

Protected Areas Resilient to Climate Change, PARCC West Africa



2015

PARCC Project Training Manual Module 3. The IUCN Red List of Threatened Species



ENGLISH



DICE
University of Kent

Durham
University

BirdLife
INTERNATIONAL



IUCN

2015

The United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC) is the specialist biodiversity assessment centre of the United Nations Environment Programme (UNEP), the world's foremost intergovernmental environmental organisation. The Centre has been in operation for over 30 years, combining scientific research with practical policy advice.



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©IUCN. Noted that some of the animations might not be displayed properly on static PDF slides. We therefore strongly urge you to consult the Red List training webpage at <http://www.iucnredlist.org/technical-documents/red-list-training>, where the presentations are downloadable as PowerPoint slideshows. IUCN will also soon be releasing a comprehensive and free online training course that covers all aspects of the Red List assessment process, which will be available on www.conservationtraining.org, and will be announced on the Red List training website when it is released.


Chapter 1. Introduction



The IUCN Red List

A brief introduction


The IUCN Red List of Threatened Species™




Introduction to the IUCN Red List

The objective:

To provide information and analyses on the status, trends and threats to species in order to inform and catalyse action for biodiversity conservation.




The IUCN Red List of Threatened Species™




What is the IUCN Red List?

World's most comprehensive information source for extinction risk of species.

- Not just a list, but a compilation of the conservation status of species at the global level
- Based on the best scientific information available
- Widely used to inform and influence biodiversity conservation




The IUCN Red List of Threatened Species™



Introduction to the IUCN Red List

IUCN Red List assessment: an estimate of extinction risk

What is the likelihood of a species becoming extinct in the near future, given current knowledge about **population trends**, **range**, and recent, current or projected **threats**?



It is not a list of species that are priorities for conservation action

The IUCN Red List of Threatened Species™




What is the IUCN Red List?

- More than just names and threat categories
- Includes information on threats (e.g. invasive species), ecological requirements, and conservation actions
- Species assessments are generated through the knowledge of thousands of the world's leading scientists through a peer review process.



The IUCN Red List of Threatened Species™



Introduction to the IUCN Red List

WHO IS INVOLVED?

The IUCN Red List of Threatened Species™

Introduction to the IUCN Red List

IUCN

Created in 1948

- 1,137 member organizations
 - 84 States
 - 117 Government agencies
 - >800 NGOs
- 1,100 staff (including Regional Offices)
- 10,000 Commission members (scientists and experts)
- ~5,000 representatives from partner organizations
- Many experts that are not Commission members

In 180+ countries

Official observer to the UN General Assembly

Introduction to the IUCN Red List

HOW IS IT COMPILED?

The IUCN Red List of Threatened Species™

Introduction to the IUCN Red List

IUCN's species work: Commission and Programme

SSC Chair
Simon Stuart

↓

SSC Steering Committee

~7,000 volunteer experts in 100+ Specialist Groups and Task Forces

IUCN Secretariat

IUCN Global Species Programme

- Biodiversity Assessment Unit
- Freshwater Biodiv. Assess. Unit
- Marine Biodiversity Unit
- Red List Unit
- Species Information Service
- SSC Network Support
- Climate Change
- Species Trade & Use Unit (connected to TRAFFIC)

IUCN Species Survival Commission

Introduction to the IUCN Red List

Red List assessments – from the field to publication

- Data collection
- Expert workshops
- Reviewing
- Quality control

Red List Partnership

IUCN
 BirdLife International
 Conservation International
 Kew
 ZSL
 Wildscreen
 SSC
 BGC
 NatureServe
 SAPIENZA UNIVERSITA DI ROMA

Introduction to the IUCN Red List


Quality control: the IUCN Red List Unit

- Management of the IUCN Red List (database, website)
- Review assessments prior to publication
- Petitions and enquiries

Introduction to the IUCN Red List

Tools and training

- Training and assessment workshops
- Tools, IT infrastructure, technical advice (SIS)
- Other projects and Red List tools
 - Red List Index
 - Global Species Assessments
 - Regional assessment initiatives
 - Climate change and extinction risk assessment



IUCN SSC

From raw data to Red List:
The Red List assessment process and role of the Red List Assessor

INTERNATIONAL UNION FOR CONSERVATION OF NATURE

Introduction to the IUCN Red List

HOW CAN RED LIST DATA BE USED?

The IUCN Red List of Threatened Species™


From raw data to Red List

WHAT IS A RED LIST ASSESSMENT?

The IUCN Red List of Threatened Species™

Introduction to the IUCN Red List

- Analysis and information
- Conservation planning and priority-setting
- International conservation policy
- Inform private sector decision-making
- Education and public awareness



From raw data to Red List

IUCN Red List assessment: an estimate of extinction risk

What is the likelihood of a species becoming extinct in the near future, given current knowledge about **population trends**, **range**, and recent, current or projected **threats**?

It is not a list of species that are priorities for conservation action




Illustration copyright Bob Orben

The screenshot shows the IUCN Red List profile for *Artibeopsylla lightfooti*. It includes a taxonomic classification table, a distribution map of Florida, and assessment information such as the year (2014) and the assessor (South Africa Frog Assessment Group). The status is listed as 'Near Threatened'.

Kingdom	Phylum	Class	Order	Family
ANIMALIA	CHORDATA	AMPHIBIA	ANURA	PHYLLOPODE

Introduction to the IUCN Red List

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. Map of species' distribution**

The screenshot shows the IUCN Red List profile for the Purple Skimmer. It includes a distribution map of Florida and assessment information. The status is listed as 'Near Threatened'.

Introduction to the IUCN Red List

What can be assessed?

IUCN Red List Categories and Criteria are used to assess:

- All described taxa (species, subspecies, varieties), except micro-organisms
- Undescribed taxa, **only if** they are:
 - A clearly distinct species
 - Museum/herbarium voucher references are provided
 - Distribution information is available
 - There is clear conservation benefit to assessing the species
- At the **global level**
- At the **regional/national level** only with the *Guidelines for Application of IUCN Red List Criteria at Regional Levels*
- **Wild populations** inside their **natural range** (including populations resulting from benign introductions)

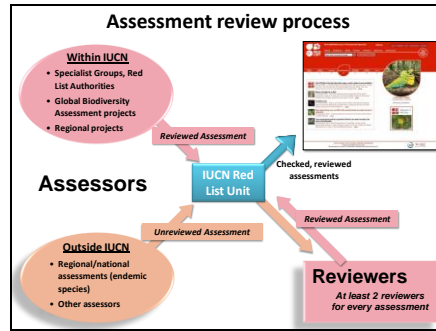
The screenshot shows the IUCN Red List profile for the Purple Skimmer, focusing on the 'List of Results' and 'Conservation Authority' sections. It lists various criteria and the authority responsible for the assessment.

Introduction to the IUCN Red List

Essential tools for Red List assessments

The image displays several key documents used in Red List assessments, including the 'Documentation Standards and Checklist for IUCN Red List Assessments and Species Accounts', the 'IUCN Red List Criteria', and the 'Guidelines for Using the IUCN Red List Categories and Criteria'.

RED LIST ASSESSMENT PROCESS



From raw data to Red List

Who is involved in producing a Red List assessment?

Project Managers	<ul style="list-style-type: none"> Coordinate assessment projects; finalize assessments; liaise between assessors/reviewers/IUCN RLU
Assessors	<ul style="list-style-type: none"> Provide data; apply the Red List Categories and Criteria considering all relevant data
Contributors (optional)	<ul style="list-style-type: none"> Provide data and contribute knowledge to the assessment, but do not apply the Red List C&C
Reviewers	<ul style="list-style-type: none"> Review each assessment before publication to ensure data is comprehensive and accurate
IUCN Red List Unit	<ul style="list-style-type: none"> Final assessment sign-off; manage Red List database/website; field petitions and enquiries

ROLE OF A RED LIST ASSESSOR

From raw data to Red List

Red List assessment process:

- Rigorous process ensures high quality assessments supported by strong data

Pre-assessment (Project Managers or Assessors): convene experts and compile data, draft supporting documentation + range map

Assess species (independently/at workshop): Red List Category and Criteria + range map + supporting documentation

Review & Consistency Check

Final review by RLU

Publish on Red List

From raw data to Red List

What does a Red List Assessor do?

- Compile all currently available data on population status, distribution, ecology, use/trade, threats & conservation measures:
 - Across the species' entire global range
 - Data may come from published studies, unpublished reports, grey literature, personal knowledge, etc.
- Assign a Red List category and criteria based on the available information
- Justify the assessment following the documentation requirements
- Prepare a range map following the mapping standards
- Know who to submit the assessment to for review and submission to the IUCN Red List Unit.

Red List Assessors are vital to listing species on the IUCN Red List!

A Red List Assessor:



Documentation standards

Categories & Criteria

Range Map

QUALITY


From raw data to Red List

How can Red List Assessors ensure assessments are high quality?

- Understand the Categories & Criteria and apply them properly
- Justify the assessments with thorough supporting data
- Follow the documentation standards
- Provide relevant references
- Submit a good map
- Double check for consistency and for errors
- Work with other relevant groups doing Red List assessments


High quality assessments get published more quickly – better for conservation!

Chapter 2. Key terms and concepts in the IUCN criteria



Key terms and concepts in the IUCN criteria

The IUCN Red List of Threatened Species™

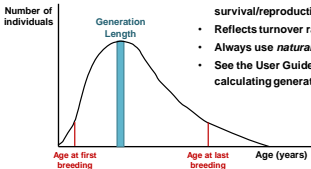



Key terms and concepts

Generation Length

Average age of parents of the current cohort (i.e., newborn individuals in the population).

- Scales time-based measurements to account for different survival/reproduction rates.
- Reflects turnover rate of breeders.
- Always use *natural* generation length.
- See the User Guidelines for methods of calculating generation length





From raw data to Red List
Rabb's Fringe-limbed Treefrog
Ecnomiohyla rabborum

Critically Endangered
A2ace;B1ab(iii)

Based on:

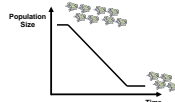
- Drastic population decline over past 3 generations, inferred from the apparent disappearance of most of the population
- Restricted range combined with continuing decline in extent and quality of habitat.



Key terms and concepts

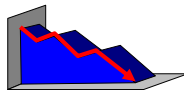
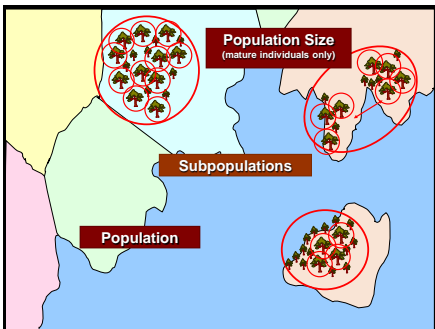

Reduction

Reduction is a decline in population size of at least the % stated in criterion A over the specified time period.



Continuing Decline

Continuing Decline is a recent, current or projected future decline which is liable to continue unless remedial measures are taken.

Key terms and concepts

	Reduction	Continuing Decline
Timing:	<ul style="list-style-type: none"> • One-off event • Ongoing 	<ul style="list-style-type: none"> • Must be ongoing – expect the decline to continue unless something is done to stop it.
Applies to:	<ul style="list-style-type: none"> • Population size 	<ul style="list-style-type: none"> • Population size • Extent of occurrence • Area of occupancy • Area, extent and/or quality of habitat • # locations • # subpopulations • # mature individuals

Key terms and concepts

Extreme Fluctuations

Population size or distribution area varies widely, rapidly and frequently (typically tenfold increase or decrease)

Real changes in total population size (e.g., dormant eggs/seeds damaged or lost) therefore **extreme fluctuation**

Key terms and concepts

Extent of Occurrence

Area of Occupancy

Extent of Occurrence: area within the shortest continuous imaginary boundary drawn around all known, inferred, or projected sites presently occupied by the taxon.
...*EOO* ≠ the species' range.

Area of Occupancy: area within the extent of occurrence which is actually occupied by the taxon (measured by overlaying a 2x2 km grid and counting number of occupied cells).

Key terms and concepts

Extreme Fluctuations

Natural seasonal fluctuations – flux of individuals between different life stages. Not real changes in total population size, therefore **not extreme fluctuation**

Key terms and concepts

EOO
AOO

Key terms and concepts

Severely Fragmented

Most individuals (>50%) found in **small, isolated subpopulations** between which there is **very little dispersal**. These subpopulations may be too small to be viable.

Taxa with highly mobile adult stages or producing large numbers of small, mobile diaspores can disperse more easily and are not so vulnerable to isolation through fragmented habitats.

Taxa producing small numbers of diaspores (or none at all), or only large ones are less able to disperse over wide areas and are more easily isolated.

Key terms and concepts

Extent of Occurrence

Comparison of taxa with same AOO but different EOO – a single threatening event is more likely to impact the taxon with the smaller EOO:

AOO = 10x4 = 40 km²
EOO = 44 km²

AOO = 10x4 = 40 km²
EOO = 105 km²

Key terms and concepts

Extent of Occurrence

Comparison of taxa with same AOO but different EOO – a single threatening event is more likely to impact the taxon with the smaller EOO.

AOO = 7x4 = 28 km²
EOO = 28 km²

AOO = 8x4 = 32 km²
EOO = 82 km²

Key terms and concepts

Location

Location is a geographically or ecologically distinct area in which a single threatening event can rapidly affect all individuals of the taxon.

Key terms and concepts

Extent of Occurrence

Migratory species:

Riverine species:

- Based on total area of river catchments occupied
- If only in a few streams, use area of sub-basin

Key terms and concepts

Location

Invasive species

2 locations

Key terms and concepts

Area of Occupancy

Linear habitats: AOO measurement must be **consistent with threshold values** – in most cases, use 2x2 km grid for AOO estimates.

AOO can be measured as the **smallest area essential at any stage to the survival**

Key terms and concepts

Location

Pollution

4 locations

Key terms and concepts

Location

4-5 locations

Key terms and concepts

Quantitative Analysis

Quantitative Analysis is any form of analysis which estimates the extinction probability of a taxon based on known life history, habitat requirements, threats and any specified management options (e.g., Population Viability Analysis (PVA)).

Key terms and concepts

Location

If most serious threat does not affect entire distribution: can use other threats to count locations in areas not affected by most serious threat.

5 locations

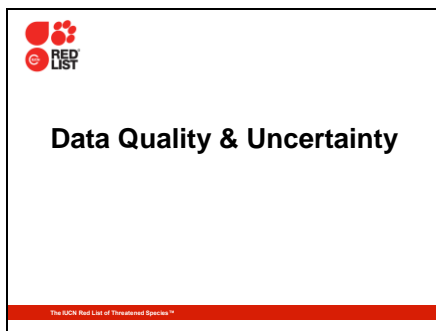
If there are no plausible threats, do not consider locations at all.

Chapter 3. IUCN Red List Categories



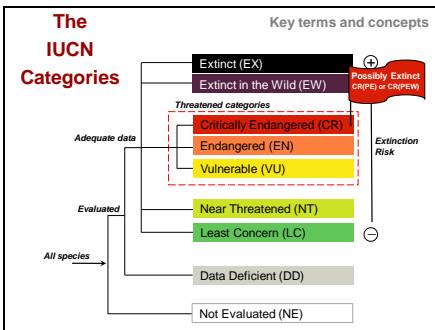
IUCN Red List Categories

The IUCN Red List of Threatened Species™



Data Quality & Uncertainty

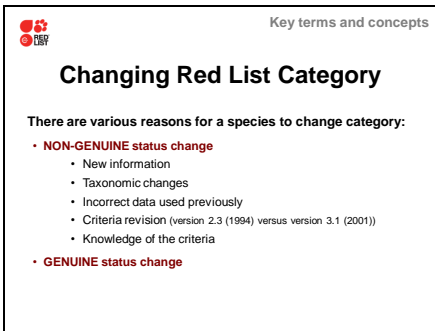
The IUCN Red List of Threatened Species™



Key terms and concepts

Dealing with a lack of high quality data

- The threatened categories use quantitative thresholds
- BUT** a lack of high quality data should not deter assessors from applying the IUCN criteria.



Changing Red List Category Key terms and concepts

There are various reasons for a species to change category:

- NON-GENUINE status change**
 - New information
 - Taxonomic changes
 - Incorrect data used previously
 - Criteria revision (version 2.3 (1994) versus version 3.1 (2001))
 - Knowledge of the criteria
- GENUINE status change**

Use any of the criteria A-E	Critically Endangered	Endangered	Vulnerable
A. Population reduction	Declines measured over the longer of 10 years or 3 generations		
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3 & A4	≥ 80%	≥ 50%	≥ 30%
A1. Population reduction (observed, estimated, or suspected) in the past where the causes of the reduction are clearly reversible AND understood AND the reduction is not expected to be repeated or to be replaced by any of the following:			
(a) direct observation			
(b) an index of abundance appropriate to the taxon			
(c) a decline in area of occupancy (AOO), extent of occurrence (EOO) and/or habitat quality			
(d) actual or potential levels of exploitation			
(e) effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites.			
A2. Population reduction (observed, estimated, or suspected) in the past where the causes of reduction may not have ceased OR may not be understood OR may not be reversible (see also (a) to (e) under A1).			
A3. Population reduction (suspected) to be met in the future (up to a maximum of 100 years) based on (b) to (e) under A1.			
A4. A. Observed, estimated, or suspected population reduction (up to a maximum of 100 years) where the four preconditions (a) to (d) are met, the threshold where the causes of reduction may not have ceased OR may not be understood OR may not be reversible, based on (a) to (e) under A1.			
B. Geographic range in the form of either B1 (extent of occurrence) AND/OR B2 (area of occupancy)			
B1. Extent of occurrence (EOO)	< 100 km ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy (AOO)	< 10 km ²	< 500 km ²	< 2,000 km ²
AND at least 2 of the following:			
(a) Severely fragmented, OR Number of locations	≤ 1	≤ 5	≤ 10
(b) Continuing decline in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals.			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals.			
C. Small population size and decline			

Key terms and concepts

Observed

Observed information is directly based on well-documented observations of all known individuals in the population.

For example: entire global population occurs in only one area and all individuals counted each year

Year 1 population = 100
Year 5 population = 47
Observed 58% decline over 4 years

Key terms and concepts

Inferred

Inferred information is based on variables that are indirectly related to the variable of interest, but in the same general type of units (e.g. number of individuals or area or number of subpopulations). Relies on more assumptions than estimated data.

For example: Past and current population sizes are not known, but trade figures for that species have declined over time.

Inferred continuing decline in population size based on decline in trade statistics for this species

Key terms and concepts

Estimated

Estimated information is based on calculations that may involve assumptions and/or interpolations in time (in the past).

For example: repeated surveys of sample sites across total range

Date	Site A	Site B	Site C	Site D	All sites	Population size estimate across total range
2005	105	110	210	50	484	2,000
2006	105	107	70	60	342	1,400
2007	90	100	25	42	257	1,000
2008	65	80	0	25	170	700

Estimated 65% decline between 2005 and 2008

Key terms and concepts

Inferred

Examples:

- Continuing decline in population size inferred from declining trade statistics
- Continuing decline in area of occupancy inferred from rate of habitat loss
- Population reduction (% decline) inferred from change in catch statistics (e.g. CPUE)

Based on indirect evidence – on variables that are indirectly related to the variable of interest, but in the same general type of units (e.g. number of individuals or area or number of subpopulations). Relies on more assumptions than estimated/projected data.

Key terms and concepts

Projected

Projected information is the same as “estimated”, but the variable of interest is extrapolated in time towards the future

For example: repeated surveys of sample sites across total range with knowledge of ongoing causes of population decline

Key terms and concepts

Suspected

Suspected information is based on circumstantial evidence, or on variables in different types of units. In general, this can be based on any factor related to population abundance or distribution.

For example: Rate of habitat loss is known, but past and current population sizes are unknown.

Population size ???

- Suspected population reduction of e.g., >50% based on 75% of habitat being lost
- Could infer a continuing decline in population size, but suspect a reduction at a specific rate (%)



Key terms and concepts

Dealing with data uncertainty

Uncertainty in the data itself (different to the lack of data) should also be considered in a Red List assessment

For example: A species has a range of population size estimates from 3 separate studies.

Study A: Population size = 100-200 (Endangered)
Study B: Population size = 200-350 (Endangered or Vulnerable)
Study C: Population size = 280-410 (Vulnerable)


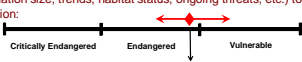



Red List Criteria & the Criteria Summary Sheet


The IUCN Red List of Threatened Species™

Key terms and concepts

Dealing with data uncertainty

- Record the range of possible values based on the available studies:
 "Based on the studies A, B and C, the current population size is between 100 and 410"
- State the range of potential Red List Categories that may be used based on the range of data:

- Select one of these categories using all available information (on population size, trends, habitat status, ongoing threats, etc.) to justify your decision:


Key terms and concepts



Rabb's Fringe-limbed Treefrog
Ecnomiohyla rabborum

Category: Critically Endangered

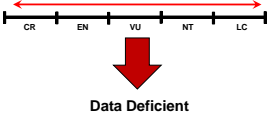
CR A2ace;B1ab(iii)

Criteria & subcriteria


Key terms and concepts

Dealing with data uncertainty


4. Species with **VERY** uncertain data (suggesting in a very wide range of potential categories) should be listed as Data Deficient.



Key terms and concepts



Nature of the Criteria

CRITERIA	Quantitative thresholds	THREATENED CATEGORIES
<p>A Population reduction</p> <p>B Restricted geographic range</p> <p>C Small population size & decline</p> <p>D Very small or restricted population</p> <p>E Quantitative analysis</p>		<div style="border: 2px solid red; padding: 2px; margin-bottom: 2px; background-color: #800000; color: white;">Critically Endangered (CR)</div> <div style="border: 2px solid orange; padding: 2px; margin-bottom: 2px; background-color: #FF8C00; color: white;">Endangered (EN)</div> <div style="border: 2px solid orange; padding: 2px; background-color: #FF8C00; color: white;">Vulnerable (VU)</div>

Key terms and concepts

Why use multiple criteria?

Not all the criteria are appropriate to all taxa.

- All taxa being assessed must be evaluated against each criterion.
- Meeting **any one** of the criteria qualifies a taxon for listing at that level of threat
- All criteria met at the **highest level of threat** should be listed.

From raw data to Red List

Past, present or future population reduction

From raw data to Red List

Criterion	Category	Definition	Subcategory
A1	Population reduction	Population reduction of at least 90% over 10 years or 3 generations, whichever is the longer, based on the most appropriate of (a) total population, (b) number of mature individuals, or (c) number of breeding pairs, or (d) number of self-sustaining populations, or (e) number of subpopulations, or (f) number of individuals in the wild.	90%
A2	Population reduction	Population reduction of at least 70% over 10 years or 3 generations, whichever is the longer, based on the most appropriate of (a) total population, (b) number of mature individuals, or (c) number of breeding pairs, or (d) number of self-sustaining populations, or (e) number of subpopulations, or (f) number of individuals in the wild.	70%
A3	Population reduction	Population reduction of at least 50% over 10 years or 3 generations, whichever is the longer, based on the most appropriate of (a) total population, (b) number of mature individuals, or (c) number of breeding pairs, or (d) number of self-sustaining populations, or (e) number of subpopulations, or (f) number of individuals in the wild.	50%
A4	Population reduction	Population reduction of at least 30% over 10 years or 3 generations, whichever is the longer, based on the most appropriate of (a) total population, (b) number of mature individuals, or (c) number of breeding pairs, or (d) number of self-sustaining populations, or (e) number of subpopulations, or (f) number of individuals in the wild.	30%

From raw data to Red List

**To use criterion A, we first need to know:
What is the generation length? Or is it likely that a three generation time period is less than 10 years?**

RED LIST

Red List Criteria: Criterion A

The IUCN Red List of Threatened Species™

From raw data to Red List

Based on **any** of four criteria:

	Timing of Pop. Decline		Causes of Pop. Decline		
	Past	Future	Stopped	Ongoing	Expected
A1	x		x		
A2	x			x	
A3		x*			x
A4	x	x*		x	x

* Up to a maximum of 100 years into the future

From raw data to Red List

Use any of the criteria A-E	Critically Endangered	Endangered	Vulnerable
A. Population reduction Declines measured over the longer of 10 years or 3 generations			
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3 & A4	≥ 80%	≥ 50%	≥ 30%

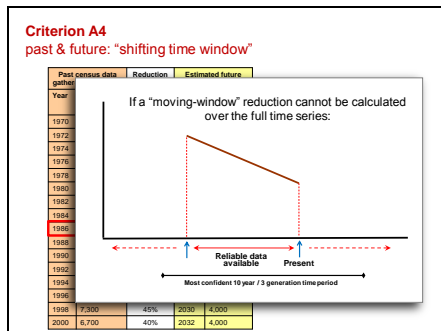
A1. Population reduction observed, estimated, inferred, or suspected in the past where the causes of the reduction are clearly reversible AND understood AND have ceased, based on and specifying any of the following:

- Direct observation
- An index of abundance appropriate to the taxon
- A decline in area of occupancy (AOO), extent of occupancy (EOO) and/or habitat quality
- Actual or potential levels of exploitation
- Effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

A2. Population reduction observed, estimated, inferred, or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible, based on (a) to (e)

A3. Population reduction projected or suspected to be met in the future (up to a maximum of 100 years), based on (b) to (e) under A1.

A4. An observed, estimated, inferred, projected or suspected population reduction (up to a maximum of 100 years) where the time period must include both the past and the future, and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible, based on (a) to (e) under A1.



From raw data to Red List

Near Threatened (NT) example:
Should be close to meeting the VU thresholds or possibly meet some of the subcriteria

- Population has declined by 40% in the last three generations
- Decline has stopped and the causes of the decline are understood; decline appears to be reversible.

NT, nearly meeting VU A1

- Population has declined by 20-25% in the last three generations
- Causes of the decline have not stopped or are not understood

NT, nearly meeting VU A2

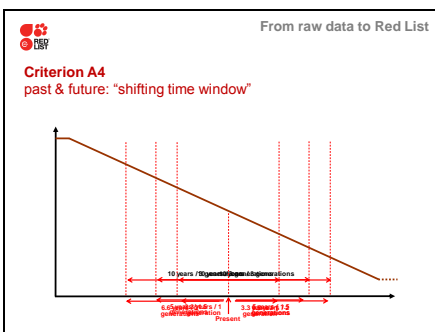
From raw data to Red List

Points to remember:

To use criterion A, an estimate of the generation length is needed

Population reduction may be a one-off event...

... Or it may be ongoing



From raw data to Red List

Points to remember:

Criterion A1 uses higher thresholds than A2, A3 and A4

Use any of the criteria A-E	Critically Endangered	Endangered	Vulnerable
A. Population reduction			
A1	≥ 90%	≥ 70%	≥ 50%
A2, A3 & A4	≥ 80%	≥ 50%	≥ 30%

From raw data to Red List

Points to remember:



A3 = projected **FUTURE** reduction so cannot be based on direct observation (X)

From raw data to Red List

Based on either:

- B1:** Estimated extent of occurrence
- AND / OR**
- B2:** Estimated area of occupancy

AND at least TWO of a-c:

- a. Severely fragmented or few locations
- b. Continuing decline
- c. Extreme fluctuations

Red List Criteria: Criterion B

The IUCN Red List of Threatened Species™


From raw data to Red List

B1 and/or B2

- Severe fragmentation or few locations
- Continuing decline
- Extreme fluctuation

From raw data to Red List

Restricted geographic range + fragmentation, continuing decline or extreme fluctuations



From raw data to Red List

Use any of the criteria A-E	Critically Endangered	Endangered	Vulnerable
B. Geographic range in the form of either B1 (extent of occurrence) AND/OR B2 (area of occupancy)			
B1: Extent of occurrence	< 100 km ²	< 5,000 km ²	< 20,000 km ²
B2: Area of occupancy	< 10 km ²	< 500 km ²	< 2,000 km ²
AND at least 2 of the following			
(a) Severely fragmented, OR Number of locations	= 1	≤ 5	≤ 10
(b) Continuing decline in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			

From raw data to Red List

Example:

- EOO = 22 km² **CR B1**
- AOO = 8 km² **CR B1+B2**
- Threatened by illegal collecting = 1 location **CR B1+B2**
- Continuing decline in the # of mature individuals **CR B1+B2**
- No extreme fluctuations **CR B1ab(ii,v)+B2ab(ii,v)**

CR B1ab(ii,v)+2ab(ii,v)

Key terms and concepts

Points to remember:

- ✓ May use B1 or B2, or both
- ✓ Must also meet **at least two** of the subcriteria a, b or c
- ✓ The subcriteria will be the **same** for B1 and B2
e.g. B1ab(ii,v) ~~and~~ B2ab(iii)

From raw data to Red List

Use any of the criteria A-E	Critically Endangered	Endangered	Vulnerable
B. Geographic range in the form of either B1 (extent of occurrence) AND/OR B2 (area of occupancy)			
B1. Extent of occurrence	< 100 km ²	< 5,000 km ²	< 20,000 km ²
B2. Area of occupancy	< 10 km ²	< 500 km ²	< 2,000 km ²
AND at least 2 of the following			
(a) Severely fragmented, OR Number of locations	= 1	≤ 5	≤ 10
(b) Continuing decline in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) subpopulations; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			

Key terms and concepts

Points to remember:

- ✓ May use B1 or B2, or both
- ✓ Must also meet **at least two** of the subcriteria a, b or c
- ✓ The subcriteria will be the **same** for B1 and B2
- ✓ B1 / B2a may be based on either **severe fragmentation** OR number of **locations**
- ✓ Remember the definitions of the terms (e.g., location)
- ✓ Be very careful with b(iii)

From raw data to Red List

Near Threatened (NT) examples:

<p>Meets VU B1a, but:</p> <ul style="list-style-type: none"> • No continuing declines <i>not b</i> • No extreme fluctuations <i>not c</i> <p>NT B1a</p>	<p>Meets CR B2b(v), but:</p> <ul style="list-style-type: none"> • >10 locations <i>not a</i> • No severe fragmentation <i>not a</i> • No extreme fluctuations <i>not c</i> <p>NT B2b(v)</p>
<p>Meets ab(iii,v):</p> <ul style="list-style-type: none"> • EOO = 22,000 km² and/or AOO = 3,000 km² (highly certain estimates) • EOO = 30,000 km² and/or AOO = 3,000 km² (uncertain estimates) <p>NT, nearly meeting VU B1ab(iii,v)+2ab(iii,v)</p>	

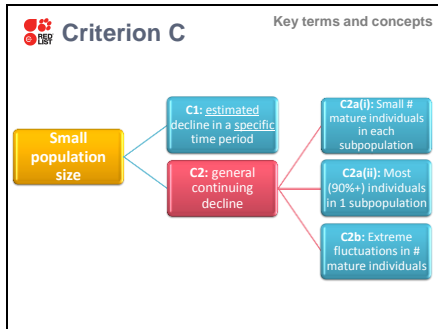
Red List Criteria: Criteria C, D and E

The IUCN Red List of Threatened Species™

Key terms and concepts

Criterion C

Small population size and continuing decline



Key terms and concepts

Criterion C

Based on small population size

AND either

C1: Continuing decline in number of mature individuals at a specified rate **OR**

C2: Continuing decline in population size **at any rate AND either**

C2a - very small subpopulations or most mature individuals in one subpopulation; **or**

Key terms and concepts

Criterion C

Use any of the criteria A-E	Critically Endangered	Endangered	Vulnerable
C. Small population size and decline			
Number of mature individuals	< 250	< 2,500	< 10,000
AND either C1 or C2:			
C1. An estimated continuing decline of at least:	25% in 3 years or 1 generation	20% in 5 years or 2 generations	10% in 10 years or 3 generations
<small>(up to a maximum of 100 years in future)</small>			
C2. A continuing decline AND (a) and/or (b):			
(a) number of mature individuals in each subpopulation:	< 50	< 250	< 1,000
(a)(i) or % individuals in one subpopulation =	90-100%	95-100%	100%
(b) extreme fluctuations in the number of mature individuals			

Key terms and concepts

Criterion C

Based on small population size

AND either

C1: Continuing decline in population size at a specified rate **OR**

C2: Continuing decline in population size **at any rate AND either**

C2a - very small subpopulations or most mature individuals in one subpopulation; **or** **C2b** - extreme fluctuations in population size.


Key terms and concepts

Near Threatened (NT) examples:

• Population size = 15,000 mature individuals	Close to VU
• Estimated 10% decline over last 3 generations and population continues to decline	Meets VU C1
NT C1	
• Population size = 13,250 mature individuals	Close to VU
• Population is declining, but rate unknown	Meets VU C2
• All individuals found in 1 subpopulation	Meets VU C2a(ii)
NT C2a(ii)	
• Population size < 2,500 mature individuals	Meets EN
• Population is declining, but rate unknown	Meets EN C2
• Largest subpop = 1180 mature individuals	Close to VU C2a(i)
NT C2a(i)	

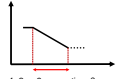
Key terms and concepts

Criterion C points to remember:



To use criterion C, an estimate of the population size is needed

To use criterion C1, an estimate of the generation length is needed



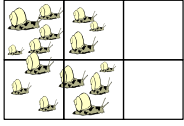
1, 2 or 3 generations? or 3, 5 or 10 years?

Key terms and concepts

Criterion D

Based on

D and D1: VERY small population size




OR

D2: VERY restricted AOO or few locations (VU only)

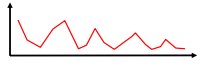
Key terms and concepts

Criterion C points to remember:

For C1, you need some population data to be able to estimate the reduction rate.



For C2, population decline can be at an unknown rate, but population structure or fluctuations must follow the rules in C2a or C2b.



Species 1		Species 2	
Year	Population size	Year	Population size
2000	1000	2000	1000
2001	1000	2001	1000
2002	1000	2002	1000
2003	1000	2003	1000
2004	1000	2004	1000
2005	1000	2005	1000
2006	1000	2006	1000
2007	1000	2007	1000
2008	1000	2008	1000
2009	1000	2009	1000
2010	1000	2010	1000
2011	1000	2011	1000
2012	1000	2012	1000
2013	1000	2013	1000
2014	1000	2014	1000
2015	1000	2015	1000
2016	1000	2016	1000
2017	1000	2017	1000
2018	1000	2018	1000
2019	1000	2019	1000
2020	1000	2020	1000
2021	1000	2021	1000
2022	1000	2022	1000
2023	1000	2023	1000
2024	1000	2024	1000
2025	1000	2025	1000
2026	1000	2026	1000
2027	1000	2027	1000
2028	1000	2028	1000
2029	1000	2029	1000
2030	1000	2030	1000

Key terms and concepts

Criterion D


Use any of the criteria A-E	Critically Endangered	Endangered	Vulnerable
D: Very small or restricted population			
Either:			
Number of mature individuals	< 50	< 250	D1: < 1,000
VU D2: Restricted area of occupancy or number of locations with a plausible future threat that could drive the taxon to CR or EX in a very short time.			D2: typically AOO < 20 km ² or number of locations ≤ 5

CR EN } → D VU → D1/D2

Key terms and concepts

Criterion D

Very small or restricted population



Key terms and concepts

Near Threatened (NT) examples:

<ul style="list-style-type: none"> Population size = 1,500 mature individuals Nearly meets VU D1 <p>NT D1</p>	<ul style="list-style-type: none"> Best estimate for population size = 2,000 mature individuals Estimate is very uncertain; population could be as low as 1,000 <p>NT D1</p>
<ul style="list-style-type: none"> AOO = 12 km² and 3 locations Population being harvested but not currently declining Harvest may increase (= plausible threat) but species only likely to become VU or EN within 1-2 generations <p>NT D2</p>	

Key terms and concepts

More examples:

- Taxon lives in one lake. AOO = 22 km²
- Population currently stable.
- No current threats, but introduction of invasive predatory fish has occurred in other nearby lakes. If fish are introduced, population will surely plummet and could become Extinct.

VU D2

- AOO = 17 km² and 2 locations
- Population is not declining
- No current threats, no plausible future threats; population likely to remain stable.


LEAST CONCERN

Key terms and concepts

	Criterion A	Criterion C	Criterion D
Small population size		X	X
Population decline	X	X	
Generation length estimate	X	For C1	
Specific population structure		For C2a	
Decline rate thresholds	Higher	Lower	
Time period for decline	Longer	Shorter	

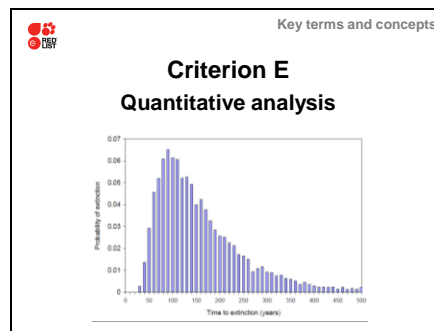
Key terms and concepts

Criterion D points to remember:



To use criteria D or D1, an estimate of the population size is needed

D1 & D2 → Vulnerable category only




Key terms and concepts

Criterion D points to remember:

For D2, there must be a serious plausible threat to the population and this must be stated in the assessment.

D2. typically:
AOO <20 km² or
number of locations ≤ 5

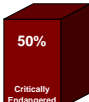


For D2, the thresholds noted in the criteria are examples only.

Key terms and concepts


Criterion E

Based on a quantitative analysis showing a probability of extinction in the wild is at least:




50%
Critically Endangered

Within 10 years or 3 generations



20%
Endangered


Within 20 years or 5 generations



10%
Vulnerable

Within 100 years


Up to a maximum of 100 years in the future

 **Criterion E** Key terms and concepts

Use any of the criteria A-E **Critically Endangered** **Endangered** **Vulnerable**


E. Quantitative analysis

Indicating the probability of extinction in the wild to be:	≥ 50% in 10 years or 3 generations (100 years max)	≥ 20% in 20 years or 5 generations (100 years max)	≥ 10% in 100 years
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 Introduction to the IUCN Red List

Criterion A	EN A2acd CR A3bd CR A4abcd
Criterion B	EN B1ab(v)+2ab(v)
Criterion C	CR C1
Criterion D	EN D VU D2
Criterion E	CR E

Final assessment:
CR A3bd+4abcd;C1;E



The Final Assessment:
Putting the criteria together to assign a final category

The IUCN Red List of Threatened Species™