# INFO ENTRY - QUESTION INFO

ENTRY NOTES:

* green = does not need to be editted
* yellow = info for the inputter
* ref\_id = “refs\_glossary\_2024-08-09.xls > “references” tab
  + if the reference not present, either add it (if you’re confident that you can follow the format), or add a comment in this doc with the info and I will adjust
* **images – file name in** “refs\_glossary\_2024-08-09.xls > “references” tab
* Ignore everything in the “POPULATE MARKDOWN” section
* Size of columns in tables and text format do not matter; see note on bold and italize below
* Any content with “glue}`` prefix or surrounded by “{{ “ / “ }}” indicates where text will be inserted from the keys
* You may see “<br>” throughout, you can ignore these
* additional formatting notes (optional)
  + \*\***bold**\*\*
  + \**italics*\*
* **Topic Info**
  + If the topic is NOT related to a question, you can leave “question” as NULL
  + “question” here is more for your reference
* **Assumptions, Pros, Cons**
  + Only for modelling approaches; can ignore otherwise (leave table here)
  + [WILL BE HERE, BUT INSERTED DIRECTLY FROM CSV FILE (THUS NO INPUT NEEDED)]
* **Advanced**
  + If the topic doesn’t warrant inclusion, you can leave as NULL
* **Figures**
  + Placeholders here as “filename” can leave in if not <5 images
* **Video**
  + no “<” before the URL text and a “>” after URL in this case
  + ref\_id in this example is not correct, just for illustrative purposes
* **Analytical tools & resources**
  + The ref\_id should be included in the reference column (and the full text reference in the master reference file). If you aren’t sure if the reference is in the master doc, add the full text ref as a comment.
  + Please add a “<” before the URL text and a “>” after (e.g., <http://www.somesitelink.com>)
  + Type can be something similar to: Article, App/Program, R package
* **References / Glossary** 
  + items in-text above (IGNORE FOR NOW)
* **Notes**
  + (future ref / not included in markdown conversion)

## Topic Info

|  |  |
| --- | --- |
| **info\_id** | sp\_low\_density |
| **question** | # Does the Target Species occur in low density?  Provide guideline of what constitutes "low density" (e.g. < x/ km2)? scale - in the area of interest? The difference between this question nd "how rare or common..." may not be readily apparent   * “low density populations (6 or 16.5 bears/100 km2)” ([Fuller et al., 2022, p. 14](about:blank)) ([pdf](about:blank)) |

## Overview

Add some info here

## Advanced

Add some info here

## Figures

|  |  |  |  |
| --- | --- | --- | --- |
| **Image** | **file\_name** | **Caption (if applicable)** | **ref\_id** |
|  | figure1\_filename.png | figure1\_caption | figure1\_ref\_id |
|  | figure2\_filename.png | figure2\_caption | figure2\_ref\_id |
|  | figure3\_filename.png | figure4\_caption | figure3\_ref\_id |
|  | figure4\_filename.png | figure4\_caption | figure4\_ref\_id |
|  | figure5\_filename.png | figure5\_caption | figure5\_ref\_id |
|  | figure6\_filename.png | figure6\_caption | figure6\_ref\_id |

## Video

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| **caption** | **URL (no < / > before/after URL** | **ref\_id** |
| vid1\_caption | vid1\_url | vid1\_ref\_id |
| vid2\_caption | vid2\_url | vid2\_ref\_id |
| vid3\_caption | vid3\_url | vid3\_ref\_id |
| vid4\_caption | vid4\_url | vid4\_ref\_id |
| vid5\_caption | vid5\_url | vid5\_ref\_id |
| vid6\_caption | vid6\_url | vid6\_ref\_id |

## Shiny

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Shiny caption = shiny\_caption

Shiny URL = shiny\_url

## Analytical tools & resources

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| **Type** | **Name** | **Note** | **URL** | **ref\_id** |
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| resource15\_type | resource15\_name | resource15\_note | resource15\_url | resource15\_ref\_id |

## References / Glossary

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| --- | --- |
| **ref\_id** | **glossary\_keys** |
| Refs | keys\_here |

## Notes

| Type | Name | Note | URL |Reference |

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# POPULATE – INFO

## File from = 00\_00\_template-master\_2024-09-30.docx

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**jupytext:**

**formats: md:**myst

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extension: .md

format\_name: myst

format\_version: 0.17.2 <!--0.13-->

jupytext\_version: 1.16.4 <!-- 6.5.4-->

kernelspec:

display\_name: Python 3

language: python

name: python3

editor\_options:

markdown:

wrap: none

<!--template v2024-09-30-->

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**(i\_**sp\_rarity)=

# {{ title\_i\_sp\_rarity }}

:::{seealso}

{bdg-link-primary-line}`Species-accumulation curves<https://ab-rcsc.github.io/rc-decision-support-tool\_concept-library/02\_dialog-boxes/01\_10\_sp\_asymptote.html>`

{bdg-link-primary-line}`Species rarity<https://ab-rcsc.github.io/rc-decision-support-tool\_concept-library/02\_dialog-boxes/01\_19\_sp\_rarity.html>`

:::

**\*\*{{ term\_**sp\_rarity }}\*\*: {{ term\_def\_sp\_rarity }}

**:::::::{tab-set}**

**::::::{tab-item} Overview**

\*\*Species rarity\*\* describes how many individuals present of the species, relative to the total number of individuals of all species (or how “represented” is the species when considering the total number of individuals of all species). Generally, species rarity can be thought of as the probability that the species occupies the site, for a given species (or study area, depending on the scale of interest) {{ref\_intext\_kays\_et\_al\_2020}}.

While technically “how rare” a species is will be fairly dynamic from place to place (e.g., will depend on geographic range, habitat specificity, local abundance, etc.; {{ref\_intext\_crisfield\_et\_al\_2024}}), for the purposes of informing study design recommendations, the \*\*species rarity categories are defined as follows\*\*:

- \*\*Common\*\*: probability of occupancy > ~0.75-0.8 (> 0.75 [{{ref\_intext\_kinnaird\_obrien\_2012}}; {{ref\_intext\_kays\_et\_al\_2020}}]; > 0.8 [{{ref\_intext\_shannon\_et\_al\_2014}}; {{ref\_intext\_wearn\_gloverkapfer\_2017}}])

- \*\*Less common\*\*: 0.25-0.75

- \*\*Rare\*\*: probability of occupancy < 0.25 {{ref\_intext\_kays\_et\_al\_2020}}

- \*\*Very-rare\*\*: probability of occupancy < 0.001 ({{ref\_intext\_wearn\_gloverkapfer\_2017}}; {{ref\_intext\_rowcliffe\_et\_al\_2008}}; {{ref\_intext\_obrien\_2010}})

- \*\*Unknown\*\*: select this option if you’re not sure of the rarity of your Target Species (single or multiple species)

- \*\*Multiple\*\*: select this option if your study includes multiple Target Species that vary in rarity.

::: {note}

Species rarity can be generally thought of as a species characteristic, however, “not in the same sense that hair colour or wing venation… it’ an emergent trait of a species' population and its environment rather than a trait of an individual organism” {{ref\_intext\_kunin\_1997}}

:::

\*\*<font size="4"><span style="color:#2F5496">How does this relate to study design?</font></span>\*\*

\*\*Species' rarity can influence the ideal camera arrangement. \*\* For example, when monitoring rare or cryptic species that are unlikely to be detected with other designs, it may be appropriate to use a \*Targeted design\* where cameras are placed in areas that are known or suspected to have higher activity levels (e.g., game trails, mineral licks, etc.).

\*\*Species' rarity can influence the ideal number of cameras and [survey](#survey) length\*\* ({{ ref\_intext\_chatterjee\_et\_al\_2021 }}). Low [detection probability](#detection\_probability) of rare or cryptic species can result in imprecise estimates if there are too few cameras or if cameras are not deployed for long enough (e.g., Steenweg et al. 2019). Chatterjee et al. (2021) suggested that for [occupancy models](#mods\_occupancy) ({{ref\_intext\_mackenzie\_et\_al\_2002 }}) of common species, to survey a minimum of 50 sites for 15–20 days. For rare, elusive species, they recommended surveying 100 sites at a minimum for 20–30 days ({{ref\_intext\_chatterjee\_et\_al\_2021 }}).

\*\*Species' rarity can influence the appropriate modelling approach.\*\* For measures of species richness or diversity, it is presumed that a camera is active long enough to detect rare species that may occur at a specific location ({{ ref\_intext\_wearn\_gloverkapfer\_2017 }}). If this is not the case, the results will indicate that the species was not present when it was (i.e., a “false negative”).

::::::

**::::::{tab-item} In-depth**

Add some info here

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**:::::{grid} 3**

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:::{figure} ../03\_images/03\_image\_files/leroy\_2024\_Rarity\_cutoff-point.png

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\*\*Leroy (2024)\*\* The rarity cut-off point is here defined as the threshold of occurrence below which species are considered rare.

::::

::::{grid-item-card} {{ ref\_intext\_leroy\_2024 }}

:::{figure} ../03\_images/03\_image\_files/leroy\_2024\_Weight\_assignation-curve.png

###### :class: img\_grid

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###### \*\*Leroy (2024)\*\*Weight assignation curve adjusted to an arbitrary rarity cut-off.

###### ::::

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figure4\_caption

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figure6\_caption

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Species accumulation and rarefaction curves

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###### Generating a rarefaction curve from collector's curves in R within the tidyverse (CC198)

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**Generating a** rarefaction curve from collector's curves in R within the tidyverse (CC198)

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**::::::{tab-item} Shiny** apps/Widgets

Check back in the future!

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**::::::{tab-item} Shiny** apps/Widgets

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###### **::::::{tab-item} Shiny** apps/Widgets

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:::::**:**

**:::::{tab-item} Analytical** tools & resources

| Type | Name | Note | URL |Reference |

|:----------------|:-------------------------------|:----------------------------------------------------------------|:----------------------|:----------------------------------------|

| R package | Package ‘**Rarity’:** Calculation of Rarity Indices for Species and Assemblages of Species **|** Allows calculation of rarity weights for species and indices of rarity for assemblages of species according to different methods (Leroy et al. 2012, Insect. Conserv. Divers. 5:159-168 <doi:10.1111/j.1752-4598.2011.00148.x>; Leroy et al. 2013, Divers. Distrib. 19:794-803 <doi:10.1111/ddi.12040>). | <https://cran.r-project.org/web/packages/Rarity/> | {{ ref\_bib\_leroy\_2023 }} |

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**::::::{tab-item} References**

{{ ref\_bib\_chatterjee\_et\_al\_2021 }}

{{ ref\_bib\_kinnaird\_obrien\_2012 }}

{{ ref\_bib\_kays\_et\_al\_2020 }}

{{ ref\_bib\_shannon\_et\_al\_2014 }}

{{ ref\_bib\_wearn\_gloverkapfer\_2017 }}

{{ ref\_bib\_rowcliffe\_et\_al\_2008)

{{ ref\_bib\_southwell\_et\_al\_2019 }}

{{ ref\_bib\_flather\_sieg\_2007 }}

{{ ref\_bib\_kunin\_1997 }}

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