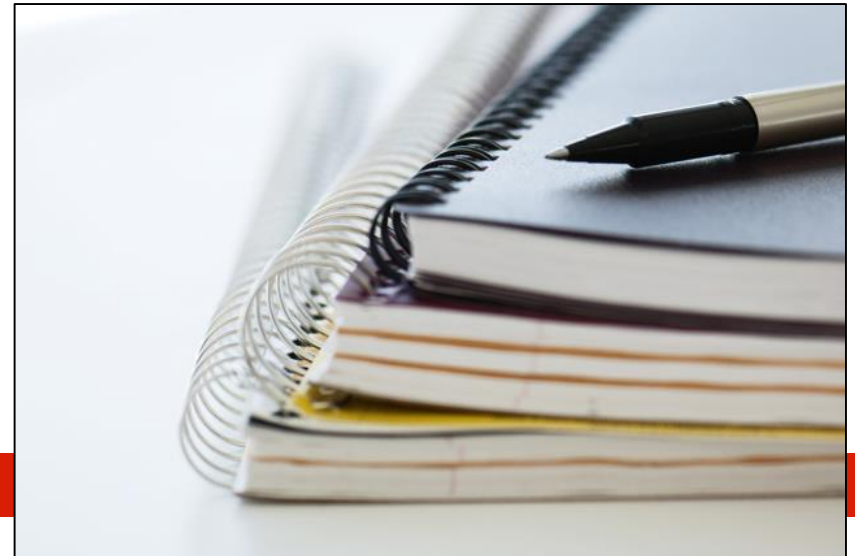




# Supporting information for IUCN Red List assessments



# Components of a Red List assessment

## 1. Red List category and criteria

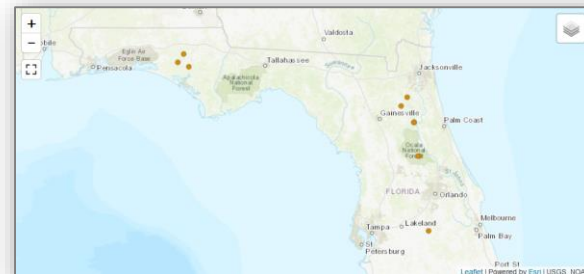


- Purple Skimmer *Libellula jesseana*
- **Vulnerable A2a;B2ab(iii)**

## 2. Documentation supporting the category and criteria

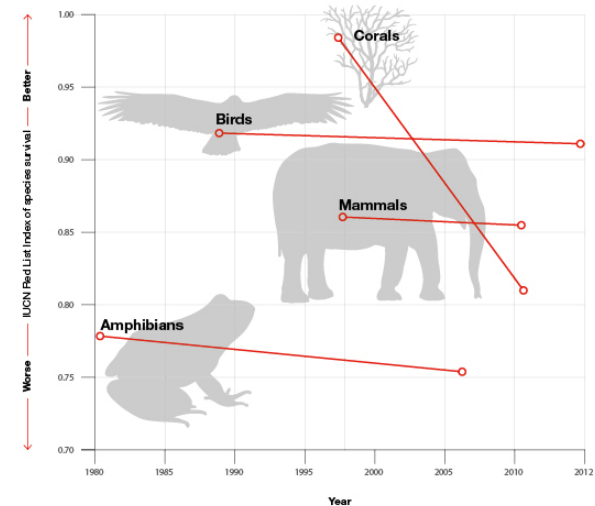
- Population size, trend and status; range; threats; conservation measures; etc.

## 3. Distribution map



# Purpose of supporting information

1. Supports and justifies the Red List assessment.
2. Allows basic analysis of Red List data across species (e.g., calculating the Red List Index).
3. Allows the Red List website to function properly (e.g., data search options).



▼ Research Needed	
<input type="checkbox"/> 1. Research (55535)	>
<input type="checkbox"/> 2. Conservation Planning (3419)	>
<input type="checkbox"/> 3. Monitoring (26556)	>
<input type="checkbox"/> 4. Other (448)	>

▼ Conservation Actions Needed	
<input type="checkbox"/> 1. Land/water protection (18964)	>
<input type="checkbox"/> 2. Land/water management (18733)	>
<input type="checkbox"/> 3. Species management (11938)	>
<input type="checkbox"/> 4. Education & awareness (6818)	>
<input type="checkbox"/> 5. Law & policy (4660)	>
<input type="checkbox"/> 6. Livelihood, economic & other incentives (941)	>

▼ Threats	
<input type="checkbox"/> 1. Residential & commercial development (13599)	>
<input type="checkbox"/> 2. Agriculture & aquaculture (24001)	>
<input type="checkbox"/> 3. Energy production & mining (6037)	>
<input type="checkbox"/> 4. Transportation & service corridors (4103)	>
<input type="checkbox"/> 5. Biological resource use (27582)	>
<input type="checkbox"/> 6. Human intrusions & disturbance (4485)	>
<input type="checkbox"/> 7. Natural system modifications (13699)	>
<input type="checkbox"/> 8. Invasive and other problematic species, genes & diseases (9920)	>
<input type="checkbox"/> 9. Pollution (10437)	>
<input type="checkbox"/> 10. Geological events (746)	>
<input type="checkbox"/> 11. Climate change & severe weather (7869)	>
<input type="checkbox"/> 12. Other options (358)	>

▼ Habitats	
<input type="checkbox"/> 1. Forest (47357)	>
<input type="checkbox"/> 2. Savanna (6421)	>
<input type="checkbox"/> 3. Shrubland (16722)	>
<input type="checkbox"/> 4. Grassland (10739)	>
<input type="checkbox"/> 5. Wetlands (Inland) (29379)	>
<input type="checkbox"/> 6. Rocky areas (eg. inland cliffs, mountain peaks) (6722)	>
<input type="checkbox"/> 7. Caves and Subterranean Habitats (non-aquatic) (1129)	>
<input type="checkbox"/> 8. Desert (1672)	>
<input type="checkbox"/> 9. Marine Neritic (10708)	>
<input type="checkbox"/> 10. Marine Oceanic (2393)	>
<input type="checkbox"/> 11. Marine Deep Benthic (1789)	>
<input type="checkbox"/> 12. Marine Intertidal (2607)	>
<input type="checkbox"/> 13. Marine Coastal/Supratidal (2247)	>
<input type="checkbox"/> 14. Artificial/Terrestrial (12047)	>
<input type="checkbox"/> 15. Artificial/Aquatic & Marine (3571)	>
<input type="checkbox"/> 16. Introduced vegetation (231)	>
<input type="checkbox"/> 17. Other (624)	>
<input type="checkbox"/> 18. Unknown (2647)	>

▼ Use and Trade	
<input type="checkbox"/> 1. Food - human (10580)	>
<input type="checkbox"/> 2. Food - animal (966)	>
<input type="checkbox"/> 3. Medicine - human & veterinary (2462)	>
<input type="checkbox"/> 4. Poisons (78)	>
<input type="checkbox"/> 5. Manufacturing chemicals (99)	>
<input type="checkbox"/> 6. Other chemicals (220)	>
<input type="checkbox"/> 7. Fuels (755)	>
<input type="checkbox"/> 8. Fibre (191)	>
<input type="checkbox"/> 9. Construction or structural materials (2026)	>
<input type="checkbox"/> 10. Wearing apparel, accessories (404)	>
<input type="checkbox"/> 11. Other household goods (827)	>
<input type="checkbox"/> 12. Handicrafts, jewellery, etc. (1049)	>
<input type="checkbox"/> 13. Pets/display animals, horticulture (12533)	>
<input type="checkbox"/> 14. Research (587)	>
<input type="checkbox"/> 15. Sport hunting/specimen collecting (1892)	>
<input type="checkbox"/> 16. Establishing ex-situ production * (1183)	>
<input type="checkbox"/> 17. Other (free text) (806)	>
<input type="checkbox"/> 18. Unknown (464)	>

# **Full documentation is an essential part of a Red List assessment**

**The Red List is a scientific publication, regularly used and cited all around the world.**

**Scientific paper standards (stand-alone pdf versions of each assessment) require documentation standards be maintained.**

**The Red List informs conservation decisions: these must be based on well-documented information.**

**Proper documentation allows for informed reassessments.**

**Without proper documentation, the Red List is just a list – the documentation contains the useful information.**



## Rules of Procedure for IUCN Red List Assessments 2017–2020

### ANNEX 1

#### Required and Recommended Supporting Information for IUCN Red List Assessments

An IUCN Red List assessment includes the Red List Category and Criteria, and a range of supporting information (documentation). The purpose of providing supporting information with the assessment is:

1. To support and justify adequately each Red List assessment.
2. To allow basic analysis of the Red List status across species, including calculating the Red List Index.
3. To allow the Red List website ([www.iucnredlist.org](http://www.iucnredlist.org)) to function properly (i.e., to allow users to search and find information on the website).

The more relevant supporting information is attached to an assessment, the more useful the assessment will be for all three of the above purposes. Within the Species Information Service (SIS) there are many data fields available to record a whole suite of information. Some of these data fields are essential to support the Red List assessment, and some are there to capture additional information for analyses and communication purposes.

IUCN has developed the following three tiers to identify the appropriate level of supporting information to include in a Red List assessment.

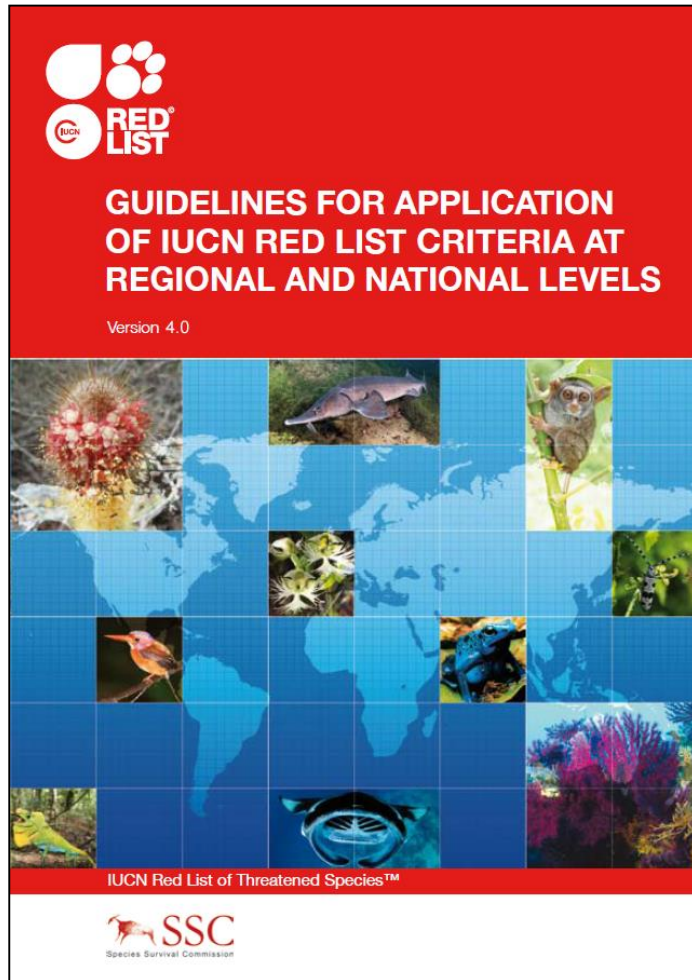
# Documentation Standards and Consistency

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# Regional Red List Documentation



## V. DOCUMENTATION AND PUBLICATION

1. IUCN Red List Criteria and guidelines must be followed in order to facilitate the exchange of information between assessors in different regions and between regional and taxonomic Red List Authorities. It is recommended that all regional (and global) assessment exercises follow the global documentation standards described in the *Documentation Standards and Consistency Checks for IUCN Red List Assessments and Species Accounts* (regularly updated and available from [www.iucnredlist.org/technical-documents/categories-and-criteria](http://www.iucnredlist.org/technical-documents/categories-and-criteria)), as outlined in Annexes 2 and 3 in IUCN 2012. See Annex 1 for shortened examples.
2. The introductory sections should include a list of the taxonomic groups that have been evaluated against the Red List Criteria as well as what taxonomic standards have been followed. Any regionally determined settings, filters, etc. should also be clearly reported.
3. Taxa that have been up- or downlisted in the regional Red List should be clearly indicated, for example by a degree sign after the category (VU<sup>°</sup>). The category of such a taxon should be interpreted as being equivalent to the same category that has not been changed (i.e. VU<sup>°</sup>=VU). The degree sign is comparable to a footnote and is used merely to flag the special history of the categorization process. Any up- or downlisting must be fully accounted for in the documentation, where the number of steps up or down also must be stated.
4. A printed regional Red List should present at least the scientific name and the authorship of the taxon, the regional Red List Category (using the English abbreviated forms) and Criteria met, the global IUCN Red List Category and Criteria, and the proportion (%) of the global population occurring within the region (Table 2). If the proportion of the global population is unknown, this should be noted with a question mark. The region may also wish to present the proportion (%) of other geographical scales (e.g. a continent), or any other additional data fields; this is up to the regional Red List authority to decide. It should be noted that the taxonomic classification level of a taxon, i.e. whether an entire species or a single subspecies with a more restricted distribution is under consideration, will influence the proportion occurring within a region. If possible, the vernacular name (in the national language) and a short summary of the supporting documentation for each taxon should also be included. Visiting taxa should preferably be listed in a separate section, but if they are included in a list of breeding taxa, it should be clearly indicated that they are visitors.



# Supporting Information for Red List assessments

## Galápagos Fur Seal (*Arctocephalus galapagoensis*)







# Galápagos Fur Seal

*Arctocephalus galapagoensis*

## CITATION

Trillimich, F. 2015. *Arctocephalus galapagoensis*. T2057A45223722. <http://dx.doi.org/10.2305/1A45223722> on 19 July 2019.

## Distribution Map:

- Created and checked at the same time as the assessment is being carried out.



The IUCN Red List of Threatened Species™  
(ISBN 2303-4535 (online))  
IUCN 2006: T2057A45223722

## THREATS

### Biological resource use

- Fishing & harvesting aquatic resources

### Invasive and other problematic species, genes & diseases

- Invasive non-native/alien species/diseases

### Pollution

- Industrial & military effluents

### Climate change & severe weather

- Habitat shifting & alteration
- Temperature extremes

## CONSERVATION ACTIONS IN PLACE

### In-place research and monitoring

- Systematic monitoring scheme : No

### In-place land/water protection

- Conservation sites identified : Yes, over entire range
- Percentage of population protected by PAs : 91-100
- Area based regional management plan : No
- Occurs in at least one protected area : Yes
- Invasive species control or prevention : Yes

### In-place species management

- Harvest management plan : No

### In-place education

- Subject to recent education and awareness programmes : Yes
- Included in international legislation : Yes
- Subject to any international management / trade controls : Yes

## Conservation actions in detail

## CONSERVATION ACTIONS NEEDED

- Site/area management

## Conservation actions in detail

## RESEARCH NEEDED

- Taxonomy
- Population size, distribution & trends
- Threats
- Population trends

## Research needed in detail

## Threats in detail

## Taxonomy

KINGDOM

**Animalia**

PHYLUM

**Chordata**

CLASS

**Mammalia**

ORDER

**Carnivora**

FAMILY

**Otariidae**

GENUS

**Arctocephalus**

### ▼ Taxonomy in detail

SCIENTIFIC NAME

*Arctocephalus galapagoensis*

AUTHORITY

Heller, 1904

SYNONYMS

*Arctocephalus australis* ssp. *galapagoensis*  
 Heller, 1904  
*Arctophoca galapagoensis* (Heller, 1904)  
*Arctophoca australis* ssp. *galapagoensis*  
 (Heller, 1904)

COMMON NAMES

English  
 Galápagos Fur Seal, Galapagos Islands Fur Seal  
 French  
 Arctocéphale des Galapagos  
 Spanish; Castilian  
 Lobo de dos pelos de Galápagos, Lobo fino de Galapágos,  
 Oso Marino de las Galápagos

TAXONOMIC SOURCES

IDENTIFICATION INFORMATION

TAXONOMIC NOTES

In 2011 the genus of all Fur Seals other than *Arctocephalus pusillus* was changed from *Arctocephalus* to *Arctophoca*, Peters 1866 (Committee on Taxonomy 2011) based on evidence presented in Berta and Churchill (2012). However, in 2013, based on genetic evidence presented in Nyakatura and Bininda-Emonds (2012), this change was considered to be premature and these species were returned to the genus *Arctocephalus* pending further research (Committee on Taxonomy 2013).

This species was formerly *Arctocephalus australis* (Repenning et al. 2007). The population colonies display through gene flow.

### Taxonomic Notes:

- Recent taxonomic changes.
- Current taxonomic doubts or debates about the validity or identity of the taxon.
- Undescribed species: provide details of who is working on a description and where the type specimens are held.

## Assessment Information

IUCN RED LIST CATEGORY AND CRITERIA

**Endangered A2ab**

ver 3.1

ASSESSMENT LANGUAGE

**English**

DATE ASSESSED

**30 October 2014**

YEAR PUBLISHED

**2015**

### Assessment Information in detail

YEAR LAST SEEN

PREVIOUSLY PUBLISHED RED LIST ASSESSMENTS

2008 — Endangered ( EN )  
 1996 — Vulnerable ( VU )  
 1982 — Out of Danger ( O )  
 1965 — Unknown ( N/A )

REGIONAL ASSESSMENTS

ASSESSOR(S)

Trillmich, F.

REVIEWER(S)

Aurioles-Gamboa, D.

CONTRIBUTOR(S)

FACILITATOR(S) / COMPILER(S)

Lowry, L., Ahonen, H., Chiozza, F. & Battistoni, A.

PARTNER(S) / INSTITUTION(S)

AUTHORITY / AUTHORITIES

IUCN SSC Pinniped Specialist Group (seals and walruses)

JUSTIFICATION

The Galápagos Fur Seal population declined by 77-80% from 1977/78 to 2001. Since then it is thought that the population has increased but is likely still reduced by 50% over the last 24-35 years. Generation length for this species may be anywhere between 8 and 11.7 years, with a best estimate of 10 years. The causes of the reduction are partly understood, have not ceased, and may not be reversible. Impacts from El Niño events and infectious diseases continue to threaten the population. Galápagos Fur Seals qualify for listing as Endangered under criterion A2ab. However, the lack of quantitative survey information for the past 12 years greatly increases the uncertainty of this assessment.

### Justification (= Rationale):

- Explain why the taxon qualifies for this Red List Category and Criteria.
- Brief summary highlighting the key issues that are explained in more detail elsewhere in the account.
- Do not simply repeat the criteria thresholds.
- Report actual estimates used for data (e.g. EOO, AOO, population size).

## Geographic Range

### NATIVE

Extant (resident)  
Ecuador (Galápagos)

Extant & Vagrant (seasonality uncertain)  
Ecuador (Ecuador (mainland)); Mexico

### NUMBER OF LOCATIONS

### UPPER ELEVATION LIMIT

5 metres

### UPPER DEPTH LIMIT

0 metres

### LOWER ELEVATION LIMIT

0 metres

### LOWER DEPTH LIMIT

115 metres

### Geographic Range in detail

#### FAO FISHING AREAS

Origin	Locations
Native	Pacific - southeast

#### ESTIMATED AREA OF OCCUPANCY (AOO) (KM²)

109400

#### CONTINUING DECLINE IN AREA OF OCCUPANCY (AOO)

#### EXTREME FLUCTUATIONS IN AREA OF OCCUPANCY (AOO)

No

#### ESTIMATED EXTENT OF OCCURRENCE (EOO) (KM²)

119277

#### CONTINUING DECLINE IN EXTENT OF OCCURRENCE (EOO)

No

#### EXTREME FLUCTUATIONS IN EXTENT OF OCCURRENCE (EOO)

No

#### CONTINUING DECLINE IN NUMBER OF LOCATIONS

No

#### EXTREME FLUCTUATIONS IN THE NUMBER OF LOCATIONS

No

#### RANGE DESCRIPTION

Galápagos Fur Seals are observed throughout the Galápagos Archipelago. Lactating females make trips of relatively short duration, which usually take them 10-20 km out to sea, but during the warm season trips last longer and go further offshore. Foraging by males outside the breeding season is unknown. Most breeding colonies are located in the western and northern parts of the Archipelago, close to productive upwelling areas offshore. Vagrants are occasionally observed including in southern Mexico during El Niño events (Aurioles-Gamboa *et al.* 2004) and pups have been reported to be born on the coast of mainland Ecuador, but that has not been confirmed.

### Range Description:

- Summarize current global range & describe known historic range.
- Can include description of breeding range, non-breeding range, and migratory routes.
- Sensitive species: avoid providing specific details of exact locations.
- Widespread taxa: can be general (avoid long lists of countries in the text)

Population

CURRENT POPULATION TREND	NUMBER OF MATURE INDIVIDUALS
Decreasing	10,000
POPULATION SEVERELY FRAGMENTED	CONTINUING DECLINE OF MATURE INDIVIDUALS
No	Unknown
<div>Population in detail</div>	
EXTREME FLUCTUATIONS	DESCRIPTION
No	<p>Age-structure data are not available for the Galápagos Fur Seal population so the generation time cannot be calculated precisely. With sexual maturity attained at about 4-6 years of age and a maximum longevity of approximately 20 years, the average age of reproducing individuals may be anywhere between 8 and 11.7 years (based on generation length estimates for other <i>Arctocephalus</i> species; Pacifici <i>et al.</i> 2013), but the best estimate is about 10 years (similar to the generation time reported for <i>Arctocephalus gazella</i> by Forcada <i>et al.</i> 2008). The number of mature animals in the population is likely to be about two-thirds of the total.</p>
NO. OF SUBPOPULATIONS	
CONTINUING DECLINE IN SUBPOPULATIONS	
EXTREME FLUCTUATIONS IN SUBPOPULATIONS	
ALL INDIVIDUALS IN ONE SUBPOPULATION	
NO. OF INDIVIDUALS IN LARGEST SUBPOPULATION	<p>Whalers and sealers harvested Galápagos Fur Seals indiscriminately during the 19th century and there were few left by 1900 (Trillmich 1987). Although there was little documentation, the population recovered substantially during the 20th century. In 1977-1978 the first systematic census efforts were conducted; 9,785 fur seals were</p>

Population:

- Summarize data available for current population size and trend
- Explain historic populations and past declines.
- Include summaries of sizes and trends for different subpopulations or specific parts of the range, if appropriate.
- If no quantitative information is available: record whether the taxon is “common”, “abundant”, “rare”, etc.
- If there are no data available at all, state this and indicate why (e.g., no surveys have been carried out, recently discovered species, difficult to detect the species so tends to be overlooked, etc.)

### ▲ Habitat and Ecology

## SYSTEM

## Terrestrial, Marine

## HABITAT TYPE

## Marine Intertidal, Marine Neritic, Marine Coastal/Supratidal, Marine Oceanic

GENERATION LENGTH (YEARS)

8-11.7,10 years

## CONGREGATORY

Congregatory (and dispersive)

## MOVEMENT PATTERNS

## Not a Migrant

## CONTINUING DECLINE IN AREA, EXTENT AND/OR QUALITY OF HABITAT

No

## ▼ Habitat and Ecology in detail

### HABITAT AND ECOLOGY

Galápagos Fur Seals are the smallest and the least sexually dimorphic of the otariid species. Adult males are 1.1-1.3 times longer and 2.0-2.3 times heavier than adult females. They are small and compact, and adult males are stocky in build. Pups are blackish brown. Pups moult female when about 4-6 months

The few adult males measured. Adult females have curvilinear growth, reaching 27–28 kg, with a maximum of 30 kg, when they are 12 months old. They become sexually mature at an age of about 5 months, but successfully rear a

Males do not become physically larger than females, a trait that will be used by females to judge the maturity of females, but exact size is not known. Males are about 1 m<sup>2</sup>, which is large compared to females; this is particularly not

Galápagos Fur Seals occasionally haul-out on rocks in the shade and the opportunity to pupping and breeding season begins in November. The peak of pupping usually occurs between the 1st and 15th of November. Pupping on other islands may be more systematic data are presented in Table 1.

## Habitat and Ecology:

- Describe essential habitats & ecological requirements.
- Include any behavioural or physiological factors that make it particularly vulnerable to specific threats.
- **Does not need to be extensive:** detailed accounts of behaviour, diet, etc. is not necessary unless it is relevant to extinction risk (e.g., evidence of very slow growth rates).



## Threats

### Biological resource use

- Fishing & harvesting aquatic resources

### Invasive and other problematic species, genes & diseases

- Invasive non-native/alien species/diseases

### Pollution

- Industrial & military effluents

### Climate change & severe weather

- Habitat shifting & alteration
- Temperature extremes

#### ▼ Threats in detail

#### THREATS

Similar to all southern fur seals there was a severe reduction of Galápagos Fur Seals as a result of 19th century exploitation by sealers and whalers. The species was near extinction early in the 20th century and has since recovered. Hunting was prohibited (but not necessarily stopped) in 1934, and additional protection was provided in 1959 when more than 80% of the Galápagos archipelago was declared a National Park (Trillmich 1987).

El Niño events dramatically elevate mortality rates of all age classes, but primarily of juveniles, and cause population declines; this is due to the dramatic decline in productivity around the archipelago during these events (Trillmich and Limberger 1985). Oceanographers differ in their predictions of how the frequency and intensity of El Niño events may change with climate warming. Cai *et al.* (2014) suggest that the total number of El Niño events will decrease slightly, but the total number of extreme events will double as global warming continues. In contrast, Santoso *et al.* (2013) predict a doubling of the frequency of El Niño events with global warming. In the

## Threats:

- Describe past, current and likely future threats and how these affect the global population (habitat loss or degradation, killing individuals, removal of individuals from the wild, etc).
- Try to be specific.
- Avoid listing all human activities occurring in the area without referring to how they affect the species.
- If there are no threats, or threats are unknown, state this and explain why.

## Use and Trade

### Use and Trade in detail

#### USE AND TRADE

Whalers and sealers harvested Galápagos Fur Seals indiscriminately during the 19th century and there were few left by 1900. The population recovered substantially during the 20th century. Galápagos Fur Seals were protected under Ecuadorian law in the 1930s, and since 1959 with the establishment of the Galápagos National Park, by the Administration of the Park. Currently there is no direct use or trade.

## Use and Trade:

- How is it collected? (individuals killed, live collection, parts harvested, etc.)
- What is it used for? (food, medicine, research, etc).
- Local, national or international trade?
- Sustainable or causing declines?

## Conservation Actions

### In-place research and monitoring

- Systematic monitoring scheme : No

### In-place land/water protection

- Conservation sites identified : Yes, over entire range
- Percentage of population protected by PAs : 91-100
- Area based regional management plan : No
- Occurs in at least one protected area : Yes
- Invasive species control or prevention : Yes

### In-place species management

- Harvest management plan : No

### In-place education

- Subject to recent education and awareness programmes : Yes
- Included in international legislation : Yes
- Subject to any international management / trade controls : Yes

#### Conservation Actions in detail

#### CONSERVATION ACTIONS

Galápagos Fur Seals were protected under Ecuadorian law in the 1930s, and since 1959 with the establishment of the Galápagos National Park, by the Administration of the Park. The waters around the islands are also protected by a 40 nautical mile no fishing zone. Tourism is regulated and most visitors are escorted by a trained Park Naturalist. The species is listed on CITES Appendix II.

#### CONSERVATION ACTIONS CLASSIFICATION SCHEME

##### Conservation Actions Needed

2. Land/water management 2.1. Site/area management

#### RESEARCH CLASSIFICATION SCHEME

##### Research Needed

1. Research	1.1. Taxonomy
	1.2. Population size, distribution & trends
	1.5. Threats
3. Monitoring	3.1. Population trends

## Conservation Actions:

- Describe conservation and research actions currently in place for the species (occurrence in protected areas, international conventions, national legislation, national Red List status, etc.)
- Describe any urgent conservation and research actions that would help to prevent its status deteriorating (be realistic about this; avoid a long and unachievable “wish-list”).

## Bibliography

### Bibliography in detail

Alava, J.J. and Salazar, S. 2006. Status and conservation of Otariids in Ecuador and the Galápagos Islands. In: A.W. Trites, S.K. Atkinson, D.P. DeMaster, L.W. Fritz, T.S. Gelatt, L.D. Rea and K.M. Wynne (eds), *Sea Lions of the World*, pp. 495-520. Fairbanks: Alaska Sea Grant College Program, Alaska, USA.

Alava, J.J., Salazar, S., Cruz, M., Jiménez-Uzcátegui, G., Villegas Amtmann, S., Paez-Rosas, D., Costa, D.P., Ross, P.S., Ikonomou, M.G. and Gobas, F.A.P.C. 2011. DDT strikes back: Galapagos sea lions face increasing health risks. *Ambio* 40: 425-430.

Aurioles-Gamboa, D., Schramm, Y. and Mesnick, S. 2004. Galapagos fur seals, *Arctocephalus galapagoensis*, in México. *Latin American Journal of Aquatic Mammals* 9: 77-90.

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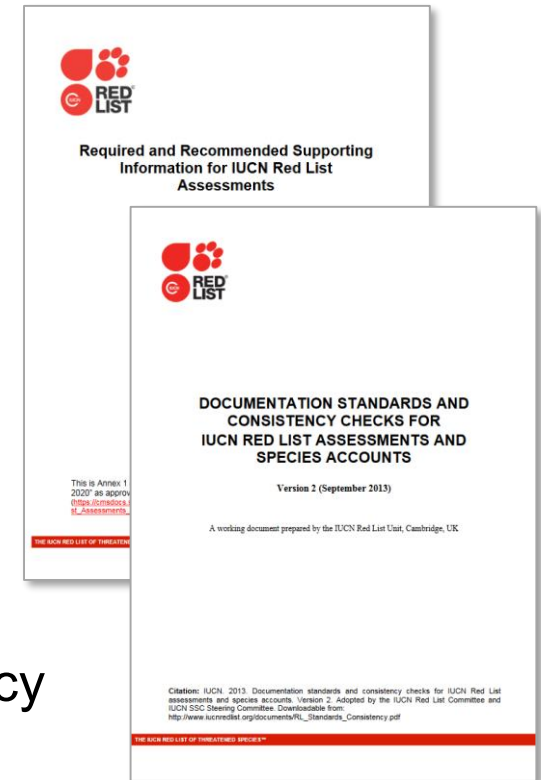
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## *In general, please...*

- Check the Required & Recommended Supporting Information for Red List Assessments
- Remember the **Distribution Map** is part of the supporting information.
- Avoid one word answers; complete sentences please.
- Explain abbreviations and acronyms.
- Be specific where possible (e.g. “area of occupancy is 8 km<sup>2</sup>” instead of “AOO is <10 km<sup>2</sup>”)
- Enter references in the correct format and check SIS *before* adding a reference.
- Do a final check of the text before moving to the next assessment (spellcheck, grammar, missing references, etc.)
- Follow the Supporting Information guidelines and use Red List terminology correctly.





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Marine Coastal/Supratidal,  
Marine Oceanic**

[Habitat and ecology in detail](#)

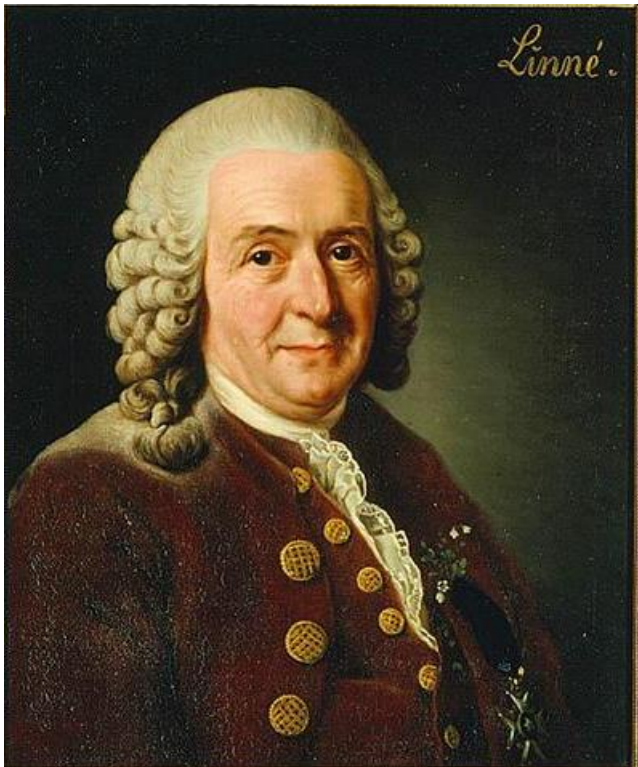
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# Taxonomic concepts and the IUCN Red List



Dr Maurice Kottelat



Dr Jan van Tol

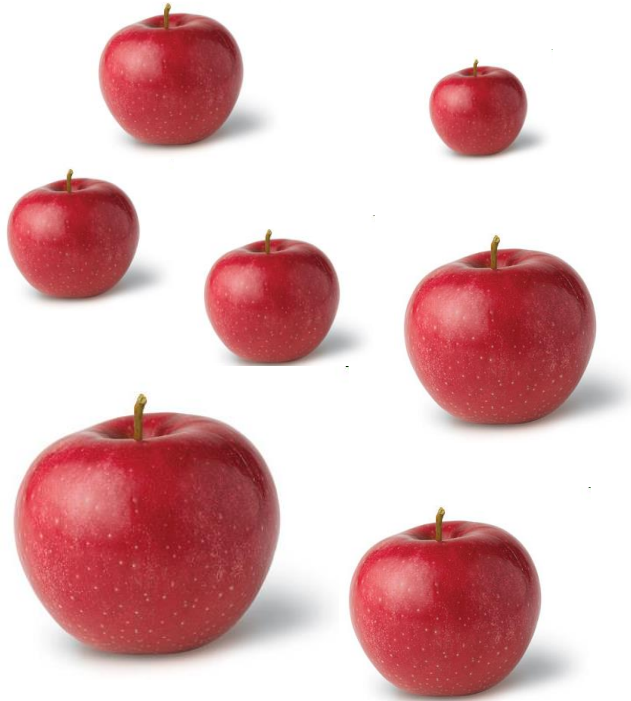


Prof. Philippe Bouchet

## **Taxonomy is a complicated world!**

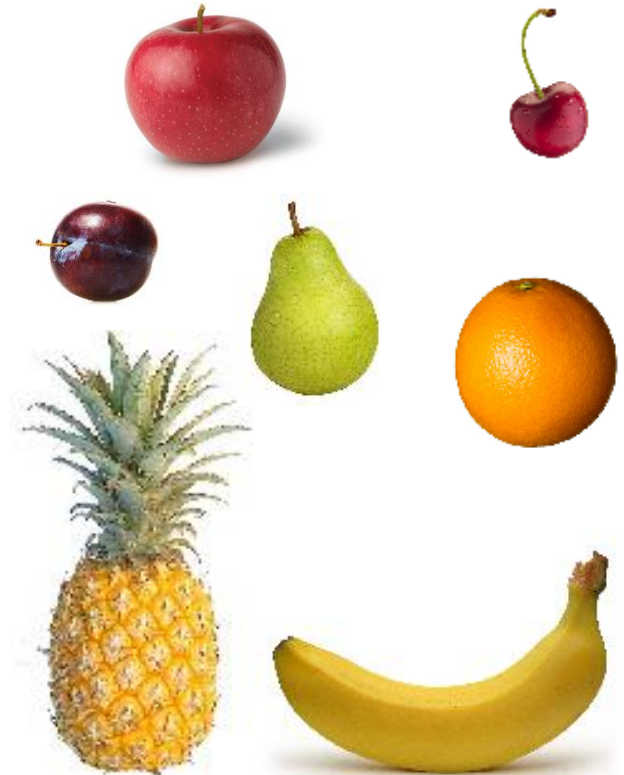
- All Red List taxa should be validly published using the appropriate international nomenclatural codes:
  - International Code of Zoological Nomenclature (ICZN)
  - International Code of Nomenclature for algae, fungi and plants (Melbourne Code)
- General standard world checklists used for nomenclature on the Red List (with some deviations by Specialist Groups)
  - See the Red List web site for a full list of taxonomic checklists used.

# CHANGING TAXONOMIC CONCEPTS



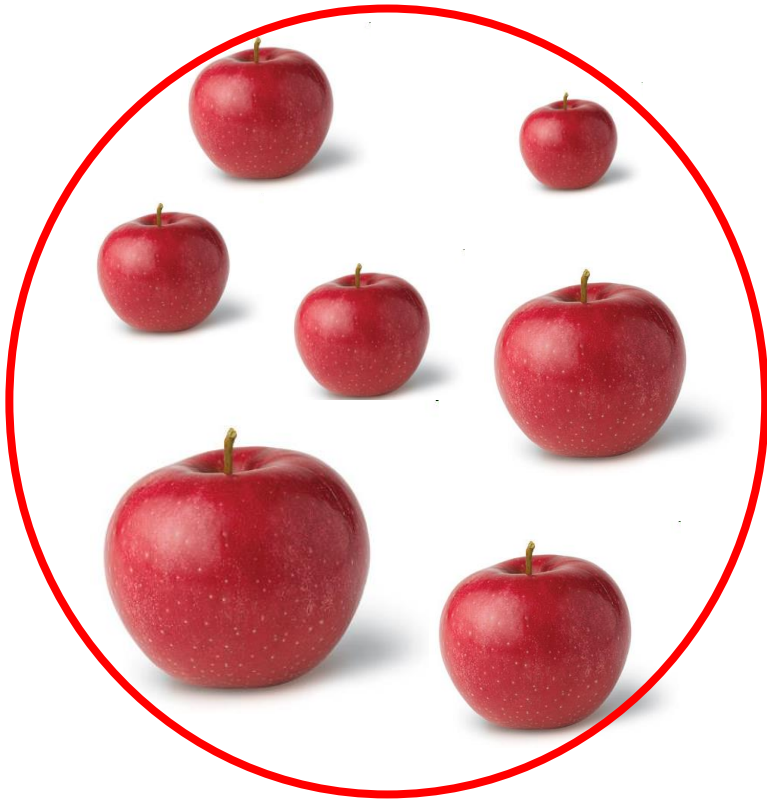
One taxonomist's bag of  
apples

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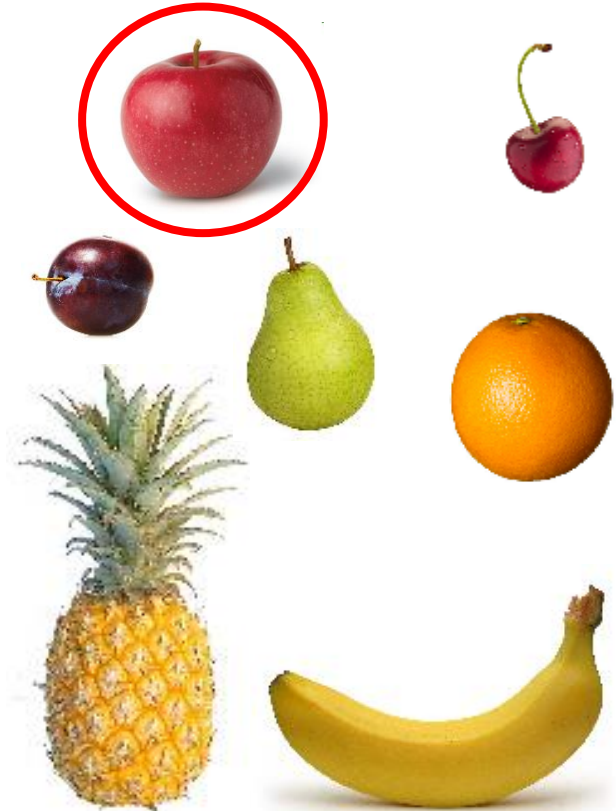


Another taxonomist's bag of  
mixed fruit

## CHANGING TAXONOMIC CONCEPTS



2010: Species = LC



2017: Species = EN

The taxonomic concept has changed since 2010, so the 2017 assessment **should not** include the 2010 assessment as part of its assessment history.