasian hobbies breed in open wooded areas, using corvid nests (and also other raptors' nests, del Hoyo et al., 1994), so they do not nest until summer when corvid nests are available, and this also coincides with more passerine fledglings being available to feed their chicks (Clark and Davies, 2018). They breed in oak woods and pine forests in North Africa (Thévenot et al., 2003; Isenmann et al., 2005) and avoid completely deforested areas (del Hoyo et al., 1994). The clutch typically consists of three eggs (Orta et al., 2020c). In winter the species may be found in a wide variety of habitats, including woodlands, savannas, grasslands, wetlands, agricultural areas, town parks and mountain grasslands (Clark and Davies, 2018). Although it does not have strict habitat requirements, it is very sensitive to human disturbance.

## THREATS

The clearing of old forest patches has caused local declines (Orta et al., 2020c). Agricultural intensification threatens Eurasian hobbies through the clear-felling of nesting trees and the reduction in prey such as insects and farmland birds (Sergio et al., 2001).

Pesticide use against locusts has been reported as a potential threat in wintering grounds (Sergio et al., 2001), and so this could be an additional threat within this region too. However, pesticide poisoning has likely had only minor impacts, as has egg collecting, which tends to be a local issue (Ferguson-Lees and Christie, 2001).



Shooting is a significant cause of mortality during migration over Mediterranean islands (Sergio et al., 2001) and probably also in North African countries, as is the case with other raptors (Brochet et al., 2016; Elhalawani, 2016). Persecution of corvids may deplete the availability of nesting sites locally and can also lead to unintentional killing (Sergio et al. 2001). A growing threat is human disturbance associated with silvicultural and hunting activities during the breeding season (Sergio et al., 2001). The species is also highly vulnerable to the effects of wind energy developments (STRIX, 2012), so the increasing number of massive wind energy projects in North Morocco could be a huge threat to the migrant population through the Strait of Gibraltar.

## **CONSERVATION**

**Conservation actions in place:** CMS Appendix II, CITES Appendix II.

**Conservation and research actions needed:** Appropriate agricultural policies should be promoted, including preservation of trees for nesting, control of pesticides to maintain insect populations throughout the bird's range, maintenance of stubble fields and hedges, and direct drilling to preserve farmland birds that Eurasian hobbies feed on. Woodlands should also be managed appropriately, avoiding the complete removal of all trees. The provision of artificial nests can also help this species when there is a lack of natural nests of other species for it to use. Policies should also look to control hunting along migration routes. Additionally, suitable impact assessments should be conducted for wind energy developments, especially in the southern part of the Strait of Gibraltar. Surveys and monitoring of the population should be conducted to determine, protect and manage potential breeding sites and key dispersal areas, including migration corridors in the western and eastern flyways. Other key research should investigate this species' migration strategies and ranging behaviour by deploying GPS loggers. In addition, as this species is migratory, work should not only focus on North Africa; wintering areas and their ecological requirements and threats should be identified to protect them; and further research is needed to determine any additional potential threats to the species in North Africa and its wintering grounds. More broadly, work is needed to increase awareness of biodiversity conservation.

Assessor(s): Cherkaoui, I., Rousselon, K., Onrubia, A., Radi, M. & Fellous-Djardini, A.

Reviewer(s): Garrido López, J.R. & Qninba, A.

Contributor(s): Gyenge, P., Bakass, B. & BirdLife International

Date: 2020-09-08



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## Short-toed snake eagle, *Circaetus gallicus* - (Gmelin, 1788)

POPULATION SIZE	AOO	EOO	TREND
2,600-2,700 mat. ind.	-	3,779,403 km <sup>2</sup>	↓

### NORTH AFRICA REGIONAL ASSESSMENT: NEAR THREATENED (NT)

This species occurs over a wide range, with a breeding population estimated to be around 2,600–2,700 mature individuals distributed in 3 subpopulations, with 98% of individuals in the Maghreb subpopulation. There are signs of decline in the past for the Maghreb subpopulation, but currently the species is considered common and thus does not seem to be in ongoing decline.

Therefore, this species is listed as Near Threatened C2a(ii) in North Africa.

### DISTRIBUTION

This eagle breeds in North Africa, including Morocco, northern Algeria, north-western Tunisia and north-eastern coastal and west-central Libya (Cowan, 1982; Isenmann and Moali, 2000; Thévenot et al., 2003; Isenmann et al., 2005, 2016; Clark and Davies, 2018; S. Buirzayqah, pers. obs.). It has bred locally in Egypt as well and there are two recent confirmed observations of breeding pairs in Sinai and on the southern coast (A. Riad, pers. obs.). There are also recent records of breeding in Moroccan Atlantic Sahara, but they are considered isolated (Bergier et al., 2017). The Tunisian range does appear to have shrunk though, due to deforestation (Isenmann et al., 2005).

A few migrants winter in North African countries, e.g. Morocco and Algeria (P. Bergier, A. Fellous-Djardini, pers. obs.), but the entire breeding population of Europe and North Africa winters in the Sahel, passing through all North African countries (Isenmann and Moali, 2000; Thévenot et al., 2003; Isenmann et al., 2005, 2016; Bergier et al., 2017; Clark and Davies, 2018).

Migrants pass especially across the Strait of Gibraltar and through Morocco (MaghrebOrnitho, 2018h), and through the Nile Valley, Red Sea Mountains and Sinai Peninsula in Egypt (Goodman and Meininger, 1989), with very few individuals migrating through Sicily and Tunisia. Some immature short-toed snake eagles leave their Sahelian wintering grounds by mid-April and, after crossing the Sahara Desert, may settle in north-eastern Morocco and northern Algeria, not returning to Europe until their second or third summer (Mellone et al., 2011).

## POPULATION

In Morocco there were estimated to be more than 1,000 breeding pairs in the 1980s (Thévenot et al., 2003). The species seems more abundant in the northern part of the country, with smaller populations in the south. However, the population is now suspected to be around 500 breeding pairs in the country (F. Cuzin, pers. obs.). In Algeria the species is distributed over the northern part of the country from the coast to the Saharan Atlas; the population appears to have been stable since the 1980s at around an estimated 500 breeding pairs nationwide (A. Fellous-Djardini, M. Saheb, H. Benmammar, pers. obs.). In Tunisia this eagle is considered quite common. Here the population is suspected to be around 300 breeding pairs (I. Essetti, pers. obs.), whereas in Libya only 15 breeding pairs are regularly reported (S. Buirzayqah, pers. obs.). There are also two recently confirmed sightings of breeding pairs in Sinai and on the coast of southern Egypt (A. Riad, pers. obs.).

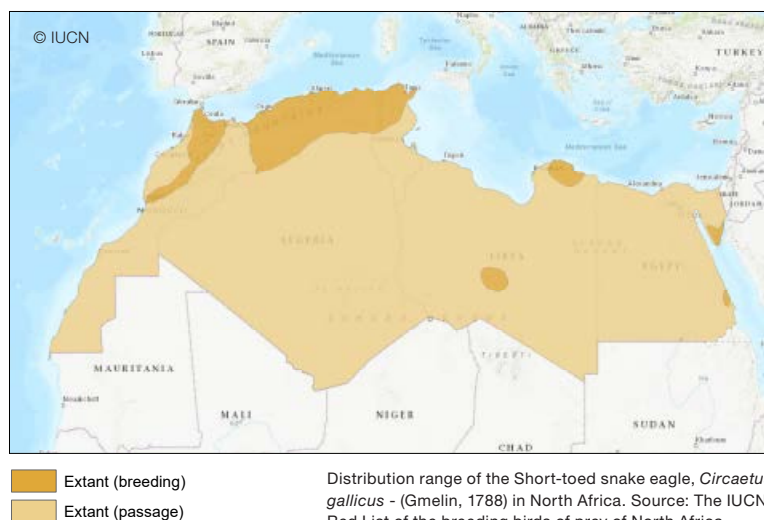
In total there are three subpopulations: a Maghreb subpopulation covering Morocco, Algeria and Tunisia, a Libyan subpopulation and an Egyptian subpopulation. The total breeding population in North Africa is estimated at around 1,300 to 1,350 breeding pairs or 2,600–2,700 mature individuals.

## HABITATS AND ECOLOGY

This species inhabits open areas but nests in a wide variety of wooded habitats (such as *Acacia* savanna, Bergier et al., 2017), from sea level up to 2,300 m elevation in Morocco (Thévenot et al., 2003). Although it occurs in open habitats, the species generally requires some degree of tree cover (del Hoyo et al., 1994), and it has been observed to visit oases (e.g. in Algeria, A. Fellous-Djardini, pers. obs.). It breeds from late March until early May (Isenmann and Moali, 2000; Isenmann et al., 2005). Nests can be found in large trees, usually in the crown, and are constructed of sticks and twigs, and lined with green leaves or grass, occasionally even pine needles (Thévenot et al., 2003; Orta et al., 2020g). Usually only a single egg is laid (Orta et al., 2020g).

Birds breeding in the Palearctic are migratory. Migrants move south between August and November, and north between February and May (Ferguson-Lees and Christie, 2001). Breeding birds arrive at their North African nesting sites around February and March (Thévenot et al., 2003; Isenmann et al., 2005). Birds are usually observed singly or in pairs, even during migration, though migrants sometimes form groups of up to 12 (Ferguson-Lees and Christie, 2001). During good rainy years, the species makes quite prolonged pre-nuptial migratory stopovers, individually or in pairs, south of the Atlantic Sahara, taking advantage of the abundance of snakes and lizards (A. Qninba, pers. comm.).

Short-toed snake-eagles prey primarily on snakes and lizards, but also take mice, amphibians and birds, and hunt them from the air, spending much of their time hovering and kiting (Clark and Davies, 2018).



## THREATS

The loss of nesting sites due to logging as well as disturbance seem to be the main threats in North Africa (Red List review workshop Tunisia, 2020). The growth and spread of the human population has resulted in disturbance of raptors and destruction of their habitats, especially in forests because of the use of wood as fuel for cooking and heating and the felling of large trees (which are used for nesting) to clear land for crops and livestock (Bergier, 1987; Stuart and Collar, 1988; Garrido et al., 2005; Vernon et al., 2005; Cherkaoui et al., 2009; BirdLife International, 2018a; Tellería et al., 2019). This is of particular importance for this species because it seeks suitable habitats outside the most populated areas (Tellería et al., 2019). In addition, snake populations may have been reduced by the increase in monocultures, hedge destruction, pesticide use and the abandonment of traditional farmland and subsequent afforestation. Habitat fragmentation due to forest fires and road construction has also been reported. Nests of the species are often destroyed (Tucker and Heath, 1994; Thévenot et al., 2003) and it can be affected by power lines (Tucker and Heath, 1994; UICN and DEF, 2020). It is also highly vulnerable to the effects of wind energy developments (STRIX, 2012). Trade in North African specimens has been reported; however, these cases are considered isolated and trade is not thought to be widespread (North African Birds, 2014b; Isenmann et al., 2016; A. Fellous-Djardini, I. Essetti, pers. comm., 2020; A. Qninba, pers. obs., 2020).

## CONSERVATION

**Conservation actions in place:** CITES Appendix II and CMS Appendix II. An initiative to identify and correct dangerous power lines has started in Morocco with the collaboration of governmental bodies and NGOs (Godino et al., 2016; Martín Martín et al., 2019).

**Conservation actions needed:** Wide-scale habitat conservation measures are required, including the maintenance of low-intensity farming with the preservation of hedges and a reduction in pesticide use. Appropriate management of woodlands should maintain old trees, prevent fires and limit road construction. Any unavoidable afforestation or deforestation should occur outside the breeding season and should only result in partial habitat change. Monitoring should be conducted to assess the potential impact of wind farms in northern Morocco; and awareness of biodiversity conservation should be reinforced. Surveys and monitoring of the population to determine, protect and manage potential breeding sites and key dispersal areas, including migration corridors, are also important. Such work could also identify any further key threats to the species. Efforts should also be made to combat any illegal trade in the species.

Assessor(s): Saheb, M., Cuzin, F., Fellous-Djardini, A., Essetti, I., Bergier, P., Benmammar Hasnaoui, H., Buirzayqah, S., Radi, M., Riad, A., Onrubia, A., Noaman, M., Etayeb, K. & Haitham, O.

Reviewer(s): Garrido López, J.R. & Qninba, A.

Contributor(s): Gyenge, P., Bakass, B., BirdLife International & Qninba, A.

Date: 2020-09-07



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## Western marsh-harrier, *Circus aeruginosus* - (Linnaeus, 1758)

POPULATION SIZE	AOO	EOO	TREND
1,500 mat. ind.	-	475,000 km <sup>2</sup>	?

### NORTH AFRICA REGIONAL ASSESSMENT: NEAR THREATENED (NT) C2a(ii); D1 (IUCN version 3.1)

This species occurs over a wide range, with a resident population estimated to be around 1,500 mature individuals in a single subpopulation. There are signs of decline in the past in Morocco, but currently the species is considered common and thus does not seem to be in ongoing decline. Therefore, this species is listed as Near Threatened C2a(ii); D1 in North Africa.

### DISTRIBUTION

The western marsh-harrier breeds mainly in north-western Africa. The subspecies *Circus aeruginosus* ssp. *harterti* is an uncommon, local breeding resident in marshes and reed wetlands of northern Morocco, Algeria and Tunisia, and the subspecies *C. a. ssp. aeruginosus* is a fairly common winter visitor and passage migrant from Eurasia (Isenmann and Moali, 2000; Thévenot et al., 2003; Isenmann et al., 2005; Clark and Davies, 2018). In Algeria the species breeds from the coast to the Saharan Atlas, with confirmation of breeding in the Eastern Erg (Oued Righ); (A. Fellous-Djardini, pers. obs.). There are doubts about its breeding in northern coastal Libya (Isenmann et al., 2016) and northern Egypt (Goodman and Meiniger, 1989; OSME, 2019).

The species winters in the same range but also south to the Moroccan Sahara (Bergier et al., 2017), in northern Libya (Isenmann et al., 2016; Clark and Davies, 2018) and in the Nile Delta and Valley (Clark and Davies, 2018). The Eurasian subspecies also occurs as a passage migrant in all North African countries (Clark and Davies, 2018). The creation of new oases by irrigation projects in Libya resulted in attractive new habitats for migrant birds, leading to reduced mortality from migration through the desert (Isenmann et al., 2016).

### POPULATION

In the 1980s, there were an estimated 500 breeding pairs in Morocco, but numbers have declined since then (Thévenot et al., 2003). The nesting population in Tunisia was estimated at 50 to 70 breeding pairs in 2005 (Isenmann et al., 2005) and the species is considered an irregular breeder there. In Algeria it is considered a common breeder

(A. Fellous-Djardini, pers. obs.) and even abundant in some areas in the western part of the country (H. Benmammar, pers. obs.). Overall the breeding population in North Africa is estimated to be around 1,500 mature individuals.

## HABITATS AND ECOLOGY

The western marsh-harrier lives in open areas. It is found mostly in marshes, reed beds and farmland, but also in coastal creeks, mudflats, sewage dumps, mangrove swamps (Clark and Davies, 2018) and arid areas. It is a generalist predator taking a variety of prey types, with small birds generally preferred (del Hoyo et al., 1994). In winter, it also feeds on carrion (Clark and Davies, 2018).

The species nests in North Africa from early February to June (Thévenot et al., 2003; Isenmann et al., 2005). A breeding pair builds a large nest of many materials, including sticks and reeds, on dry ground in wet areas and occasionally on dry farmland and raises from one to four chicks (Clark and Davies, 2018). It breeds at up to 2,000 m elevation at the Moroccan Middle Atlas lakes (Thévenot et al., 2003).

In North Africa it is sedentary, but *C. a. aeruginosus* is migratory and migrants pass through from mid-August to early November (mainly in the second half of September). Spring passage is from late February to early May, reaching a peak in mid-March to mid-April, with males preceding females. Some thousands of these migrant birds winter in the region (A. Onrubia, pers. obs.).

Migration is generally on a broad front, although there are some concentrations at a few sites (Brown et al., 1982). Recent observations north of the Atlantic Sahara (March 2020) confirm that the western marsh-harrier migrates in mixed groups with *Circus pygargus* (A. Qninba and F. Cuzin, pers. obs.). Hundreds of birds occasionally gather at roosting sites, sometimes with other harriers such as *C. pygargus*, but otherwise they are usually solitary, associating only temporarily at especially rich feeding sites (Snow and Perrins, 1998; Ferguson-Lees and Christie, 2001; Orta et al., 2020h).

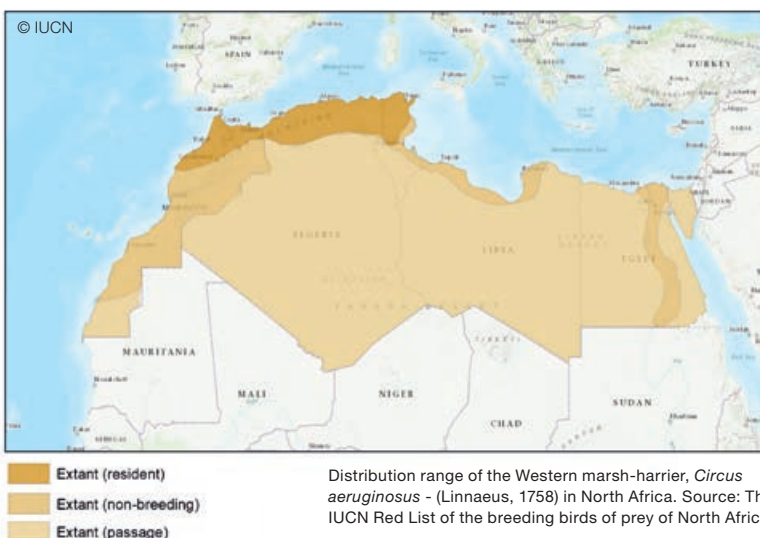
## THREATS

No major threats to this raptor are reported at the regional level. Potential threats might include wetland desiccation and drainage, and pollution.

However, the species has been recorded in some wetlands contaminated with organic pollutants in Algeria (A. Fellous-Djardini, pers. comm., 2020). Nests may be destroyed by human activities and chicks captured by young men to sell in markets, and the species may also be affected by feral dogs (Red List review workshop Tunisia, 2020).

## CONSERVATION

**Conservation actions in place:** CITES Appendix II and CMS Appendix II.



**Conservation actions needed:** Research is needed on limiting factors and habitat management. Surveys and monitoring of the population to determine, protect and manage potential breeding sites and key dispersal areas, including migration corridors, would also be beneficial.

Assessor(s): Fellous-Djardini, A., Benmammar Hasnaoui, H., Cuzin, F., Saheb, M., Radi, M., Essetti, I., Onrubia, A. & Noaman, M.

Reviewer(s): Garrido López, J.R. & Qninba, A.

Contributor(s): Gyenge, P., Bakass, B. & BirdLife International

Date:2020-09-07





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## Sooty falcon, *Falco concolor* - Temminck, 1825

POPULATION SIZE	AOO	EOO	TREND
1,100-1,800 mat. ind.	-	1,921,706 km <sup>2</sup>	?

### NORTH AFRICA REGIONAL ASSESSMENT: NEAR THREATENED (NT) D1 (IUCN version 3.1)

Although the number of individuals in North Africa is small (1,100–1,800 mature individuals) and distributed in a single subpopulation, current population data from Egypt indicate that previous surveys may have underestimated populations and that the species is not in continuous decline. The species is assessed as Near Threatened under criterion D1.

### DISTRIBUTION

The species' breeding records are discontinuously and highly locally distributed from the Libyan Desert eastwards through Egypt, including the Sahara Desert, the east coast and the Red Sea islands (Gallo-Orsi et al., 2014, unpublished; Isenmann et al., 2016; Clark and Davies, 2018; Habib, 2019b). The majority of the population winters in Madagascar, but an unknown proportion winters in coastal Mozambique and South Africa (Clark and Davies, 2018). It migrates through Libya and Egypt, with vagrants recorded in Tunisia and Algeria (Isenmann and Moali, 2000; Isenmann et al., 2005).

### POPULATION

The Egyptian population was estimated at 190 breeding pairs in 2012–17, a drop of 27% in less than two decades (Habib, 2019b). However, more recent surveys in the western desert have indicated that a better estimate of the population in Egypt may be in the range of 300–400 pairs, and the previous figure may have underestimated the population size, and in fact the species is not in continuous decline (A. Riad, pers. obs.). In Libya, 250–500 breeding pairs are estimated to exist (S. Buirzayqah, pers. obs.), so the North African breeding population is estimated at 1,100–1,800 mature individuals.

## HABITATS AND ECOLOGY

The sooty falcon breeds colonially in hot, arid deserts and coastal habitats without vegetation, and on coral islands, where its breeding coincides with the autumn migration of the small birds on which it feeds (Clark and Davies, 2018). It nests in a hole or on a cliff ledge, but sometimes at other sites such as old herons' nests and camel markets (Clark and Davies, 2018). Clutches consist of two or three, occasionally four eggs (Jennings, 2010). Eggs are laid from July to August and young birds are fed with migrant passerines (Isenmann et al., 2016).

It is a migratory species; birds arrive in their wintering grounds in Madagascar and south-east Africa from late October, and return to their breeding sites in April (del Hoyo et al., 1994). During migration, they occur in a variety of well-watered open habitats (Clark and Davies, 2018). Migrants generally travel singly, in pairs or in small flocks (Brown et al., 1982; Ferguson-Lees and Christie, 2001). In the non-breeding season these birds are gregarious and forage for large insects over grasslands and open habitats, while small mammals, bats and fish have also been found in their diet (Clark and Davies, 2018). Satellite tracking of an adult bird from the United Arab Emirates showed that it took 13 days to migrate to Madagascar, following an inland route of more than 5,600 km and stopping over at three sites in East Africa with some shrub cover and fresh water (Javed et al., 2012).

## THREATS

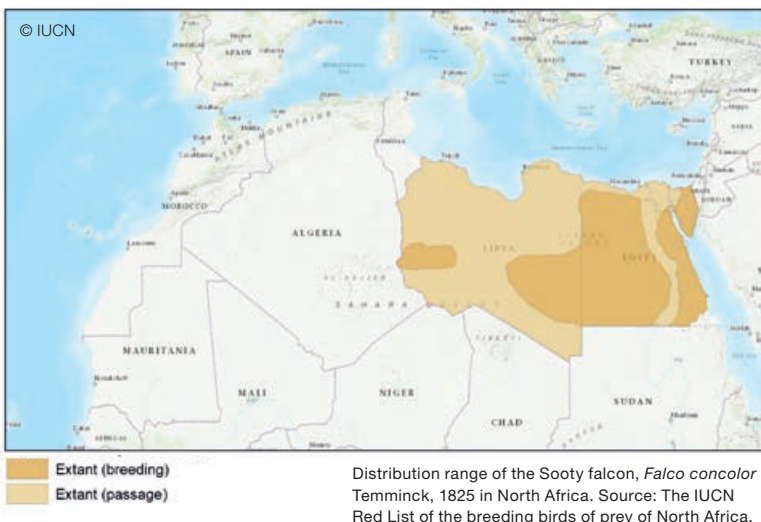
The species has suffered from the collection of nestlings for falconry, and illegal killing may also affect the remaining population (Aspinall, 1996; McGrady et al., 2016, 2018). The entire North African region faces the problem of raptor poaching for illegal trade, in which falcons are the main species affected (Bergier, 1987; Emile et al., 2014; Brochet et al., 2016; Elhalawani, 2016; MaghrebOrnitho, 2020).

## CONSERVATION

**Conservation and research actions in place:** CITES Appendix II. CMS Appendix II. There is a draft International Single Species Action Plan (Gallo-Orsi et al., 2014, unpublished).

**Conservation and research actions needed:** Awareness of the species should be raised. Research should be conducted to inventory, survey and monitor the population to determine, protect and manage potential breeding sites and key dispersal areas, including migration corridors. Research on the ecology of breeding, non-breeding and migrating birds is needed, involving GPS tagging and on-the-ground investigations, to assess potential threats to the species. Habitats should be protected in the species' wintering areas as well as along some of its migratory routes, while within North Africa the provision of nest boxes or suitable rock shelters for nesting might enhance the breeding populations in some areas.

The proposed draft International Single Species Action Plan should be completed, and efforts should be made to decrease poaching and the illegal trade as much as possible and to control the export of wild birds.



Assessor(s): Riad, A., Buirzayqah, S. & Haltham, O.

Reviewer(s): Garrido López, J.R. & Numa, C.

Contributor(s): Gyenge, P. & BirdLife International

Date: 2020-09-08



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## Eleonora's falcon, *Falco eleonora* - Gén , 1839

POPULATION SIZE	AOO	EOO	TREND
4,400 mat. ind.	52km <sup>2</sup>	232,658 km <sup>2</sup>	↑

### NORTH AFRICA REGIONAL ASSESSMENT: NEAR THREATENED (NT) B2ab(v) (IUCN version 3.1)

In North Africa, breeding populations are restricted to 10 islands and cliffs with an area of occupancy of approximately 52 km<sup>2</sup>. Although the population was decreasing in the past, it is currently increasing in some localities thanks to increased monitoring and restricted access to the islands. Some threats such as poisoning, disturbance by people, nest disturbance and predation are still ongoing in some areas. Emerging threats from tourism activities could affect the main subpopulation in Morocco in the future if access restrictions are not maintained in the long term. The introduction of predators to the islands is also a potential threat which could drastically reduce the number of nest sites, the area of occupancy and the number of mature individuals, especially if it affects the main colony in Morocco. The species is evaluated as Near Threatened under criterion B2ab(v) based on the number of locations, small area of occupancy and high dependency on current conservation actions, especially restrictions on access to breeding colonies.

### DISTRIBUTION

The species breeds only in colonies on islands in the Mediterranean Sea and along the north-west coast of Africa (Clark and Davies, 2018). There are ten colonies in total in the region from the Atlantic coast of Morocco (Sidi Moussa cliffs [Sal ] and Essaouira islands), through Algeria (western islands in Oran–Honaine and eastern islands in Collo–Annaba) to Tunisia (Galite Islands and Fratelli Islands) (Azafzaf, 2004; Rguibi et al., 2012a; Qninba et al., 2015a; Peyre et al., 2018; Cuzin, 2019). The entire population migrates in autumn to winter mainly in Madagascar but also in the islands of R union, Mauritius and Rodrigues as well as eastern and south-eastern Africa (Clark and Davies, 2018), crossing nearly the whole of Africa including the Sahara desert (L pez-L pez et al., 2009).

## POPULATION

In Morocco some estimates give 1,340 pairs (Qninba et al., 2016; MaghrebOrnitho, 2016; Cuzin, 2019), although a recent census increased this figure to 1,531 pairs, 31 pairs breeding in Salé (I. Cherkaoui, pers. obs.) and 1,500 pairs on the islands, where the population is stabilising (Qninba, 2019). In Algeria, the breeding population is estimated at 445 pairs (Peyre et al., 2018); some of the colonies are at maximum nesting capacity and the species is now colonising cliffs on the mainland (M. Saheb, pers. obs.). In Tunisia, the population has been estimated at 137 pairs in the past (Rguibi et al., 2012a), whereas more recent estimates indicate it could be between 150 and 200 breeding pairs (H. Azafzaf, pers. comm.). Based on these estimates, the total regional population could fall in the range of 2,000–2,200 pairs (4,400 mature individuals).

The population is increasing throughout the species' North African range (Rguibi et al., 2012a; Qninba et al., 2016; Peyre et al., 2018), basically thanks to direct and indirect conservation actions which restrict access to the colonies. The largest colony in the Essaouira Archipelago in Morocco has doubled its population since 2010 (Cuzin, 2019). However, some small colonies are decreasing and some have even gone extinct in Algeria and Morocco (Touati et al., 2017; Cuzin, 2019).

## HABITATS AND ECOLOGY

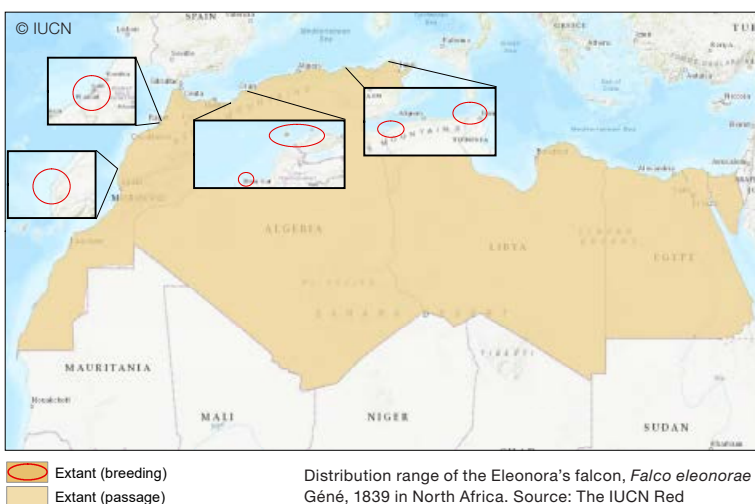
Eleonora's falcon occurs on islands and coastal cliffs during the breeding season (Rguibi et al., 2012a; Clark and Davies, 2018) and hunts in the coastal area, moving up to a few tens of kilometres in search of food in various environments (dunes, river mouths, steppes, cultivated land, cities etc.) (Cuzin, 2019). It occurs in a wide variety of habitats on migration, including coastal seas, islands, islets, open forests, woodlands, savannas, grasslands, agricultural areas, wetlands and deserts (López-López et al., 2009; Clark and Davies, 2018). The species is fully migratory, leaving its Mediterranean breeding grounds in October and November to winter in Madagascar, East Africa and the Mascarene Islands (Clark and Davies, 2018). The return journey begins in late April and May (Orta et al., 2020f). They are generally gregarious (though sometimes solitary), tending to move in small, loose flocks, and on migration often associate with other species flying at high altitudes, including *Falco subbuteo* (Snow and Perrins, 1998; Ferguson-Lees and Christie, 2001).

Eleonora's falcons nest in colonies numbering from a few up to a hundred or more pairs during late summer and early autumn at strategic sites where they can hunt migrant passerines and other small birds like common hoopoes (*Upupa epops*), swifts (*Apus sp.*) or European turtle-doves (*Streptopelia turtur*) to feed their chicks (Rguibi et al., 2012a; Clark and Davies, 2018). It has been estimated that about one and a half million small migrating birds are consumed annually by the large falcon colony in the Essaouira islands in Morocco (Rguibi et al., 2012b).

Eleonora's falcons even keep some of their captured prey alive as a form of fresh food storage behaviour (Qninba et al., 2015b). They are mainly insectivorous outside the breeding season, feeding predominantly on cicadas,

locusts, grasshoppers and Coleoptera in their winter quarters, and they only hunt while flying (Rguibi et al., 2012a; Clark and Davies, 2018).

Birds nest in the holes and ledges of sea cliffs, or on the ground, never far from the sea (del Hoyo et al., 1994; Rguibi et al., 2012a). Clutches usually consist of two or three eggs, laid in late July (Orta et al., 2020f). The female broods for 28–33 days and during this period is supplied with food by the male; the young birds remain in the nest for 28–35 days (Rguibi et al. 2012a).



## THREATS

The species has historically suffered from exploitation and persecution by local people, including the collection of chicks for food (Global Raptor Information Network, 2020), which is a threat not only in breeding colonies but also along its migratory routes and in its winter quarters (Rguibi et al., 2012a). The entire North African region faces the problem of raptor poaching for illegal trade, and falcons are the main species affected (Bergier, 1987; Emile et al., 2014; Brochet et al., 2016; Elhalawani, 2016; MaghrebOrnitho, 2019b,c). In Egypt, Eleonora's falcons may be also trapped for use as lures to attract other target species (Porter, 2005; BirdLife International, 2015). In Libya, individuals are trapped for falconry and fetch high prices on the national market (K. Etayeb, pers. comm.), and in Morocco chicks are collected from the Salé colony and sold in the markets of Salé and Rabat.

Human disturbance and urbanisation associated with tourism development has also been reported to negatively influence birds' breeding success (Martínez-Abraín et al., 2002; Orta et al., 2020f; Touati et al., 2017; Peyre et al., 2018; M. Saheb, pers. obs.), particularly in relation to the decline of the only breeding colony on the mainland in Morocco, at Salé (Rguibi et al., 2012b; Cuzin, 2019). Urban expansion is pushing this colony towards the northern cliffs of Salé. The colony in the Essaouira Archipelago is also threatened by the development of large tourist projects on the stretch of coast opposite the Archipelago, in particular around the mouth of Oued Ksob, where Eleonora's falcons find fresh water for bathing and drinking; in this regard, the construction of a dam upstream on Oued Ksob has stopped the summer water flow and falcons are currently forced to go much further upstream to find temporary pools (A. Qninba, pers. obs.).

Predation by rats, cats, dogs and yellow-legged gulls (*Larus michahellis*) is also important on some breeding islands (Ferguson-Lees and Christie, 2001; Rguibi et al., 2012a; Touati et al., 2017; Cuzin, 2019). Interspecific competition with Scopoli's shearwater (*Calonectris diomedea*) for nesting crevices has also been found in Algeria (Touati et al., 2017). Additionally, pollution by ornithocide substances was thought to be responsible for the decline in some breeding populations (Rguibi et al., 2012a), and on Hadibas Island (Algeria) some adult falcons have been found poisoned with rodenticides (M. Saheb, pers. obs.). The species is also sensitive to the effects of wind energy developments (STRIX, 2012).

It is important to note that Eleonora's falcon is a long-distance migrant and, hence, population changes may be influenced by factors occurring in widely separated breeding and non-breeding areas and during migration (López-López et al., 2009; Mellone et al., 2013). The importance of humid forests for the conservation of the Eleonora's falcon should be of concern, given the current loss of this habitat in Madagascar (Mellone et al., 2012).

## CONSERVATION

**Conservation actions in place:** CMS Appendix II. CITES Appendix II. Barcelona convention: Annex II. An International Species Action Plan was published in 1999 (Ristow, 1999) and was reviewed in 2010. Since 2005 the Conservatoire du Littoral has been coordinating an international programme for promoting and assisting with the management of small Mediterranean islands, known as the PIM Initiative, which is financed by the Fonds Français pour l'Environnement Mondial (FFEM – French Global Environment Facility), the Agence de l'eau Rhône Méditerranée–Corse and the City of Marseille. This programme has supported monitoring programmes in Tunisia and Morocco, where Eleonora's falcon has been monitored for a long time at its main colony in the Essaouira islands (Qninba et al., 2016). Research on the species has been conducted in Morocco, Algeria and Tunisia. A net expansion of the species has been observed in Morocco thanks to the end of direct persecution (Rguibi et al., 2012a). In Morocco, the species is included in the preparation of a raptor conservation strategy (<https://www.iucn.org/news/mediterranean/202001/first-steps-towards-a-moroccan-strategy-raptor-conservation-iucns-guidance>).

**Conservation actions needed:** While there is an International Species Action Plan, the development of local plans would also be beneficial (see Rguibi et al., 2012a). Effective actions to protect coastal areas should be implemented and Environmental Impact Assessments conducted on all developments in coastal areas. National and international coastal tourism policies should discourage the development of new resorts and favour environmentally friendly, sustainable tourism, especially around the only mainland colony in Morocco.

Although some colonies are currently undisturbed because access is limited, all colonies should be protected from intrusion by employing staff to monitor and guard the colonies, if necessary, and banning access from 1 July to 1 November. The species' wintering areas, ecological requirements and threats should be identified and protection implemented for these areas and migration routes. The impact of predation by rats, cats and dogs should be investigated and invasive species eradication programmes should be implemented. Awareness of the species should be raised and the value of its habitat promoted. In addition, further measures should be put in place to study and control the trapping of this species; and coordinated surveys of the full breeding population would also be beneficial for species monitoring purposes.

Assessor(s): Qninba, A., Azafzaf, H., Cherkaoui, I., Saheb, M., Chokri, M.A., Etayeb, K. & Yamoun, B.

Reviewer(s): Numa, C. & Garrido López, J.R.

Contributor(s): Gyenge, P., Bakass, B. & BirdLife International

Date: 2020-09-08

# 7. Least Concern (LC) and marginal species Not Applicable (NA)

Summary justification of the Regional Red List assessments of the breeding raptors of North Africa assessed as Least Concern (LC) and marginal species Not Applicable (NA).

## Least Concern

Common name	Scientific name	Regional category	Regional trend
<b>Eurasian sparrowhawk</b>	<i>Accipiter nisus</i>	LC	Unknown
<p>The species breeds in all North African countries except Egypt. The overall population size is suspected to be between 4,000 and 7,000 mature individuals in the region. The population trend is not known, but the population is not believed to be decreasing rapidly enough to approach the thresholds for a threatened category. Therefore, the species is evaluated as Least Concern.</p> <p>Assessor(s): Rousselon, K., Azafaf, H., Cherkaoui, I., Bergier, P., Buirzayqah, S., Riad, A., Haitham, O., Chokri, M., Etayeb, K., Saheb, M. &amp; Monti, F.            Reviewer(s): Garrido López, J.R. &amp; Qninba, A.            Contributor(s): Gyenge, P., Bakass, B. &amp; BirdLife International            Date: 2020–09–07</p>			
<b>Golden eagle</b>	<i>Aquila chrysaetos</i>	LC	Stable
<p>This is a widespread species in North Africa breeding from Morocco to Egypt. Although its population is small (3,300 mature individuals), it is not considered to be declining. Therefore, it is assessed as Least Concern.</p> <p>Assessor(s): Garrido López, J.R., Rousselon, K., Irizi, A., Benmammar Hasnaoui, H., Buirzayqah, S., Riad, A., Haitham, O., Monchaux, G. &amp; Hamdi, N.</p> <p>Reviewer(s): Qninba, A. &amp; Bautista, J.            Contributor(s): Gyenge, P., Bakass, B., BirdLife International, Fellous-Djardini, A. &amp; Qninba, A. Date: 2020–09–07</p>			
<b>Bonelli's eagle</b>	<i>Aquila fasciata</i>	LC	Stable
<p>This is a widespread species in North Africa, breeding from Morocco to Egypt. Although its population is small (1,900-3,200 mature individuals), it is not considered to be declining, and it does not approach the thresholds for listing in a threatened category. Therefore, it is assessed as Least Concern.</p> <p>Assessor(s): Irizi, A., Benmammar Hasnaoui, H., Rousselon, K., Buirzayqah, S., Haitham, O., Monchaux, G. &amp; Riad, A.            Reviewer(s): Qninba, A. &amp; Garrido López, J.R.            Contributor(s): Gyenge, P., Bakass, B., BirdLife International, Ouni, R., Qninba, A. &amp; Hamdi, N. Date: 2020–09–07</p>			
<b>Long-legged buzzard</b>	<i>Buteo rufinus</i>	LC	Unknown
<p>This species has a large range and a breeding population of 6,000–8,000 mature individuals throughout North Africa. The population trend is not known, but the population is not believed to be decreasing rapidly enough to approach the thresholds for a threatened category, even though the Moroccan population has decreased.</p> <p>Assessor(s): Ouni, R., Irizi, A., Benmammar Hasnaoui, H., Monchaux, G., Hamdi, N., Haitham, O., Riad, A. &amp; Buirzayqah, S.            Reviewer(s): Garrido López, J.R. &amp; Qninba, A.            Contributor(s): Gyenge, P., Bakass, B., BirdLife International, Garrido López, J.R. &amp; Qninba, A. Date: 2020–09–07</p>			

Common name	Scientific name	Regional category	Regional trend
<b>Black-winged kite</b>	<i>Elanus caeruleus</i>	LC	Increasing
<p>The North African population of the species is estimated to number 2,600–3,000 mature individuals. The population is reported to be increasing and its range is expanding in Morocco, Algeria, Tunisia and Egypt. Therefore, the species is listed as Least Concern.</p> <p>Assessor(s): Rousselon, K., Hamdi, N., Haitham, O., Buirzayqah, S., Irizi, A., Ouni, R., Monchaux, G., Riad, A. &amp; Benmammar Hasnaoui, H.  Reviewer(s): Garrido López, J.R. &amp; Qninba, A.  Contributor(s): Gyenge, P., Bakass, B. &amp; BirdLife International Date: 2020–09–08</p>			
<b>Booted eagle</b>	<i>Hieraaetus pennatus</i>	LC	Stable
<p>With a population size of ca. 10,000 mature individuals or more, and no evidence of a population decline, the resident population does not approach the thresholds of threatened categories under any criterion. Therefore, the species is listed as Least Concern.</p> <p>Assessor(s): Cherkaoui, I., Azafzaf, H., Chokri, M.A., Benmammar Hasnaoui, H., Rousselon, K., Buirzayqah, S., Etayeb, K. &amp; Monti, F.  Reviewer(s): Garrido López, J.R. &amp; Qninba, A.  Contributor(s): Gyenge, P., Bakass, B., Garrido López, J.R., BirdLife International &amp; Qninba, A. Date: 2020–09–08</p>			
<b>Black kite</b>	<i>Milvus migrans</i>	LC	Unknown
<p>This species occurs over a large range, with a breeding population estimated at 4,500 breeding pairs or 9,000 mature individuals. The population trend is not known, but the population is not believed to be decreasing rapidly enough to approach the thresholds for a threatened category. For these reasons the species is evaluated as Least Concern.</p> <p>The subspecies <i>Milvus migrans</i> ssp. <i>aegyptius</i> has a very small population (150 mature individuals in one subpopulation) in Egypt which is considered to be gradually declining due to habitat degradation for agriculture and development. If in the future this population is treated as a separate species, it would likely qualify to be listed as regionally threatened in category Critically Endangered (CR) under criterion C2a(ii).</p> <p>Assessor(s): Benmammar Hasnaoui, H., Riad, A., Irizi, A., Ouni, R., Monchaux, G., Hamdi, N., Haitham, O. &amp; Buirzayqah, S.  Reviewer(s): Garrido López, J.R. &amp; Qninba, A.  Contributor(s): Gyenge, P., Bakass, B., BirdLife International, Garrido López, J.R. &amp; Qninba, A. Date: 2020–05–17</p>			
<b>Lanner falcon</b>	<i>Falco biarmicus</i>	LC	Unknown
<p>This species has a resident population estimated at 5,000–6,000 mature individuals. The population sizes in Libya and Egypt are thought to be declining because of poaching and illegal trade, but the populations in Morocco and Tunisia are thought to be stable or increasing, so the overall trend is unknown. Therefore, it does not warrant listing as threatened under any criterion and is listed as Least Concern. However, further research should be conducted to detect any change in the population trend. The species may undergo significant declines in the near future as a result of poaching, and could be uplisted; therefore, a reassessment of its risk of extinction is recommended in 5 years.</p> <p>Assessor(s): Buirzayqah, S., Riad, A., Haitham, O., Benmammar Hasnaoui, H., Irizi, A., Hamdi, N., Ouni, R., Rousselon, K. &amp; Monchaux, G.  Reviewer(s): Garrido López, J.R. &amp; Qninba, A.  Contributor(s): Gyenge, P., Bakass, B. &amp; BirdLife International Date: 2020–05–22</p>			
<b>Lesser kestrel</b>	<i>Falco naumanni</i>	LC	Increasing
<p>This species has a resident population estimated at 5,000–6,000 mature individuals which is not declining and is even increasing in urban areas, and not facing major threats. For these reasons the species is evaluated as Least Concern.</p> <p>Assessor(s): Cherkaoui, I., Saheb, M., Essetti, I., Fellous-Djardini, A., Benmammar Hasnaoui, H., Cuzin, F., Radi, M., Onrubia, A., Noaman, M. &amp; Garrido López, J.R.  Reviewer(s): Barrios, V. &amp; Qninba, A.  Contributor(s): Gyenge, P., Bakass, B., BirdLife International, Cuzin, F. &amp; Qninba, A. Date: 2020–09–08</p>			



Common name	Scientific name	Regional category	Regional trend
Peregrine falcon	<i>Falco peregrinus</i>	LC	Stable

This species has a resident population estimated at 4,580–5,800 mature individuals. The population trend is tentatively assumed to be stable overall, but there is evidence for localised declines, e.g. in Libya. The species is evaluated as Least Concern, but given the increasing pressure from threats, trapping in particular, in the future the species may be assessed as declining and so it would warrant being uplisted. Further research will be required to detect any such changes in the population trend.

Assessor(s): Rousselon, K., Hamdi, N., Haitham, O., Buirzayqah, S., Irizi, A., Ouni, R., Monchaux, G., Riad, A. & Benmammar Hasnaoui, H.

Reviewer(s): Garrido López, J.R. & Qninba, A.

Contributor(s): Gyenge, P., Bakass, B. & BirdLife International Date: 2020–09–08

Common kestrel	<i>Falco tinnunculus</i>	LC	Unknown
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The resident population does not approach the thresholds for Vulnerable under criteria B, C or D because it has an extremely large range and is suspected to have a large breeding population. The population trend is not known, but the population is not believed to be decreasing rapidly to approach the thresholds for Vulnerable under criterion A. For these reasons the species is evaluated as Least Concern, but further research should be conducted to ascertain its actual breeding numbers and trend.

Assessor(s): Hamdi, N., Monchaux, G., Ouni, R., Haitham, O., Riad, A., Irizi, A., Benmammar Hasnaoui, H. & Buirzayqah, S.

Reviewer(s): Garrido López, J.R. & Qninba, A.

Contributor(s): Gyenge, P., Bakass, B., Garrido López, J.R., BirdLife International & Qninba, A. Date: 2020–05–10

Northern long-eared owl	<i>Asio otus</i>	LC	Unknown
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It is a widespread species in non-desert Morocco, Algeria and eastern Tunisia, breeding also locally in Libya and Egypt, where it is a recent breeder. The population size and trend are not known but it is likely to number more than 1,000 breeding pairs (>2,000 mature individuals) and not to be declining. Therefore, it is not believed to approach the thresholds for a threatened category, because of its wide range where it is common and its recent colonisation in Egypt. The species is evaluated as Least Concern.

Assessor(s): Buirzayqah, S., Haitham, O., Irizi, A., Monchaux, G., Ouni, R., Riad, A., Benmammar Hasnaoui, H. & Hamdi, N.

Reviewer(s): Garrido López, J.R. & Qninba, A.

Contributor(s): Gyenge, P., Bakass, B. & BirdLife International Date: 2020–09–08

Little owl	<i>Athene noctua</i>	LC	Unknown
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This species is a fairly common resident of all countries in North Africa up to 2,600 m elevation, from the coast to the sand deserts and along the Nile Valley and Delta and the north of Egypt. The population size of this widespread species is not known, but it is large and is not believed to be decreasing. Therefore, it is evaluated as Least Concern.

Assessor(s): Monchaux, G., Buirzayqah, S., Haitham, O., Hamdi, N., Irizi, A., Ouni, R. & Riad, A. Reviewer(s): Garrido López, J.R. & Qninba, A.

Contributor(s): Gyenge, P., Bakass, B., BirdLife International & Qninba, A.

Date: 2020–09–08

Pharaoh eagle-owl	<i>Bubo ascalaphus</i>	LC	Unknown
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The species is widespread in the region and the population size is estimated to be at least 10,000 mature individuals. The population trend is not known for this species, but it is not thought to warrant listing as threatened under any criterion. Therefore, it is evaluated as Least Concern.

Assessor(s): Irizi, A., Hamdi, N., Monchaux, G., Ouni, R., Haitham, O., Riad, A. & Buirzayqah, S. Reviewer(s): Garrido López, J.R. & Qninba, A.

Contributor(s): Gyenge, P., Bakass, B., BirdLife International, Qninba, A. & Rousselon, K.

Date: 2020–09–08

Common name	Scientific name	Regional category	Regional trend
<b>Common scops-owl</b>	<b><i>Otus scops</i></b>	<b>LC</b>	<b>Unknown</b>
<p>This species breeds in forests in the northern Maghreb (Morocco, Algeria, Tunisia and north-western Libya) south to the Sahara desert, and also in oases, up to 2,500 m. The population size is not known; however, the population is not considered to be facing declines or major threats.</p> <p>Assessor(s): Cuzin, F., Essetti, I., Fellous-Djardini, A., Noaman, M., Onrubia, A., Radi, M. &amp; Saheb, M. Reviewer(s): Garrido López, J.R. &amp; Qninba, A.  Contributor(s): Gyenge, P., Bakass, B. &amp; BirdLife International  Date: 2020-09-09</p>			
<b>Tawny owl</b>	<b><i>Strix aluco</i></b>	<b>LC</b>	<b>Unknown</b>
<p>The population size and trend are not known, but it is not uncommon, is not believed to be decreasing, nor is it facing any major threats. For these reasons the species is evaluated as Least Concern.</p> <p>Assessor(s): Radi, M., Benmammar Hasnaoui, H., Cuzin, F., Essetti, I., Fellous-Djardini, A., Noaman, M., Onrubia, A. &amp; Saheb, M.  Reviewer(s): Garrido López, J.R. &amp; Qninba, A.  Contributor(s): Gyenge, P., Bakass, B. &amp; BirdLife International Date: 2020-09-09</p>			
<b>Barn owl</b>	<b><i>Tyto alba</i></b>	<b>LC</b>	<b>Unknown</b>
<p>This species is a fairly common resident in North Africa up to 2,000 m, from the coast to the sand deserts, where it is less abundant, and along the Nile River in Egypt, including suburban environments. The population size is not known; however, the population is not considered to be facing declines or major threats.</p> <p>Assessor(s): Saheb, M., Cuzin, F., Essetti, I., Fellous-Djardini, A., Noaman, M., Onrubia, A. &amp; Radi, M. Reviewer(s): Garrido López, J.R. &amp; Qninba, A.  Contributor(s): Gyenge, P., Bakass, B. &amp; BirdLife International  Date: 2020-09-09</p>			

## Not Applicable

### MARGINAL SPECIES NOT APPLICABLE (NA)

Common name	Scientific name	Regional category	Regional trend
<b>Eurasian buzzard</b>	<i>Buteo buteo</i>	NA	
Rare local Eurasian migrant and winter visitor (Isenmann and Moali, 2000; Isenmann et al., 2005, 2016; Clark and Davies, 2017; OSME, 2019). It used to be widespread in Morocco during winter (Thévenot et al., 2003) but the number of migrant birds has declined from several hundred in the 1980s to a few dozen currently due to climate change; the same might be happening throughout North Africa (Martin et al., 2014).			
<b>Hen harrier</b>	<i>Circus cyaneus</i>	NA	
Rare winter visitor from Eurasia to the Mediterranean coast of North Africa, which is the southern edge of its wintering range (Clark and Davies, 2017). Scarce winter visitor in Morocco down to the Saharan coast (Thévenot et al., 2003; Bergier et al., 2017), Algeria (Isenmann and Moali, 2000), Tunisia (Isenmann et al., 2005) and Libya (Isenmann et al., 2016). It also occurs inland and along the River Nile in Egypt (Clark and Davies, 2017).			
<b>Lesser spotted eagle</b>	<i>Clanga pomarina</i>	NA	
This species breeds in central and eastern Europe and Iran, wintering in Africa (Bosch and Meyburg, 2012) with marginal breeding in Algeria (Isenmann and Moali, 2000). The breeding population migrates over Israel and Egypt in spring and autumn (Krumenacker, 2013; BirdLife International, 2016), and over the Strait of Gibraltar and Italy to pass through Morocco, Algeria, Tunisia and Libya (Isenmann and Moali, 2000; Isenmann et al., 2005; Onrubia et al., 2011; Bosch and Meyburg, 2012; Isenmann et al., 2016).			
<b>White-tailed eagle</b>	<i>Haliaeetus albicilla</i>	NA	
This species breeds and winters in Asia, northern and eastern Europe and south-eastwards to the eastern side of the Persian Gulf (BirdLife International, 2016), with marginal breeding in Algeria until the last quarter of the 20 <sup>th</sup> century (1–2 pairs in 1975, Isenmann and Moali, 2000), Egypt in 19 <sup>th</sup> century (Goodman and Meininger, 1989) and maybe Tunisia (Heim de Balsac and Mayard, 1962). It is now a very rare winter vagrant in Morocco, Algeria, Tunisia and Egypt (Goodman and Meininger, 1989; Thévenot et al., 2003; Isenmann and Moali, 2000; Isenmann et al., 2005; Clark and Davies, 2018).			
<b>European honey-buzzard</b>	<i>Pernis apivorus</i>	NA	
Recorded on both migrations throughout North Africa (Goodman and Meininger, 1989; Isenmann and Moali, 2000; Thévenot et al., 2003; Isenmann et al., 2005, 2016; Bergier et al., 2017; OSME, 2019).			
<b>Saker falcon</b>	<i>Falco cherrug</i>	NA	
A species recorded on both migrations and a scarce winter visitor throughout North Africa (Goodman and Meininger, 1989; Isenmann and Moali, 2000; Thévenot et al., 2003; Isenmann et al., 2005, 2016; Bergier et al., 2017; OSME, 2019).			
<b>Merlin</b>	<i>Falco columbarius</i>	NA	
Holarctic species exceptionally breeding locally in Algeria in the 19 <sup>th</sup> century (Isenmann and Moali, 2000). Currently it is a rare to uncommon winter visitor to coastal northern Africa, recorded in Morocco, Algeria, Tunisia and along the River Nile in Egypt; vagrant in Libya (Isenmann and Moali, 2000; Thévenot et al., 2003; Isenmann et al., 2005, 2016; Clark and Davies, 2017).			
<b>Red-footed falcon</b>	<i>Falco vespertinus</i>	NA	
Palearctic migrant recorded on both passages from Morocco to Egypt, wintering in eastern and southern Africa, with a loop migration which brings the birds further west in spring and east in autumn (Goodman and Meininger, 1989; Isenmann and Moali, 2000; Thévenot et al., 2003; Isenmann et al., 2005; Bergier et al., 2015; Isenmann et al., 2016; Clark and Davies, 2017).			
<b>Short-eared owl</b>	<i>Asio flammeus</i>	NA	
This is a species recorded on both migrations and a scarce winter visitor throughout North Africa (Goodman and Meininger, 1989; Isenmann and Moali, 2000; Thévenot et al., 2003; Isenmann et al., 2005, 2016; Bergier et al., 2017; OSME, 2019).			
<b>Eurasian eagle owl</b>	<i>Bubo bubo</i>	NA	
This Eurasian species (BirdLife International, 2017) has some unconfirmed marginal records in Morocco (Thévenot et al., 2003; Ramirez and Onrubia, 2016) and Algeria (Isenmann and Moali, 2000).			

Populations of raptor must to be surveyed and monitored to protect them. Only regular counts can provide the data required to follow up raptor populations in detail and determine their threats. ©Jose Rafael Garrido





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The lesser kestrel has an abundant breeding population in North Africa, which is increasing in some urban areas, and not facing major threats. It is evaluated as Least Concern. © Matías de las Heras Carmona





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