Appendix 5 –FAIRWILD RISK ANALYSIS METHODOLOGY FOR PLANTS

**IUCN Medicinal Plant Specialist Group (Danna Leaman, Uwe Schippmann)**

**Version 2/2021**

**4. METHODOLOGY: THE MATRIX**

The factors assessed during the risk analysis for plants are presented in **Table 1**. These were selected as those which can be used to inform resilience and also which are likely to have information available in the scientific community.

During the process of conducting a risk analysis, each factor is assessed as Low, Medium or High Risk, and assigned the corresponding score: Low Risk = 1, Medium Risk = 2; and High Risk = 3. **Table 2** shows the three scoring levels for each factor and the indicators for each risk level as they are currently defined.

The scores of all individual factors are then combined to give an overall score between 9 (minimum) and 27 (maximum). This score is then used to assign an overall risk rating, as follows: 9-14 = Low Risk; 15-21 = Medium Risk; and 22-27 = High Risk. The quantitative nature of the analysis enables comparison of relative risk of over-collection between different combinations of species/part collected/country of collection, and tracking of changes in assignment of collection risk over time as more information becomes available or factors change (e.g. scale and trend of use and trade).

Resilience of a species to wild collection may be different for different collection operations. Resilience is dependent on the plant part gathered (factor "Plant part collected"). The factor "Conservation Status Assessment" takes into account the species’ conservation status over its entire range, as well as in the country of collection. The factors "Typical population size" and “Habitat specificity” may differ between countries and regions. Therefore, if a species has been evaluated for one country and a new application targets another country, a new analysis must be carried out, including both data collection and matrix completion.

**4.1. Use of existing Red Lists**

The first factor of the matrix evaluates the “Conservation Status Assessment” and takes into account existing Red List information. During the development of the matrix it was decided that a species which is globally or nationally (in the country of collection) assessed as Critically Endangered (CR) or Endangered (EN) according to or equivalent to the IUCN Red List Categories and Criteria would be automatically assigned as High Risk in terms of resilience. The other factors of the matrix are in these cases irrelevant. For species evaluated as Vulnerable (VU), Near Threatened (NT), Data Deficient (DD) and Least Concern (LC) or those with no conservation status assessment, one of the level states 1-3 is assigned and the other factors of the matrix have to be evaluated.

**4.2. Addressing lack of data**

In principle, even wild plant species with little information in scientific literature can be accepted into the FairWild system. In the case where data on a factor are unavailable, the precautionary principle will be used and the factor scored as "2" indicating that it is "unknown" in the respective cell of the matrix.

However, with an increasing number of factors without available information, there becomes less information upon which to base the risk analysis score. Again using the precautionary principle, the matrix will therefore be completed differently depending on the number of unknown factors:

* **One or two factors are unknown**: these factors are scored as 2, unless another scoring is justified using inferred information from another related species.
* **Three to four factors are unknown**: as above, unless the harvest is destructive to the individual plants (Plant part collected = 3). In this case, the harvest is automatically classified as High Risk.
* **Five to seven factors are unknown**: The harvest is automatically classified as High Risk

It should not be possible for more than seven factors to be unknown, as the Conservation Status Assessment Factor and Plant Part Collected will always be known.

**Table 1**: Factors of Resilience

|  |  |
| --- | --- |
| **Factor** | **Definition** |
|  |  |
| **Conservation Status Assessment** | This factor evaluates the known conservation status of populations of the target species. In case national and/or global threat assessments have rated the species as Critically Endangered (CR) or Endangered (EN) according to or equivalent to the IUCN Red List Categories and Criteria (version 3.1), the species is automatically assigned to the High Risk category. For species evaluated as Vulnerable (VU), Near Threatened (NT), Data Deficient (DD) and Least Concern (LC) or those with no conservation status evaluation, one of the level states 1-3 is assigned. |
| **Threat Causes** | This factor assesses whether the known causes of threat to the target species -if any- are single or multiple. Threat causes other than collection include habitat loss, degradation or land use changes, impact of invasive alien species. |
| **Scale and trend of use and trade** | This factor assesses the level of trade (volumes if available; otherwise, a qualitative assessment), its diversity (only single use or multiple uses) and its current and future trend. It also takes into account whether trade is on a local, national, or international scale. |
| **Plant part collected** | The resilience of the target species is dependent on the plant part which is collected in relation to the ability of the individual plant and the harvested population to recover. E.g. collection of leaves from a tree species is regarded as having low risk of killing the tree or decreasing the population over time, while collection of roots from an herb species rates as High Risk because each plant collected may be destroyed by the collection. For the evaluation of this factor, the life form of the species (annual, biennial, perennial, geophyte, shrub, and tree) has to be taken into account. In case branches would be cut to harvest leaves, this destructive harvest practice must be handled under “Threat causes” (Factor 11). |
| **Geographic Distribution** | This factor assesses the known global range of the species. |
| **Typical population size** | This factor assesses the spatial distribution across the range of the species. It measures whether populations are large, abundant and homogeneous or small, clumped and scattered. This factor may be assessed differently depending on the country of collection because many species are distributed across national political boundaries and may be more abundant in the centre of their natural range and less abundant at the periphery. |
| **Habitat Specificity** | This factor assesses habitat preference of the target species. It looks at the number of habitats occupied and also at the possible threat to these habitats. This factor may be assessed differently depending on the country of collection. |
| **Regeneration** | This factor assesses the capacity of the individual plant (or the population, in the case of annuals or lethal harvest) to regenerate the material collected after harvest. Aspects of this are the general growth rate and especially the (re-)sprouting capability (rhizomes, creepers, clonal growth) of perennials. |
| **Reproduction** | This factor evaluates the relative reproductive specialization of the target species, where asexual reproduction, abiotic pollination and seed dispersal, and abundant pollinators and seed dispersers are less specialized than sexual reproduction, biotic pollination and seed dispersal, and abundant pollinators and seed dispersers. A reduction in availability of individuals or reproductive parts (flowers, seeds) will have a greater impact with greater specialization. |

Table 2: Factors and definition of risk levels

|  |  |  |
| --- | --- | --- |
| Risk Level | **Score** | **Definition** |
| Conservation Status Assessment | | |
| Low Risk | 1 | Conservation status assessed as "Least Concern" (LC); populations not declining (stable or increasing) |
| Medium Risk | 2 | Conservation status assessed as "Data Deficient" (DD) or threat category for the species has not (yet) been assigned; populations not known to be declining |
| High Risk | 3 | Conservation status assessed as "Near Threatened" (NT) or "Vulnerable" (VU); populations declining |
| Threat Causes | | |
| Low Risk | 1 | No threats to the species are known or likely to exist |
| Medium Risk | 2 | Species faces single threat cause |
| High Risk | 3 | Species either faces multiple threat causes or severe habitat loss; or destructive collection practices are used |
| Scale and trend of use and trade | | |
| Low Risk | 1 | Used in one field; trade level low or even decreasing; no shortage of material observed |
| Medium Risk | 2 | Several non-conflicting uses; trade level medium or slowly increasing |
| High Risk | 3 | Multiple, conflicting uses; trade level high; demand increasing; shortages of material in trade |
| Plant part collected | | |
| Low Risk | 1 | Collection of leaves, flowers or fruits of trees, shrubs or perennial plants |
| Medium Risk | 2 | Exudates (sap, resin) |
| High Risk | 3 | Collection of whole plants; collection of annual plants; collection of bulbs, bark or roots; apical meristem of monocarpic species |
| Geographic Distribution | | |
| Low Risk | 1 | Distribution is internationally widespread, species occurs on >1 continent |
| Medium Risk | 2 | Distribution is regionally restricted, often to one continent |
| High Risk | 3 | Distribution is locally restricted, i.e. to several or few countries or even endemic to one country |
| Typical Population Size | | |
| Low Risk | 1 | Populations often large and spread homogeneously across the landscape |
| Medium Risk | 2 | Populations mostly medium-sized, sometimes large, often clumped |
| High Risk | 3 | Populations everywhere small; scattered thinly across the landscape |
| Habitat Specificity | | |
| Low Risk | 1 | Species is highly adaptable to various habitat types; habitat stable |
| Medium Risk | 2 | Species is adapted to few habitat types or many, but threatened habitat types |
| High Risk | 3 | Species is narrowly specific to one habitat type or few, but threatened habitat types |
| Regeneration | | |
| Low Risk | 1 | Species is fast growing and/or easily re-sprouting after collection |
| Medium Risk | 2 | Growth rate medium and partly re-sprouting after collection |
| High Risk | 3 | Species is slow growing and/or not re-sprouting |
| Reproduction | | |
| Low Risk | 1 | Species reproduces asexually or is wind pollinated; many viable seeds with abiotic dispersal |
| Medium Risk | 2 | Species reproduces mainly sexually and has common pollinators; seed dispersal biotic with common dispersers |
| High Risk | 3 | Species is dioecious or has monocarpic apical meristem; adapted to specialised pollinators and/or seed dispersers; produces only few viable seeds. |