# Mapping Standards and Data Quality

## for the IUCN Red List Spatial Data

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# Contents

# 1 Spatial data and The IUCN Red List

Spatial data are a key component of The IUCN Red List of Threatened Species (hereafter "IUCN Red List"). Several of the Red List criteria are based on measures of species' distributions. Data are also used for spatial filtering on The IUCN Red List website, and for spatial analyses to support conservation. This guidance document provides an overview of the different elements of spatial data on The IUCN Red List and outlines what kinds of spatial data Red List Assessors are required to provide with each assessment, along with relevant formats and standards.

Note that spatial data are also a key component of IUCN Green Status of Species assessments (hereafter "IUCN Green Status"). Aligning mapping processes between The IUCN Red List and IUCN Green Status is increasingly important as the IUCN Green Status assessment process is taking off to help both processes be as efficient as possible. While in this document, we primarily focus on mapping guidance for the IUCN Red List, we highlight where special consideration should be given to the IUCN Green Status process and have started to integrate guidance specific to IUCN Green Status mapping. The guidance given in this document to help align these two processes will evolve over time.

## 1.1 Why spatial data are required

Spatial data are some of the most frequently used data on The IUCN Red List. They are crucial information for conservation planning and enable a broad variety of research in support of conservation. They are essential for supporting Red List assessments under criteria B and D2. Each assessment should provide spatial data in some form.

Assessors should produce the most accurate depiction of a taxon's current and historic distribution based on their knowledge and the available data, in a format that is considered most appropriate to inform conservation action for the taxon. These maps are also displayed and can be used for spatial searches on The IUCN Red List website.

## 1.2 Reasons for a distribution map

A key component of spatial data is the distribution map (see section 2.3), which is a depiction of a taxon's distribution; this does not equate to either the spread of extinction risk (i.e., extent of occurrence) or the occupied range area (i.e., area of occupancy) as defined by the IUCN Red List Categories and Criteria.

There are three main reasons for creating a distribution map for a taxon being assessed for the IUCN Red List:

- **Informing Red List assessments**: Distribution maps can help to inform Red List assessments by supporting calculations of some parameters used in the assessment process, such as the extent of occurrence (EOO).

- **Helping to identify conservation priorities**: Spatial data can be used for analyses, which can inform conservation planning and policy, identify priority areas for conservation, identify gaps in scientific knowledge, and help inform business decisions (for example, where not to expand development).

- **Visual representation**: A distribution map provides a visual representation of a taxon's distribution. By combining spatial data for many taxa and analysing these alongside other Red List data (such as Red List category), informative maps can be prepared to, for example, highlight areas with high numbers of threatened species.

## 1.3 IUCN Red List versus IUCN Green Status mapping

Note that for an IUCN Green Status assessment, assessors are asked to map three things:

- the historical (indigenous) part of the range, back to the benchmark date determined in the Green Status assessment;
- the expected additional range; and
- the delineated spatial units (although this is not compulsory).

Since both IUCN Red List and IUCN Green Status assessments will be displayed on the IUCN Red List website with an accompanying map, it is important to be mindful of both processes and align the maps as much as possible to ensure their usefulness to the Red List end user.

Here are some key points to remember and be mindful of:

### 1.3.1 Historical range

In IUCN Red List assessments, assessors largely focus on mapping current known limits of range. While they are also encouraged to map historical range where this is relevant (e.g., to illustrate or provide context to local extirpations or range loss), in practice, mapping of historical range is usually completed only for a limited group of (often charismatic) species. With the exception of globally Extinct and Extinct in the Wild species, mapping historical range is also not required or recommended supporting information.

However, for an IUCN Green Status assessment, mapping historical range (as part of indigenous range) is essential. Assessors must use the best available information to construct a map that accurately reflects the historical range. Crucially, mapped historical range in IUCN Green Status assessments is explicitly tied to a "benchmark date" established as part of a IUCN Green Status assessment, which must be later than 1500 and before 1950. In other words, mapped historical range represents, to the best available knowledge, the limits of distribution of the species at that stated point in time.

Thus, for IUCN Red List assessors, there are two aspects to be mindful of when mapping historical range:

a.        Historical range should not be mapped to a date earlier than 1500 – this is to ensure consistency with mapped historical range in IUCN Green Status assessments, and also to ensure consistency with the 1500 cut-off date for species to be considered as eligible for listing on the Red List. This means, for example, that a map showing historical range of the lion would not show extirpated range in Greece, since it far precedes the 1500 date.

b.        If assessors want to map/show historical range, they should seriously consider also carrying out a Green Status assessment; however, if this is not possible (e.g. due to time constraints) then they should at least ensure that they map historical range to an explicitly indicated benchmark date. This would have the advantage of ensuring better interpretation of what historical / extirpated range in a Red List map corresponds to, and increase the utility of these spatial data in subsequent IUCN Green Status assessments.

### 1.3.2 Mapping of Subspecies, Varieties or Subpopulations versus Green Status Spatial Units

In a Green Status assessment, a species' range is subdivided into Spatial Units, in which the state of the species is assessed as Absent, Present, Viable, or Functional. Spatial units can be delineated by subpopulation, ecological and geographical features, and location, or a combination of these. Because IUCN Red List spatial data already have a  data field "Tax_comm" that allows assessors to indicate subspecies, varieties or subpopulations, the introduction of an additional field to capture spatial units, especially where the spatial units do not conform with subpopulations, could lead to issues when visualising the distribution maps on the IUCN Red List website. It is also likely to add substantial complexity for any end users hoping to utilise the spatial data for conservation purposes. Further guidance will be forthcoming to assist assessors who wish to map Spatial Units in a GSS assessment in how to capture this information in the attribute data.

## 2 What distribution data are needed for Red List assessments?

In addition to the textual description of the species' distribution and its countries of occurrence (COO; coded by presence, origin and seasonality) (see Supporting Information Guidelines), spatial data are required to support all IUCN Red List assessments, except for taxa of unknown provenance (see Annex 1 of the Rules of Procedure). These spatial data come in the form of a distribution map that represents the best available depiction of the historical, present and projected distribution of a taxon – also coded by presence, origin and seasonality.

## 2.1 Species distribution text and map status in SIS

SIS (Species Information Service) stores information on the geographic distribution, how the distribution map was created, and the data sources/methods used. This is recorded within the *Geographic Range* text and the *Map Status* fields in the *Distribution* section of a taxon's assessment.

*Geographic Range*: in this text field, a concise narrative of currently available information on the geographic range of the taxon is required supporting information for all taxa that are not assessed as Least Concern (Table 2 of Annex 1 of the Rules of Procedure). For taxa that are particularly sensitive to collecting or hunting, it is prudent to avoid providing information that allows people to see exactly where the taxon can be found, but a less precise summary should be provided.

*Map Status*: It is mandatory to fill the *Map Status* field in SIS, which can take the values below:

- Done – the map has been completed to the required standards and will be provided as part of the assessment. It will be published unless the data are marked as sensitive (see sections 4 and 8.5).
- Missing – the map is missing and needs to be located. An assessment with this status cannot be submitted or published.
- Incomplete – the map will be provided, but it is known not to be complete, for example there was not enough information to map certain parts of the range. Incomplete maps will be published (unless the data are marked as sensitive, see sections 4 and 8.5). A reason for the map being incomplete must be provided in the justification box in SIS.
- Not Possible – making a distribution map for the species is not possible. For example, the distribution is only known at a coarse country level, or is not known (such as for some Data Deficient taxa). A reason must be provided in the justification box in SIS. Red List assessments with this map status will be published without a distribution map.

## 2.2 Countries of occurrence (COO)

The countries where the taxon occurs must be entered into SIS, with the appropriate distribution codes for Presence, Origin and Seasonality (see section 5 for an explanation of the Presence, Origin and Seasonality codes). Assessors need to ensure that the Countries of Occurrence (COO) indicated on the spatial map are consistent with those listed in SIS. See section 6 (Countries of occurrence (COO) in SIS) for more information.

To minimize inconsistencies between SIS and the distribution map, it is also crucial to make sure that the appropriate recommended country basemap dataset is used (this is available from the GIS Tools, Software and Recommended Base data page on the IUCN Red List website).

## 2.3 Distribution map

We encourage Assessors to provide the best possible map they can make (i.e., as accurate as possible considering the available data). To ensure efficiency and ease of data management, it is preferable to submit the distribution map data in one or more of the following:

1) **Occurrence Data (Point/s)**: Each historical, present and possible occurrence of a taxon is represented by a pair of coordinates known as a point locality.

2) **Polygon Data (limits of distribution/field guide map):** The historical, present and possible distribution of a taxon's occurrences is represented by a polygon or set of polygons.

3) **Polygon Data (basins):** The historical, present and possible distribution of a taxon's occurrences is represented by a basin (HydroBASIN) or a set of basins. 'Basin' is used as a short term for HydroBASIN – more information can be found here.

The recommended projection is WGS 1984 (World Geodetic Survey 1984, EPSG:4326).

Polygon data are generally provided in form of a distribution map (commonly referred to as "limits of distribution" or "field guide" map) which aims to represent the known and possible present and historical distribution of a taxon within its native and introduced range. The limits of distribution are determined by using known occurrences of the taxon, along with knowledge of habitat, elevation limits, and other expert knowledge of the taxon and its range. Essentially, a polygon displays the limits of a taxon's distribution, and is intended to communicate that the taxon probably only occurs within the polygon, but it does not mean that it is distributed equally within that polygon or occurs everywhere within that polygon.

Options 1, 2 and 3 above are not mutually exclusive; an assessment can be supported by a combination of the three. Independent of the method used, a minimum set of attribute data (metadata) should be provided; the attribute information is described further in section 4.

For assessments that are accompanied by points only, it is recommended, if possible and appropriate, that a polygon map representing the distribution is also provided. Plausible options include, for example, the Minimum Convex Polygon (MCP) map (equivalent to the maximum EOO as defined in this document). Such a polygon should be marked in the polygon attribute table as *generalisd* = 1 (see Table 2 in section 4.1.2). It would be used for display on the IUCN Red List website along with the points, and could also be used for analysis purposes.

# 3 Taxon and system differences

There are preferred approaches (polygons, basins, points) for different taxonomic groups and systems. These are not intended to be strict rules; for any deviations, please contact the GIS team within the IUCN Red List Unit.

## 3.1 Terrestrial and marine taxa

A taxon's distribution can be provided either as point or polygon data or both; in the case of species occurring in both terrestrial and freshwater habitats (e.g. Odonata), distribution can also be mapped as basins. For polygons, areas of unsuitable habitat, climate or physical geography (e.g., altitude, bathymetry, hydrology) should be removed to provide a refined range.

## 3.2 Inland water taxa (freshwater)

It is highly recommended that the distribution maps for inland water taxa use the official HydroBASIN sub-basin layer, available from the GIS Tools, Software and Recommended Base data page on The IUCN Red List website. HydroBASINS are available in different resolutions (size of sub-basins), with the smaller sub-basins (e.g., levels 10 and 12) being nested within larger sub-basins (e.g., level 8). The appropriate resolution to use will depend on the level of knowledge of the taxon as well as size of its distribution range.

For inland water taxa, as with other groups, the distribution map should represent the best possible representation of the distribution. For those inland water taxa with distributions more restricted than the finest scale HydroBASINS layer (such as the location of a cave or small wetland to which a taxon is restricted), the range should be mapped as a polygon reflecting the specific distribution, rather than generalising to the finest scale HydroBASINS layer. If a coarser HydroBASINS layer is used (for example where a taxon only occurs at an edge of the basin or only in a main channel), the minimum convex polygon (MCP) will be inflated (see EOO description in section 7.1).

If point data are being provided for inland water taxa, Assessors are strongly encouraged to provide the corresponding HydroBASINS data as well. HydroBASINS data are used in multiple freshwater-focused projects coordinated by the IUCN Biodiversity Assessment and Knowledge Team and providing these data will ensure the maps are included as part of large-scale analyses using this type of spatial data.

More detailed information about mapping of inland water taxa can be found in the Freshwater Mapping Protocol.

# 4 Attributes for distribution maps

For the distribution map, there is a list of data attributes which must be recorded for both polygon and point data. These attributes help describe the taxon's distribution. Please refer to the Excel file 'IUCN Standard attributes for spatial data' available from the Mapping Standards and Data Quality for IUCN Red List Spatial Data page on The IUCN Red List website. This file provides detailed guidance on required and recommended attribute data fields, including definitions, field types, field lengths, and equivalent data fields in other datasets.

Tables 1 and 2 list the standard attributes for spatial data; the codes used to indicate Presence, Origin and Seasonality. These codes are also used to create legends for the distribution map (see section 9.2).

Please note that only the Required and Recommended fields are displayed in Tables 1 and 2 – more information on these can be found in Mapping Standards and Data Quality for IUCN Red List Spatial Data on The IUCN Red List website.

The spatial attributes' field names are limited to 10 characters in order to match the Shapefile format (the Shapefile format does not allow field lengths of greater than 10 characters).

## 4.1 Polygon and point data

### 4.1.1 Required polygon and point attributes

Table 1 lists the required attributes for polygon and point data. Note that some of these attributes are taxon dependent: these are the attributes described as "**[Required (if relevant)]**" in the Description column. For example, for a polygon depicting the distribution of a subspecies (e.g., *Panthera leo* ssp. *persica*) the ***subspecies*** attribute field must be completed.

**Table 1:** Required attributes for polygons and points ( ✔ indicates whether the field applies to polygons and/or points)

| Field | Description | Notes | Polygons/ Basins | Points |
|---|---|---|---|---|
| **sci_name** | Scientific name of the taxon | This must match the corresponding field in SIS, e.g. *"Panthera leo"*; "*Panthera leo* ssp. *persica*"; *"Veratrum mengtzeanum* subsp. *mengtzeanum"*; "*Cedrus libani* var. *brevifolia*". Previously known as *binomial*. | ✔ | ✔ |
| *hybas_id* | HydroBASIN ID **[Required if** HydroBASINS have been used for mapping the data] | If HydroBASINS have been used to provide distribution data, the hybas_id, which is the unique identifier of that basin where the taxon has been mapped, should be provided. | ✔ | |
| **presence** | Is/Was the species in this area | See Presence codes (default is 1 if not indicated). | ✔ | ✔ |
| **origin** | Why/ How the species is in this area | See Origin codes (default is 1 if not indicated). | ✔ | ✔ |
| **seasonal** | What is the seasonal presence of the species in the area **[Required if applicable]** | See Seasonality codes (default is 1 if not indicated or not applicable). | ✔ | ✔ |
| **compiler** | Name of the individual/s or institution responsible for generating the point or polygon distribution, if not IUCN | Names should be given in full (e.g., "John Smith"; "NatureServe"; "World Conservation Monitoring Centre"). If not indicated, this will default to "IUCN (International Union for Conservation of Nature)". | ✔ | ✔ |
| **yrcompiled** | Year in which the taxon distribution was mapped, compiled, or modified | If not indicated, this will default to the current year. | ✔ | ✔ |
| **citation** | Individual/s or institution/s responsible for providing the map data for the Red List assessment to IUCN. This field is used for the overall map citation | This must be the same throughout the file. It is how the map data will be credited on the IUCN Red List. If not indicated, this will default to "IUCN (International Union for Conservation of Nature)". | ✔ | ✔ |
| **dec_lat** | The geographical latitude in decimal degrees | E.g., -41.097. Positive values are north of the equator; negative values are south of it. Valid values lie between -90 and 90. | | ✔ |

| dec_long | The geographical longitude in decimal degrees | E.g., -121.25. Positive values are east of the Greenwich Meridian; negative values are west of it. Valid values lie between -180 and 180. | | ✔ |
|---|---|---|---|---|
| spatialref | The ellipsoid, geodetic datum or spatial reference system (SRS) upon which the geographic coordinates (supplied in dec_lat and dec_long) are based | Data is preferred in WGS84. If blank, the default of WGS84 will be assumed.  E.g.: "WGS84"; "EPSG:4326"; "NAD27"; "Campo Inchauspe"; "European 1950"; "Clarke 1866". | | ✔ |
| subspecies | Subspecies Name/Epithet **[Required if relevant]** | To indicate that the data relates to a specific subspecies (or variety) of the assessed taxon. This must then match the infra name in SIS, e.g., "*persica*", "*brevifolia*". | ✔ | ✔ |
| subpop | Subpopulation Name/Epithet **[Required if relevant]** | To indicate that the data relates to a specific subpopulation of the assessed taxon, e.g., "Hawaiian subpopulation". | ✔ | ✔ |
| data_sens | Flags up whether or not the polygon distribution/data point is sensitive. **[Required if data is sensitive]** | This is most likely to be the case if the polygon or point shows individual localities of a sensitive nature as determined by the Assessor. True or false field: 1 or 0. If 1 for true/yes, the field **sens_comm** should be completed. Default is 0 for false/no. | ✔ | ✔ |
| sens_comm | Comments on why the data are considered sensitive **[Required if data_sens is 1]** | [Max. 254 characters] | ✔ | ✔ |

Notes:
1)  The **citation** must be the same for all polygons, HydroBASINS and points for a given taxon.
2)  Alongside coding of sensitive data via the **data_sens** field in the spatial data's attribute table, Assessors must code the species distribution as sensitive in SIS (Distribution tab -> Map Status tab -> "Data Sensitive?" checkbox).


### 4.1.2 Recommended polygon and point attributes

The Recommended attributes are listed in Table 2. Although they are not required, these attributes should be recorded whenever this information is available, so we encourage effort being made to enter the relevant information into these fields as much as possible.

**Table 2:** Recommended attributes for polygons and points

| Field | Description | Notes | Polygons/ Basins | Points |
|---|---|---|---|---|
| **event_year** | The four-digit year in which the Event (object or observation) occurred | For example, 2008. | | ✓ |
| **source** | Source of the distribution range / point data | Relates to the primary source used to compile each polygon or point, especially in a recently published range map, or a set of point data. References should be in the format "AuthorX and AuthorY, date" and the reference should be in the corresponding IUCN Red List assessment. [Max. 254 characters] | ✓ | ✓ |
| **basisofrec** | The specific nature of the data record. (reference valid Feb2021: https://dwc.tdwg.org/list/#dwc_basisOfRecord) | Options: "PreservedSpecimen", "FossilSpecimen", "LivingSpecimen", "HumanObservation", "MachineObservation", "StillImage", "MovingImage", "SoundRecording" | | ✓ |
| **catalog_no** | An identifier (preferably unique) for the record within the data set or collection | Name of the museum or herbarium and the specimen number. | | ✓ |
| **dist_comm** | Distribution comments that refer directly to the polygon or point | Examples include whether the polygon represents the type locality, names of protected areas or geographical features, and so forth. May also include specific notes on presence, origin or seasonality. [Max. 254 characters] | ✓ | ✓ |
| **island** | Name of the island on which the polygon or point is located | This relates mainly to very small islands or atolls (e.g., "Midway Atoll"; "Meemu Atoll"; "Bohol") | ✓ | ✓ |
| **tax_comm** | Taxonomic comments that refer directly to the polygon | Includes notes on polygons pertaining to subspecies, varieties or subpopulations. [Max. 254 characters] | ✓ | ✓ |
| **generalisd** | Flag to indicate whether the polygon is generalised | True or false field: 1 or 0. Set to 1 if the polygon shows a generalised distribution. Default is 0 for false/no. | ✓ | |

**Notes:**

1) For entries in the *source* attribute field that approach the 254 character limit, apply standard abbreviations and then define these within the reference list within SIS.

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### 4.1.3 Optional data attributes

Optional attributes may be used and some are taxon dependent. The list of optional attributes can be found in the Excel file 'IUCN Standard attributes for spatial data', available from the Mapping Standards and Data Quality for IUCN Red List Spatial Data page on The IUCN Red List website).

Note: Please make sure to use the most recent 'IUCN Standard attributes for spatial data' Excel file, as this will be regularly updated with the most recent information, and includes a log to indicate what has changed.

# 5 Coding of Presence, Origin and Seasonality for distribution maps

Every polygon and point occurrence in the distribution map requires Presence, Origin and Seasonality to be recorded using the relevant codes from Tables 3, 4 and 5.

## 5.1 Presence codes

Table 3 outlines the definitions for the various coding options for a taxon's Presence within a particular area. These Presence codes and their definitions apply both to spatial data (i.e., polygons and point data) and to non-spatial data (e.g., countries of occurrence in SIS).

Note that the Presence codes were updated in February 2014, so please make sure that you check the current definitions, and understand what implications this might have for any existing spatial data if these have not yet been migrated (see section 10.1.1). See section 7.1 to check how extent of occurrence (EOO) should be calculated using the revised Presence codes.

**Table 3:** Codes for recording the Presence of a taxon within a polygon or for a point occurrence.

| CODE | PRESENCE | DEFINITION |
|------|----------|------------|
| 1 | Extant | The species is known or thought very likely to occur currently in the area, which encompasses localities with current or recent (last 20-30 years) records where suitable habitat at appropriate altitudes remains (see note 2). Extant polygons can include inferred or spatially projected sites of present occurrence (see the *Guidelines for Using the IUCN Red List Categories and Criteria* for further guidance). Extant ranges should be considered in the calculation of EOO or AOO. When mapping an "assisted colonisation" it is important to note that this range should be treated as Extant. |
| 2 | *Probably Extant* | *This code value has been discontinued for reasons of ambiguity. It may exist in the spatial data but will gradually be phased out.* |
| 3 | Possibly Extant | There is no record of the species in the area, but the species may possibly occur, based on the distribution of potentially suitable habitat at appropriate altitudes, although the area is beyond where the species is Extant (i.e., beyond the limits of known or likely records), and the degree of probability of the species occurring is lower (e.g., because the area is beyond a geographic barrier, or because the area represents a considerable extension beyond areas of known or probable occurrence). Identifying Possibly Extant areas is useful to flag up areas where the taxon should be searched for. Possibly Extant ranges should not be considered in the calculation of EOO or AOO. |
| 4 | Possibly Extinct | The species was formerly known or thought very likely to occur in the area (post 1500 CE), but it is most likely now extirpated from the area because habitat loss and/or other threats are thought likely to have extirpated the species, and there have been no confirmed recent records despite searches. Possibly Extinct ranges should not be considered in the calculation of EOO or AOO. |
| 5 | Extinct | The species was formerly known or thought very likely to occur in the area (post 1500 CE), but it has been confirmed that the species no longer occurs because exhaustive searches have failed to produce recent records, and the intensity and timing of threats could plausibly have extirpated the taxon. Extinct ranges should not be considered in the calculation of EOO or AOO. |
| 6 | Presence Uncertain | A record exists of the species' presence in the area, but this record requires verification or is rendered questionable owing to uncertainty over the identity or authenticity of the record, or the accuracy of the location. Presence Uncertain records should not be considered in the calculation of EOO or AOO. |
| 7 | Expected Additional Range | The species is not currently known to occur in the area, but this area is expected to (1) become suitable in the next 100 years, taking into account range shifts resulting from climate change, AND (2) to become occupied by the species, with or without human assistance. ***Expected additional range is only considered in a Green Status of Species assessment and not for point occurrences.*** |

**Notes:**

1) These codes are mutually exclusive, e.g., a polygon coded as "Extant" cannot also be coded as "Extinct".

2) When there is uncertainty as to whether or not a species still occurs in an area in which it was formerly known to occur (usually because there have been no recent surveys), it is necessary for Assessors to judge whether it is more appropriate to assign a coding of "Extant", "Possibly Extant" or "Possibly Extinct" (based on available knowledge of remaining habitat, intensity of threats, adequacy of searches, and other evidence).

3) EOO calculations should be based on polygons coded as "Extant" only.

4) The old Presence code 2 ("Probably Extant") is now discontinued. See for more information.

5) Note that Presence code 7 ("Expected Additional Range") has been introduced for the purpose of IUCN Green Status assessment processes. In mapping expected additional range, Green Status assessors are effectively projecting forward in time to regions not currently occupied by the species, but that the species is expected to occupy in 100 years. It is therefore a completely distinct mapped part of range that is considered only in Green Status assessments.

## 5.2 Origin Codes

Table 4 outlines the definitions for the various coding options for a taxon's Origin within a particular area. These Origin codes and their definitions apply both to spatial data (i.e., polygons and point data) and to non-spatial data (e.g., Countries of occurrence in SIS)

**Table 4:** Codes for recording the Origin of a taxon within a polygon or for a point occurrence.

| CODE | ORIGIN | DEFINITION |
|------|--------|------------|
| 1 | Native | The species is/was native to the area. |
| 2 | Reintroduced | The species is/was reintroduced within its known historical range through either direct or indirect human activity. |
| 3 | Introduced | The species is/was introduced outside of its known historical distribution range through either direct or indirect human activity. Does not include species subject to assisted colonisation. Includes species intentionally moved outside of its native range to perform a specific ecological function. |
| 4 | Vagrant | The species is/was recorded once or sporadically, but it is known not to be native to the area. |
| 5 | Origin Uncertain | The species' provenance in an area is not known (it may be native, reintroduced or introduced) |
| 6 | Assisted Colonisation | Species subject to intentional movement and release outside its native range to reduce the extinction risk of the taxon. |

**Notes**:

1) EOO estimates should be based on Origin codes 1, 2, and 6.

2) The codes are mutually exclusive, for example, a polygon coded as "Introduced" cannot also be coded as "Native".

3) Point or polygon occurrences resulting from reintroduction or assisted colonisation should only be included in a species' distribution map when those subpopulations satisfy the conditions for inclusion in a Red List Assessment (see Section 2.1.3 in the Guidelines for Using the IUCN Red List Categories and Criteria for further guidance).

## 5.3 Seasonality Codes

Table 5 outlines the definitions for the various coding options for a taxon's Seasonality within a particular area. These Seasonality codes and their definitions apply both to spatial data (i.e., polygons and point data) and to non-spatial data (e.g., Countries of occurrence in SIS).

**Table 5:** Codes for recording the Seasonality of a taxon within a polygon or for a point occurrence.

| CODE | SEASONALITY | DEFINITION |
|------|-------------|------------|
| 1 | Resident | The species is/was known or thought very likely to be resident throughout the year. |
| 2 | Breeding Season | The species is/was known or thought very likely to occur regularly during the breeding season and to breed or capable of breeding. |
| 3 | Non-breeding Season | The species is/was known or thought very likely to occur regularly during the non-breeding season. In the Eurasian and North American contexts, this encompasses 'winter'. |
| 4 | Passage | The species is/was known or thought very likely to occur regularly during a relatively short period(s) of the year on migration between breeding and non-breeding ranges. |
| 5 | Seasonal Occurrence Uncertain | The species is/was present, but it is not known if it is present during part or all of the year. |

**Notes:**

1)  'Regularly' means known or thought to occur in at least 30% of years. Where it is deemed important to record the occurrence of breeding/passage etc. for a species which occurs less often than 30% of years (for example because the population is now tiny), the category can be ticked, but a comment added to the *dist_comm* field (e.g., "Only recorded in 2 years during 1985-2000").

2)  If the species does not regularly breed, but there are occasional breeding records, this can be noted in the *dist_comm* field.

3)  If there is insufficient information to be confident of assigning Non-breeding Season vs. Passage categories, a best guess should be made, and a comment entered in the *dist_comm* field that some ambiguity exists. Where there is extreme uncertainty, the "Seasonal Occurrence Uncertain" value should be used.

## 5.4 Presence, Origin and Seasonality quick reference

Table 6 presents a "quick reference" summary of the Presence, Origin and Seasonality codes from Tables 3, 4 and 5.

Please note that these codes are mutually exclusive within the columns. For example, a polygon coded as Presence 1 ("Extant") cannot also be coded as Presence 5 ("Extinct"); however, Presence can be coded as 1 ("Extant") and Origin as 5 ("Origin uncertain") for the same polygon.

**Table 6:** Summary of Presence, Origin and Seasonality codes.

| Code | Presence | Origin | Seasonality |
|---|---|---|---|
| 1 | Extant | Native | Resident |
| 2 | Probably Extant | Reintroduced | Breeding season |
| 3 | Possibly Extant | Introduced | Non-breeding season |
| 4 | Possibly Extinct | Vagrant | Passage |
| 5 | Extinct (post 1500) | Origin uncertain | Seasonal Occurrence Uncertain |
| 6 | Presence uncertain | Assisted Colonisation | |

# 6 Countries of occurrence (COO) in SIS

Assessors need to ensure that the Countries of Occurrence (COO) indicated on the spatial map are consistent with those listed in SIS. In future, there may be some functionality to help automate this process – but it will still be the Assessor's responsibility to ensure that the COO recorded in SIS correspond to those displayed on the distribution map.

To minimize inconsistencies between SIS and the distribution map, it is also crucial to make sure that the appropriate recommended country basemap dataset is used (this is available from the [GIS Tools, Software and Recommended Base data](#) page on the IUCN Red List website).

## 6.1 Countries with multiple distribution codes in the spatial data

In the selections for Countries of Occurrence (COO) in SIS there is only one entry recorded for each country where the taxon occurs. However, since it can happen that within a country there are multiple polygons or points with different distribution codes, it is important that the appropriate corresponding code is captured for the non-spatial data. Below are the rules to guide this coding to ensure correspondence between the spatial and non-spatial data.

- Presence codes ( > means has precedence over):
  1. Extant > 3. Possibly Extant > 4. Possibly Extinct > 5. Extinct > 6. Presence Uncertain
- Origin codes:
  1. Native > (2. Reintroduced / 6. Assisted Colonisation) > 3. Introduced > 4. Vagrant > 5. Origin Uncertain

For example, if a taxon has two polygons (A and B) for Country X, where polygon A is coded as *presence* 1 and *origin* 5, and polygon B is coded as *presence* 3 and *origin* 3, then when recording the COO for Country X, *presence* should be 1 and *origin* should be 3.

It is possible to select multiple codes for Seasonality for each country, so no such rule is necessary for Seasonality coding.

Note that in recording Countries of Occurrence in SIS, it is possible for a country to have multiple sub-countries which may have different Presence, Origin and Seasonality codes. The same rules as above apply. For example, if a taxon occurs in two sub-countries (A and B) for Country X, where sub-country A is coded as *presence* 1 and *origin* 5, and sub-country B is coded as *presence* 3 and *origin* 3, then when recording the COO for Country X, *presence* should be 1 and *origin* should be 3.

# 7 Extent of occurrence (EOO), area of occupancy (AOO)

## 7.1 Extent of occurrence (EOO)

Extent of occurrence (EOO) is defined as "the area contained within the shortest continuous imaginary boundary which can be drawn to encompass all the known, inferred or projected sites of present occurrence of a taxon, excluding cases of vagrancy".

EOO is a parameter that measures the spatial spread of the areas currently occupied by the taxon. It is included in the IUCN Red List Criteria as a measure of the degree to which risks from threats are spread spatially across the taxon's geographical distribution (see section 4.9 of the Guidelines for Using the IUCN Red List Categories and Criteria).

### 7.1.1 How should EOO be calculated for polygon maps and point maps?

EOO should be calculated by applying a Minimum Convex Polygon (MCP) (the smallest polygon in which no internal angle exceeds 180 degrees and which contains all the sites of occurrence) around the mapped range, which should be mapped as accurately as possible based on all of the available data.

More information on EOO can be found in Joppa, L. N., Butchart, S. H. M., Hoffmann, M., Bachman, S. P., Akçakaya, H. R., Moat, J. F., Böhm, M., Holland, R. A., Newton, A., Polidoro, B. and Hughes, A. 2016. Impact of alternative metrics on estimates of extent of occurrence for extinction risk assessment. *Conservation Biology* 30: 362–370. doi:10.1111/cobi.12591.

Exceptions will **not be allowed** for taxa with:

1. 'Doughnut distributions', for example aquatic species confined to the margins of a lake. (Such distributions should reduce, not increase, extinction risk for threats that are also restricted to similar distributions).

2. Small and highly disjunct subpopulations (e.g., for which the majority of the population occurs on a mainland with an additional subpopulation on a small and distant island, the inclusion of which within the MCP would considerably increase the EOO estimate). Note this contradicts what is stated in the Mace *et al*. (2008) paper.

3. Curved linear distributions that are shaped in an arc. (Most of the increase in EOO estimate for such taxa would be as a result of joining up the various "blobs" into a single polygon, rather than from including the area within the inside of the curve).

Note that MCPs are in some cases considered less suitable as a method for comparing two or more temporal estimates of EOO for assessing reductions or continuing declines. Therefore, a method such as the α-hull (a generalization of a convex hull) is recommended for assessing reductions in EOO. For further information, refer to Section 4.9 in the [Guidelines for Using the IUCN Red List Categories and Criteria](#).

In the case of migratory species, EOO should be based on the minimum of the breeding or nonbreeding (wintering) areas, but not both, because such species are dependent on both areas, and the bulk of the population is found in only one of these areas at any time. If EOO is less than AOO, EOO should be changed to make it equal to AOO to ensure consistency with the definition of AOO as an area within the EOO.

For more information on EOO, see section 4.9 in the [Guidelines for Using the IUCN Red List Categories and Criteria](#).

The IUCN Red List EOO Calculator tool, which runs in ArcGIS (downloadable from the [GIS Tools, Software and Recommended Base data](#) page on the IUCN Red List website) calculates EOO using only polygons and points of *presence* 1 ("Extant") (see Figure 1 and 2) and *origin* 1, 2 or 6 ("Native", "Reintroduced", "Assisted colonisation"), and it does so separately for Seasonality codes 1 and 2 (if present) or 1 and 3 (if present), with EOO being taken as the lower of these two values.

It is recommended that area or geometry calculations are performed in Cylindrical Equal Area (world) projection (but other map projections can also be used if they provide better results e.g., for specific locations)

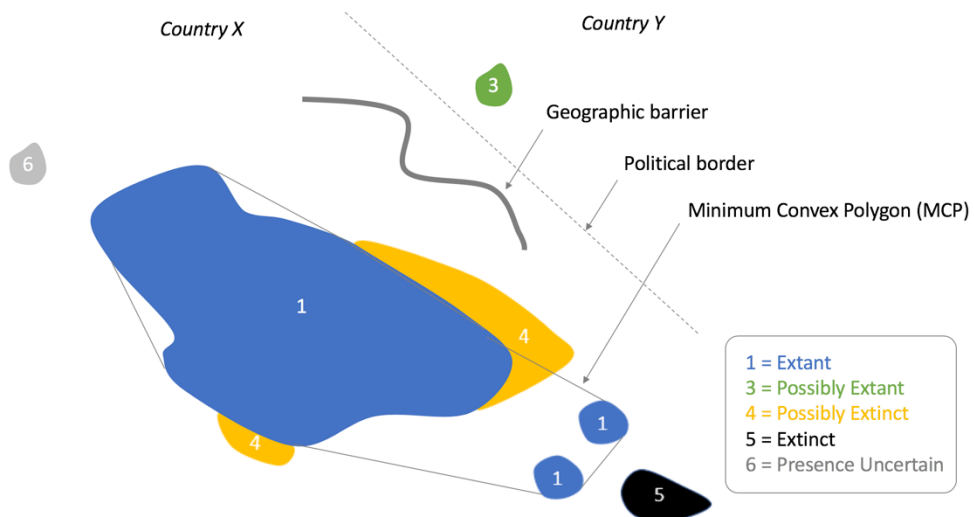**Figure 1**: Schematic representation of polygon presence coding and calculation of EOO.
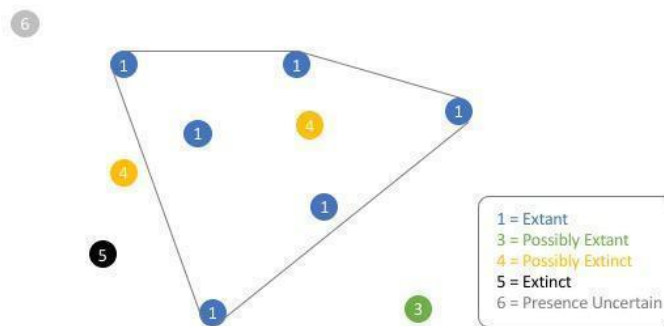


**Figure 2:** Schematic representation of point presence coding and calculation of EOO.

## 7.2 Area of occupancy (AOO)

Area of occupancy (AOO) is a scaled metric that represents the area of suitable habitat currently occupied by the taxon. Area of occupancy is included in the IUCN Red List Criteria for two main reasons:

1.  AOO is a measure of the 'insurance effect,' whereby taxa that occur within many patches or large patches across a landscape or seascape are 'insured' against risks from spatially explicit threats. In such cases, there is only a small risk that the threat will affect all occupied patches within a specified time frame. In contrast, taxa that occur within few small patches are exposed to elevated extinction risks because there is a greater chance that one or few threats will affect all or most of the distribution within a given time frame.

2.  There is generally a positive correlation between AOO and population size. AOO can therefore be a useful metric for identifying species at risk of extinction because of small population sizes when no data are available to estimate population size and structure.

***To ensure valid use of the criteria and maintain consistency of Red List assessments across taxa it is essential to scale estimates of AOO using 2 x 2 km grid cells.*** Estimates of AOO are highly sensitive to the spatial scale at which AOO is measured. Thus, it is possible to arrive at very different estimates of AOO from the same distribution data if they were calculated at different scales. The thresholds of AOO that delineate different categories of threat in criteria B2 and D2 are designed to assess threats that affect areas in the order of 10-2,000 km², and therefore assume that AOO is estimated at a particular spatial scale. The Red List Guidelines require that AOO is scaled using 2 x 2 km grid cells (i.e., with area of 4 km²) to ensure that estimates of AOO are commensurate with the implicit scale of the thresholds. Use of the smallest available scale (finest grain) to estimate AOO (sometimes erroneously called "actual area" or "actual AOO") is not permitted, even though mapping a species' distribution at the finest scale may be desirable for purposes other than calculating AOO. Habitat maps with higher resolutions can be used for other aspects of a Red List assessment, such as calculating reduction in habitat quality as a basis of population reduction for criterion A2(c) or estimating continuing decline in habitat area for B2(b), as well as for conservation planning.

For more information on AOO, see section 4.10 in the Guidelines for Using the IUCN Red List Categories and Criteria.

# 8 Generating a distribution map

## 8.1 Software and formats

There are several ways in which maps can be generated, and the preference is always to generate **digital maps** (such as maps in the form of Shapefiles, KML or ESRI File Geodatabase). There is a suite of software that can be used to do this, including:

1. ArcGIS desktop – licensed software. IUCN can provide a license for this under strict terms of use (contact the IUCN Red List for further information), provided the software is being used for the assessment of a taxon, or for such similar purpose.
2. QGIS – free open-source software
3. Google Earth Pro – free software.
4. Google My Maps in Google Drive – free software.

The IUCN Red List Unit and Red List Partners have developed a series of tools to make the mapping process easy for Assessors. These resources can be found on the GIS Tools, Software and Recommended Base data page on the IUCN Red List website.

## 8.2 Tools

The GIS Tools, Software and Recommended Base data page on the IUCN Red List website provides access to a range of tools to help you to create distribution maps for taxa being assessed for The IUCN Red List. Some important tools worth mentioning here are:

- Red List Toolbox: This is designed for use with ArcGIS Desktop, and includes documentation to help Assessors generate a digital map in the appropriate format and structure.

- GeoCAT: The Royal Botanic Gardens, Kew developed this free, online tool to allow users to create maps using point data. It supports the IUCN Points standards, and also includes tools that automatically calculate EOO and AOO (based on the point data).

- IUCN Freshwater Mapping Application (FWMA): This free, online mapping tool was developed for creating distribution maps for inland water species. It is integrated with SIS (i.e., it links to taxa within existing working sets in SIS) and it includes HydroBASINS, allowing users to map to those areas. Please contact the IUCN Biodiversity Assessment and Knowledge Team for more information.

- **Tool profiles:** Several researchers have developed tools to aid mapping of spatial data and estimation of Red List metrics such as EOO and AOO from spatial data. Tool profiles have been developed by the Red List Technical Working Group to give a brief overview of each tool, and detail developer information, links to help files, support networks and associated research

publications. The profiles are available on the GIS Tools, Software and Recommended Base data page on the IUCN Red List website.

## 8.3 Standard GIS layers / basedata

A recommended list of GIS layers (or 'spatial basedata') is available for Assessors to use when they are creating distribution maps. These layers include, for example, the Country layer, which should be used as the base-layer for mapping taxa to countries. It is important that Assessors use these recommended spatial data layers (basedata maps) to ensure that the generated maps comply with other tools within the Red List, and also to standardise the maps displayed on the IUCN Red List.

More information on these basedata can be found on the GIS Tools, Software and Recommended Base data page on the IUCN Red List website.

These basedata may change, or decisions may be taken by the IUCN SSC Red List Technical Working Group to recommend different basedata; therefore, it is strongly recommended that Assessors check the IUCN Red List website for current guidance and information.

## 8.4 Mapping consistency

The following recommendations are provided to ensure consistency between taxa being mapped:

1. **How to convert points to polygon ranges**: it is at the Assessor's discretion to decide on the method of creating a polygon from points, should they wish to do so. Some suggestions (that can be used singly or in combination) are:
   a) Buffering the points to a distance appropriate for the taxon. The buffer distance may be selected with consideration of aspects of the taxon's life history, such as roaming range, feeding range, breeding or migration.
   b) Using habitat as a guide to map areas around the points.
   c) Using spatial data of other taxa, for example a prey or host species.
   d) Bathymetry and altitude selection. Note that raster files cannot be submitted but conversion from raster to polygon is possible in ArcMap and QGIS software.

2. **Overlapping polygons within a taxon's range**: whilst it is entirely feasible for a species to have overlapping polygons with different combinations of attributes (e.g. where breeding and migrating parts of the population overlap), it is important to ensure that this is actually intended, and not a mistake during the mapping process. In order to prevent discrepancies, check whether adjoining polygons overlap each other. The ranges of a taxon's subspecies, varieties and subpopulations may overlap. Overlapping polygons can introduce geometry challenges, including during analysis.

3. **Mapping subspecies, varieties and subpopulations**: Infra-rank level assessments should be accompanied by their own individual map. Distributions of subspecies, varieties and subpopulations can also be designated within the species' distribution map.

4. **Restricted ranges**: when mapping a small area, such as a cave, small HydroBASIN or island it is import to keep in mind the scope of the taxon and its habitat and ecology, while not generalising the range as this may inflate the Minimum Convex Polygon (MCP) and change the extent of occurrence. For inland water assessments, as with other groups, the map should be the best possible representation of the distribution. For those inland water taxa with distributions more restricted than the finest scale HydroBASIN layer, the range should be mapped as a polygon reflecting, for example, the location of a cave or small wetland to which a taxon is restricted, rather than generalising to the finest scale HydroBASIN layer.

5. **Island taxa**: When a taxon is present on an island it is important to state the island in the attributes due to organisations using different global country basedata, some of which may not have the island you have selected.

6. **Marine taxa**: Bathymetry is important to consider when generating maps for marine taxa, combined with knowledge of the species habitat preferences, position in the water column, and whether it occurs in coastal waters or the open ocean. For example, if a benthic or demersal marine species is found between 5-25 m depth, the polygon could be restricted to where the depth is between 5 and 25 depth. A bathymetry raster can be found on the [GIS Tools, Software and Recommended Base data page](#) to help guide mapping decisions.

7. **Projections**: Each taxon's spatial data is required to have a specified coordinate system. This enables the taxon's spatial data to be integrated with other spatial datasets. The recommended coordinate system for the IUCN Red List is WGS84 (EPSG: 4326). To check the projection of a file in ArcMap, go to the file's properties and check the Source tab. If the "Geographic Coordinate System" says <Undefined>, you can use the Define Projection (Data Management) tool. If the "Geographic Coordinate System" is something other than the WGS_1984 projection you can convert it using the Project tool.

8. **Smoothing**: Smoothing a polygon removes sharp angles in the polygon and is used for aesthetic reasons. If this tool is used, please ensure that it does not affect the coverage of the taxon's spatial range.

9. **Citation**: this must be the same for all polygons, points or basins for a given taxon assessment

For tools, general guidance and information on best practices for mapping ranges please refer to the 'Spatial Data & Mapping Resources' section of the Resources & Publications page.

## 8.5 Sensitive species guidelines

A taxon's map (or part of a map) will not be shown or made publicly available when the *data_sens* field contains a 1 (this means that the specific taxon polygon or point is marked as being sensitive). Information on why this polygon or point is sensitive should be recorded in the *sens_comm* attribute (see Tables 1 and 2). A generalised polygon may be used instead, or may be supplied alongside a non-generalised map marked as sensitive. This will enable the sensitive species' generalised location to be shown and made publicly available without disclosing the species' precise location.

In addition, Assessors must ensure that the species distribution is marked as sensitive in SIS (Distribution tab -> Map Status tab -> "Data Sensitive?" checkbox).

### 8.5.1 Generalised polygon

A generalised polygon may be used to give an approximate indication of a taxon's location. There are two methods to consider depending on the situation:

- **Buffer:** a buffer of a minimum of 10 km when more than one point is available (the buffer distance can be larger, for example the range could be mapped to country-level).
- **Irregular polygon:** if only one point is provided then a round buffer would show the species to be in the centre. An irregular shaped polygon would therefore show approximately where the taxon is distributed but generalised enough to avoid giving away its exact location.

The use of a generalised polygon to calculate the EOO and AOO may lead to inflated figures; in such cases, a non-generalised polygon should be used to calculate these parameters.

A new field, *generalisd*, has been added to indicate if a polygon is generalised. Please ensure that this field is present and that *generalisd* = 1 for all generalised polygons.

For further details see the Sensitive Data Access Restrictions Policy for the IUCN Red List.

# 9 What will happen to your map data?

Once distribution map data have been checked and processed, and are part of assessments that are being published on the IUCN Red List, the data are used in the following ways:

- **IUCN Red List website**: Points and polygons are displayed on the IUCN Red List website, as an interactive tool.
    - o The spatial data is projected to WGS84/ Mercator for display on the map.
- **PDF of assessment**: The map is used in the PDF which has a DOI (Digital Object Identifier) attached to it, and therefore exists like a publication.
- **Integrated Biodiversity Assessment Tool (IBAT)**: The data are submitted to IBAT which provides a basic risk screening of biodiversity. It draws together globally recognised biodiversity information from a number of IUCN's Knowledge Products. The IUCN Red List of Threatened Species spatial data are provided in a hexagonal grid format, and are made available as a full download for certain categories of user access.
- **Data download from IUCN Red List website**: Spatial data are made available for download individually or in bulk.
    - o If downloaded data is used in data analyses (e.g., species richness maps, climate change vulnerability projections) the spatial data used should be referenced and credited appropriately.
    - o The points and polygons may be used to generate images of the maps, for example using the Map Batcher tool to present maps in a format for use in workshops, presentations, etc.
- **API**: The data are made available through an API (which is an interface through which the Red List data can be queried and used programmatically). Access to the API is granted, for non-commercial use, through a token, to provide some level of control.
- **Sensitive data**: Maps, or parts of maps, that are marked as Sensitive in the map attribute data (i.e., *data_sens* field is 1) are not displayed on the IUCN Red List website, or made available, unless special permission has been granted.

## 9.1 Countries of occurrence (COO) data

Countries of occurrence (COO) information is displayed on the IUCN Red List website. This information is used to support the website's functionality (especially country searches) and to allow basic analyses (e.g., endemism).

## 9.2 Legend combinations from distribution codes

Different combinations of the Presence, Origin and Seasonality codes are used to create legends for the final distribution maps.

Please refer to the list of Presence, Origin and Seasonality codes given in section 5 above.

# 10 Updates regarding Spatial Data

## 10.1 Presence Codes (last updated 2024)

Presence codes were updated with new definitions in 2014, and a new Presence Code was added in 2024. Data prior to these changes will remain and be updated as re-assessments take place.

### 10.1.1 Implications of updated Presence for existing spatial data (2014)

Some distribution maps published on the IUCN Red List were created using a previous version of the Presence codes. The implications of the current Presence codes (as defined in Table 3) on existing spatial data that have not been migrated yet are outlined below.

1. All polygons or points currently coded using the old *presence* 2 ("Probably Extant") should be recoded as *presence* 1 ("Extant") or *presence* 3 ("Possibly Extant").

2. For inland water taxa:

    (i)   HydroBASINS coded as *presence* 2 should be recoded as *presence* 1 if they fall within an MCP drawn around all existing *presence* 1s, or as *presence* 3 ("Possibly Extant") if they fall outside this MCP.

    (ii)  If **all** HydroBASINS in the map are coded as *presence* 2 (for example where point locality data are unavailable and distributions have been inferred), you will need to decide which Presence code (1 or 3) is appropriate for the occurrence of the taxon in each of these areas. Please note that if *presence* 3 is used for all HydroBASINS on the map, this may have consequences for the taxon's Red List assessment (for example EOO cannot be calculated if no records exist for the taxon, which will affect any taxa currently assessed under criterion B1); in such cases a reassessment will be required.

    If unsure about the above, please contact the Red List Unit for further clarification.

3. Some polygons or points currently coded as 3 may need review to see whether they should be recoded as 1 (because they may actually represent inferred or projected sites of occurrence). This would not affect EOO estimation if such records are within the current MCP, but obviously would if such records fall beyond the current MCP.

4. Some polygons or points currently coded as *presence* 6 ("Presence Uncertain") may need to be reassigned to 1 or 3 or 4 (see Note 2 attached to Table 3).

See Figures 1 and 2 in section 7 for more information on recoding Presence codes and on using the Presence codes for EOO calculations.

### 10.1.2 Presence code Expected Additional Range (2024)

In 2024, a new Presence code (7) was added to account for mapping of Expected Additional Range in Green Status of Species assessments. See Table 3 for definition and short summary of use.

## 10.2 Origin code Assisted Colonisation (last updated 2016)

New Origin code (6) added for species subject to intentional movement and release outside its native range to reduce the extinction risk of the taxon.

## 10.3 Legend Update (last updated 2016)

The legend was improved to contain all the combinations of values for Presence, Origin and Seasonal. The new list can be found in the 'Spatial Data & Mapping Resources' section of the Resources & Publications page. Previously, all the different legends (or distribution codes combinations) were not being displayed on the website, but now they all are. Please download the latest version from the website to ensure that you are using the latest codes.

## 10.4 Spatial distributions for infra-rank assessments (last updated 2021)

Guidance was included on infra-rank level assessments which should now be accompanied by their own individual map. Note that distributions of subspecies, varieties and subpopulations can also still be designated within the species' distribution map.

# 11 Abbreviations, acronyms and definitions

**AOO**: Area of occupancy. A parameter used in the IUCN Red List Categories and Criteria to measure the area within the 'extent of occurrence' that is occupied by a taxon, excluding cases of vagrancy (see section 4.10 of the [Guidelines for Using the IUCN Red List Categories and Criteria](#)).

**Assisted colonisation**: The intentional movement and release of an organism outside its indigenous range to reduce the extinction risk of the focal taxon. Within the mapping process, the assisted colonisation range should be coded in the attributes as "Extant" (*presence* = 1 "Extant", *origin* = 6 "Assisted Colonisation").

**EOO**: Extent of occurrence. A parameter used in the IUCN Red List Categories and Criteria to measure the spatial spread of the areas currently occupied by the taxon (see section 4.9 of the [Guidelines for Using the IUCN Red List Categories and Criteria](#)).

**MCP**: Minimum convex polygon. This is the smallest polygon in which no internal angle exceeds 180 degrees and which contains all sites of known, inferred and projected occurrence.

**Polygon**: A map feature that bounds an area at a given scale, such as a country on a world map or a district on a city map.

**Projection**: A projection uses the datum as a point of reference, its location on Earth. In GIS, there are two types of "coordinate systems": **Geographic** Coordinate System: a georeference or location of the map on the globe and **Projected** Coordinate System: how the map is displayed. The standard Geographical Coordinate System the IUCN Red List uses is [WGS 1984](#).

**SIS**: Species Information Service.

Internal document versioning

| Versions | Dates | Authors | Changes |
|---|---|---|---|
| 1.0 | | | |
| 1.1 | 12/11/2012 | J.Able / A.Joolia | Introduction, and re-arranging sections |
| 1.1 | | Jemma Able | Added comments about which additions are relatable to which rows from the Action points from the RLTWG (in MappingStandardsGeneral folder) |
| 1.2 | 02/02/2015 | Jemma Able | Shared document with Adrian, Ackbar and Craig for comments. |
| 1.5 | 01/06/2016 | Ackbar Joolia/Jemma Able/ Steven Bachman/ Axel | Multiple changes post RLTWG |
| 1.6 | 01/12/2016 | Ackbar Joolia/Jemma Able | More edits, links to online resources |
| 1.7 | 15/01/2017 | Ackbar Joolia | More editing, comment incorporate, document clean |
| 1.8 | 05/06/2017 | Caroline Pollock and Craig Hilton-Taylor | Editing, numbering, formatting, etc. |
| 1.9 | 23/03/17 | Jemma Window | Editing text for Spatial Updates |
| 1.10 | 13/06/17 | Jemma Window | Combined versions 1.8 and 1.9. Made edits to comments. |
| 1.11 | 16/06/17 | Jemma Window | Added IBAT description and changed projection definition |
| 1.12 | 23/06/2017 | Ackbar Joolia / Jemma Window | Finalise edits |
| 1.13 | 05/03/2018 | Jemma Window / Ackbar Joolia | Added comments to Axel's comments |
| 1.14 | 04/2018 | RLTWG | Multiple updates on document |
| 1.15 | 07/2018 | A.Joolia/K.Harding | Check feedback from RLTWG, integrate new diagram, final check before publication |
| 1.18 | 08/2019 | K Harding, A.Joolia, M.Rivers | Changes to field specifications: 'yrcompiled'; max characters 254; id_no no longer recommended; seasonal required if applicable; basisofrec moved in order. Field names lower case. Amendments to text. Links updated. 'generalisd' field added; reformatting |
| 1.19 | 11/2020 | RLTWG | Multiple updates on document, such as text editing for clarity and |

| | | | update of broken or faulty hyperlinks; addition of subspecies range mapping requirements |
|---|---|---|---|
| 1.20 | 23/01/2024 | RLTWG | Integrated guidance on alignment between IUCN Red List and IUCN Green Status assessment mapping, including a new section 1.3 and Presence code for Expected Additional Range (7). |