

# In depth review of the conservation status of individual CMS Appendix I-listed species

## *Tadarida brasiliensis* (Mexican Free-tailed bat)



Appendix I (1979)



IUCN assessment (2015)

Least Concern / Stable

Selected for review based on conservation status (Least Concern), population trend (stable) and an IUCN Red List assessment that indicates the species is abundant with no major threats across its range.



■ Extant (resident)

**Range:** From southern Brazil, Bolivia, Argentina and Chile to Oregon, southern Nebraska and Ohio of the United States of America (hereafter United States), and to the Greater and Lesser Antilles.



Base map: United Nations Geospatial, 2021<sup>a</sup>  
 Range data: IUCN 2008. *Tadarida brasiliensis*. The IUCN Red List of Threatened Species. v. 2022-1  
 Image: Adobe Stock

### 1. Conservation status and threats

#### Appendix I listing criteria

Article III paragraph 2 of the Convention states that “*migratory species may be listed in Appendix I provided that reliable evidence, including the best scientific evidence available, indicates that the species is endangered*”. Following Resolution 13.7, the term “endangered” is interpreted as “*facing a very high risk of extinction in the wild in the near future*”.

Article III paragraph 3 of the Convention states that a migratory species may be removed from Appendix I when the COP determines that the species is no longer endangered, and the species is not likely to become endangered again because of loss of protection due to its removal from Appendix I.

<sup>a</sup> The designations employed and the presentation of material on this map and any others in this report do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. Final boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined. Final status of the Abyei area is not yet determined. A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas)

Summary of conservation status	
IUCN assessment	<p><b>IUCN Red List Status<sup>1 a</sup></b></p> <p>The diagram shows a horizontal timeline with three orange arrow-shaped boxes pointing to the right. The first box is labeled 'LR/nt' with '1996' below it. The second box is labeled 'LC' with '2008' below it. The third box is labeled 'LC' with '2015' below it. The boxes are connected by white lines, indicating a progression of status over time.</p>
IUCN Population Trend	Stable (2015) <sup>1</sup>
IUCN Red List key information	<ul style="list-style-type: none"> <li>• Widely distributed and abundant, with a “presumed large population” (no global population estimate indicated).</li> <li>• Documented reduction in population in northern Mexico and southern US in the 1980s.</li> <li>• Not used in trade.</li> <li>• A “large subpopulation” is reportedly protected in Tucuman, Argentina, and a large conservation programme is in place in Mexico.</li> </ul>
Complementary or equivalent information on conservation status	<p><b>National Red List assessments:</b> Argentina (Least Concern, 2019); Plurinational State of Bolivia (Least Concern, 2008); Brazil (Least Concern, 2013); Chile (Least Concern, 2017); Paraguay (Least Concern, 2017); Uruguay (Least Concern, 2019)<sup>2</sup>.</p> <p><i>Tadarida brasiliensis</i> was included in the original version of the Appendices when the Convention was adopted in 1979 on the basis that declines of &gt;90% were recently noted in some populations, suspected to be caused by excessive application of pesticides<sup>3</sup>. While subsequent studies indicate several North American colonies underwent significant declines during the second half of the 20<sup>th</sup> century, the magnitude of these declines is unknown due to a lack of monitoring<sup>4,5</sup>. In addition to pesticides, disturbance and/or destruction of roosting sites have been proposed as possible drivers of past declines<sup>6</sup>. It is important to note that older, less reliable census techniques may have overestimated populations and exacerbated the extent of declines<sup>4,5</sup>.</p> <p>A census using modern methods estimated the midsummer southwestern United States cave population at 9 million individuals<sup>7</sup>. The combined population of the United States and Mexico “may easily reach” 10 million to 100 million individuals<sup>8</sup>.</p> <p>Northwards range expansion since approximately 2007 into western North Carolina, eastern Tennessee, and Virginia<sup>9</sup>.</p> <p>While several distinctions among North American populations of <i>T. brasiliensis</i> have been proposed, genetic studies indicate little genetic differentiation within North American populations, but did find significant genetic differences between North American and South American populations<sup>10</sup>.</p>
Biological vulnerability	<p><b>Reproductive output:</b> Low compared to other mammals, including compared to other small mammals such as shrews<sup>11,12</sup>. Females reach sexual maturity at ~1 year and males at 2 years<sup>13</sup>. Gestation just over 90 days, with a maximum of one pup produced per year<sup>4</sup>. Prenatal and pre fledging pup and adult mortality reportedly low<sup>3</sup>. Average longevity of over 11 years<sup>4</sup>. Young capable of flight at approximately 5 weeks<sup>13</sup>.</p> <p><b>Roosting behaviour:</b> For daytime roosts <i>T. brasiliensis</i> uses a range of habitat including caves, tunnels, wells, hollow trees, buildings and bridges; however, for breeding roosts, “a few select caves” are used by migrating Texas population<sup>4</sup>. The species roosts in high concentrations at a small number of sites, which makes it especially vulnerable to habitat loss<sup>4,14</sup>.</p>
Summary of threats	
Current and future threats	<p>IUCN assessment reports “no major threats” to the species across its range<sup>4</sup>. Local threats according to IUCN assessment and the wider scientific literature include:</p> <ul style="list-style-type: none"> <li>• <b>Habitat loss and disturbance:</b> Damage to, or destruction of, roosting caves noted to be rising in Mexico<sup>4</sup>, and mining of caves reported in the Antilles<sup>1</sup>. One source suggested that “human disturbance and vandalism of key roosting sites in caves are likely the single most serious causes of decline”<sup>6</sup>, and loss of old buildings and bridges may also affect the species<sup>6</sup>. <i>T. brasiliensis</i> colonies were considered likely to be negatively impacted by anthropogenic noise<sup>15</sup>.</li> </ul>

<sup>a</sup> LR/nt = Lower Risk/near threatened (old category no longer in use), LC = Least Concern. The IUCN categories and criteria have changed over time, therefore changes in a species’ categorisation may reflect changes in the criteria, rather than genuine changes in conservation status. The current criteria, Version 3.1, were published in 2001.

- **Wind farms:** *T. brasiliensis* accounted for the highest number of fatalities in studies of wind farms in Brazil and Oklahoma, United States<sup>16,17</sup>.
- **Climate change:** Increased vegetative growth at the mouths of roosting caves, driven by climatic change, was speculated to be potential future threat as the vegetation could obstruct the entrance of caves<sup>18</sup>. However, its northward expansion in range was considered likely to be linked to climate change, and, as a result, the species is expected to continue to expand into new regions<sup>9</sup>.
- **Pesticides:** Organochloride pesticides have been suggested to be the cause of past declines<sup>7,19</sup>.
- **Persecution:** Perceived risk of rabies may lead to intentional destruction of large colonies<sup>7</sup>. Some subpopulations “exterminated as plagues” in “several places” in Uruguay<sup>1</sup>.

## 2. Migratory behaviour and transboundary movements

Some *T. brasiliensis* populations have long-distance seasonal migrations, while other populations are non-migratory, or only move short distances<sup>5</sup>. Populations in central and southwestern United States are “typically migratory”<sup>5</sup>: migratory colonies overwinter in central and southern Mexico and return to northern Mexico and southwestern United States for the summer breeding season<sup>4,6</sup>. Most of the individuals migrating to southwestern United States in the summer are female, with males largely not thought to leave the subtropical and tropical portion of the species’ range<sup>4</sup>. While migratory and non-migratory *T. brasiliensis* populations of the subspecies *T. b. mexicana* have been suggested to represent genetically distinct groups, this was not supported by a genetic study<sup>20</sup>. Little information was located on migratory routes of Central and South American populations, but the subspecies *T. b. brasiliensis* (suggested to occur throughout South America) is known to migrate throughout much of its range<sup>10</sup>.

## 3. Existing protection and management

### CMS Actions

This species is not currently included in any CMS Agreement or MOU.

### CMS Resolutions

Given the threats facing *T. brasiliensis*, the following CMS Resolutions are likely to be relevant:

- [CMS Resolution 11.27 \(Rev.COP13\)](#) on renewable energy and migratory species urges CMS Parties to undertake careful physical planning of wind energy projects, with special attention to the mortality of bats resulting from collisions with wind turbines and to consider means of reducing disturbance.

### Other international instruments

No other international instruments relevant to *T. brasiliensis* identified.

## Potential implications of removal from Appendix I

As a CMS Appendix I species, Range States shall endeavour to prohibit the taking of the species (with certain precise exceptions) and conserve and, where feasible and appropriate, restore habitats of importance in preventing the species from being in danger of extinction. It does not appear that harvest of *T. brasiliensis* is a significant threat to the species<sup>1</sup>, but local populations in the United States and Mexico may be threatened by disturbance of important cave sites<sup>4</sup>. There are national efforts to protect roosting sites that host large populations of *T. brasiliensis* in the United States, Mexico, and Argentina<sup>2,4,21</sup>. In addition, the Latin American and Caribbean Network for the Conservation of Bats (RELCOM) has promoted a regional network of “AICOMs and SICOMs” (Important Areas and Sites for Bat Conservation): currently 156 AICOMs and 53 SICOMs are recognized across 23 countries in Latin America and the Caribbean<sup>22</sup>. It is unclear whether the removal of an international commitment to conserve its habitat would affect national and regional efforts to conserve important sites for the species. It should be noted that national laws that afford protection to *T. brasiliensis* may have been put in place due to the species being listed in CMS Appendix I.

#### 4. Concluding statement

*T. brasiliensis* is a widespread migratory bat species that is believed to have suffered significant population declines in the second half of the 20<sup>th</sup> century, at least in its northerly range (United States and Mexico); however, the extent of this decline is unclear due to changes in census techniques over time. The species is currently considered abundant and widespread; however, there is a lack of available information on the species' status in South America. *T. brasiliensis* does not appear to be threatened by harvest or trade. Habitat loss and roost site disturbance likely represent the main threats to local populations, and wind farms possibly presenting a greater threat in the future. *T. brasiliensis* could benefit from continued coordination among Range States to protect and restore important habitats along its migratory routes, particularly key roosting and breeding caves. As the available evidence indicates the species is not endangered but could benefit from continued coordination among Range States, the suitability of listing *T. brasiliensis* in CMS Appendix II could be considered.

#### References

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# Vicugna vicugna (Vicuña)



**Appendix I (1979)**  
 Except Peruvian populations  
 Reservations entered by Argentina and  
 Bolivia  
**Appendix II (1979)**



**IUCN assessment (2018)**  
**Least Concern / Increasing**

Selected for review based on conservation status (Least Concern), population trend (increasing) and improvement in conservation status.



■ Extant (resident)  
 ■ Extant & introduced (resident)

**Countries of occurrence:** Argentina, Plurinational State of Bolivia (hereafter Bolivia), Ecuador (introduced), Chile, Peru



Base map: United Nations Geospatial, 2021  
 Range data: IUCN 2018. *Vicugna vicugna*. The IUCN Red List of Threatened Species. v. 2022-1  
 Image: Adobe Stock

## 1. Conservation status and threats

### Appendix I listing criteria

Article III paragraph 2 of the Convention states that “migratory species may be listed in Appendix I provided that reliable evidence, including the best scientific evidence available, indicates that the species is endangered”. Following Resolution 13.7, the term “endangered” is interpreted as “facing a very high risk of extinction in the wild in the near future”.

Article III paragraph 3 of the Convention states that a migratory species may be removed from Appendix I when the COP determines that the species is no longer endangered, and the species is not likely to become endangered again because of loss of protection due to its removal from Appendix I.

### Summary of conservation status

IUCN assessments	IUCN Red List Status <sup>1 a</sup>			
	<b>VU</b> 1982, 1986, 1988, 1990, 1994	<b>LC/cd</b> 1996	<b>LC</b> 2008	<b>LC</b> 2018

<sup>a</sup> **VU** = Vulnerable, **LC/cd** = Least Concern/conservation dependent (old category no longer in use), **LC** = Least Concern. The IUCN categories and criteria have changed over time, therefore changes in a species' categorisation may reflect changes in the criteria, rather than genuine changes in conservation status. The current criteria, Version 3.1, were published in 2001.

	<p><b>IUCN Green Status<sup>2 b</sup></b></p> <p><b>Moderately Depleted</b> 2021</p> <p>Species Recovery Score = <b>67%</b></p> <p>“The Vicuña’s Species Recovery Score of 67% (Moderately Depleted) reflects widespread past decimation of the species for its valuable wool; only in the last decades has the species been restored to viable populations across its range thanks to legal protection from hunting, an international trade ban, and the introduction of sustainable livelihood schemes”.<sup>2</sup></p> <ul style="list-style-type: none"> <li>• <b>Conservation Legacy: High.</b> Without past conservation actions the species would almost certainly be close to extinction.</li> <li>• <b>Conservation Dependence: Medium.</b> Species could become threatened across its range within 10 years due to poaching if conservation actions were stopped.</li> <li>• <b>Conservation Gain: Medium.</b> It is expected the species could achieve a recovery score of 92% within 10 years if conservation efforts continue.</li> </ul>
<p><b>IUCN Population Trend</b></p>	<p><b>Increasing</b> (2018)<sup>1</sup></p> <p>Annual growth rate of 11% in Ecuador<sup>3</sup>. Decline of 5000 individuals reported 2008-2017 in Chile<sup>1</sup>.</p>
<p><b>IUCN Red List key information</b></p>	<p><b>Global population estimate:</b> 473 297 - 527 691<sup>1</sup></p> <p><b>National censused/estimated populations:</b> Argentina: 72,800–127,072 (national census, 2006)<sup>6</sup>; Bolivia: 163,331 (estimate, 2017)<sup>5</sup>; Chile: 12,103 (estimate, 2017)<sup>5</sup>; Ecuador: 7185 (2016)<sup>3</sup>; Peru: 218,000 (national census, 2019)<sup>4</sup>.</p> <p>NB: Peru is not included in the CMS Appendix I listing.</p>
<p><b>Complementary or equivalent information on conservation status</b></p>	<p><b>National Red List assessments:</b> Argentina: Least Concern (2012)<sup>7</sup>; Bolivia: Least Concern (2009)<sup>8</sup>; Ecuador: Least Concern (2021)<sup>9</sup>; Peru: Near Threatened (2018)<sup>10</sup>.</p> <p><i>Vicugna vicugna</i> was included in the original version of the Appendices when the Convention was adopted in 1979.</p> <p>Not listed in: Endangered Species of Chile (2009)</p>
<p><b>Biological vulnerability</b></p>	<p><b>Reproductive output:</b> low compared to other mammals<sup>11</sup>. Age at first breeding 3-5 years (males) and 2 years (females)<sup>12</sup>. Gestation averages 330-350 days and females give birth to one calf<sup>12</sup>. 10-30% calves died four months after birth in a national reserve in Peru<sup>12</sup>.</p> <p><b>Habitat breadth:</b> occurs at the limits of habitable environments in high-altitude, equatorial grassland throughout the Andean mountains, approximately 3000-5000 m above sea level<sup>1,12</sup>.</p>
<p><b>Summary of threats</b></p>	
<p><b>Current and future threats</b></p>	<ul style="list-style-type: none"> <li>• <b>Poaching</b> for illegal fibre markets represents the main threat to the species, particularly affecting isolated Chilean populations<sup>1</sup>.             <ul style="list-style-type: none"> <li>○ Little information could be located on current scale of poaching. At least 3289 hunted illegally in Bolivia 2008-2013, 149 illegal harvests reported in Argentina 2012-2013, and 49 Vicuñas illegally killed in Chile during the first months of 2014<sup>14</sup>.</li> <li>○ Vicuña fibre is highly valuable, but cost of raw fibre has declined over time: from USD 1000/kg at the end of the 1990s to USD 250–300/kg in recent years<sup>13</sup>.</li> </ul> </li> <li>• <b>Habitat loss:</b> livestock overgrazing and habitat fragmentation due to industrial and agricultural development may threaten populations outside of protected areas<sup>1</sup>.</li> <li>• <b>Disease:</b> mange caused by the <i>Sarcoptes scabiei</i> mite is increasing “at an alarming rate” in several populations across its range<sup>1</sup>.</li> <li>• <b>Climate change:</b> Vicuña live “at the limits of habitable environments”, therefore arid high altitude Vicuña habitat will likely be impacted by climate change<sup>1</sup>.</li> <li>• <b>Hybridisation</b> with domesticated alpaca<sup>1</sup>.</li> </ul>

## 2. Migratory behaviour and transboundary movements

Some Vicuña populations are known to straddle international boundaries<sup>15</sup>, and these populations may cross borders due to the natural mobility of Vicuña herds (such as during daily movements to find water)<sup>12,15</sup>. Transboundary

<sup>b</sup> The IUCN Green Status of Species assesses the recovery of species’ populations and measures conservation success. The “Species Recovery Score”, which ranges from 0-100%, indicates the extent to which a species is “fully recovered”. Further details the IUCN Green Status of Species, including definitions and methodologies, are available at: <https://www.iucnredlist.org/about/green-status-species>

crossings of Vicuña from Peru into Bolivia have been reported, which requires considerations of use rights among local communities that use Vicuña fibre as a resource either side of these borders<sup>16</sup>.

### 3. Existing protection and management

#### CMS Actions

This species is not currently included in any CMS Agreement or MOU, and no other actions under CMS were identified.

#### Other international instruments

##### Convention for the Conservation and Management of the Vicuña (Vicuña Convention), 1979

- Signatories: Argentina, Bolivia, Chile, Ecuador, Peru

##### Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

- All populations were listed in CITES Appendix I in 1975, prohibiting international commercial trade in vicuña fibre. Since 1987, specific populations have been progressively transferred to Appendix II, where international trade is allowed but regulated.

##### Current listing in CITES (details available at [Species+](#))

- Appendix I (as of 26/11/2019): Except the populations of Argentina (the populations of the Provinces of Jujuy, Catamarca and Salta, and the semi-captive populations of the Provinces of Jujuy, Salta, Catamarca, La Rioja and San Juan), Chile (populations of the region of Tarapacá and of the region of Arica and Parinacota), Ecuador (the whole population), Peru (the whole population) and the Plurinational State of Bolivia (the whole population), which are included in Appendix II.
- Appendix II (as of 26/11/2019): Parts of populations of Argentina and Chile, and the populations of Bolivia, Peru and Ecuador not included in Appendix I. For the exclusive purpose of allowing international trade in fibre from Vicuñas (*Vicugna vicugna*) and their derivative products, only if the fibre comes from the shearing of live Vicuñas. Trade in products derived from the fibre may only take place in accordance with certain provisions<sup>c</sup>.

#### Potential implications of removal from Appendix I

As a CMS Appendix I species, Range States should prohibit the taking of the species with certain precise exceptions. Historically, individuals were killed for their meat, skin, and fibre; however, current legal take and trade in Vicuña fibre originates from live-shorn individuals and a number of sustainable use initiatives have been developed<sup>1,17</sup>. While the improved conservation status of the Vicuña represents a conservation success story, the IUCN Red List assessment for *V. vicugna* emphasises the importance of maintaining “political actions to control the current situation in order to avoid the risk of revisiting past circumstances that left the species near extinction”<sup>1</sup>, and the species’ recent IUCN Green Status assessment highlights the dependence of *V. vicugna* on continued conservation efforts<sup>2</sup>.

### 4. Concluding statement

While Vicuña populations have recovered considerably over the past several decades, poaching for valuable Vicuña fibre represents a major threat to the species and expert assessments indicate that the species’ continued recovery is contingent on the maintenance of conservation actions<sup>1</sup>. Some populations occur at international boundaries and may therefore frequently cross these borders. The IUCN Red List assessors highlighted that the species may benefit from ongoing cross-border cooperation among Andean countries, such as the coordination of anti-poaching efforts. As a precautionary measure, the Appendix I listing of *V. vicugna* provides on-going protection from take.

It is important to note that Peruvian populations are not included in the Appendix I listing and that reservations have been entered by Argentina and Bolivia.

### 5. References

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<sup>c</sup> For full listing note, see: <https://cites.org/sites/default/files/eng/app/2022/E-Appendices-2022-06-22.pdf>.

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# *Pelecanus onocrotalus* (Great White Pelican)



**Appendix I (1994)**  
Only Palearctic populations  
**Appendix II (1986)**  
Western Palearctic populations



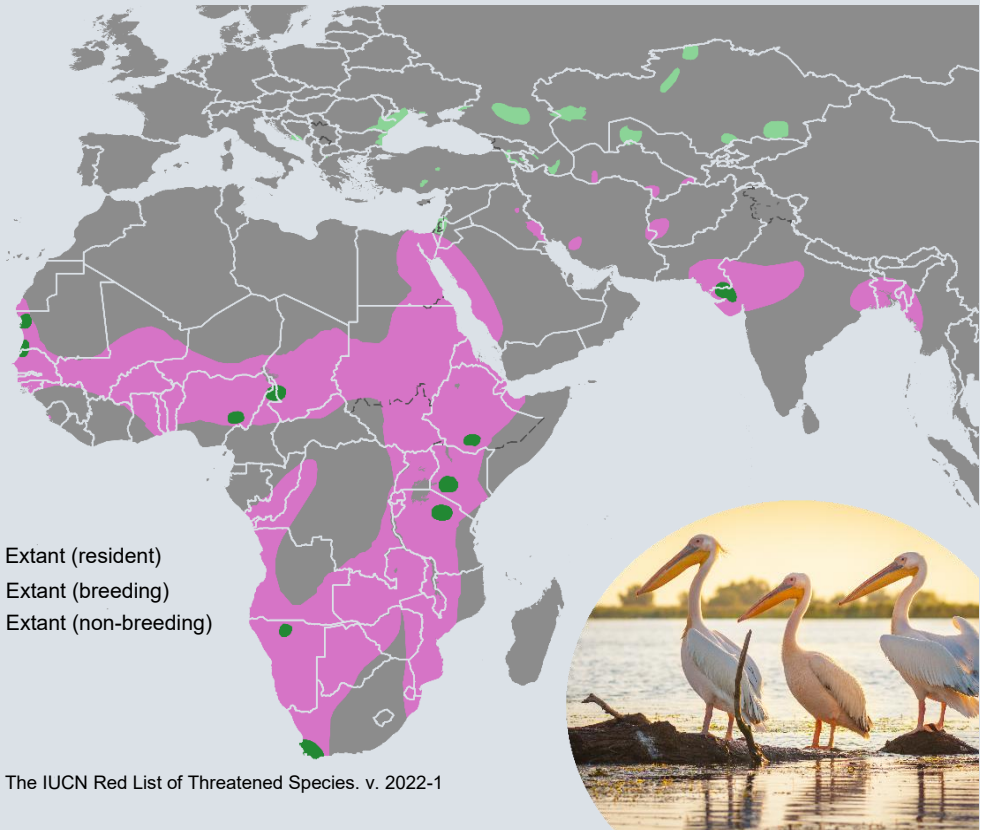
**IUCN assessment (2020)**

**Least Concern / Unknown**

Selected for review based on conservation status (Least Concern) sustained over multiple assessments and population trend (unknown globally, but increasing in Europe according to the latest IUCN Red List assessment for

The **Palearctic** includes Europe, North Africa and Asia north of the Himalayas (excluding the Indian subcontinent and southeast Asia).

**Western Palearctic** encompasses the region including Europe, North Africa and the Middle East, excluding southern parts of the Arabian Peninsula. The original Appendix II listing proposal for *P. onocrotalus* ([COP4 II/26](#)) also refers to populations in the Caspian region and the Islamic Republic of Iran.



**Base map:** United Nations Geospatial, 2021  
**Range data:** IUCN 2021. *Pelecanus onocrotalus*. The IUCN Red List of Threatened Species. v. 2022-1  
**Image:** Adobe Stock

## 1. Conservation status and threats

### Appendix I listing criteria

Article III paragraph 2 of the Convention states that *migratory species may be listed in Appendix I provided that reliable evidence, including the best scientific evidence available, indicates that the species is endangered*. Following Resolution 13.7, the term “endangered” is interpreted as “*facing a very high risk of extinction in the wild in the near future*”.

Article III paragraph 3 of the Convention states that a migratory species may be removed from Appendix I when the COP determines that the species is no longer endangered, and the species is not likely to become endangered again because of loss of protection due to its removal from Appendix I.

### Summary of conservation status

<b>IUCN assessments</b>	<b>IUCN Red List Status (Global)<sup>1a</sup></b>
	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p><b>LR/LC</b></p> <p>1988, 1994, 2000</p> </div> <div style="font-size: 2em;">➔</div> <div style="text-align: center;"> <p><b>Least Concern</b></p> <p>2004, 2008, 2009, 2012, 2016, 2018, 2020</p> </div> </div>
	<b>IUCN Red List Status (Europe)<sup>2</sup></b>

<sup>a</sup> LR/LC = Lower Risk/Least Concern (old category no longer in use). The IUCN categories and criteria have changed over time, therefore changes in a species’ categorisation may reflect changes in the criteria, rather than genuine changes in conservation status. The current criteria, Version 3.1, were published in 2001.

	Least Concern 2015	Least Concern 2020
	Neither the Global nor Europe IUCN Red List Assessments directly align with the CMS Appendix I listing for <i>P. onocrotalus</i> , which covers Palearctic populations only.	
<b>IUCN Population Trend</b>	<b>Unknown</b> (2020; some populations are decreasing, while others are reported to be increasing, stable or have unknown trends) (Global) <sup>1</sup> <b>Increasing</b> (2020) (Europe) <sup>2</sup>	
<b>IUCN Red List key information</b>	<p><b>Estimated extent of occurrence:</b> 51,200,000 km<sup>2</sup> (Global)<sup>1</sup>; 169,000 km<sup>2</sup> (Europe)<sup>2</sup></p> <p><b>Population size:</b> 265,000-295,000 individuals (Global)<sup>1</sup>; 9300-20,400 pairs, or 18,700-40,700 mature individuals (Europe)<sup>2</sup>; 8,600-19,000 pairs or 17,300-37,900 mature individuals (European Union)<sup>2</sup></p> <p><b>National population estimates (Europe)<sup>2</sup>:</b></p> <ul style="list-style-type: none"> <li>• <i>Breeding populations:</i> Georgia: 10-100 pairs (2013-2017; unknown population trend), Greece: 610-940 pairs (2013-2018; increasing population trend), Romania: 8000-18,000 pairs (2013-2018; increasing population trend), Russian Federation: 600-700 pairs (2008-2018; increasing population trend), Türkiye: 50-80 pairs (2002-2012; unknown population trend).</li> <li>• <i>Wintering populations:</i> Azerbaijan: 50-500 individuals (1996-2019; unknown population trend), Bulgaria: 1-20 individuals (2013-2018; stable population trend), Romania: 15-24 individuals (2013-2018; unknown population trend), Türkiye: 29-380 (2013-2019; unknown population trend).</li> </ul>	
<b>Complementary or equivalent information on conservation status</b>	<p><b>Palearctic populations outside of Europe:</b> countries outside of Europe<sup>b</sup> reportedly held a significant proportion (approximately 50%) of the Palearctic breeding population in the 1980s and 1990s<sup>3</sup>. No recent assessments or population estimates could be located for these populations.</p> <p>In 2000, the entire Palearctic population (including the European population) was estimated to number between 6,800 and 11,000 pairs. This estimate was based on information from older surveys in the Islamic Republic of Iran (population estimate: 300-400 pairs; survey period: 1990s), Kazakhstan (2600-5100 pairs; 1980s), Turkmenistan (100-450 pairs; 1980s) and Uzbekistan (300-650 pairs; 1980s<sup>3</sup>).</p>	
<b>Biological vulnerability</b>	<p><b>Reproductive output:</b> moderate, compared to other birds<sup>4</sup>. <i>Pelecanus onocrotalus</i> produces relatively few offspring (clutch size: 2) and reaches sexual maturity at approximately 3.5 years (1272 days)<sup>5</sup>.</p> <p><b>Habitat breadth:</b> <i>P. onocrotalus</i> is a habitat specialist<sup>4</sup> associated with wetlands, which nests in large colonies situated in locations inaccessible to predators, such as extensive reedbeds, swamps, mudflats, sandbanks or gravel banks<sup>1</sup>.</p>	
<b>Summary of threats</b>		
<b>Current and future threats</b>	<p>Summary of threats according to the IUCN Red List assessment<sup>1</sup>, supplemented with additional information from the wider scientific literature:</p> <ul style="list-style-type: none"> <li>• <b>Disturbance at nesting sites</b> regarded as the main threat to populations in the Black Sea – Mediterranean flyway, which are considered strictly dependent on the continuation of conservation management, including wardening to protect breeding colonies<sup>6</sup>.</li> <li>• <b>Avian influenza:</b> outbreaks of highly pathogenic avian influenza is an increasing threat to <i>P. onocrotalus</i> populations<sup>7</sup>. In early 2021, avian influenza outbreaks affected <i>P. onocrotalus</i> in UNESCO and Ramsar Sites in Senegal and Mauritania. 750 deaths (mostly juveniles) were recorded at the Djoudj National Bird Sanctuary, Senegal, which hosts overwintering populations of Palearctic migratory birds<sup>8</sup>.</li> <li>• <b>Habitat destruction:</b> the loss and degradation of wetlands, including stopover sites used on migration, was a major cause of historic declines across the Palearctic<sup>1,6,9</sup>. This species is particularly sensitive to changes in wetland hydrology at breeding sites which can impact the viability of nesting areas or the availability of prey<sup>1,6</sup>.</li> <li>• <b>Direct persecution</b> (e.g., shooting, destruction of nests) reportedly remains one of the most widespread ongoing threats affecting pelican populations in the Black Sea – Mediterranean flyway region, according to an assessment conducted in 2012<sup>6</sup>. Persecution was a major cause of the historic 20<sup>th</sup> century decline of this species in some European countries<sup>6</sup> and is largely driven by the perceived conflict between pelicans and fisheries<sup>1,6</sup>.</li> </ul>	

<sup>b</sup> These countries do not include the Russian Federation and Türkiye.

- **Hunting:** the extent and impact of hunting is not well understood<sup>1</sup>. In Egypt, *P. onocrotalus* is both targeted directly by hunters for food and illegally caught in nets set to capture other target species for consumption<sup>10,11</sup>, and is reportedly hunted for sport in parts of Southern and Eastern Europe<sup>1</sup>.
  - **Agricultural and industrial pollution** of freshwater wetlands has the potential to negatively affect populations of this species, through the accumulation of pollutants in adult birds following the consumption of contaminated fish<sup>1</sup>. The long-term impact of this threat on *P. onocrotalus* populations is currently unknown<sup>1</sup>.
  - **Collisions with electric power lines** have been highlighted as an additional source of mortality for some populations in the Black Sea – Mediterranean flyway region<sup>6, 12</sup>.
  - **Climate change** has the potential to amplify the threat to this species posed by abrupt changes in wetland hydrology, particularly if the frequency of extreme weather events such as storms increases<sup>6</sup>.
- Disturbance, habitat destruction, persecution, hunting and pollution were all noted as threats to *P. onocrotalus* in the original CMS Appendix I listing proposal for the Palearctic population ([CMS/Inf. 1.8/ A I/1](#)).

## 2. Migratory behaviour and transboundary movements

Northern populations are migratory<sup>1</sup>, with the largest breeding colony outside of Africa nesting in the Danube Delta, Romania, from March to April and leaving from September to early November<sup>10</sup>. Wintering grounds of European populations are thought to lie mainly in Africa<sup>10</sup>, with the Danube Delta colony known to overwinter in equatorial Africa, including in Sudan and Kenya<sup>13</sup>. The migration route from Romania to equatorial Africa spans from the Black Sea through to Bulgaria, Türkiye, and into the east Mediterranean and Egypt<sup>13</sup>.

## 3. Existing protection and management

### CMS Actions

#### [Agreement on the Conservation of African-Eurasian Migratory Waterbirds \(AEWA\)](#)

- Current listing: Table 1, Column A (Europe and Western Asia breeding population; populations in Eastern, Southern and West Africa are listed in Table 1, Column B).
- Parties to AEWA are required to implement legal measures prohibiting the taking of birds and eggs, deliberate disturbance and the possession or utilisation of, and trade in, Table 1, Column A populations.
- Under the Agreement, Parties also commit to establishing protected areas to conserve habitats important for the populations listed in Table 1, and to limit disturbance at breeding colonies, in addition to other activities outlined in the [AEWA Action Plan](#).

#### [Central Asian Flyway \(CAF\) Action Plan](#)

- Current listing: Table 2, Column A.
- Range States are required to implement legal measures prohibiting taking, deliberate disturbance and trade of Table 2, Column A populations. The CAF Action Plan also includes provisions covering habitat conservation and monitoring of listed populations.

### CMS Resolutions

Given the threats facing *P. onocrotalus*, the following CMS Resolutions are likely to be relevant:

- [7.04 Electrocution of Migratory Birds](#), [10.11 \(Rev.COP13\) Power Lines and Migratory Birds](#), [11.16 \(Rev.COP13\) The Prevention of Illegal Killing, Taking and Trade of Migratory Birds](#), [12.11 \(Rev.COP13\) Flyways](#), [12.12 \(Rev.COP13\) Action Plans for Birds](#) and [12.21 Climate Change and Migratory Species](#).

### Other international instruments

#### **EU Birds Directive (Directive 2009/147/EC)**

- Current listing: Annex I.
- Under the EU Birds Directive, EU Member States are required to prohibit the deliberate killing or capture, destruction or damage to eggs and nests and the deliberate disturbance of Annex I species.
- Member States must also designate and manage “their most suitable territories in number and size” as Special Protection Areas (SPAs) for Annex I species. SPAs automatically form part of the Natura 2000 network, established through the Habitats Directive (Directive 92/43/EEC). As part of this regulation, Member States have a duty to take appropriate steps to avoid the deterioration of habitats within Natura 2000 sites and prevent disturbance to the species for which the site was designated.
- 97 Natura 2000 sites have been designated for *P. onocrotalus* across four EU Member States<sup>14</sup>.
- *P. onocrotalus* is not one of the Annex I species that has a European Bird Species Action Plan<sup>15</sup> or priority funding under LIFE<sup>16</sup>.

#### **Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention)**

- Current listing: Appendix II (Strictly Protected Fauna Species).
- Requires Contracting Parties to prohibit deliberate capture and killing, damage to breeding sites, disturbance, the taking of eggs and the possession of, and internal trade in, Appendix II species.

#### 4. Concluding statement

Both the global and European populations of *P. onocrotalus* were categorised as Least Concern in IUCN Red List assessments conducted in 2020. While European populations of this species are reported to be recovering, the current status of the remainder of the Palearctic population is unknown. A recent assessment of the conservation status of *P. onocrotalus* in the Black Sea – Mediterranean flyway has emphasised that the population in this region is dependent on the continuation of ongoing conservation measures, including efforts to protect nesting colonies from disturbance and persecution. The IUCN Red List assessment for Europe also highlighted the need to improve the monitoring of persecution incidents and enforcement of existing legislation protecting this species. Given the continued pressures from disturbance, persecution and habitat loss or degradation, and the growing threat from avian influenza outbreaks, the Appendix I listing provides important protections for the Palearctic populations of the species.

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# Haliaeetus albicilla (White-tailed Sea-eagle)

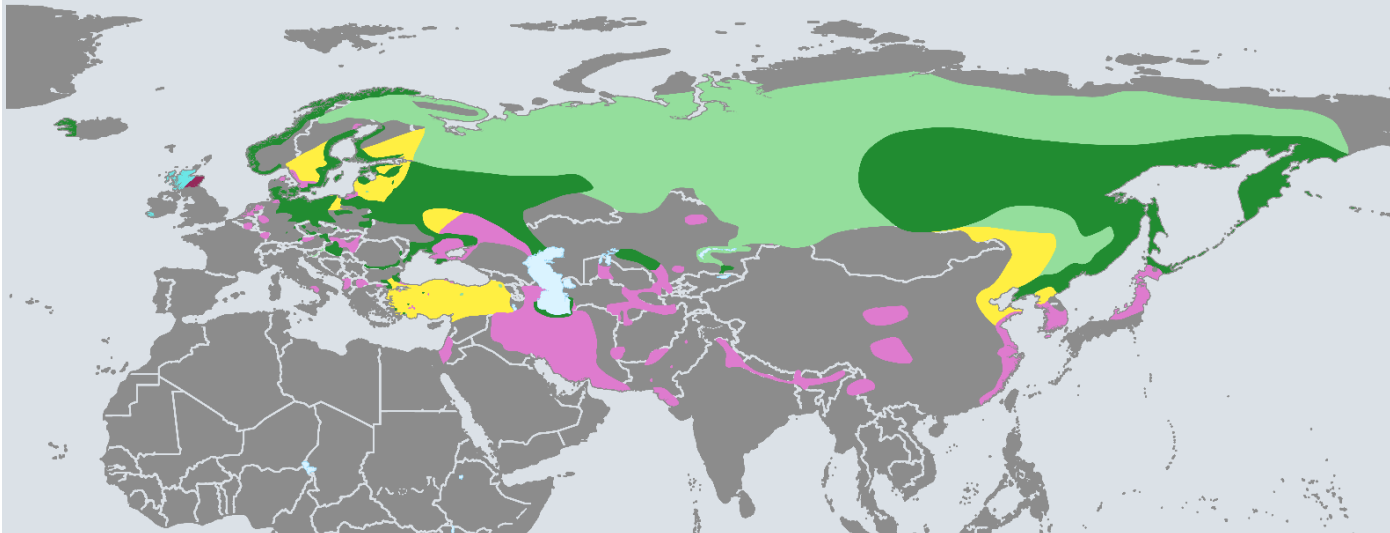


Appendix I (1985)  
Appendix II (1979)



IUCN assessment (2021)  
Least Concern / Increasing

Selected for review based on improved conservation status (Least Concern) and population trend (increasing).



■ Extant (resident)    ■ Extant (breeding)    ■ Extant (non-breeding)    ■ Extant (passage)  
■ Extant and reintroduced (resident)    ■ Extant and reintroduced (passage)



**Base map:** United Nations Geospatial, 2021  
**Range data:** BirdLife International and Handbook of the Birds of the World 2021.  
*Haliaeetus albicilla*. The IUCN Red List of Threatened Species. v. 2022-1  
**Image:** AdobeStock

## 1. Conservation status and threats

### Appendix I listing criteria

Article III paragraph 2 of the Convention states that *migratory species may be listed in Appendix I provided that reliable evidence, including the best scientific evidence available, indicates that the species is endangered*. Following Resolution 13.7, the term “endangered” is interpreted as “*facing a very high risk of extinction in the wild in the near future*”.

Article III paragraph 3 of the Convention states that a migratory species may be removed from Appendix I when the COP determines that the species is no longer endangered, and the species is not likely to become endangered again because of loss of protection due to its removal from Appendix I.

### Summary of conservation status

IUCN assessments	IUCN Red List Status (Global) <sup>1 c</sup>			
	T	LR/NT	NT	LC
	1988	1994, 2000	2004	2005, 2008, 2009, 2012, 2015, 2016, 2020, 2021

<sup>c</sup> T = Threatened (old category no longer in use), LR/NT = Lower Risk/Near Threatened (old category no longer in use), NT = Near Threatened, LC = Least Concern. The IUCN categories and criteria have changed over time, therefore changes in a species' categorisation may reflect changes in the criteria, rather than genuine changes in conservation status. The current criteria, Version 3.1, were published in 2001.

	<p><b>IUCN Red List Status (Europe)<sup>2</sup></b></p> <p style="text-align: center;"><b>Least Concern</b> 2015, 2020</p> <p><b>IUCN Red List Status (Mediterranean)<sup>3</sup></b></p> <p style="text-align: center;"><b>Endangered</b> 2021</p>
<p><b>IUCN Population Trend</b></p>	<p><b>Increasing</b> (2021) (Global)<sup>1</sup>  <b>Increasing</b> (2020) (Europe)<sup>2</sup>  <b>Unknown</b> (2021) (Mediterranean)<sup>3</sup></p> <p>The <i>H. albicilla</i> population also appears to be increasing in Japan<sup>4</sup> and parts of the Russian Federation which lie within Europe<sup>5,6</sup>.</p>
<p><b>IUCN Red List key information</b></p>	<p><b>Estimated extent of occurrence:</b> 42,700,000 km<sup>2</sup> (Global)<sup>1</sup>; 169,000 km<sup>2</sup> (Europe)<sup>2</sup>; 85,712 km<sup>2</sup> (Mediterranean)<sup>3</sup>.</p> <p><b>Population size:</b></p> <ul style="list-style-type: none"> <li>• Global: 28,200-58,400 mature individuals, although this preliminary figure is extrapolated from estimates for the European breeding population and requires further validation<sup>1</sup>.</li> <li>• Europe: 10,400-14,600 pairs or 20,900-29,200 mature individuals (breeding population; 50-74% of the global population); 7200-11,700 mature individuals (wintering population). Approximately 50% of the European population is found in Norway and the European part of the Russian Federation<sup>2</sup>.</li> <li>• EU-28: 4800-6300 pairs or 9600-12,600 mature individuals (breeding population); 6000-9600 mature individuals (wintering population)<sup>2</sup>.</li> <li>• Mediterranean: 21-38 mature individuals<sup>3</sup>.</li> </ul>
<p><b>Complementary or equivalent information on conservation status</b></p>	<p><b>National Red List assessments<sup>d</sup>:</b></p> <ul style="list-style-type: none"> <li>• <i>Europe</i>: Albania: Critically Endangered (2013); Bulgaria: Vulnerable (2011); Croatia: Vulnerable (2007); Estonia: Near Threatened (2008); Finland: Least Concern (2019); Germany: Not Threatened (2016); Greece: Critically Endangered (2009), Iceland: Endangered (2018); Lithuania: Near Threatened (2021); Netherlands: Endangered (2016), Norway: Least Concern (2021); Poland: Least Concern (2020); Russian Federation: Least Concern (2020); Slovakia: Vulnerable (2013); Sweden: Near Threatened (2020); United Kingdom: Amber<sup>e</sup> (2021).</li> <li>• <i>Asia</i>: China: Vulnerable (2015); Japan: Endangered (2012); Nepal: Critically Endangered (2017); Republic of Korea: Vulnerable (2011).</li> </ul> <p><b>European Breeding Bird Atlas (EBBA):</b> increase in the number of occupied 50 km grid squares (change index: +49.3<sup>f</sup>) between two periods of population monitoring conducted in the 1980s (EBBA 1) and 2013-2017 (EBBA 2)<sup>7</sup>, indicative of range expansion within Europe.</p>
<p><b>Biological vulnerability</b></p>	<p><b>Reproductive output:</b> low compared to other birds<sup>8</sup>. <i>H. albicilla</i> matures at a relatively late age (~4.7 years)<sup>9</sup> and produces comparatively few offspring (clutch size: 2)<sup>9</sup>. Breeding failure can also be “very high”, with 0.2-1.1 chicks typically fledging per breeding pair<sup>10</sup>.</p> <p><b>Habitat breadth:</b> utilises a diverse range of freshwater and marine aquatic habitats<sup>9</sup>, and ranks among the most generalist bird species (based on the number of habitats occupied, as listed in the global IUCN assessment)<sup>11</sup>.</p> <p><b>Ecological role:</b> as a facultative scavenger, <i>H. albicilla</i> is particularly vulnerable to the accumulation of environmental pollutants<sup>11-13</sup>.</p>
<p><b>Summary of threats</b></p>	
<p><b>Current and future threats</b></p>	<ul style="list-style-type: none"> <li>• <b>Habitat loss and degradation:</b> destruction of wetland habitats<sup>1,15</sup>. Forestry practices, which can lead to the loss of mature trees as nest sites, also pose a threat to this species<sup>15</sup>.</li> <li>• <b>Accidental poisoning</b> caused by consumption of carrion contaminated with <b>spent lead</b> ammunition is a considerable source of mortality for White-tailed Sea-eagles across</li> </ul>

<sup>d</sup> A non-exhaustive list based on a combination of the National Red List assessments documented on the National Red List database ([www.nationalredlist.org](http://www.nationalredlist.org)) and those identified through additional web searches.

<sup>e</sup> In the United Kingdom *Birds of Conservation Concern* report, “Amber” indicates species whose conservation status is of moderate concern, based on a range of criteria outlined in Stanbury *et al.* (2021)<sup>[14]</sup>. When IUCN Red List criteria were applied to Great Britain, *H. albicilla* was assessed as “Endangered”<sup>[14]</sup>.

<sup>f</sup> Measures of the magnitude of the change in the number of occupied squares between EBBA1 and EBBA2 (0 indicates no change, -100 extinction and +100 colonisation).

Europe<sup>12, 16-18</sup> and in Japan<sup>19</sup>; it is estimated that the adult population size of *H. albicilla* in Europe is 14.4% smaller than it would be if no lead poisoning took place<sup>20</sup>. *H. albicilla* is also at risk of incidental poisoning by agricultural pesticides<sup>1, 21-22</sup>

- **Environmental pollutants:** breeding success in *H. albicilla* populations across northern and central Europe was substantially reduced by high environmental concentrations of organochlorine contaminants (e.g., PCB, DDT) between the 1950s and mid-1980s<sup>23-26</sup>. Productivity has since recovered following bans on organochlorine chemicals<sup>23-26</sup>, although adverse impacts of these contaminants on reproduction in some populations were reported as recently as the early 2010s<sup>26</sup>.
- **Energy infrastructure:** direct collisions with wind turbines and electrocution from power lines can cause significant additional mortality<sup>27-29</sup>. At one wind-power plant in Norway, annual white-tailed eagle mortality was ~8/year from turbine collisions and ~2-3/year from electrocution<sup>30</sup>. Onshore wind farms have also been shown to displace this species from areas of suitable habitat<sup>31</sup>.
- **Direct persecution** was one of the main reasons for the historic decline in *H. albicilla* populations during the 19<sup>th</sup> and early 20<sup>th</sup> centuries<sup>1, 15</sup>. A 2019 assessment of the scale of illegal killing of birds in Northern and Central Europe and the Caucasus suggested that >1% of the global population of this species may be illegally killed each year<sup>32</sup>.
- **Collisions with road traffic**<sup>12</sup> and **avian influenza virus**<sup>33,34</sup> also threaten the species.

Persecution, loss of habitat, and the risk of contamination from environmental pollutants were all recognised as threats to *H. albicilla* in the original CMS Appendix I listing proposal for this species in 1985 ([CMS/Inf. 1.8/ A I/3](#)).

## 2. Migratory behaviour and transboundary movements

According to the species' IUCN assessment, *H. albicilla* migrates mainly in the north and east of its breeding range and winters in continental Europe and southern Asia<sup>1</sup>. Sedentary populations occur elsewhere, such as in Greenland, Iceland, and Norway<sup>10</sup>. The original listing proposal ([CMS/Inf. 1.8/ A I/3](#)) for *H. albicilla* stated that: “the population from north USSR (beyond about 60 N) is all migratory. In the west and south of the breeding area, the young birds travel for a shorter distance and the adults are partly sedentary. The breeding and wintering area is widespread in Europe, but in Asia the birds winter further from their breeding area.”

## 3. Existing protection and management

### CMS Actions

#### [Memorandum of Understanding on the Conservation of Migratory Birds of Prey in Africa and Eurasia \(Raptors MOU\)](#)

- Current listing: Category 3 (*H. albicilla* was previously listed in Category 2, which includes species considered to have unfavourable conservation status at the regional level; this species was moved to Category 3 in 2015, which covers all other migratory raptors).
- Signatories commit to adopting and implementing measures to conserve migratory birds of prey and their habitats. This includes efforts to implement adequate legal protection for birds of prey, assess problems posed by human activities, identify important areas and migratory routes and develop cooperative international projects to promote effective conservation, in addition to other general conservation measures outlined in the [MOU text](#).
- The MOU Action Plan (Annex 3 of the MOU text<sup>9</sup>) outlines the key conservation actions needed to ensure all populations of African-Eurasian migratory birds of prey are maintained in, or returned to, favourable conservation status. Activities are prioritised according to the conservation status of the species affected, reflected in the species category. Specific actions are addressing most of the threats listed above.

### CMS Resolutions

Given the threats facing *H. albicilla*, the following CMS Resolutions are likely to be relevant:

- [7.5 \(Rev.COP12\) Wind Turbines and Migratory Species](#), [8.12 \(Rev.COP12\) Improving the Conservation Status of Raptors and Owls in the African-Eurasian Region](#), [10.11 \(Rev.COP13\) Power Lines and Migratory Birds](#), [11.15 \(Rev.COP13\) Preventing Poisoning of Migratory Birds](#), [11.16 \(Rev.COP13\) The Prevention of Illegal Killing, Taking and Trade of Migratory Birds](#), [11.27 \(Rev.COP13\) Renewable Energy and Migratory Species](#), [12.11 \(Rev.COP13\) Flyways](#), [12.12 \(Rev.COP13\) Action Plans for Birds](#) and [12.21 Climate Change and Migratory Species](#).

### Other international instruments

#### EU Birds Directive (Directive 2009/147/EC)

<sup>9</sup> Proposed [amendments](#) to the MOU text were discussed by the Raptors MOU Technical Advisory Group in December 2021.

- Current listing: Annex I.
- Under the EU Birds Directive, EU Member States are required to prohibit the deliberate killing or capture, destruction or damage to eggs and nests and the deliberate disturbance of Annex I species.
- Member States must also designate and manage “their most suitable territories in number and size” as Special Protection Areas (SPAs) for Annex I species. SPAs automatically form part of the Natura 2000 network, established through the Habitats Directive (Directive 92/43/EEC). Under this regulation, Member States have a duty to take appropriate steps to avoid the deterioration of habitats within Natura 2000 sites and prevent disturbance to the species for which the site was designated. 772 Natura 2000 sites have been designated for *H. albicilla*<sup>35</sup>.
- *H. albicilla* is not one of the Annex I species that has a European Bird Species Action Plan<sup>36</sup> or priority funding under LIFE<sup>37</sup>.

#### Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention)

- Current listing: Appendix II (Strictly Protected Fauna Species).
- Requires Contracting Parties to prohibit deliberate capture and killing, damage to breeding sites, disturbance, the taking of eggs and the possession of, and internal trade in, Appendix II species.

#### Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

- Appendix I (1977). Reservation entered by Saudi Arabia in 1996.

#### European Union Wildlife Trade Regulations

- Annex A (1997). Genus listing *Haliaeetus*.

## 4. Concluding statement

White-tailed Sea-eagle populations have recovered over recent decades, following a decline in the prevalence of some environmental pollutants, improved legal protection and active conservation efforts, including reintroduction programmes in some European countries<sup>1</sup>. However, this species still faces pressure from a range of anthropogenic threats, including illegal persecution, inadvertent poisoning and collisions with energy infrastructure<sup>1</sup>. Additionally, while the species' global IUCN Red List assessment categorizes the species as Least Concern, national red list assessments indicate its conservation status varies considerably across its range. Sustained recovery may therefore depend on the continuation of existing conservation measures, including initiatives to phase out the use of lead ammunition and mitigate the negative impacts of energy infrastructure on this species. The IUCN Red List assessment for the White-tailed Sea-eagle also highlights the importance of introducing, enforcing or strengthening current legislation which prohibits intentional killing<sup>1</sup>, in order to counter the threat to this species posed by illegal persecution<sup>25</sup>. Given the role of CMS Appendix I in maintaining an international obligation for Range States to protect this species from take, the Appendix I listing of *H. albicilla* provides important safeguards for the species.

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# Podocnemis expansa (South American River Turtle)



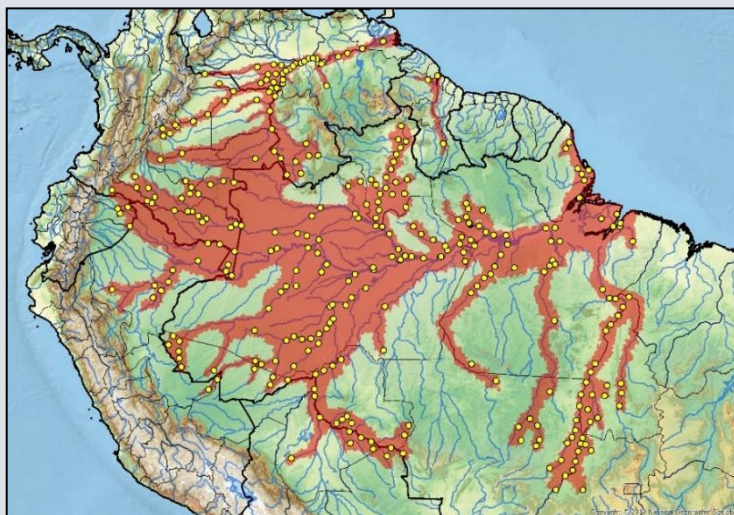
**Appendix I (1979)**  
Only Upper Amazon populations\*  
**Appendix II (1979)**



**IUCN assessment (1996) [needs updating]**  
**Lower Risk/conservation dependent**  
Population trend unspecified

\*Upper Amazon includes Brazil, Colombia (non-Party), Ecuador, Peru and Venezuela (non-Party)

Selected for review to provide an update on conservation status as the IUCN Red List assessment is annotated as needing updating.



Yellow dots = native populations and recorded specimens

**Countries of occurrence:** Plurinational State of Bolivia (hereafter Bolivia), Brazil, Colombia, Ecuador, Guyana, Peru, Bolivarian Republic of Venezuela (hereafter Venezuela)



**Map:** Reprinted with permission from: A. G. J. Rhodin *et al.*, "Turtles of the World: Annotated Checklist and Atlas of Taxonomy, Synonymy, Distribution, and Conservation Status (9th Ed.)" in *Conservation Biology of Freshwater Turtles and Tortoises: A Compilation Project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group*, vol. 8, A. G. J. Rhodin, J. B. Iverson, P. P. van Dijk, C. B. Stanford, E. v Goode, K. A. Buhmann, and R. A. Mittermeier, Eds. Chelonian Research Monographs, 2021, pp. 89.  
**Image:** Adobe Stock

## 1. Conservation status and threats

### Appendix I listing criteria

Article III paragraph 2 of the Convention states that *migratory species may be listed in Appendix I provided that reliable evidence, including the best scientific evidence available, indicates that the species is endangered*. Following Resolution 13.7, the term "endangered" is interpreted as "facing a very high risk of extinction in the wild in the near future".

Article III paragraph 3 of the Convention states that a migratory species may be removed from Appendix I when the COP determines that the species is no longer endangered, and the species is not likely to become endangered again because of loss of protection due to its removal from Appendix I.

### Summary of conservation status

<b>IUCN assessments</b>	<b>IUCN Red List Status<sup>1a</sup></b>
	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="background-color: #e67e22; color: white; padding: 10px; text-align: center;"> <b>E</b> 1982, 1986, 1988, 1990, 1994                 </div> <div style="font-size: 2em;">➔</div> <div style="background-color: #f1c40f; color: white; padding: 10px; text-align: center;"> <b>LC/cd</b> 1996                 </div> </div>
	<b>IUCN Tortoise &amp; Freshwater Turtle Specialist Group provisional Red List assessment<sup>2</sup></b> <div style="background-color: #8e44ad; color: white; padding: 10px; text-align: center; margin-top: 10px;"> <b>Critically Endangered</b> 2011                 </div>

<sup>a</sup> E = Endangered, LC/cd = Least Concern/conservation dependent (old category; no longer applied to new assessments). The IUCN categories and criteria have changed over time, therefore changes in a species' categorisation may reflect changes in the criteria, rather than genuine changes in conservation status. *P. expansa* was assessed using criteria Version 2.3; the current criteria, Version 3.1, were published in 2001.

<b>IUCN Population Trend</b>	Unspecified (1996) <sup>1</sup>
<b>Current information on conservation status</b>	<p><b>National Red List assessments (* = Upper Amazon):</b></p> <ul style="list-style-type: none"> <li>• <i>CMS Parties</i>: Brazil*: Near Threatened (2014)<sup>3</sup>; Ecuador*: Critically Endangered (2005)<sup>4</sup>; Peru*: Endangered (2018)<sup>5</sup>; Bolivia: Endangered (2009)<sup>6</sup>.</li> <li>• <i>Non-Parties</i>: Colombia*: Critically Endangered (2015)<sup>7</sup>; Venezuela*: Critically Endangered (2015)<sup>8</sup>.</li> </ul> <p><i>Podocnemis expansa</i> was included in the original version of the Appendices when the Convention was adopted in 1979 on the basis that the species was overexploited and regularly moves across national boundaries.</p> <p>There is insufficient monitoring data to reliably evaluate the species' global population status or population trend across the Amazon basin, with only a few long-term population studies published outside Brazil<sup>9</sup>. However, the species is believed to have generally declined across its range compared to historical abundances<sup>9</sup>. Analysis of trends in the number of nesting females in nine Brazilian rivers suggest that some populations are declining, while others appear to be recovering<sup>9</sup>. The population of the species in a reserve that once contained one of the largest populations in Brazil had reduced from approx. 6500 females in the 1960s and 1970s<sup>unpublished data in [10]</sup> to &lt;600 in 2012–2014<sup>9</sup>.</p> <p>At least one river turtle conservation programme can be found in every country across the species' range, mainly to protect nesting beaches to reduce egg and hatchling mortality<sup>9</sup>.</p>
<b>Biological vulnerability</b>	<p>The species' large size, relatively high clutch sizes/fecundity, and gregarious nesting behaviour makes <i>P. expansa</i> attractive to harvesters<sup>11</sup> and regular migrations may make <i>P. expansa</i> especially vulnerable to over-harvesting far from protected nesting beaches<sup>12,13</sup>.</p> <p><b>Body size:</b> Adult size (max straight carapace length) and body mass: 55 cm males, 109 cm females<sup>1</sup>; 25.8 kg<sup>14</sup>–45 kg<sup>15</sup>.</p> <p><b>Reproductive output:</b> Age at sexual maturity 10–17 years<sup>16–18</sup>. Size (curved carapace length) at sexual maturity 46.5 cm (females) and 32.1 cm (males)<sup>12</sup>. Incubation period averages 36–75 days<sup>19</sup> with a clutch size of 75–123 and a hatching success rate of 83%<sup>11</sup>.</p> <p><i>P. expansa</i>'s feeding and reproductive cycle is adapted to the dynamics of river systems (see section: 2. <i>Migratory behaviour and transboundary movements</i>), and is therefore particularly sensitive to damming of large rivers for hydroelectric projects<sup>11</sup>.</p>
<b>Summary of threats</b>	
<b>Current and future threats</b>	<ul style="list-style-type: none"> <li>• <b>Overexploitation:</b> Widespread demand for meat, eggs,<sup>15, 20</sup> and oil in the Amazon basin<sup>15</sup>, primarily for the domestic market<sup>21</sup>. Recent harvests have been documented in: Brazil<sup>22</sup>, Colombia<sup>23</sup>, Ecuador<sup>24</sup>, Peru<sup>25</sup>, and Venezuela<sup>12</sup>. Past unsustainable harvests resulted in depleted populations across the species' range<sup>9, 15, 26</sup>.</li> <li>• <b>Habitat degradation:</b> Destruction of flooded forests and floodplains due to the introduction of cattle pastures have contributed to population declines past<sup>25</sup> and present<sup>19</sup> and are anticipated to contribute to further population declines in future<sup>27</sup>.</li> <li>• Considered possible that harvest for illegal trade and habitat destruction across the species' range have surpassed the effects of conservation actions<sup>28</sup>, as the loss of adults exceeded recruitment in some sites<sup>9</sup>.</li> <li>• <b>Hydroelectric dams:</b> Potential flooding of, and isolation from, nesting sites and feeding grounds caused by the construction of hydroelectric dams<sup>9, 11, 19, 29</sup>.</li> <li>• <b>Dredging:</b> Disturbance of fluvial sediment dynamics and destruction of nesting sites caused by dredging of riverbeds<sup>30</sup>.</li> <li>• <b>Climate change:</b> Unexpected rise in river water levels, attributed to the effects of climate change and deforestation could affect reproductive success with flooding of nests resulting in egg mortality<sup>11, 15, 29, 31 in 32</sup>. However, one study suggested that increased precipitation and higher river levels might enhance connectivity and facilitate migrations for females, thus increasing number of nests<sup>33</sup>.</li> </ul> <p>Anthropogenic disturbances from climate change, habitat disturbance, and overexploitation could alter climatic cycles, disrupt migration patterns, and decrease genetic variation in the future<sup>27</sup>.</p>

## 2. Migratory behaviour and transboundary movements

*Podocnemis expansa* is one of two known riverine turtles in which both sexes migrate between feeding and nesting areas<sup>13</sup>. Turtles feed in flooded forests during the annual flooding season, and, once water levels drop in the dry season, they migrate to nesting beaches in large aggregations<sup>15, 19, 20</sup>. The timings of these migrations depend upon the dynamics of the river systems and vary by basin and sub-basin throughout the species' range<sup>27</sup>. Females have been recorded migrating distances over 400 km between nesting beaches and feeding areas<sup>34, 35</sup>, and over 200 km between nesting beaches, in consecutive years<sup>35</sup>.

## 3. Existing protection and management

### CMS Actions

This species is not currently included in any CMS Agreement or MOU, and no other actions under CMS were identified.

While there are no formal CMS actions, at least one river turtle conservation programme can be found in every country across the species' range, mainly to protect nesting beaches to reduce egg and hatchling mortality<sup>9</sup>.

### Other international instruments

#### Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

- Appendix II (1975). Genus listing for *Podocnemis*.

#### European Union Wildlife Trade Regulations

- Annex B (1997). Genus listing for *Podocnemis*

## 4. Concluding statement

While the IUCN Red List assessment lists the species as Lower Risk/conservation dependent, this assessment, from 1996, is in need of updating and a more recent Red List assessment by the IUCN Tortoise & Freshwater Turtle Specialist Group provisionally re-categorised the species as Critically Endangered in 2011. According to national red list assessments, the species is considered either Endangered or Critically Endangered in five of the seven Range States including four countries in the Upper Amazon. Harvest of the species from the wild for its meat and eggs continues within the Upper Amazon and is considered to be the main threat to the species. Climate change could exacerbate the impact of current threats such as harvesting and habitat degradation, and could potentially alter the species' migrations. Given the species threatened status and the ongoing threats, the CMS Appendix I listing provides important protections for the species.

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# In depth review of the conservation status of individual CMS Appendix II-listed species

## Loxodonta cyclotis (African Forest Elephant)



Appendix II (1979)



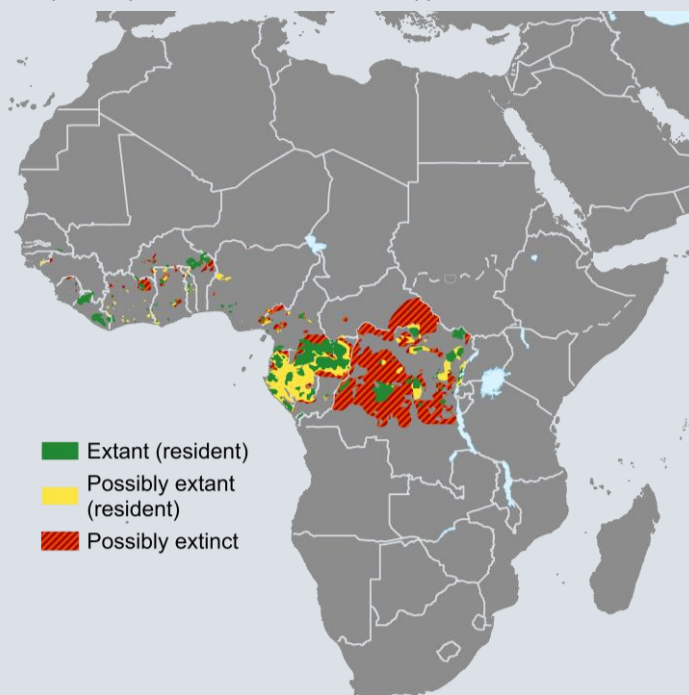
IUCN assessment (2020)

Critically Endangered / Decreasing

*Loxodonta cyclotis* has been listed in CMS Appendix II since 1979. Originally, it was included as part of the listing for *Loxodonta africana* as these were previously considered the same species. Since 2008, following the adoption of a new nomenclatural reference (Wilson and Reeder, 2005), *L. africana* and *L. cyclotis* have been recognised as two separate species that are both listed in Appendix II.

**Countries of occurrence:** Angola, Benin, Burkina Faso, Cameroon, Central African Republic, Republic of the Congo, Democratic Republic of the Congo (hereafter DRC), Côte d'Ivoire, Equatorial Guinea, Gabon, Ghana, Guinea, Guinea-Bissau, Liberia, Niger, Nigeria, Senegal, Sierra Leone (non-Party), South Sudan (non-Party), Togo

**Extinct:** Republic of the Gambia



■ Extant (resident)  
■ Possibly extant (resident)  
■ Possibly extinct



**Base map:** United Nations Geospatial 2023  
**Range data:** IUCN SSC African Elephant Specialist Group 2021. *Loxodonta cyclotis*. The IUCN Red List of Threatened Species. v. 2022-2  
**Image:** Adobe Stock

### 1. Conservation status and threats

#### Appendix I and II listing criteria


Article III paragraph 2 of the Convention states that “*migratory species may be listed in Appendix I provided that reliable evidence, including the best scientific evidence available, indicates that the species is endangered*”. Following Resolution 13.7, the term “endangered” is interpreted as “*facing a very high risk of extinction in the wild in the near future*”.

Article IV paragraph 1 states that “*Appendix II shall list migratory species which have an unfavourable conservation status and which require international agreements for their conservation and management, as well as those which have a conservation status which would significantly benefit from the international co-operation that could be achieved by an international agreement.*” Further, paragraph 2 notes that “*If the circumstances so warrant, a migratory species may be listed both in Appendix I and Appendix II.*”

#### Summary of conservation status

IUCN assessment	IUCN Red List Status <sup>1a</sup>
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<sup>a</sup> This is the first IUCN assessment of *Loxodonta cyclotis* as a separate species from *Loxodonta africana*. *L. africana* was most recently assessed as Endangered (2020).

	
<b>IUCN Population Trend</b>	<b>Decreasing</b> (2020) <sup>1</sup> . Estimated decline of over 80% over the past three generations (93 years) “that is understood to be continuing and likely irreversible” <sup>1</sup> . However, subpopulation trends across the continent vary, with some stable or increasing, and others declining at faster rates <sup>1</sup> .
<b>IUCN Red List key information</b>	<p>On the basis of genetic, behavioural, ecological and reproductive information, IUCN recognized the distinction of <i>L. africana</i> and <i>L. cyclotis</i> as separate species in 2021.</p> <p><b>Range:</b></p> <ul style="list-style-type: none"> <li>• The Central African forest represents ~95% of the current known and possible range for <i>L. cyclotis</i>, with the remaining 5% in West African forests<sup>1</sup>.</li> <li>• The Central African <i>L. cyclotis</i> population is now 10% of its potential historic size (estimated at 1,000,000 individuals based on forest cover) and occupies less than 25% of its potential range<sup>2</sup>.</li> <li>• In West Africa, range is decreasing and highly fragmented<sup>1</sup>; seven Range States reported to have fewer than 100 <i>L. cyclotis</i> each<sup>1</sup>.</li> <li>• Many local subpopulations have been extirpated<sup>1</sup>.</li> </ul> <p><b>Population size:</b></p> <ul style="list-style-type: none"> <li>• No available population estimate for <i>L. cyclotis</i> across its combined range of Central and West Africa<sup>1</sup>.</li> </ul> <p><b>National protection:</b> While most of the 20 <i>L. cyclotis</i> range countries are reported to offer the “highest possible protection status” to <i>L. cyclotis</i>, there is “varying degrees of legal protection” across its range<sup>1</sup>.</p>
<b>Complementary or equivalent information on conservation status</b>	<p>Population surveys of <i>L. cyclotis</i> present methodological problems due to the species’ dense forest habitat and its cryptic behaviour<sup>2,3</sup>. As such, few national surveys of elephants in forested habitats have been conducted<sup>4</sup>.</p> <p><b>Central Africa</b></p> <ul style="list-style-type: none"> <li>• Population in its Central African range estimated between 50,000 and 130,000, but with savannah elephants and “hybrid morphs” suggested to represent over a quarter of these<sup>5</sup>.</li> <li>• Dung surveys in 2011 estimated approximately ~100,000 individuals across Central Africa, with Gabon, Republic of the Congo and DRC estimated to host majority of the <i>L. cyclotis</i> population in this region (estimated at 52%, 20%, and 19%, respectively<sup>2</sup>). However, recent surveys indicate the proportion of the Central African population held in Gabon may be higher: a DNA-based assessment in 2019-2020 estimated 95,110 forest elephants in the country alone<sup>4</sup>.</li> <li>• Gabon is therefore considered to be the main stronghold for the species, with the Gamba Complex of Protected Areas considered particularly important<sup>6</sup>.</li> <li>• Studies indicate population decline of ca. 60% in Central Africa over a ten-year period at the start of 21<sup>st</sup> century<sup>2,7</sup>.</li> </ul> <p><b>West Africa</b></p> <ul style="list-style-type: none"> <li>• Smaller populations are found in West Africa, which are fragmented, isolated, and declining rapidly<sup>8</sup>. These are mostly found in protected areas surrounded by agriculture<sup>8</sup>.</li> </ul>
<b>Biological vulnerability</b>	<p><b>Reproductive output:</b> Low reproductive potential (based on demographic study of one <i>L. cyclotis</i> population in Dzanga, Central African Republic)<sup>9</sup>. Median age of first reproduction was 23 years with a gestation of 22 months, followed by a median inter-birth interval of 68 months (~5.5 years).</p> <p><b>Habitat breadth:</b> Prefers open canopy secondary forest<sup>10,11</sup>. The Central African forest is of “critical importance” to the species, being the largest contiguous elephant habitat remaining on the African continent<sup>12</sup>.</p>
<b>Summary of threats</b>	
<b>Current and future threats</b>	<p><b>Poaching and illegal trade</b> is the main cause of <i>L. cyclotis</i> population declines<sup>1-3,7,13</sup>.</p> <ul style="list-style-type: none"> <li>• Cameroon, Gabon and the Republic of the Congo are reported to be affected by heavy poaching<sup>3</sup>. One study highlighted major population loss (78-81%) due to cross-border poaching between 2004-2014 in Minkébé National Park (MNP), Gabon<sup>13</sup>.</li> </ul>

- Asia is the main destination of illegally trafficked ivory; particularly China, Viet Nam, and Thailand<sup>1</sup>.
- Between 2011-2018, illegal killing rates of elephants in Central Africa remained high and did not show improvement<sup>14</sup>.
- ~23% of 49 large ivory seizures from 2002-2019 contained primarily *L. cyclotis* ivory<sup>15</sup>
- An assessment of poaching hotspots based on genetic analyses of ivory seizures from 1996-2014 found that 86-93% of seized *L. cyclotis* ivory originated from the Tri-National Dja-Odzala-Minkébé ('TRIDOM') landscape in northern Gabon, Republic of the Congo, and Dzanga-Sanga Special Reserve in southwestern Central African Republic<sup>16</sup>.

**Habitat loss and fragmentation**, driven by land conversion for urban expansion, infrastructure and agriculture<sup>1</sup>, reduces the habitat available for foraging and exposes elephants to threats such as poaching and human-elephant conflict<sup>8</sup>. Since 2001, the Central African forest region has lost over 6 million hectares of primary forest<sup>17</sup>, with an estimated 500,000 hectares of forest lost each year<sup>18</sup>. Up to 70% of the entire African elephant population is estimated to live outside protected areas<sup>3</sup>. While timber concessions can host large *L. cyclotis* populations, these habitats may increase exposure of elephants to poaching<sup>19</sup>.

**Human-elephant conflicts** primarily occur in the context of agriculture<sup>20</sup> and crop damage by elephants can be severe, with significant economic losses and other social impacts<sup>20,21</sup>. Crop damage has been linked to retaliatory killings and reduced support for conservation efforts<sup>22</sup>. Human-elephant conflict is reported to have risen sharply in Gabon in recent years<sup>23</sup>, and effective non-lethal deterrent measures are urgently needed<sup>20</sup>.

## 2. Migratory behaviour and transboundary movements

*L. cyclotis* can move long distances and may move regularly in search of resources such as food and mineral salts<sup>1</sup>. It is estimated that 76% of Africa's elephants (*L. africana* and *L. cyclotis*) have ranges that cross one or more national borders<sup>24</sup>. Fifteen *L. cyclotis* subpopulations are known to span international boundaries<sup>1</sup>, with over 25,000 *L. cyclotis* occurring in the TRIDOM Gabon Landscape transboundary protected area<sup>24</sup> (see section on *Existing protection and management* below). A GPS-tracking study has shown *L. cyclotis* individuals consistently crossing the international border between Republic of the Congo and Central African Republic<sup>25</sup>.

## 3. Existing protection and management

### CMS Actions

#### [CMS-CITES Joint Work Programme 2021-2025](#)

- African and Asian elephants are "shared species of particular attention" under the joint programme of work for CMS and CITES.
- Joint activities include, for example, maximizing synergies between CMS and the CITES Monitoring the Illegal Killing of Elephants (MIKE) programme and jointly supporting the implementation of the African Elephant Action Plan (AEAP), including supporting the fundraising of African elephant conservation programmes<sup>26</sup>.

#### [West African Elephant Memorandum of Understanding \(MOU\) \(2005\)<sup>b</sup>](#)

- The West African Elephant MOU aims to restore and maintain West African elephant populations through international collaboration across Range States, NGOs, scientists and local people.
- Signatories (includes all 13 West African Elephant Range States): Benin, Burkina Faso, Cote d'Ivoire, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo. Three meetings of the Signatories were held in 2009, 2011, and 2021.
- At the third meeting of the Signatories in 2021, it was agreed to amend the MOU and adopt the AEAP as its core strategy for the conservation of West African Elephants; the AEAP itself was revised in 2023 (see section on *Other international instruments*). The amended MOU was circulated and accepted by all Signatories.

#### CMS Scientific Council

- At the 5<sup>th</sup> Sessional Committee of the CMS Scientific Council in 2021, the Programme of Work for Terrestrial Species Conservation Issues was agreed, which included an activity led by the CMS Secretariat to: "*Encourage African Range States, and IGO and NGO partners, to take actions commensurate with the needs of the savanna and forest African elephants (Loxodonta cyclotis and L. africana) in relation to the recently*

<sup>b</sup> The West African Elephant MOU was signed when the CMS standard nomenclature only recognised one species, *L. africana*; the amended MOU recognises *L. africana* and *L. cyclotis* as separate species.



revised Red List Assessment and within their local context.” The outcomes of this activity will be reported at COP14 ([UNEP/CMS/ScC-SC5/Outcome 1.3](#))

#### CMS Resolutions of relevance to *L. cyclotis*

- [Resolution 12.19: Endorsement of the African Elephant Action Plan](#)

#### Other international instruments

##### Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES)

- Under CITES standard nomenclature, all African elephants are recognised as a single species, *Loxodonta africana*. At CITES CoP19 (Nov 2022), Decisions 19.275-19.277 were adopted which initiated work to consider the implications of CITES recognising *L. cyclotis* as a separate species. Any recommendations for a new standard nomenclatural reference for African elephants will be considered at its next triennial meeting (CoP20, 2025).
- The entire population of *Loxodonta africana* was listed in CITES Appendix I<sup>c</sup> in 1990; the populations of Botswana (1997), Namibia (1997), Zimbabwe (1997) and South Africa (2000) have since been transferred to Appendix II.<sup>d</sup> Therefore, in effect, the Forest Elephant populations of West and Central Africa are covered by a CITES Appendix I listing.
- National Ivory Action Plans (NIAPs): seven *L. cyclotis* Range States are required to produce and implement NIAPs (Category A: DRC, Nigeria, Togo; Category B: Gabon; Category C: Angola, Cameroon, Republic of the Congo)<sup>e</sup>.
- Zero export quotas for tusks as part of elephant hunting trophies have been established for 2023 by all *L. cyclotis* Range States (resulting from a recommendation in a Resolution of the Conference of the Parties).
- Monitoring the Illegal Killing of Elephants (or MIKE) Programme is a site-based system designed to monitor trends in levels of illegal killing of elephants and build capacity in sites spread across the range of African and Asian elephants. The Elephant Trade Information System (ETIS) was established under CITES Resolution Conf. 10.10 (Rev. CoP18) to track the trends in the illegal trade in ivory and other elephant specimens, and to provide an information base to support decision-making. Both MIKE and ETIS provide mechanisms for monitoring trends in illegal killing and trade of elephants on an on-going basis

##### EU Wildlife Trade Regulations

- *Loxodonta africana* Annex A, except for the populations of Botswana, Namibia, South Africa, and Zimbabwe, which are included in Annex B.
- Relevant EU decisions for *L. cyclotis* Range States: trade suspension for wild-sourced trophies from Cameroon established in 2014.

##### African Elephant Action Plan (AEAP)<sup>f</sup>

- Agreed in the margins of CITES CoP15 in 2010 with the goal to secure and restore where possible sustainable elephant populations throughout their present and potential range in Africa, recognising their potential to provide ecological, social, cultural and economic benefits.
- Endorsed by CMS COP12 in 2017 as the core strategy for the conservation of African Elephants under CMS ([Resolution 12.19](#))
- A revised AEAP<sup>g</sup> has been prepared by Cameroon and Zimbabwe for re-endorsement at COP14 ([UNEP/CMS/COP14/Doc.29.4.1/Annex 1](#)).

##### African Elephant Fund

- A multi-donor technical trust fund under the auspices of the United Nations Environment Programme (UNEP) to attract funding and direct resources for effective implementation of the African Elephant Action Plan.

##### Transboundary protected areas and complexes

- [TRIDOM Gabon Landscape](#): Cameroon, Republic of the Congo and Gabon<sup>27</sup>
- [Sangha Tri-National Landscape](#): Cameroon, Republic of the Congo, and the Central African Republic<sup>28</sup>
- [W-Arly-Pendjari \(WAP\) Complex](#): Benin, Burkina Faso, Niger<sup>29</sup>. Holds West Africa's largest elephant population, one of few populations “with potential long-term viability”<sup>3</sup>.

## 4. Concluding statement

<sup>c</sup> International trade in CITES Appendix I-listed species is only permitted in exceptional circumstances; trade in hunting trophies of Appendix-I species is permitted under specific conditions (see Resolution Conf. 2.11 (Rev.)).

<sup>d</sup> The Appendix II listing is subject to an annotation. Full text of the annotation is available at: <https://cites.org/sites/default/files/eng/app/2022/E-Appendices-2022-06-22.pdf>.

<sup>e</sup> Category A = Parties most affected by the illegal trade in ivory; Category B = Parties markedly affected by the illegal trade in ivory; Category C = Parties affected by the illegal trade in ivory. Further information on NIAPs is available at: <https://cites.org/eng/niaps>

<sup>f</sup> 38 African elephant range states currently implement the AEAP; the full list is available at:

[https://wedocs.unep.org/bitstream/handle/20.500.11822/26224/AEF\\_Implementation.pdf?sequence=1&isAllowed=y](https://wedocs.unep.org/bitstream/handle/20.500.11822/26224/AEF_Implementation.pdf?sequence=1&isAllowed=y)

<sup>g</sup> The revised AEAP will distinguish between *L. africana* and *L. cyclotis*.

*L. cyclotis* is assessed as Critically Endangered, with declines occurring both within and outside of protected areas, primarily driven by poaching. Rapid habitat loss, degradation and fragmentation driven by agricultural and urban expansion may also exacerbate the threat of poaching and increase the likelihood of human-elephant conflicts. A number of international efforts are underway to address these threats, including the CMS-CITES Joint Work Programme 2021-2025 and the African Elephant Action Plan (AEAP), which is currently endorsed by all *L. cyclotis* Range States and a revised AEAP will be presented for re-endorsement at CMS COP14 in 2023.

The West African Elephant MOU under CMS applies to both *L. africana* and *L. cyclotis* and is signed by all West African Range States. However, the vast majority of the *L. cyclotis* population occurs in Central Africa (in Gabon, Republic of the Congo, and DRC). Therefore, the implementation of the revised AEAP, including the mobilisation of the necessary financial and technical resources, will be particularly important for these populations that are not covered by the MOU.

Additionally, *L. cyclotis* appears to meet the criteria for CMS Appendix I, which could provide additional protections for this Critically Endangered species by prohibiting take. This would also align with the CITES Appendix I listing (albeit under the name *L. africana*) and could strengthen existing national protections and promote the protection and restoration of their habitats.

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# Phoebastria irrorata (Waved Albatross)



Appendix II (1997)



IUCN assessment (2018)

Critically Endangered / Decreasing

**Countries of occurrence:** Chile\*, Colombia\*, Ecuador (Galápagos), Peru

**Vagrant:** Panama

\* not indicated in range map but included in IUCN assessment countries of occurrence<sup>1</sup>



Base map: United Nations Geospatial, 2023

Range data: BirdLife International and Handbook of the Birds of the World (2016) 2013. *Phoebastria irrorata*. The IUCN Red List of Threatened Species. v. 2022-2

Image: Adobe Stock

## 1. Conservation status and threats

### Appendix I listing criteria

Article III paragraph 2 of the Convention states that “*migratory species may be listed in Appendix I provided that reliable evidence, including the best scientific evidence available, indicates that the species is endangered*”. Following Resolution 13.7, the term “endangered” is interpreted as “*facing a very high risk of extinction in the wild in the near future*”.

Article IV paragraph 1 states that “*Appendix II shall list migratory species which have an unfavourable conservation status and which require international agreements for their conservation and management, as well as those which have a conservation status which would significantly benefit from the international co-operation that could be achieved by an international agreement.*” Further, paragraph 2 notes that “*If the circumstances so warrant, a migratory species may be listed both in Appendix I and Appendix II.*”

### Summary of conservation status

IUCN assessment	IUCN Red List Status (Global) <sup>1 a</sup>
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<sup>a</sup> **NT** = Near Threatened, **LR/nt** = Lower Risk/near threatened (old category no longer in use), **VU** = Vulnerable, **CR** = Critically Endangered. The IUCN categories and criteria have changed over time, therefore changes in a species’ categorisation may reflect changes in the criteria, rather than genuine changes in conservation status. The current criteria, Version 3.1, were published in 2001.

	
<b>IUCN Population Trend</b>	<b>Decreasing (2018)</b> (Global) <sup>1</sup> . Potential 30-49% population decline over the past three generations (~85 years) “linked to bycatch mortality in artisanal fisheries in its principal foraging grounds” <sup>1</sup> .
<b>IUCN Red List key information</b>	<p><b>Estimated area of occupancy (AOO):</b> 9 km<sup>2</sup>  <b>Estimated extent of occurrence (EOO):</b> 280,000 km<sup>2</sup></p> <p><i>Phoebastria irrorata</i> is primarily found in Ecuador and has an extremely small breeding range that is confined to the Galápagos archipelago.</p> <ul style="list-style-type: none"> <li>• <b>Isla Española:</b> ~12,000 breeding pairs 1970-1971<sup>2</sup>, 15,600-18,200 pairs in 1994<sup>3</sup> and 19,214 pairs in 2001<sup>4</sup>.</li> <li>• <b>La Plata Island:</b> fewer than 10-20 pairs<sup>1</sup>.</li> <li>• <b>Isla Genovesa:</b> three adults and 11 non-breeding pairs were seen in 2001<sup>4</sup>.</li> </ul> <p>There is evidence of <b>substantial recent population decline</b><sup>5</sup>.</p> <ul style="list-style-type: none"> <li>• Ongoing rate of decline could be even greater, but long generation times mean this is hard to predict<sup>1</sup>.</li> <li>• In 2011, declines in the numbers of breeding adults were estimated at 6.3% per year since 2007 at southeast Isla Española<sup>6</sup>.</li> <li>• Adult survival declined between 1999-2004<sup>7,8</sup>.</li> <li>• Even if immediate action was taken the curb adult mortality, the population is predicted to decline for a decade until current juveniles reach breeding age<sup>9</sup>.</li> </ul>
<b>Complementary or equivalent information on conservation status</b>	<p><b>National Red Lists:</b> Ecuador (Galápagos: Critically Endangered; Continental Ecuador: Not Evaluated)<sup>10</sup>; Peru (Critically Endangered)<sup>11</sup>. Both Ecuador and Peru have national laws for the protection of species that are considered endangered<sup>12</sup>.</p> <p>Isla Española and Isla Genovesa fall within the Galápagos Marine Reserve (GMR), a multiple-use marine protected area. Industrial fishing is prohibited<sup>13</sup>, and in 2000, a ban on longline fishing in the GMR was ratified<sup>14</sup>; however, some experimental artisanal longlining projects have been conducted since<sup>13</sup>.</p>
<b>Biological vulnerability</b>	<p><b>Reproductive output:</b> <i>P. irrorata</i> is a long-lived bird with a low reproductive output, so its population is inherently vulnerable to adult mortality<sup>7</sup>. They form monogamous pairs, breed once a year April-June and lay 0-1 eggs per season, which are incubated for around 65 days<sup>15</sup>. However, some pairs may skip breeding in certain years<sup>1</sup>. Nesting is terricolous (eggs are laid in a shallow depression in the ground, without a nest) and mobile incubation (eggs moved up to 40 metres over several days) often results in egg loss and contributes to low breeding success<sup>5,15</sup>.</p> <ul style="list-style-type: none"> <li>• Mean breeding success in a subpopulation on Isla Española was 22.9% during 2000-2004, primarily due to egg loss<sup>1</sup>.</li> <li>• Mortality due to egg abandonment, predation or being wedged in rocks is responsible for 10-80% of all reproductive failures<sup>2,16</sup>.</li> </ul> <p><b>Age at maturity:</b> four to six years of age or more<sup>1</sup>. Myhrvold <i>et al.</i> reports average female maturity of 3032 days (8.31 years)<sup>17</sup>.</p> <p><b>Generation time:</b> <i>P. irrorata</i> has a long generation time of around 28.3 years<sup>1</sup>, and a long lifespan (longest observed lifespan 40 years<sup>17</sup>), which is considered to be an underestimate based on the lifespans of other albatross species<sup>8</sup>.</p>
<b>Summary of threats</b>	
<b>Current and future threats</b>	<p><b>Incidental and targeted capture</b><sup>5</sup></p> <ul style="list-style-type: none"> <li>• <i>P. irrorata</i> is frequently attracted to baited hooks on longlines, which often results in injury or death. Despite longline fishing being banned in the Galapagos Marine Reserve, statistical and anecdotal evidence suggests the longline ban has been ineffective in eradicating illegal, unreported and unregulated fishing in the last two decades<sup>14</sup>. Legislation explicitly sanctions the use of longlines, but not the transport and possession of longline fishing gear<sup>14</sup>.</li> <li>• In small-scale Ecuadorian and Peruvian fisheries, <i>P. irrorata</i> was the most frequent bycatch, caught in demersal and surface longlines and shark driftnets, which is a</li> </ul>

	<p>significant source of adult mortality<sup>8,18</sup>. Bycatch is estimated at 0.11 birds per 1000 hooks (sufficient to drive significant declines)<sup>4</sup>. Fishers often keep these birds dead or alive, for feathers or for human consumption<sup>7,15,18,19</sup>.</p> <ul style="list-style-type: none"> <li>• There is also evidence of intentional capture of <i>P. irrorata</i> for varying reasons, including consumption<sup>5,19</sup>.</li> <li>• Peru's National Red List reports that the main threats to <i>P. irrorata</i>'s populations in northern and central Peru are incidental and direct catch in fisheries by gillnets and other fishing gear, particularly as bycatch during the fishing of <i>Prionace glauca</i> (Blue Shark), <i>Isurus oxyrinchus</i> (Shortfin Mako Shark), <i>Coryphaena hippurus</i> (Mahi Mahi) and <i>Dosidicus gigas</i> (Humboldt Squid)<sup>11,20</sup>. Intentional captures have been recorded in Salaverry, Chimbote and San Jose<sup>11,19</sup>.</li> <li>• <b>Skewed sex ratio</b>: males are more likely to be killed in longline operations due to their higher chance of success in stealing bait<sup>5</sup>. This results in a female-skewed sex ratio<sup>7</sup>, reducing effective population size. It also negatively impacts chick-raising due to the essential parental partnership in raising chicks<sup>21</sup>.</li> </ul> <p><b>Temperature extremes</b>, particularly those associated with the El Niño Southern Oscillation (ENSO) events, cause severely reduced reproductive output (in some cases, zero reproduction), increased adult mortality and increased negative interactions with fisheries<sup>1,8,20,22</sup>.</p> <p><b>Introduced mosquitoes</b> (<i>Aedes taeniorhynchus</i>) cause distress in <i>P. irrorata</i>, which is suggested to contribute to egg relocation behaviour and to increase the chance of mass egg-abandonment<sup>2,22,23</sup>. Increased abundance of <i>A. taeniorhynchus</i> during warm ENSO years suggests this threat may increase with climate change<sup>21</sup>.</p> <p><b>Gastrointestinal parasites and avian pox</b> are more nascent threats that may exacerbate population decline in the future<sup>24,25</sup>.</p> <p><b>Oil spills</b> have negatively impacted the population of <i>P. irrorata</i> in the past and may be a future threat<sup>22,26</sup>.</p>
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## 2. Migratory behaviour and transboundary movements

Breeds on Isla Española and La Plata Island in the Galápagos, Ecuador<sup>15</sup>. Non-breeding adults mainly travel east and south-east into the waters of the Ecuadorian and Peruvian continental shelf to the extreme north of Chile to feed from mid-December to mid-March<sup>1,21,26</sup>. They are very rarely seen north of the equator but are occasionally sighted off the coasts of Colombia and Panama<sup>27,28</sup>. During the incubation and chick rearing periods, performs both short-range foraging trips within the GMR and long-range trips outside the reserve, as far as the Peruvian upwelling zone<sup>4</sup>.

## 3. Existing protection and management

### CMS Actions

#### [Agreement on the Conservation of Albatrosses and Petrels \(ACAP\)](#)

- ACAP is a multilateral agreement under CMS that aims to coordinate international activities for the conservation of CMS-listed albatrosses, petrels, and shearwaters; *P. irrorata* Range States Peru, Ecuador and Chile are Parties to ACAP.
- The Española Island *P. irrorata* population is identified as a Priority Population for conservation under ACAP (AC10 Doc. 11. Rev.1).
- The [Plan of Action for the Waved Albatross](#) was adopted during the 4<sup>th</sup> meeting of the ACAP Advisory Committee<sup>b</sup> (AC4) in 2008 ([AC4 Doc. 50 Rev.4](#)), with the aim of summarising the species biology, conservation status and threats, and conservation actions needed.

<sup>b</sup> The ACAP Advisory Committee provides scientific and technical advice to ACAP Parties.

- Implementation reports from Ecuador and Peru were presented to AC5 in 2010 ([AC5 Doc.20](#)), and at AC6 in 2011 ([AC6 Doc.29](#)); a number of actions undertaken related to studies of interactions with fisheries, including identification of fishers where bycatch is occurring and mitigation trials.
- A workshop held in Ecuador in 2018 reviewed the Plan of Action, which identified key strategies and new work avenues ([PaCSWG6 Inf.16](#)).
- At AC11 in 2021, The ACAP Population and Conservation Status Working Group (PaCSWG) highlighted the need for a comprehensive revision of the action plan for *P. irrorata*, which was supported by Peru ([AC12 Report](#)).

#### CMS Resolutions of potential relevance to *P. irrorata*

- [12.22: Bycatch](#); [12.11 \(Rev.COP13\): Flyways \(& Annexes 1, 2\)](#); [12.20: Management of marine debris](#); [12.21: Climate change and migratory species](#); [Res 11.16 \(Rev.COP13\) The prevention of illegal killing, taking and trade of migratory birds \(IKB\)](#); and [7.3 \(Rev.COP13\): Oil pollution and migratory species](#)

#### Other international instruments

The Galápagos Islands were inscribed on the UNESCO List of World Heritage in Danger in 2007, and subsequently removed in 2010 due to Ecuador's efforts to address invasive species, overfishing, and unregulated tourism<sup>29</sup>.

#### Regional Fisheries Management Organizations (RFMOs)

- Both the IATTC and SPRFMO management areas overlap with parts of *P. irrorata*'s non-breeding range<sup>30,31</sup>. *P. irrorata* was reported to have high overlap with the IATTC longline fishing effort (1997-2004).
- [Inter-American Tropical Tuna Commission \(IATTC\)](#):
  - [Resolution C-11-03](#) to mitigate the impact on seabirds of fishing for species covered by the IATTC
- [South Pacific Regional Fisheries Management Organisation \(SPRFMO\)](#)
  - [Conservation Management Measure \(CMM\) 09-2017](#): Conservation and Management Measure for minimising bycatch of seabirds in the SPRFMO Convention Area

## 4. Concluding statement

*P. irrorata* is a Critically Endangered albatross species with an extremely small breeding range and low reproductive output and is estimated to have undergone a marked decline (30-49%) over its past three generations. However, updated population data is needed to understand the current status of the species, noting that the most recent census of its main breeding site (Isla Española, Galápagos) was conducted in 2001. Its primary threats include mortality from incidental and targeted catch by fisheries, although it is unclear to what extent these threats continue to drive declines. Additionally, climate change is likely to pose an increased threat to this species in the future. A Plan of Action for the Waved Albatross, developed under the CMS daughter agreement ACAP, has implemented a number of projects related to addressing interactions with fisheries, and the need for a comprehensive review of this plan has been recognised. While the species' breeding range is within the Galápagos Marine Reserve (GMR), the species regularly moves outside of the GMR during breeding and non-breeding periods, where the species may be more exposed to interactions with fisheries.

Based on the species' Critically Endangered status, the ongoing threats to the species through incidental and targeted take, particularly in parts of its range that fall outside of the GMR, *P. irrorata* appears to meet the criteria for CMS Appendix I. At COP13, the Scientific Council urged Range States of albatross species identified within ACAP as Priority Populations for conservation actions (which includes *P. irrorata*) to consider listing these species on Appendix I at COP14 ([UNEP/CMS/COP13/Doc.27.1.7](#)).

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# Galeorhinus galeus (Tope Shark)

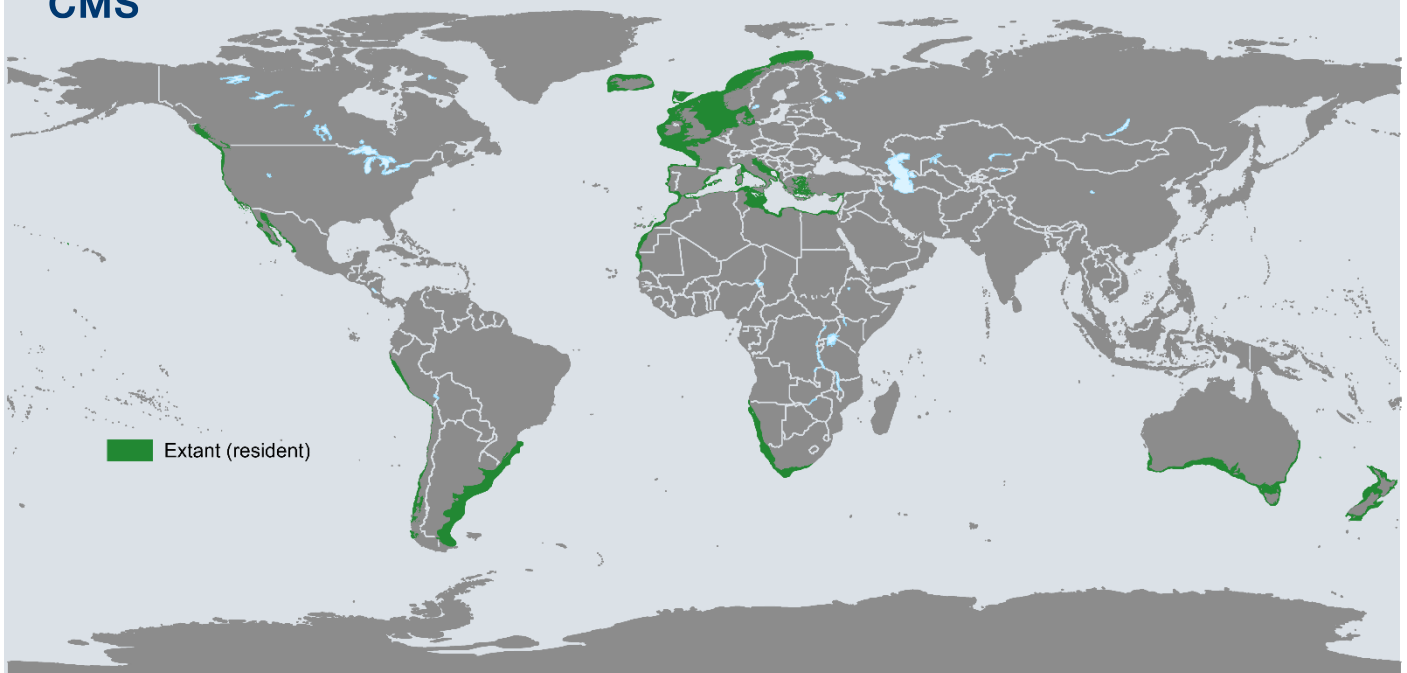


Appendix II (2020)



IUCN assessment (2020)

Critically Endangered / Decreasing



Extant (resident)

NB. Not representative of the full range of *G. galeus* as a depth cut off has been applied. A full distribution map can be found at

<https://www.fao.org/figis/geoserver/factsheets/species.html>

Base map: United Nations Geospatial 2023

Range data: IUCN SSC Shark Specialist Group 2019. *Galeorhinus galeus*. The IUCN Red List of Threatened Species. v. 2022-2.

Image: Adobe Stock



## 1. Conservation status and threats

### Appendix I listing criteria

Article III paragraph 2 of the Convention states that “*migratory species may be listed in Appendix I provided that reliable evidence, including the best scientific evidence available, indicates that the species is endangered*”. Following Resolution 13.7, the term “endangered” is interpreted as “*facing a very high risk of extinction in the wild in the near future*”.

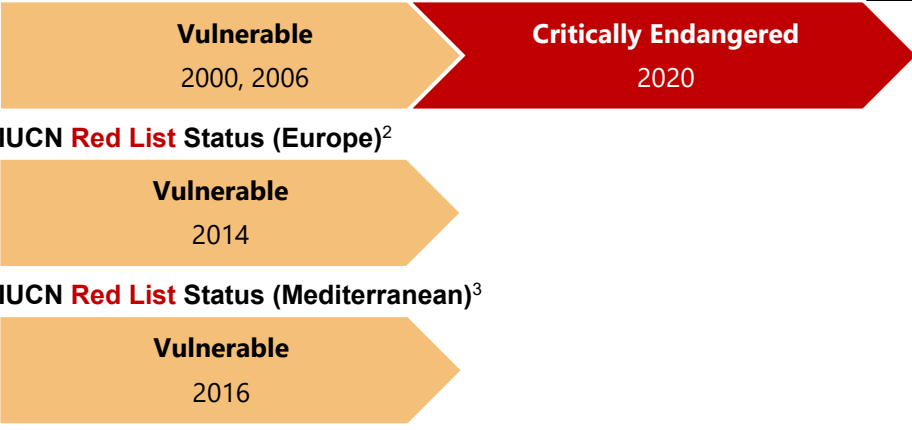
Article IV paragraph 1 states that “*Appendix II shall list migratory species which have an unfavourable conservation status and which require international agreements for their conservation and management, as well as those which have a conservation status which would significantly benefit from the international co-operation that could be achieved by an international agreement.*” Further, paragraph 2 notes that “*If the circumstances so warrant, a migratory species may be listed both in Appendix I and Appendix II.*”

### Summary of conservation status

IUCN assessment <sup>a</sup>	IUCN Red List Status (Global) <sup>1</sup>
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<sup>a</sup> The IUCN categories and criteria have changed over time, therefore changes in a species’ categorisation may reflect changes in the criteria, rather than genuine changes in conservation status. The current criteria, Version 3.1, were published in 2001.



	 <p><b>IUCN Red List Status (Europe)<sup>2</sup></b></p> <p><b>Vulnerable</b> 2014</p> <p><b>IUCN Red List Status (Mediterranean)<sup>3</sup></b></p> <p><b>Vulnerable</b> 2016</p>
<b>IUCN Population Trend</b>	<p><b>Decreasing</b> (2020) (Global)<sup>1</sup>. Steep declines reported, with overall estimated median reduction in stock of 88%; highest probability &gt;80% reduction over three generational lengths (79 years) in: Southwest Atlantic, southern Africa, Australia, and to a lesser extent in the Northeast Atlantic; 30-49% in New Zealand.</p> <p><b>Decreasing</b> (2014) (Europe)<sup>2</sup>. 38% decline over three generations; same decline inferred to have occurred throughout its European distribution.</p> <p><b>Decreasing</b> (2016) (Mediterranean)<sup>3</sup>. 38% decline over three generations.</p>
<b>IUCN Red List key information</b>	<ul style="list-style-type: none"> <li>• Up to six distinct subpopulations with no evidence of mixing between subpopulations, although extensive movements are made within each<sup>1</sup>.</li> <li>• The stock in southern Australian waters appears to have stabilized since 2000 due to management measures, possibly aided by the immigration of large mature animals from New Zealand<sup>1</sup>.</li> <li>• Northeast Atlantic subpopulation has been stable in recent years, possibly due to management measures, and some recovery in part of the Northeast Pacific<sup>1</sup>.</li> </ul>
<b>Complementary or equivalent information on conservation status</b>	<p><b>National and regional Red List assessments<sup>*b</sup>:</b></p> <ul style="list-style-type: none"> <li>• <u>CMS Parties</u>: Brazil: Critically Endangered (2014)<sup>4</sup>; Australia: Conservation Dependent (2009)<sup>5</sup>; Croatia: Endangered (2007)<sup>6</sup>; Germany: Highly Threatened (2013)<sup>7</sup>; France: Data Deficient (2013)<sup>8</sup>; Ireland: Vulnerable (2016)<sup>9</sup>; Italy: Critically Endangered (2013)<sup>10</sup>; New Zealand: Not Threatened (2018)<sup>11</sup>; Norway: Not suitable (2021)<sup>12</sup>; Sweden: Vulnerable (2010)<sup>13</sup></li> <li>• <u>Non-Parties</u>: Canada: Vulnerable (2014)<sup>14</sup></li> <li>• <u>Regional</u>: Baltic Sea: Endangered (2007)<sup>15</sup></li> </ul> <p>While no population estimates could be identified, shark population declines have largely been the result of inadequate fisheries management<sup>14</sup>; the efficacy of recent measures to limit fishing mortality on <i>G. galeus</i> stocks are yet to be evaluated.</p>
<b>Biological vulnerability</b>	<p><i>G. galeus</i> is a long-lived, relatively slow-growing, and slow-reproducing species, making it intrinsically vulnerable to overexploitation<sup>16</sup>.</p> <p><b>Generational length:</b> 26.3 years<sup>1</sup></p> <p><b>Maximum body size:</b> 155<sup>17</sup>-200<sup>18</sup> cm total length (TL) (females); 148<sup>17</sup>-158<sup>18</sup> cm TL (males).</p> <p><b>Reproductive output:</b> Age at female sexual maturity 9.9<sup>19</sup>-15<sup>20</sup> years (average 12.5 years) and maximum age of reproduction estimated as 40 years<sup>1</sup>. Size at sexual maturity: 107-170 cm TL (males), 118-185<sup>17,21</sup> TL cm (females). Gestation period of ~12 months. Number of offspring 6-52 (average 20-35)<sup>22</sup>. Reproduction is aplacental viviparous<sup>1</sup>, with a reproductive cycle that varies regionally, from annual to triennial<sup>1,22</sup>.</p> <p><b>Habitat breadth:</b> a demersal-pelagic shark, widespread in temperate waters in most oceans, on continental and insular shelves and upper to mid shelves. Most frequently occurring at depths down to 200 m, though has been recorded at depths of 826 m<sup>1,23</sup>.</p>
<b>Summary of threats</b>	
<b>Current and future threats</b>	<p><b>Incidental and targeted capture:</b> Global target and incidental catch (retained or discarded) in commercial and small-scale fisheries using demersal and pelagic gillnets, trawls and longline, as well as recreational fisheries<sup>1</sup>.</p> <ul style="list-style-type: none"> <li>• While the species is primarily caught in commercial fisheries<sup>24,25</sup> it is also landed by local demersal artisanal fisheries<sup>26</sup>.</li> </ul>

<sup>b</sup> Based on a non-exhaustive search.

- Retained for the meat, fins, and liver oil<sup>27</sup>.
  - FAO global capture production data (2011-2020) recorded 41,598 tonnes of live weight<sup>28</sup>. However, in some cases landings data are incomplete, as some landings are reported in aggregated categories, for example, 'Dogfish and Hounds', and not all Range States report species-specific data<sup>1</sup>.
  - At-vessel-mortality when released (as bycatch) ranges from 2-73% in gillnet and 0% on longline<sup>29</sup>.
- Habitat degradation:** in potential nursery areas that can negatively affect recruitment as an indirect and sublethal source of mortality<sup>26</sup>.
- Renewable energy infrastructure:** installation of high voltage direct current sub-sea cables particularly for wind farms across migration lanes may affect feeding and navigation<sup>30-32</sup>.
- As most research on threats to chondrichthyan species are not reported at the species-level, *G. galeus* is likely to face a variety of additional threats including pollution<sup>33</sup> and climate change<sup>34</sup>.

## 2. Migratory behaviour and transboundary movements

The species is known for extensive seasonal migrations in most parts of its range. Sub-adult as well as adult *G. galeus* all migrate and show strong segregation by sex and age ([UNEP/CMS/COP13/Doc.27.1.10](#)). Migratory movements are often linked to reproductive behaviour, where females move between aggregation areas and nursery/pupping sites<sup>31</sup>. For example, seasonal migrations have been reported between wintering grounds and summer/pupping/nursery grounds in the Southwestern Atlantic<sup>35</sup>, Australia and possibly around South Africa ([UNEP/CMS/COP13/Doc.27.1.10](#)). Seasonal latitudinal and offshore migrations have been shown in the Eastern North Pacific ([UNEP/CMS/COP13/Doc.27.1.10](#)). Tagging studies around the British Isles showed both far-ranging migrations and site fidelity though no clear migration patterns regarding seasonality or direction have been identified in the Northeast Atlantic distribution range ([UNEP/CMS/COP13/Doc.27.1.10](#)).

## 3. Existing protection and management

### CMS Actions

#### [Memorandum of Understanding on the Conservation of Migratory Sharks \(Sharks MOU\)](#)

- Aims to achieve and maintain a favourable conservation status for migratory sharks based on the best-available scientific information, and taking into account the socio-economic and other values of these species for the people of the Signatories.
- Signatories should endeavour to cooperate through [regional fisheries management organizations \(RFMOs\)](#), [the Food and Agriculture Organization \(FAO\)](#), [Regional Seas Conventions \(RSCs\)](#) and [Fisheries related Organizations](#).
- Listed in Annex 1 of the MOU in 2023 ([CMS/Sharks/MOS4/Doc.9.1.1](#))

#### CMS Resolutions of relevance to *G. galeus*

- [13.3: Chondrichthyan species \(sharks, rays, skates and chimaeras\)](#)

### Other international instruments

There are a number of national and regional fisheries management measures that would reduce fishing pressure on *G. galeus*. In addition to the measures outlined below, there are provisions in place to address incidental catch, data collection and research not outlined here that may be of relevance to *G. galeus*.

#### Food and Agriculture Organization of the United Nations (FAO)

- [International Plan of Action for the Conservation and Management of Sharks 1999](#): a voluntary instrument covering conservation, management and reporting with respect to shark fisheries.

#### Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and Its Protocols (Barcelona Convention)

- [Annex II](#)

#### Regional Fisheries Management Organizations (RFMOs)

*Galeorhinus galeus* is not listed as a target or key species under any RFMO and no species-relevant provisions were identified, however, the following generic provisions have been implemented for non-key sharks:

- [Indian Ocean Tuna Commission \(IOTC\)](#)
  - [Resolution 13/06: \(2013\) on the scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries.](#)

- [Resolution 17/05: \(2017\) on the conservation of sharks caught in association with fisheries managed by IOTC.](#)
- [International Commission for the Conservation of Atlantic Tunas \(ICCAT\)](#)
  - [Recommendation 04-10: \(2005\) concerning the conservation of sharks caught in association with fisheries managed by ICCAT.](#)
  - [Recommendation 18-06: \(2019\) on the improvement of compliance review of conservation and management measures regarding sharks caught in association with ICCAT fisheries](#)
- [Commission for the Conservation of Southern Bluefin Tuna \(CCSBT\)](#)
  - [Resolution \(2021\) to align CCSBT's Ecologically Related species measures with those of other tuna RFMOs](#)
- [Western and Central Pacific Fisheries Commission \(WCPFC\)](#)
  - [Conservation and Management Measure 2022-04: \(2022\) for sharks](#)
- [Inter-American Tropical Tuna Commission \(IATTC\)](#)
  - [Resolution C-05-03: \(2005\) on the conservation of sharks caught in association with fisheries in the eastern Pacific Ocean](#)
  - [Resolution C-16-04: \(2016\) amendment to Resolution C-05-03](#)
  - [Resolution C-16-05: \(2016\) on the management of shark species](#)

#### 4. Concluding statement

*G. galeus* has been categorised as Critically Endangered in the global IUCN Red List assessment in 2020, and as Vulnerable for regional assessments for Europe and the Mediterranean in 2014 and 2016. The primary threat to *G. galeus* is overexploitation from target and incidental catch. While some populations in Australia, New Zealand and the northeast Atlantic are reported to have stabilized, the species has declined globally (>80% over the last three generations), with significant reductions in most studied stocks across its range. Noting that "all geographic populations would benefit from collaborative studies" ([CMS/Sharks/MOS4/Doc.9.1.1](#)), *G. galeus* was included in Annex 1 of the Sharks MOU in 2023 and is covered by Resolution 13.3 on chondrichthyan species, as well as regional management measures.

Given its Critically Endangered status, continued population declines and overexploitation, *G. galeus* appears to meet the criteria for CMS Appendix I. Such a measure would need careful consideration of the wider context, including on the risks and benefits to conservation, as well as coherence with existing measures under national, regional and international bodies (e.g. RFMOs). The species would benefit from continued international cooperation under its Appendix II listing, through the Sharks MOU.

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# Sphyrna lewini (Scalloped Hammerhead Shark)

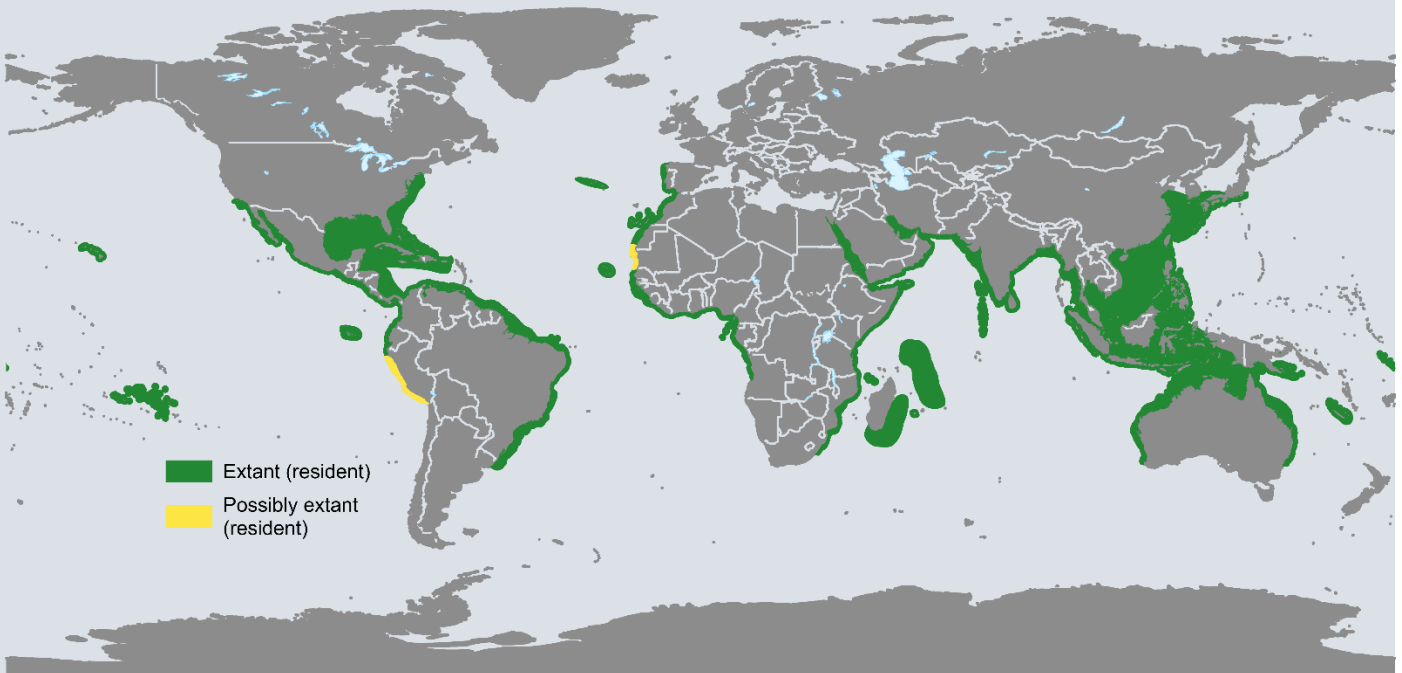


Appendix II (2015)



IUCN assessment (2018)

Critically Endangered / Decreasing



■ Extant (resident)  
■ Possibly extant (resident)



**Base map:** United Nations Geospatial 2023  
**Range data:** IUCN SSC Shark Specialist Group 2018. *Sphyrna lewini*. The IUCN Red List of Threatened Species. v. 2022-2  
**Image:** Adobe Stock

## 1. Conservation status and threats

### Appendix I listing criteria

Article III paragraph 2 of the Convention states that “*migratory species may be listed in Appendix I provided that reliable evidence, including the best scientific evidence available, indicates that the species is endangered*”. Following Resolution 13.7, the term “endangered” is interpreted as “*facing a very high risk of extinction in the wild in the near future*”.

Article IV paragraph 1 states that “*Appendix II shall list migratory species which have an unfavourable conservation status and which require international agreements for their conservation and management, as well as those which have a conservation status which would significantly benefit from the international co-operation that could be achieved by an international agreement.*” Further, paragraph 2 notes that “*If the circumstances so warrant, a migratory species may be listed both in Appendix I and Appendix II.*”

### Summary of conservation status

IUCN assessment <sup>a</sup>	IUCN Red List Status (Global) <sup>1</sup>

<sup>a</sup> The IUCN categories and criteria have changed over time, therefore changes in a species’ categorisation may reflect changes in the criteria, rather than genuine changes in conservation status. The current criteria, Version 3.1, were published in 2001.

	<p><b>IUCN Red List Status (Europe)<sup>2</sup></b></p> <p><b>Data Deficient</b> 2015</p>
<p><b>IUCN Population Trend</b></p>	<p><b>Decreasing</b> (2018) (Global)<sup>1</sup>. Steep declines reported with estimated &gt;80% (76.9-97.3%)<sup>b</sup> reduction in population over three generation lengths (72.3 years) in all oceans, with some signs of stabilization and possible recovery in response to management only in the Northwest Atlantic and Gulf of Mexico.</p> <p><b>Decreasing</b> (2015) (Europe)<sup>2</sup>. Declines of 76-78% over 31 years in Northwest Atlantic; population trends unclear for Northeast Atlantic and the Mediterranean.</p>
<p><b>IUCN Red List key information</b></p>	<ul style="list-style-type: none"> <li>• Total population size unknown<sup>1</sup>.</li> <li>• Lack of effective domestic implementation of internationally agreed actions<sup>1</sup>.</li> <li>• Global population recovery requires initiatives such as capture prevention, minimising bycatch mortality, promotion of safe release and improved catch reporting, along with full implementation of additional commitments agreed through international treaties<sup>1</sup>.</li> </ul>
<p><b>Complementary or equivalent information on conservation status</b></p>	<p><b>National Red List assessments<sup>*c</sup></b></p> <ul style="list-style-type: none"> <li>• <u>CMS Parties</u>: Australia: Conservation Dependent (2018)<sup>3</sup>; Brazil: Critically Endangered (2014)<sup>4</sup>; Dominican Republic: Endangered (2011)<sup>5</sup>; United Arab Emirates: Endangered (2019)<sup>6</sup>; France: Data Deficient (2013)<sup>7</sup>; Italy: Not Applicable (2013)<sup>8</sup>;</li> <li>• <u>Non-Parties</u>: Colombia: Vulnerable (2017)<sup>9</sup>; Venezuela: Vulnerable (2017)<sup>10</sup></li> </ul> <p>While no population estimates could be identified, shark population declines have been largely the result of inadequate fisheries management<sup>11</sup>.</p>
<p><b>Biological vulnerability</b></p>	<p><i>S. lewini</i> is a long-lived, relatively slow-growing, and slow-reproducing species, making it intrinsically vulnerable to overexploitation<sup>12</sup></p> <p><b>Generation length</b>: 24.1 years<sup>1</sup>. Population growth rate estimates are 0.10<sup>13</sup>–1.22<sup>14</sup> per year.</p> <p><b>Maximum body size</b>: 340–420 cm total length (TL)<sup>15</sup>.</p> <p><b>Reproductive output</b>: Age at female sexual maturity 13.2 years<sup>16</sup> and maximum age of female reproduction is 35<sup>1</sup>. Size at sexual maturity: 140–198 cm TL (males), 200–250 TL cm (females)<sup>1</sup>. Placental viviparous reproduction<sup>17</sup> with annual or biennial reproductive cycle<sup>12,18</sup>. Number of offspring is 12-41.</p> <p><b>Habitat breadth</b>: Circumglobal in tropical to warm-temperate seas, it is a coastal and semi-oceanic pelagic shark, found over continental and insular shelves and nearby deep water<sup>17</sup>. Adults have been shown to aggregate at seamounts and oceanic islands<sup>19,20</sup></p>
<p><b>Summary of threats</b></p>	
<p><b>Current and future threats</b></p>	<p><b>Incidental and targeted catch</b>: Caught globally as target and incidental catch (retained or discarded) in commercial and small-scale coastal and pelagic longline, purse seine, gillnet and trawl fisheries<sup>1</sup>.</p> <ul style="list-style-type: none"> <li>• Large numbers are caught by small-scale coastal artisanal fisheries over much of its range<sup>12</sup>.</li> <li>• Fins are the primary product in trade and highly valued<sup>20</sup>, recorded as the third most prevalent species for fin trade in Hong Kong retail markets<sup>21</sup>, while meat and other products are consumed domestically<sup>22-24</sup>.</li> <li>• Taken as targeted and incidental catch in domestic fisheries within Exclusive Economic Zones and in multinational fisheries on the High Seas<sup>20</sup>.</li> <li>• Landings may also result from non-target species being caught incidentally and then retained. Between 2001-2005, 42% of the retained pelagic megafauna incidentally caught in industrial trawler fisheries off northwest Africa consisted of hammerhead species (<i>S. lewini</i>, <i>S. mokarran</i>, <i>S. zygaena</i>)<sup>25</sup>. Landing data for <i>S. lewini</i> caught in artisanal and industrial fisheries in Colombia indicated 99% of catch corresponded to immature individuals<sup>10</sup>. High mortality (62.9%<sup>26</sup>-91%<sup>27</sup>) for animals caught incidentally and released<sup>1,26</sup>.</li> </ul>

<sup>b</sup> Estimated three generation population trends for each region were weighted according to relative size of each region; two sources of Atlantic data were used to generate two global trends<sup>11</sup>.

<sup>c</sup> Based on a non-exhaustive search.

- Often unreported or underreported in fisheries statistics.
- FAO global capture production data (2011-2020) recorded 1,359 tonnes of live weight at the species level<sup>28</sup>. However, the large majority of hammerhead catches are reported in aggregated categories<sup>29</sup>, with the capture over 75,000 tonnes of 'Hammerhead sharks, etc. nei ('not elsewhere included')' reported in the same time period<sup>28</sup>.
- International trade in *S. lewini* reported by CITES Parties 2017-2021 predominantly comprised fins (93,839 kg), bodies (36,672 kg) and meat (17,000 kg). The species met four of five criteria to identify noteworthy patterns of trade as part of the selection process for inclusion in the CITES Review of Significant Trade following CoP19<sup>d30</sup>.

As most research on threats to Chondrichthyan species are not reported at the species-level, *S. lewini* is likely to face a variety of additional threats including habitat loss and degradation<sup>31</sup>, pollution<sup>32</sup> and climate change<sup>33</sup>.

## 2. Migratory behaviour and transboundary movements

The species is circumglobal in tropical to warm temperate seas, highly mobile and migratory<sup>17</sup>. It has been observed migrating along continental margins as well as between oceanic islands in tropical waters [CMS/Sharks/MOS2/Doc.8.2.10/Annex 7](#). Only males move across ocean basins, while females move regionally and tend to favour coastlines, archipelagos, or specific nursery areas<sup>34,35</sup>. Adults spend most of the time offshore in midwater and females migrate to the coastal areas to pup<sup>1</sup>. Individuals have travelled maximum distances ranging 629<sup>36</sup>–1,941 km<sup>37</sup>. Individuals have been known to display a level of site fidelity in some areas [CMS/Sharks/MOS2/Doc.8.2.10](#).

## 3. Existing protection and management

### CMS Actions

#### [Memorandum of Understanding on the Conservation of Migratory Sharks \(Sharks MOU\)](#)

- Aims to achieve and maintain a favourable conservation status for migratory sharks based on the best-available scientific information, and taking into account the socio-economic and other values of these species for the people of the Signatories.
- Signatories should endeavour to cooperate through [regional fisheries management organizations \(RFMOs\)](#), [the Food and Agriculture Organization \(FAO\)](#), [Regional Seas Conventions \(RSCs\)](#) and [Fisheries related Organizations](#).
- Listed in Annex 1 of the MOU in 2016 ([CMS/Sharks/MOS2/Doc.8.2.8](#))

#### CMS Resolutions of relevance to *S. lewini*

- [13.3: Chondrichthyan species \(sharks, rays, skates and chimaeras\)](#)

### Other international instruments

There are a number of national and regional fisheries management measures that would reduce fishing pressure on *S. lewini*. In addition to the measures outlined below, there are provisions in place to address incidental catch, data collection and research not outlined here that may be of relevance to *S. lewini*.

#### United Nations Convention on the Law of the Sea (UNCLOS)

- [Annex I. Highly Migratory Species](#): (1982) family listing for Sphyrnidae

#### Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

- Appendix II (2013) for *Sphyrna lewini*
- Appendix II (2023) family listing for Sphyrnidae

#### Food and Agriculture Organization of the United Nations (FAO)

- [International Plan of Action for the Conservation and Management of Sharks 1999](#): a voluntary instrument covering conservation, management and reporting with respect to shark fisheries.

<sup>d</sup> The CITES Review of Significant Trade process is the "review of the biological, trade and other relevant information on Appendix-II species subject to levels of trade that are significant in relation to the population of the species, in order to identify problems concerning the implementation of Article IV, paragraphs 2 (a), 3 and 6 (a) of the Convention, and possible solutions" ([CITES glossary](#)). The five criteria for the identification of noteworthy trends are: Endangered species; Sharp Increase (global); Sharp Increase by Country (China; Indonesia; Kenya; Nicaragua; Sri Lanka; Yemen); High Volume; and High Volume (Globally Threatened). Identification of noteworthy trends does not necessarily indicate unsustainability or preclude the species' inclusion in the Review of Significant Trade.

## European Union Wildlife Trade Regulations

- Annex B (2013) for *Sphyrna lewini*

## Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean and Its Protocols (Barcelona Convention)

- [Annex II](#)

## Regional Fisheries Management Organizations (RFMOs)

*Sphyrna lewini* is included under a family-specific resolution under ICCAT and as a key species under WCPFC; other RFMOs have generic provisions for non-key sharks (including prohibitions and restrictions on retention and finning), which may be applicable to *S. lewini*.

- International Commission for the Conservation of Atlantic Tunas (ICCAT)
  - [Recommendation 10-08](#): (2010) on **hammerhead sharks (family Sphyrnidae)** caught in association with fisheries managed by ICCAT, which prohibits retaining onboard, transshipping, landing, storing, selling or offering for sale any part or whole carcass of Hammerhead Sharks (except *Sphyrna tiburo*), and exempting those caught by developing coastal Contracting Parties, and Cooperating non-Contracting Parties for local consumption.<sup>e</sup>
  - [Recommendation 04-10](#): (2005) concerning the conservation of sharks caught in association with fisheries managed by ICCAT.
  - [Recommendation 18-06](#): (2019) on the improvement of compliance review of conservation and management measures regarding sharks caught in association with ICCAT fisheries
- Western and Central Pacific Fisheries Commission (WCPFC)
  - **Key Shark Species**: (2010) which includes the species in the [WCPFC's Shark Research Plan](#)
  - [Conservation and Management Measure 2022-04](#): (2022) for sharks
- Commission for the Conservation of Southern Bluefin Tuna (CCSBT)
  - [Resolution](#) (2021) to align CCSBT's Ecologically Related species measures with those of other tuna RFMOs
- Inter-American Tropical Tuna Commission (IATTC)
  - [Resolution C-05-03](#): (2005) on the conservation of sharks caught in association with fisheries in the eastern Pacific Ocean
  - [Resolution C-16-04](#): (2016) amendment to Resolution C-05-03
  - [Resolution C-16-05](#): (2016) on the management of shark species
- Indian Ocean Tuna Commission (IOTC)
  - [Resolution 13/06](#): (2013) on the scientific and management framework on the conservation of shark species caught in association with IOTC managed fisheries.
  - [Resolution 17/05](#): (2017) on the conservation of sharks caught in association with fisheries managed by IOTC.

## 4. Concluding statement

*S. lewini* has been categorised as Critically Endangered in the global IUCN Red List assessment in 2018, and as endangered in several national assessments. Exacerbated by life history traits that make it intrinsically vulnerable to overexploitation, the species is primarily threatened by targeted and incidental catch. While there are some signs of stabilization of populations in Northwest Atlantic and Gulf of Mexico, the species has suffered significant reductions in stocks across its range and therefore is decreasing globally (>80% over past three generations). Under CMS, the Scalloped Hammerhead Shark is listed in CMS Appendix II; Annex 1 of the Sharks MOU and is covered by Resolution 13.3 on Chondrichthyan species, as well as regional management measures. The IUCN Red List assessment for the species recommended the prohibition of retention and landings of all Scalloped Hammerhead Sharks “as long as the global population is classified as Critically Endangered or Endangered”.

Given its Critically Endangered status, continued population declines and overexploitation, *S. lewini* appears to meet the criteria for CMS Appendix I. Such a measure would need careful consideration of the wider context, including on the risks and benefits to conservation, as well as coherence with existing measures under national, regional and international bodies (e.g. RFMOs). The species would benefit from continued international cooperation under its Appendix II listing, through the Sharks MOU.

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# Anguilla anguilla (European eel)

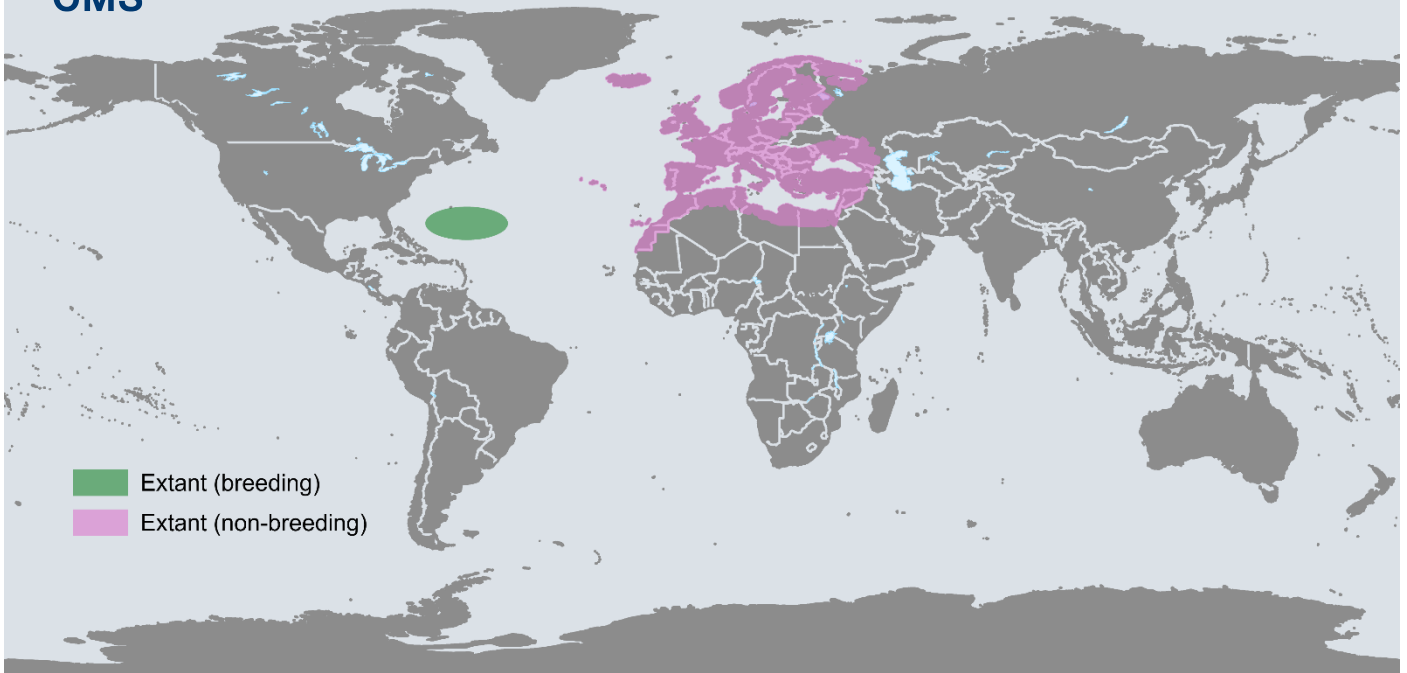


Appendix II (2015)



IUCN assessment (2018)

Critically Endangered / Decreasing



■ Extant (breeding)  
■ Extant (non-breeding)



**Base map:** United Nations Geospatial 2023  
**Range data:** Anguillid Eel Specialist Group (AESG) 2020. *Anguilla anguilla*. The IUCN Red List of Threatened Species. v. 2022-2.  
**Image:** Adobe Stock

## 1. Conservation status and threats

### Appendix I listing criteria

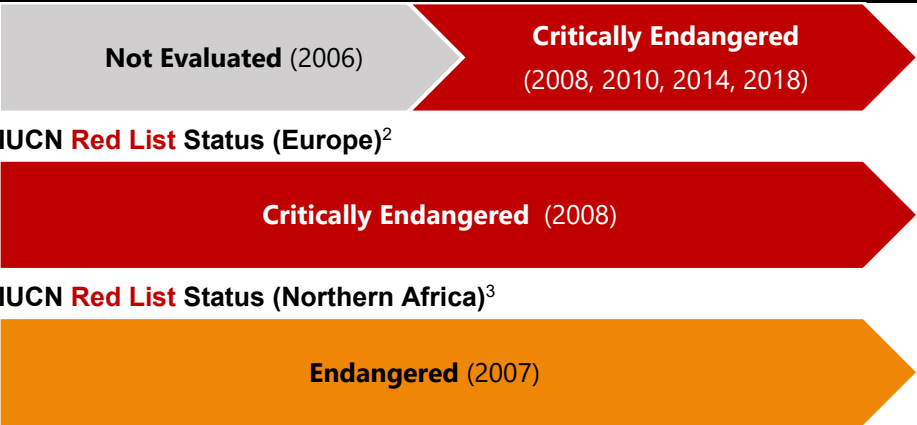
Article III paragraph 2 of the Convention states that “*migratory species may be listed in Appendix I provided that reliable evidence, including the best scientific evidence available, indicates that the species is endangered*”. Following Resolution 13.7, the term “endangered” is interpreted as “*facing a very high risk of extinction in the wild in the near future*”.

Article IV paragraph 1 states that “*Appendix II shall list migratory species which have an unfavourable conservation status and which require international agreements for their conservation and management, as well as those which have a conservation status which would significantly benefit from the international co-operation that could be achieved by an international agreement.*” Further, paragraph 2 notes that “*If the circumstances so warrant, a migratory species may be listed both in Appendix I and Appendix II.*”

### Summary of conservation status

IUCN assessment	IUCN Red List Status (Global) <sup>1a</sup>
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<sup>a</sup> Not Evaluated = a taxon that has not yet been evaluated against the criteria. The IUCN categories and criteria have changed over time, therefore changes in a species’ categorisation may reflect changes in the criteria, rather than genuine changes in conservation status. The current criteria, Version 3.1, were published in 2001.

	 <p><b>IUCN Red List Status (Europe)<sup>2</sup></b></p> <p><b>IUCN Red List Status (Northern Africa)<sup>3</sup></b></p>
<p><b>IUCN Population Trend</b></p>	<p><b>Decreasing</b> (2018) (Global)<sup>1</sup>  <b>Decreasing</b> (2008) (Europe)<sup>2</sup>  <b>Decreasing</b> (2007) (Northern Africa)<sup>3</sup></p>
<p><b>IUCN Red List key information</b></p>	<ul style="list-style-type: none"> <li>• Unknown global population size due to limited and geographically uneven data.</li> <li>• Continental distribution across Europe and Northern Africa is over 90,000 km<sup>2</sup>.</li> <li>• Available data for every life stage (leptocephalus larvae, glass eel, yellow eel, silver eel) confirms widespread steady decline in recruitment and abundance.</li> <li>• Ongoing concern over the effectiveness of current management measures, including Eel Management Plans (EMPs; for European Union Member States only).</li> </ul>
<p><b>Complementary or equivalent information on conservation status</b></p>	<p><b>National Red List assessments<sup>b</sup>:</b></p> <ul style="list-style-type: none"> <li>• <i>Europe</i>: Denmark: Critically Endangered (2009), France: Critically Endangered (2019), Germany: Highly Threatened (2013), Ireland: Critically Endangered (2011), Norway: Endangered (2021), Sweden: Critically Endangered (2010).</li> </ul> <p><b>Regional Red List assessments:</b></p> <ul style="list-style-type: none"> <li>• Baltic Sea: Critically Endangered (2007), North Belgium: Critically Endangered (2013).</li> </ul> <p>The latest <b>International Council for the Exploration of the Sea (ICES)</b> report on European Eel noted that the species' status remains critical and that glass eel recruitment is extremely low (0.5% in the North Sea and 9.7% elsewhere in Europe for 2022, in comparison to 1960-1979 levels)<sup>4</sup>.</p>
<p><b>Biological vulnerability</b></p>	<p><b>Reproductive output:</b> <i>A. anguilla</i> is semelparous (breeds only once at the end of their lifetime) and exhibits facultative catadromy (migrates from freshwater to the sea to spawn; however some individuals never reach freshwater and inhabit marine waters for their entire lifecycle)<sup>1,5</sup>.</p> <ul style="list-style-type: none"> <li>• Estimated generation length is 13 years, although methods for accurately aging eels are highly variable and debated<sup>1</sup>.</li> <li>• Estimates for age at which eels undertake the spawning migration vary; 2-15 and 2-30 years for males and females, respectively<sup>6</sup>. Age at migration is greatly dependent on environmental factors including food availability, barriers to migration and growth rate<sup>1</sup>.</li> <li>• Spawning occurs in a 2000 km area of the Sargasso Sea<sup>7</sup> between late winter and early spring<sup>8,9</sup>.</li> </ul> <p><i>A. anguilla</i> is a panmictic species (originates from a single randomly mating spawning stock) and therefore requires an international approach to conservation management as overexploitation in one area will negatively impact recruitment of the global stock<sup>10,11</sup>.</p> <p><b>Habitat breadth:</b> the species' catadromous life cycle and utilisation of marine, brackish and freshwater habitats<sup>12</sup> makes European Eel particularly vulnerable to anthropogenic development and climate change (See Section: 2. Migratory behaviour).</p>
<p><b>Summary of threats</b></p>	
<p><b>Current and future threats</b></p>	<ul style="list-style-type: none"> <li>• <b>Overexploitation:</b> Harvesting for live eel farming and meat consumption, primarily driven by demand from East Asia, occurs throughout the continental life stages of European Eels<sup>13</sup>. <b>Illegal harvest and large-scale illegal trade</b> of <i>A. anguilla</i> occurs every year across the species' range, and the volume of trade appears to outnumber that of legally traded eels in Europe<sup>1,4,15</sup>.</li> </ul>

<sup>b</sup> A non-exhaustive list based on a combination of the IUCN Red List assessment and those identified through additional web searches.

- **Habitat loss, degradation and fragmentation:** dams, hydropower turbines and pumps are a barrier to migration and result in higher mortality along the migratory route<sup>1,16</sup>.
  - **Pollution and parasites:** pollutants can disrupt eels' physiology and may lower reproductive success and limit the capacity of eels to successfully migrate<sup>17,18</sup>.
  - **Climate change:** the impact on the species is not fully understood, but may affect abundance by altering ocean conditions and circulations that larvae rely on during migration from the spawning area to continental waters<sup>4</sup>
  - **Predation** during the species' long migration is a common cause of natural mortality<sup>1,8</sup>.
- The severity and impact of these threats varies significantly across the species' range and the synergy between these multiple treats requires further research<sup>1,19</sup>.

## 2. Migratory behaviour and transboundary movements

Undertakes the longest and most complex migration of any anguillid species<sup>20</sup>. Spawning is believed to occur in the marine waters of the Sargasso Sea<sup>7</sup> and the leptocephalus larvae migrate to the continental waters of Europe and North Africa where they become glass eels<sup>1,21</sup>. Yellow eels live in fresh, brackish and coastal waters for the majority of their life and develop into silver eels to migrate between 5000-10,000 km back to the marine spawning grounds to reproduce and subsequently die<sup>5,8</sup>. The average length of migration from continental waters to the marine spawning area is two years<sup>22</sup>. The species is rarely observed in open water and there is limited research on the marine phase of its lifecycle<sup>1</sup>. The complex and long migration requires significant energy reserves<sup>19</sup>, and the species' utilisation of habitats with varying salinity throughout its lifecycle make the species particularly vulnerable to migratory barriers including hydropower turbines and pumps, water management systems and dams<sup>23</sup>.

## 3. Existing protection and management

### CMS Actions

[Concerted Action 12.1 on the European Eel](#) adopted at COP12 (2017):

- Aimed to enhance cooperation between Range States through policy workshops, identify conservation and data gaps, engage with all relevant stakeholders, develop species specific actions that complement CITES and IUCN and provide a management template for other Anguillid species.
- Three meetings of the Range States of European Eel have been convened (2016, 2018, 2019); these meetings identified the urgent need for international cooperation to address the challenges of conservation and reinforce action for the species.
- At the [third meeting of Range States](#) an Action Plan for the European Eel was proposed and a [draft outline](#) was presented to CMS COP13.

Concerted Action 12.1 was considered complete at COP13. However, further work on European Eel was proposed: [CMS Decisions 13.76-13.79 on European Eel](#) were adopted at COP13; Decision 13.79 directs the CMS Secretariat, inter alia, to “develop a draft Action Plan for the European Eel (*Anguilla anguilla*), following guidance provided by Range State Parties”. This work remains in progress.

### Other international instruments

#### Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES):

- Appendix II: 2009.
- European Eel from Algeria, Morocco, Tunisia is included in the CITES Review of Significant Trade process<sup>c</sup> (selected post CITES CoP17).
- Zero export quotas for all life stages in place for 2023 from all EU Member States and for glass eels from Algeria, Morocco, and Tunisia; additional quotas in place for Algeria: 8,000 kg adults; Morocco: 5,500 kg adults and 500,000 kg adults raised in aquaculture based on a harvest of 2t on glass eels; Tunisia: 90,000 kg all export restricted to specimens greater than 30 cm in length and 100,000 kg live or frozen wild-taken specimens<sup>d</sup>.
- As part of the selection process for inclusion in the CITES Review of Significant Trade following CoP19, the species met two of five criteria to identify noteworthy patterns of international trade – Endangered species, and

<sup>c</sup> The CITES Review of Significant Trade process is the “review of the biological, trade and other relevant information on Appendix-II species subject to levels of trade that are significant in relation to the population of the species, in order to identify problems concerning the implementation of Article IV, paragraphs 2 (a), 3 and 6 (a) of the Convention, and possible solutions” ([CITES glossary](#)). The five criteria for the identification of noteworthy trends are: Endangered species; Sharp Increase (global); Sharp Increase by Country; High Volume; and High Volume (Globally Threatened).

<sup>d</sup> Quotas for Algeria, Morocco and Tunisia are based on CITES Standing Committee recommendations. At the 75th meeting of the CITES Standing Committee, the IUCN Anguillid specialist group identified the need for the production of formal Non-Detriment Findings for Algeria, Morocco and Tunisia to justify export quotas.

High Volume (Globally Threatened). Global CITES trade in *A. anguilla* 2017-2021 predominantly comprised live catch (1,596,400 kg) and meat (229,351 kg) from wild and ranched sources<sup>14</sup>.

#### EU Wildlife Trade Regulations:

- Annex B: 2009.
- Prohibition of import for wild and ranched *A. anguilla* for all the European Range States prevents countries issuing import permits for the species.

#### International Council for the Exploration of the Sea (ICES):

ICES reported that the conservation status of the species remains critical and advised that there should be zero catches in all habitats for 2023 (both recreational and commercial, and including catches of glass eels for restocking and aquaculture) when the precautionary approach is applied<sup>4</sup>. Additional ICES advice for 2023 included that all non-fisheries related anthropogenic mortalities should be zero, and the quantity and quality of eel habitats should be restored, including restoring connectivity<sup>4</sup>.

#### EU Council Regulation No 1100/2007:

- Aim to reduce the anthropogenic pressure on the species through removing migratory barriers, restocking and improved fisheries management<sup>1,24</sup>.
- **Eel Management Plans (EMPs)** have been developed in EU Member States.

#### EU Water Framework and Marine Strategy Framework directives (MSFD):

- Aim to improve continental environmental conditions and may improve reproductive success across the population<sup>4</sup>.

#### Regional Fisheries Management Organizations (RFMOs):

- General Fisheries Commission for the Mediterranean (GFCM): multiannual management plan for European Eel in the Mediterranean Sea (Recommendation GFCM/42/2018/1).

## 4. Concluding statement

*A. anguilla* stocks have been severely depleted in recent decades and will take decades to recover. *A. anguilla* continues to be threatened by a range of anthropogenic pressures including overexploitation, habitat degradation and barriers to migration. The species is particularly vulnerable to these threats due to its complex and long migratory route, and utilisation of multiple aquatic habitat types throughout its facultatively catadromous lifecycle. It is not clear which of these pressures are the most significant and it has been noted that future conservation action should focus on multiple threats to be successful. There is also an urgent need to address the lack of data on population size, distribution and migratory patterns. The development of a CMS Action Plan for the European Eel is currently underway and indicates the continuation of efforts to address the critical conservation status of the species, which may be complemented by further action.

Given the species' critically endangered status and noting also the latest ICES Advice for zero catch in all habitats to reduce non-fishery anthropogenic mortality to zero and restore eel habitat, *A. anguilla* appears to meet the criteria for Appendix I. Such a measure would need careful consideration of the wider context, including on coherence with existing measures under national, regional and international bodies. Additionally, noting the ongoing development of an Action Plan for the European Eel under CMS, international cooperation should continue under the existing Appendix II listing for *A. anguilla*.

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