

Cycas Conservation Centers in the Nilgiri Biosphere Reserve, Western Ghats, India.

Abstract

The study on harvest impacts, life history, ecological status and distribution of *Cycas circinalis* L. along the Western Ghats has brought to the forefront a need for implementing in situ conservation strategies. Keystone Foundation (www.keystone-foundation.org) believes that involving communities who live closest to the forests that are home to the Cycads would be the most important step in this direction. We propose to use the facilities in 3 villages where Keystone works to develop a Cycas information center and to organize exposure trips for people from neighbouring indigenous communities, especially the children, to these centers. We foresee through these efforts an increased awareness on the special status of this plant and participation in conservation efforts. We are also aware that communities across India are using this plant and we would like to document the ethno ecological information especially in relation to the role of the plant in the ecosystem.

Preliminary results from 2007-2008

Our conservation work on *Cycas circinalis* has been grounded very well with support from TCS. Three sites (Jeminarai and Velleri combei in Tamil Nadu, and Nilambur in Kerala) were monitored on a monthly basis to understand the leafing and reproductive phenology of *C. circinalis* individuals as well as the timing and rates of harvest. Midway through the study we were also able to add on one extra site, in Sitthukunni which is at the foothills of the Coonoor slopes in Tamil Nadu. The data shows some interesting patterns. For example, to date we have found that harvest intensity and size of the leaf are independent of each other. The monthly monitoring has also brought in very interesting data with regard to the harvest frequency of different plant parts, and important issues with regard to illegal harvests.

To assess the conservation status of *C. circinalis* we have been carrying out a survey of populations in different parts of the Western Ghats. So far four sites in three states have been visited: Melkote in Karnataka, Silent Valley National Park in Kerala, Peppara Sanctuary in Kerala and Annamalai Sanctuary in Tamil nadu. At each of these sites, 20mX20m plots were laid and the demographic status of the population was assessed. Other observations with regard to people's use of the plant and the volume of trade were also collected.

Keystone has initiated *C. circinalis* seedling nurseries in five indigenous villages in the NBR as a conservation strategy. A total number of 5000 seedlings have been raised so far, many of which have been planted in the farmlands of the people. The seeds were collected from adjoining forest areas and we are monitoring the success of these seedlings in nurseries.

To increase awareness about the importance of *C. circinalis* conservation, we have put together a permanent exhibition at the Bee Museum in Ooty which is a famous tourist destination. There are *C. circinalis* posters and plants on display. The Cycas T-shirts we designed have been well-received (both the adult and children sizes) and are being sold through the Green shops. We have also made *C. circinalis* saplings available for sale at the Bee Museum, and these are popular.

We have not yet carried out our annual remonitor of the dynamics of *C. circinalis* populations in our permanent plots in four different locations. This will take place in May 2008.

In the Kotagiri site, initially people stayed away from harvesting the leaves from our plots but now they have resumed and do the harvests clandestinely. This brings to the fore front the issue of working closely with communities that are closer to the plants. While laws may be there and awareness can be high, if the communities living close to the biodiversity do not care for the species, then we will always find that we have come in too late. Keeping this backdrop in mind we wish to propose the following objectives that arise from the lessons we learnt from last year's project.

Project objectives

Our work to date has confirmed the need to work on the conservation of *C. circinalis* and also highlights the great need to work with forest communities more closely. It is with this in mind we propose two new objectives related to obtaining more ethnoecological information and to establishing Cycas conservation centers. We also propose to continue the work of some of our previous objectives.

Objective 1: Monitor the ethnoecological uses of the cycads by the communities.

To date we have much anecdotal information on how *C. circinalis* is used, but we would like to obtain ethnoecological information more scientifically and rigorously. By using detailed questionnaires to interview people in villages where *C. circinalis* is harvested and/or used in the NBR, and documenting who actually does what with which part of the plant, we will be able to better quantify the extent and volume of the use, and better understand how we might best promote conservation. We would like to share the questionnaire with our NGO partners in other parts of the Indian subcontinent to document the use and distribution of various Cycas species from their areas. In this documentation we would also like to highlight the frugivores, pollinators, predators and any other plant or animal relationship that may exist with the Cycads of that particular site.

Objective 2: Develop Cycas Conservation Villages to better foster cycad conservation.

We propose to develop an area in the villages of Appankaapu (Kerala), Pillur and Velleri Combei (Tamil Nadu) as Cycas information centers. We will create information in the local language and create an exclusive cycad nursery in the area. In each village, the Cycas village information centers will act as a learning center and children from the indigenous communities will be taken there by Keystone for exposure visits. These visits will also feature a walk through the nearby forests which are home to the cycads. Through this we hope to inculcate a Cycas conservation concern within the future generations of the cycad users and the indigenous people. In addition, the people in the villages of Velleri Combei and Maricode, where illegal harvesting by outsiders is a major problem, would greatly benefit from a communication system that could serve to get the message of illegal harvests out to the authorities. Meetings with village communities on the special status of cycads and also exposure visits will be planned for the community leaders, women's groups etc.

Objective 3: Continue to assess the conservation status of *C. circinalis* over a larger area.

Our study to date has now covered parts of Tamil Nadu, Karnataka and Kerala, but there are large areas of the NBR and elsewhere in the Western Ghats that we still did not survey. It is essential that we obtain an idea of the status of populations over a good part of *C. circinalis*' range in Western Ghats in order to identify those populations or regions with highest priority for conservation and restoration. We will continue to carry out surveys to identify existing populations and then establish 20x20 m plots in which to record the number, size and status of all *C. circinalis* individuals. We will use log-linear analyses to compare population structure across sites and multivariate analyses to identify possible relationships between population structure and other variables (canopy cover, fire, grazing etc).

Objective 4: Continue to promote and test the potential for germination and outplanting of seedlings.

We plan to extend our current outplanting efforts to other communities and to outplant in homegardens as a strategy for conservation, through the sustainable harvest of leaves and seeds from cultivated populations. Specifically, we would like to work with an additional three villages. The production of leaves and seeds from cultivated populations for sale and local use should lead to decreases in pressure on wild populations. We will continue germination trials and monitor growth and survival of out planted seedlings.

Objective 5: Continue to monitor the demographic rates and population growth/decline of C. circinalis populations subject to different types of exploitation.

We will continue to remonitor the *C. circinalis* in our permanent plots in May 2009, in order to obtain another year of data on rates of survival, growth and germination. We will use this data to assess changes in population structure and also to create matrix models to estimate finite rates of population growth/decline and to identify the impacts of harvest on population growth rates. The opportunity to monitor our populations for another year will provide us with more accurate information and provide a better understanding of the population dynamics of this species.

Timeline

Project timeframe is one year; objective numbers correspond to those listed above.

Objective	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
1			X	X	X	X	X	X	X	X		
2	X	X	X	X	X	X	X	X	X	X	X	X
3				X	X	X						
4	X	X	X	X	X	X	X	X	X	X	X	X
5										X		

Budget

Objectives and associated activities	Cost
<i>Objective 1: Ethnoecological study:</i> Monthly travel to study sites in the NBR	\$500
<i>Objective 2: Establish Cycas conservation villages:</i> Posters, information displays, field trips for youth to centers, exposure visits, cell phone for Vellericombei (to report harvesters)	\$1250
<i>Objective 3: Population surveys in Western Ghats:</i> Travel to sites (& accommodation)	\$250
<i>Objective 4: C. circinalis nurseries:</i> seeds, pay assistants for upkeep of nurseries	\$380
<i>Objective 5: Remonitor populations:</i> pay for guide& assistant	\$120
TOTAL REQUESTED FROM TCS	\$2500