

## Final Evaluation Report

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Your Details	
<b>Full Name</b>	Devika M Anilkumar
<b>Project Title</b>	IUCN status assessment, Niche modelling and Niche profiling of endemic tree species for effective species recovery and ecorestoration.
<b>Application ID</b>	37165-1
<b>Date of this Report</b>	28 <sup>th</sup> July 2023

**1. Indicate the level of achievement of the project's original objectives and include any relevant comments on factors affecting this.**

Objective	Not achieved	Partially achieved	Fully achieved	Comments
Threatened status assessment using IUCN Red list criteria				Completed assessment for 12 targeted species. Ten submitted to IUCN red list using SIS tool kit. One already published, three scheduled for publication this month, four reviews completed and two are under review.
Niche modelling for prediction of potential habitat				Niche modelling completed for 12 targeted species using modified niche modelling standardised for the Western Ghats region.
Niche Profiling				Completed for the 12 targeted species which segregated into five different habitat profile of the Western Ghats forest.
Species recovery and ecorestoration plan				The potential habitats for ecorestoration and totally converted regions were predicted at each ecoregion level. Five incorporated into forest working plan of one ecoregion, biodiversity strategy action plan of two local bodies. Others will be submitted to forest department.

**2. Describe the three most important outcomes of your project.**

**a) IUCN Threatened status assessment for the selected species:**

Completed assessments for 12 targeted plant species endemics to the Western Ghats-Sri Lanka biodiversity hotspot using IUCN Red List criteria. Among these 10 are tree species from different evergreen forests, and two are epiphytic herbs from montane evergreen habitats. Ten were submitted to the IUCN Red List using the SIS toolkit, and one has already been published. Three species are scheduled for publication this month, review has been completed for four species, and two are under review by the IUCN review team.

Targeted species	Habit	IUCN assessment status	Previous status	Present status
<i>Diospyros crumenata</i>	Tree	Assessment completed, submitted to IUCN, Published in red list. <a href="https://www.iucnredlist.org/specie">https://www.iucnredlist.org/specie</a>	EN	EN

		<a href="https://www.iucnredlist.org/species/30864/9578063">s/30864/9578063</a>		
<i>Cryptocarya anamalayana</i>	Tree	Assessment completed, submitted to IUCN, Published in red list. <a href="https://www.iucnredlist.org/species/38783/138508350">https://www.iucnredlist.org/species/38783/138508350</a>	NE	EN
<i>Cryptocarya sheikelmudiyana</i>	Tree	Assessment completed, submitted to IUCN, Published in red list. <a href="https://www.iucnredlist.org/species/187622842/187623277">https://www.iucnredlist.org/species/187622842/187623277</a>	NE	CR
<i>Elaeocarpus recurvatus</i>	Tree	Assessment completed, submitted to IUCN, Under publication. <a href="https://www.iucnredlist.org/species/33642/9800036">https://www.iucnredlist.org/species/33642/9800036</a>	VU	EN
<i>Syzygium lanceolatum</i>	Tree	Assessment completed awaiting assignment form IUCN	NE	awaiting
<i>Ficus beddomei</i>	Tree	Assessment completed, submitted to IUCN, Published in red list	NE	EN
<i>Syzygium occidentale</i>	Tree	Assessment completed, submitted to IUCN, Published in red list. <a href="https://www.iucnredlist.org/species/31199/9608095">https://www.iucnredlist.org/species/31199/9608095</a>	VU	EN
<i>Aporosa bourdillonii</i>	Tree	Assessment completed awaiting assignment form IUCN	EN	awaiting
<i>Ochna gamblei</i>	Tree	Assessment completed, submitted to IUCN, Published in red list	NE	EN
<i>Syzygium caryophyllatum</i>	Tree	Assessment completed, submitted to IUCN, Under publication. <a href="https://www.iucnredlist.org/species/38036/10094391">https://www.iucnredlist.org/species/38036/10094391</a>	EN	NT
<i>Medinilla anamalaiana</i>	Epiphyte	Assessment completed, submitted to IUCN, Under review	NE	awaiting
<i>Impatiens parasitica</i>	Epiphyte	Assessment completed, submitted to IUCN, Under review	NE	awaiting

**b). Niche specific potential habitat prediction from landscape to local ecoregion level:**

All 12 targeted species were Niche modelled using modified niche modelling standardised for the Western Ghats region. 19 bioclimatic parameters from the WorldClim were used along with terrain, vegetation, land use, and elevation parameters for the prediction of potential habitat. This is again fine-tuned for representing landscape and ecoregion levels. The extent of actual distribution, niche-specific potential habitat for conservation, degraded areas suitable for ecological restoration, and non-recoverable converted habitats were identified and

estimated. Completed for the 12 targeted species, which segregated into five different habitat profiles of the Western Ghats Forest.

**c). Species recovery and ecorestoration plan:**

The population data estimated for the 12 targeted species from the field work, population density, and other population characteristics were enumerated from the field data using the methodology provided by IUCN. The Importance Value Index was used to find associated species in different vegetation strata of the representing ecosystem. This is again niche profiled using the three-dimensional model. Five different habitat models were produced as a result. The whole set of data, including population estimation, distribution pattern, niche specific potential habitats, and predicted conservation and ecorestoration areas at the ecoregion level, was used for the preparation of species recovery and restoration plans. This is developed for each ecoregion level for all targeted species. The associated species can be used for ecorestoration based on population estimation, and the niche profiles can be used as a model for practical restoration. The ecorestoration plan for five species and their habitat was incorporated into the working plan of Vazhachal Forest Division, Kerala Forest Department, Biodiversity Strategy Action Plan of Athirappilly, and Sree Narayana Puram Grama Panchayath.

**3. Explain any unforeseen difficulties that arose during the project and how these were tackled.**

There was a 5-month delay in obtaining permission for the field work for this particular study due to processing delays from the Kerala Forest and Wildlife Department (Permission No: KFDHQ/3646/2022-CWW/WL10 dated January 25, 2023, issued to Devika M. Anilkumar and Dr. KH Amitha Bachan). Already existing permission for some areas and species for the PhD programmes was used to fill the gap, and the field plan was modified accordingly.

**4. Describe the involvement of local communities and how they have benefited from the project.**

Only local people from indigenous communities were employed throughout the field work and data collection. These include protected areas such as five tiger reserves, three national parks, five wildlife sanctuaries, 15 forest areas outside PAs, and a few communities conserved sacred groves within Kerala, Karnataka, and Tamil Nadu states. The forest department, local self-governments (LSGs), Biodiversity Management Committee (BMC) members of different LSGs, and members and officials of MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) were sensitised to the importance of niche specific local community conservation and ecological restoration of threatened tree species and their representing ecosystems.

**5. Are there any plans to continue this work?**

The IUCN global red list assessment team has assigned us a total of 57 tree species, and we would like to continue working on this for other species as well. The Kerala Forest Department imbibed the idea of niche specific local communities involved in

conservation and ecological restoration of threatened tree species and their ecosystems rather than going for wide propagation and planting of individual tree species. As a result, the Vazhachal Forest Division of the Kerala Forest Department incorporated niche specific ecorestoration plans for five species and their habitats. Discussion with the Kerala Forest Department is advancing for the incorporation of niche-specific ecorestoration plans for selected species (Item No. 5: Minutes of Kerala Forest Department, Planning and Development, No. P4-1537/2021, dated 16.06.2023). We plan to continue discussion with the Kerala Forest Department and Forest Departments of other states in the Western Ghats biodiversity hotspot through the IUCN Western Ghats Plant Specialist Group, of which Dr. KH Amitha Bachan is a member.

Kerala State Biodiversity Board and BMCs of Athirappilly and Sree Narayanapuram Grama Panchayath were also sensitised for niche specific ecorestoration plans and implementation involving local communities. The plans for respective species for the Athirappilly Vazhachal ecoregion were incorporated into the panchayath-level biodiversity strategy action plan of Athirappilly Grama Panchayath, and we were officially involved in the preparation. The same is under process for the Sree Narayanapuram Grama Panchayath. The BMC of the Sree Narayanapuram Grama Panchayath imbibed our plan and developed a coastal vegetation belt restoration involving local women through the MGNREGA scheme, for which we are consultants. The field trials of the coastal vegetation belt have already started. We plan to extend this model for the conservation and restoration of the targeted species and their habitat throughout its predicted areas through a similar consultation process.

We also plan to have local nurseries and field trials for niche specific ecological restoration, at least in a few of the predicted habitats, with multi-stakeholder involvement.

#### **6. How do you plan to share the results of your work with others?**

All the IUCN Red List assessments will be available on the IUCN website (<https://www.iucnredlist.org/>). Also, we shared already published links through our organisation's website, exhibitions, and social media platforms. We had interaction with officials such as the Kerala Forest Department, Kerala State Biodiversity Board, and LSGs, also plan for more interactive workshops and consultations with officials of different states. The results were also presented at one national and four international conferences, of which three received best paper presentation awards. We are planning to have an interaction with the IUCN Western Ghats plant specialist group to disseminate the niche specific restoration plan to other states.

#### **7. Looking ahead, what do you feel are the important next steps?**

Sensitisation of different stakeholder groups through interaction, consultation, and workshops Incorporation into the management plans of different forest administrative units of each ecoregion unit. Incorporation into BSAP of different LSGs and BMCs. Development of local nurseries of saplings of targeted and associated species. Field trials for field-level eco-restoration and monitoring involving local

communities to improve the resilience of habitats and ecosystems Publications as a research paper in national and international journals. Ecorestoration manuals.

**8. Did you use The Rufford Foundation logo in any materials produced in relation to this project? Did the Foundation receive any publicity during the course of your work?**

I have made paper presentations at four international and one national-level conferences. Acknowledged the Rufford Grant support along with the logo in the presentations. used the logo in the regional-level workshops and also mentioned it on our website. The grant support was mentioned in the document shared with the Kerala Forest Department and Kerala State Biodiversity Board, which is reflected in the permission letter issued.

**9. Provide a full list of all the members of your team and their role in the project.**

**Dr. Amitha Bachan KH:** Research supervisor and IUCN Co assessor, Dr. Babu Ambat:

**Director CED, Dr. A. Biju:** Principal MES Asmabi College, Dr. Maya Mohan: Western Ghats Hornbill Foundation. For permission and facilities provided in each institution.

**Manikyaraj, Shenthil Kumar,** Thankappan, Sudhi of Kadar indigenous community

**Madhavan, Sudhakaran** of Kattunaika indigenous community

**Manikandan** of Malasar indigenous community

Vishnu, Kamaraj, Manoj of Muthuvan indigenous community

For the support during field work and data collection.

**10. Any other comments?**

**Paper presentation awards**

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