

# Rescuing endangered wild orchids from a man-made flood

April 11 2012, By Hong Liu, Feng Chang-Lin, Shu-Wei Cai and Yi-Bo Luo

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This gorgeous flowering plant of *Cymbidium tracyanum* is among the rescued orchids. Image: Florida International University

You may have heard stories about emergency rescues of plants or animals from habitats facing imminent destruction. This is one of those stories, except that the scope of the rescue is unprecedented and the transplantation itself was -- and continues to be -- of great scientific significance.

The rescue itself happened in 2006, in a remote area of Southwestern China in and near the Yachang National Orchid [Nature Reserve](#) in Guangxi Zhuang [Autonomous Region](#), in the foothills of the Yunnan-Guizhou plateau. The Yachang Reserve was still in its infancy at that time. This remote, 220-squarekilometer (85 square mile), nature

preserve holds more than 150 species of [orchids](#), some of them in extremely large, relatively undisturbed populations. It exemplifies the world orchid hotspot that is Southwestern China, consisting of Yunnan, Guangxi and Guizhou Provinces.

Terrain in the Yachang Reserve and adjacent areas is complex, with rolling hills in some places and steep, near-vertical rock walls in others. Deep [valleys](#) cut by rivers or seasonal streams are common. Two major rivers, Hongshui in the north and Nanpanjiang (a tributary to the Hongshui) in the west, flow through or adjacent to the Yachang Reserve. The reserve and adjacent forests range in elevations from 350 meters (1,150 feet) above sea level at the Hongshui river banks in the northwest to 1,970 meters (1.2 miles) above sea level at the highest point of the Panguang Mountain in the southeast. The Hongshui River is the site of China's second largest hydropower project. In 2006, the project was near completion, which would mean damming the river and flooding long sections of its banks—host to tropical pine, mixed pine and evergreen broad-leaved forests. At that point, guided by Chinese endangered species protection laws and regulations, and prompted by author Yi-Bo Luo, the Guangxi Forestry Bureau (the provincial government agency in charge of all of Guangxi's protected areas) negotiated successfully with the construction company undertaking the hydroelectric power project. That company agreed to set aside nearly 10 million RMB (equivalent to \$1.5 million) to implement an unprecedented wild plant rescue mission.

Nearly all the staff of the young Yachang Reserve was mobilized to carefully translocate nearly 1,000 delicate, reproductive-size orchid plants from locations slated for flooding. Altogether, the plants represented 29 species and 16 genera. Because of poaching concerns, these orchids were relocated to a fenced, patrolled forest site at around 1,000 meters (3,280 feet) above sea level—as much as 600 meters (nearly 2,000 feet) higher than their original locations. In addition, a landscape company was hired to relocate about 200 individuals of the

narrowly endemic cycad, *Cycas segmentifida*, and nearly 1,500 trees of nine other species on the Chinese endangered plants list. These non-orchid plants were taken to a forestry farm located at 450 meters (1,480 feet) above sea level. The whole rescue action took nearly seven months to complete.

The conservation significance of the rescue action is apparent. But, it turns out, it also has scientific significance. For more than half of the orchid species, the relocation placed them out of their natural elevation range, which provided us a unique opportunity to test the new conservation idea of assisted colonization. Assisted colonization is the movement of a species by humans to habitats at beyond its native range—to higher latitudes or higher elevations predicted to be suitable under future climatic conditions. Such drastic conservation measures may be needed because many currently endangered species may not be able to keep pace with climate change due to their limited dispersal ability across already fragmented habitats. These species, without help, are expected to experience [habitat](#) loss, population declines and elevated risks of extinction. The measure is highly controversial among the scientific community and has been attempted on only a few occasions. The debate around assisted translocation as a viable conservation tool has been largely philosophical and hypothetical, as little direct biological data exist in the literature.

Then, nearly two years after the assisted translocation of the wild orchids, a large scale, extreme cold spell struck southern China. In the Yachang region, the average temperature in January and February of 2008 was the second-lowest recorded since 1964, when the weather station was established. Severe drought followed in early 2010. In the Yachang region, the rainfall during the 2010 dry season (October–April) was the lowest in recorded history. Yet, more than half of the translocated orchids, within or out of range, survived these extreme weather events.

The rescue and the subsequent extreme weather provided a unique opportunity to assess impacts of rare but significant weather events on translocated populations, providing data that are vital in projecting the long-term viability of populations subject to assisted colonization. Our study on the mortality patterns of these transplants currently is being peer-reviewed for publication in an academic journal. We continue to work together to learn as much as we can from these managed relocation “experiments” in order to inform our future conservation actions.

Provided by Florida International University

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