Carnivorous Plant Specialist Group

EXTERNALLY FUNDED RESEARCH PROJECT:

IMPLEMENTATION OF RED LIST ASSESSMENTS OF SOME THREATENED BUT CURRENTLY DATA DEFICIENT SPECIES

FINAL REPORT

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Note: Appendices have been removed from the online version of this document as they contain sensitive locale and logistical information. – Robert Cantley, CPSG Chair, July 2014

EXECUTIVE SUMMARY

An externally funded project was undertaken by the Carnivorous Plant Specialist Group, with the aim of conducting research to gather data to facilitate IUCN Red List assessments of 19 *Nepenthes* pitcher plant species, all of which were considered to be threatened in the wild, and for which adequate, up to date information about their conservation status was lacking. Of the 19 species intended for survey, 13 had not been assessed previously, whereas the remaining six species had, but it was felt that their conservation status might have changed significantly in recent times.

Five field expeditions were undertaken to various parts of Southeast Asia during 2013. The areas visited included Sumatra (2 expeditions), New Guinea, Palawan, Luzon, and Sulawesi. Due to short-term habitat destruction wrought by a typhoon in Mindanao in late 2012, seven of the 19 species originally intended for survey could not be reached in the wild, so several other species (from different regions) that were considered to be of equivalent value to the project, were chosen as substitutes. This resulted in a significant re-arrangement of the sequence and destinations of the field expeditions.

Despite the initial setbacks, the project was highly successful, delivering significantly better outcomes than originally anticipated. A total of 28 *Nepenthes* species were surveyed, with 26 receiving new or revised Red List assessments (two species could not be properly assessed using the data we obtained). All data were entered into the Species Information Service in December 2013, along with distribution maps and supporting documentation. Reviews of 27 of these assessments were completed by the end of December 2013, with the final species being completed and reviewed in mid-January 2014.

This project has resulted in new, complete Red List assessments for more than 15% of all *Nepenthes* species and has resulted in a significant reduction in the number of 'data deficient' and 'not evaluated' species. This represents an excellent outcome for the recently re-established Carnivorous Plant Specialist Group and stands us in good stead to attain our goal of revising the Red List assessments for all *Nepenthes* species in the next few years.

INTRODUCTION

RE-ESTABLISHMENT OF THE CARNIVOROUS PLANT SPECIALIST GROUP AND INITIAL GOALS

The Carnivorous Plant Specialist Group (CPSG), a Red List Authority within the Species Survival Commission (SSC), was re-established in 2012. At the outset, the primary objective of the group was to complete new and revised Red List Assessments for all major groups of terrestrial carnivorous plants. This includes, but is not necessarily limited to, the pitcher plant genera *Nepenthes*, *Cephalotus*, *Sarracenia*, *Darlingtonia* and *Heliamphora*; the members of the sundew family, *Drosera* and *Dionaea*; the butterworts, *Pinguicula*; and sundry other genera, such as *Byblis* and *Drosophyllum*. In 2012, Mr. Robert Cantley was appointed as Chair of the re-established CPSG, while I (Charles Clarke) was appointed as the Scientific Focal Point.

Upon being appointed, we determined that the genus most in need of new/updated Red List (RL) assessments is *Nepenthes*. This large genus comprises more than 140 species, with a centre of distribution in Southeast Asia. The vast majority of species occur in Indonesia, Malaysia and the Philippines, with outliers in Australia, New Caledonia, Indo-China, India, Sri Lanka, Seychelles and Madagascar. The last round of RL assessments for *Nepenthes* was conducted in the late 1990s and was published by Arx *et al*. (2001). Since that time, a large number of new *Nepenthes* taxa have been described (but not assessed for the Red List), while several others that were assessed in 2001 have not been surveyed since (Figures 1 & 2). Given rapid rates of habitat destruction in Southeast Asia, coupled with a dramatic increase in the horticultural popularity of *Nepenthes*, we were concerned that a number of species that were not considered threatened in 2001 may be threatened now. However, in order to determine whether or not our suspicions were correct, it was necessary to conduct field surveys for the not evaluated (NE) and data deficient (DD) species, as well as new assessments for species that were assessed in 2001. This is a substantial task that we expect to take at least 2-3 years, and in order to complete it, external funding is required to pay the costs of those CPSG members who are prepared to undertake the necessary field work.

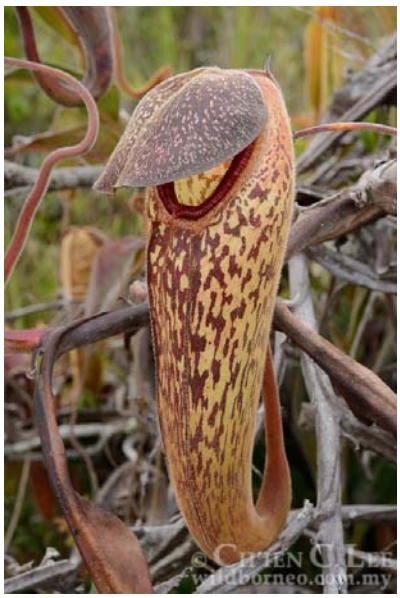

Figure 1. *Nepenthes klossii* is an example of a little-known species that was assessed for the IUCN Red List in 2001, but whose conservation status might have changed, due to habitat destruction. Photo: © Ch'ien C. Lee.

Against this background, in late 2012 the Chair of the CPSG successfully sought sponsorship to conduct RL assessments on *Nepenthes* species.

PROJECT OBJECTIVES

The principal objectives of the project were twofold:

- Expeditions to the habitats where these species have been recorded would be made by suitably qualified personnel, with the express aims of surveying the Area of Occupancy (AOO), Extent of Occurrence (EOO) and estimating the population size and condition.

Where possible, an assessment would be made of the primary threats to the species and where appropriate, suggestions may be offered as to how these threats might be mitigated.

- Data from surveys were then to be collated by the CPSG Red List Authority, distribution maps prepared and supporting documentation gathered for submission to SIS to enable reliable, up to date RL assessments to be completed.

An initial list of 19 DD and NE *Nepenthes* species was compiled, based on perceived levels of urgency and geographical distribution (Table 1, Figure 3). Although the emphasis was on DD/NE species, six of the species on our list had been assessed for the Red List before, but it was felt that as the threat levels to these species might have changed significantly since they were last assessed, they were now effectively DD and the need for new information was urgent.

Figure 2. *Nepenthes lamii* is a highland species from Mt. Doorman in New Guinea. Assessed as VU in 2001, it has since been split into two species, *N. lamii* and *N. monticola*, neither of which has been assessed since the split. Photo: © Ch'ien C. Lee.

Table 1. Proposed list of *Nepenthes* species to survey for the IUCN Red List in this project. Species listed in blue text were previously assessed for the IUCN Red List in 2001, but it was felt at the start of this project that their RL status was in urgent need of review.

Group #	Geographical area	*Nepenthes* species to be surveyed
1	New Guinea	*N. klossii*, *N. lamii*, *N. monticola*, *N. paniculata*
2	Sumatra	*N. aristolochioides*, *N. rigidifolia*, *N. sumatrana*, *N. tenuis*
3	Philippines	*N. copelandii**, *N. deaniana*, *N. micramphora**, *N. mindanaoensis**, *N. palawanensis*, *N. peltata**, *N. petiolata**, *N. robcantleyi**, *N. saranganiensis**
4	Borneo	*N. clipeata*, *N. pilosa*

* Denotes species from Mindanao that could not be assessed due to the effects of a typhoon that hit the region in late 2012.

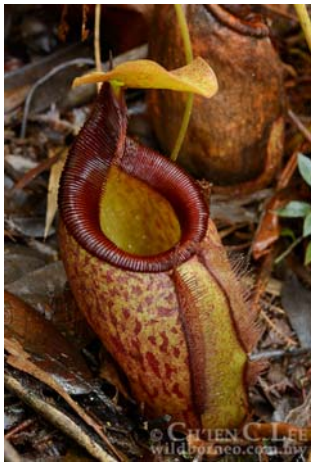

Figure 3. *Nepenthes leonardoi* is a montane species from Palawan in the southern Philippines. It is very similar (and presumed to be closely related) to several other species from the mountains of Palawan, most of which have only been described in the last few years. These include *N. deaniana, N. attenboroughii, N. gantungensis, N. palawanensis, N. mira*, and *N. mantalingajanensis*. In the third CPSG expedition for 2013, Ch'ien Lee and Charles Clarke surveyed *N. deaniana* and *N. leonardoi*, and insodoing, were also able to confirm the distributions of the remaining montane species from Palawan, thereby facilitating new RL assessments for all of them. Although *N. leonardoi* is presently known from a single mountain in Palawan, the area in which it grows is remote and undisturbed by human activities. For this reason, it was assessed as VU for the IUCN Red List.

PROJECT DELIVERABLES

The success of the project was to be measured in the form of completed Red List Assessments on each of the 19 *Nepenthes* species listed in the original proposal being submitted to the SIS, complete with all supporting documentation in conformance with the requirements of Annex I of the IUCN Red List Assessment Process 2013-2016.

IMPLEMENTATION OF THE PROJECT ACTIVITIES

COMPLETED FIELD EXPEDITIONS AND DATA GATHERING EXERCISES

Five field expeditions were undertaken. The locations, participants and *Nepenthes* species surveyed are listed in Table 2. As a result of these expeditions, a total of 28 species were assessed in total, nine more than the original goal of 19 species. However, two species (*N. alzapan* and *N. pilosa*) could not be assessed properly and remain DD, which meant that the total number of species given an effective RL assessment was 26. Furthermore, several significant problems (all beyond our control) arose almost as soon as the project started (see below), and this meant that seven of the original 19 species could not be surveyed. Rather than fall short of our objectives, we decided to substitute the seven species that we could not survey with others that we felt were of similar value to the project. In addition, we were unable to arrange a field trip to central Borneo to survey *N. pilosa*; while it was deemed that a field trip to survey *N. clipeata* was not required. However, several species that were not on our original list were encountered on the field trips, thereby facilitating the additional assessments, while a taxonomic change to the status of several sub-populations of *N. pilosa* (which are now known as a distinct species, *N. chaniana*) enabled us to assess these subpopulations under the heading of *N. chaniana*.

The participants on each expedition completed a brief field report. These reports are attached in Appendices 1-5.

Table 2. Summary details of the field expeditions undertaken. Species from the original list are in purple text; species that we substituted for ones on the original list are in blue text, while species in green text were additional.

Trip	Geographical area	Participants	Month of travel	DD/NE *Nepenthes* species surveyed
1	Sulawesi	Ch'ien Lee	March	*N. nigra, N. pitopangii*
2	Sumatra	Charles Clarke		*N. aristolochioides, N. naga, N. rigidifolia, N. sumatrana.*
3	Philippines	Charles Clarke, Ch'ien Lee	July	*N. alzapan, N. campanulata, N. deaniana, N. gantungensis, N. leonardoi, N. mantalingajanensis, N. mira, N. philippinensis, N. palawanensis,*
4	Sumatra	Nana Hernawati	October	*N. adnata, N. tenuis*
5	New Guinea	Charles Clarke, Ch'ien Lee	October-November	*N. klossii, N. lamii, N. monticola, N. papuana, N. paniculata*
-	None: Data derived from other sources.	Charles Clarke, Ch'ien Lee, Nana Hernawati	N/A	*N. chaniana, N. clipeata, N. pilosa, N. rowanae, N. tenax, N. treubiana.*

CHALLENGES AND SETBACKS

In late 2012, a powerful typhoon hit the southern Philippines, devastating large parts of eastern Mindanao. This made it impossible to schedule field expeditions to this restive part of the Philippines. Seven of the species that we originally intended to survey occur in this region (*N. copelandii, N. micramphora, N. mindanaoensis, N. peltata, N. petiolata, N. robcantleyi, N. saranganiensis*), thereby reducing the number of "assessable" species on our original list to 12. Furthermore, we were unable to find any suitable people to undertake the expeditions to central Borneo to survey *N. pilosa*. In the end, *N. pilosa* could not be assessed, so we substituted it with *N. chaniana*, a species that was described in 2006 and used to be considered to be *N. pilosa*. We based our assessment of *N. chaniana* on recent field observations undertaken by Charles Clarke & Ch'ien Lee. We amended the existing assessment of *N. pilosa* to DD. Once it became apparent that we would be unable to survey several species from the Philippines, we asked Nana Hernawati, a *Nepenthes* specialist from Sumatra, if she could undertake a series of three field expeditions to survey several of the Sumatran DD/NE species. She agreed, but due to a prolonged delay in transferring the necessary funds to her, she was only able to complete one expedition.

OUTCOMES

Of the 28 species that were assessed, eight had been assessed previously and were given a revised RL assessment, while 20 DD/NE species were assessed for the first time (Figure 4). This compares with 19 species on our original list, of which six had been assessed previously. Assessments for all 28 species were entered into SIS in November-December 2013 (along with distribution maps and necessary supporting documentation), with reviews completed for 27 species by the end of 2013 (the assessment for *N. paniculata* was completed in mid-January 2014, as we needed to wait to receive some important information from Dr. Alastair Robinson, who was able to view this species in the wild in late 2013).

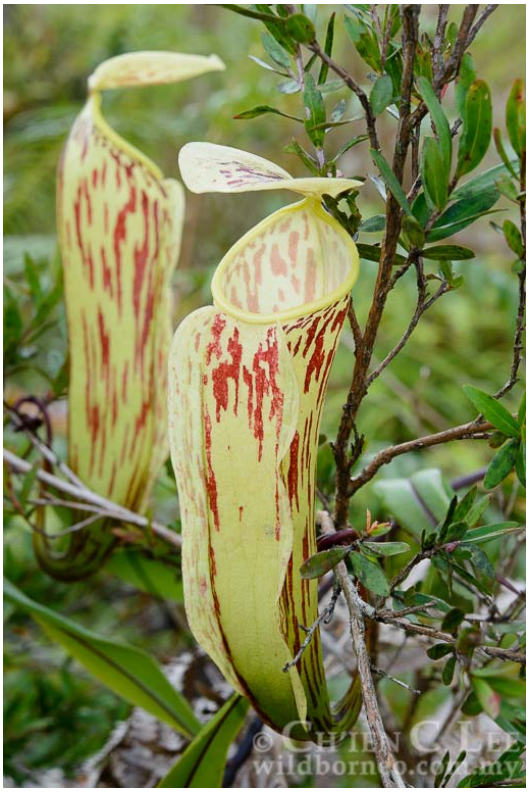

Figure 4. *Nepenthes glabrata* is a species from the mountains of Sulawesi. At the time it was described, it was known only from a single wild plant. In the first expedition of this project, Ch'ien Lee discovered a large subpopulation of this species, thereby extending its known geographical range and population size significantly. Not only did this discovery facilitate the first RL assessment for *N. pitopangii*, it showed that some species that are not well-documented are not necessarily rare, and that comprehensive field observations are required in order for accurate RL assessments to be made. Photo: © Ch'ien Lee.

Table 3 summarises the *Nepenthes* species that have been assessed for the IUCN Red List as a direct result of this project. Of these 28 species, two (*N. alzapan* and *N. pilosa*) were assessed as DD and as such do not contribute to the total number of species given effective RL assessments. Of the 26 species given an effective RL assessment, the breakdown of numbers for each assessment category were as follows: CR – 4 species, EN – 7 species, VU – 9 species, LC – 6 species. Three of the four CR species were assessed as CR in 2001; the only new addition to this group was *N. rigidifolia*, which was previously NE. While there is cause for deep concern about the long term survival of several species, there are also grounds for cautious optimism as more than half of the species were

assessed as LC or VU, indicating that there are no strong threats to the majority of *Nepenthes* species at present, and that the distribution and intensity of threatening processes is confined to certain geographical areas and species that are prized in horticulture.

In addition to the species surveyed for RL assessments during this project, Ch'ien Lee and I discovered a new, undescribed species of *Nepenthes* on the expedition to Mount Doorman in New Guinea. As no herbarium specimens have been collected yet, this species is unlikely to be formally described for at least another 1-2 years and little is known about its geographical range and population size at present. Nevertheless, the discovery of a new species represents an excellent, unexpected outcome of this project.

Table 3. *Nepenthes* species assessed in this project, and their assessment categories.

***Nepenthes* species**	**Previous RL assessment (based on Arx et al. (2001), if described at that time)**	**New (2013) RL assessment**
adnata	DD	EN
alzapan	NE	DD
aristolochioides	CR	CR
campanulata	CR	EN
chaniana	NE	EN
clipeata	CR	CR
deaniana	NE	VU
gantungensis	NE	VU
klossii	VU	EN
lamii	VU	VU
leonardoi	NE	VU
mantalingajanensis	NE	VU
mira	VU	VU
monticola	NE	LC
naga	NE	VU
nigra	NE	LC
palawanensis	NE	EN
paniculata	EN	EN
papuana	DD	VU
philippinensis	NE	LC
pilosa	DD	DD
pitopangii	NE	VU
rigidifolia	NE	CR
rowanae	NE	LC
sumatrana	CR	CR
tenax	NE	LC
tenuis	DD	EN
treubiana	VU	LC

REFERENCE

Arx B, Schlauer J, Groves M. 2001. *Cites Carnivorous Plant Checklist*. Royal Botanic Gardens, Kew, UK.

OUTCOMES/ACHIEVEMENTS:

- Completed field observations and data collection to facilitate RL assessments of all published *Nepenthes* species from Papua.
- Completed RL assessments for *N. lamii, N. klossii, N. paniculata, N. papuana* and *N. monticola*.
- Discovered a new species of *Nepenthes* on Mt. Doorman.
- Ascertained that the only *Nepenthes* species from Papua that currently appear to be in need of regular monitoring are *N. klossii* and *N. paniculata*.