

NTBG & San Diego Zoo Go Wild Over Plants

by Jon Letman, Associate Editor

We first get the message in the nursery – the child’s nursery – in the form of rhymes and ditties, stuffed animals, and picture books brimming with cheery primary color birds, bees, bunnies, and bears who dwell in fairy tale habitats.

Children’s books like *The Great Kapok Tree*, *The Very Hungry Caterpillar*, and *Trout are Made of Trees*, teach us from our earliest days of the interdependence of plants and animals.

All creatures depend on plants for something: oxygen, food, habitat, shade, shelter, protection, and even recreation. Likewise, plants benefit from the presence of animals, birds, and insects which spread pollen, disperse seeds, produce fertilizer, and control harmful weeds and insects. Animals breakdown wood and leaf litter, cycle nutrients, and improve overall soil fertility, allowing young plants to gain a toe-hold and established plants to thrive. It only follows then that we should think of botanical and zoological gardens as two different forms of a like-minded body. When they work together, they can be an even greater force in wildlife conservation.

One such collaboration is NTBG’s partnership with the San Diego Zoo. In 2010, the two institutions¹ signed a Memorandum of Understanding (MOU) which defines specific conservation goals, strengthens the organizations’ relationship, and allows for increased cooperation in plant conservation which, as any zebra or elephant will tell you, helps animals too.

¹ along with Durban Botanic Gardens (South Africa); Honolulu Botanical Gardens, the University of Hawai’i Lyon Arboretum and Botanical Garden, Waimea Valley (O’ahu); and The Huntington Library, Arts Collections, and Botanical Gardens (Southern California)



▲ *Erythrina americana* in McBryde Garden

▼ San Diego Zoo's Michael Letzring and Christy Powell collect materials for DNA from trees in the McBryde Garden. The zoo has the third largest collection of *Erythrina* in the U.S., thanks to collaborations with other institutions like the NTBG.

Photos by author





▲ Back at the zoo, Powell examines an unidentified species of *Erythrina*.
Photo by Ken Bohn, San Diego Zoo; used with permission

Cooperation between NTBG and the zoo dates back to the beginning of this century when the zoo began to introduce rare *Erythrina* species from the Garden into its own collection.

“In 1999 the San Diego Zoo started receiving cuttings from Waimea Valley which got quite a few from NTBG,” says Zoo Plant Propagator Christy Powell. “One of our former horticulturists at the zoo worked at Waimea Valley in the 1960s, which is how we established our relationship with Hawai‘i.”

Powell explains the aim of the *Erythrina* conservation project: “In 2005 I wrote a grant through the Association of Zoological Horticulture for a micropropagation lab at the zoo. We were able to start one up on zoo grounds and, through that, began propagating different orchids, bamboo, and other species *in vitro*. In the past we had problems bringing *Erythrina* cuttings back [from Hawai‘i]. If

they were too small in diameter they dried up and didn't do well.”

Today the zoo has 48 species of this genus, the third largest collection in the United States after NTBG's 65 species and hybrids, and 63 species at Waimea Valley. The zoo's own collection began with an *Erythrina coralloides* in the childrens' zoo in 1935 by Kate Sessions, renowned California horticulturist, known as the 'Mother of Balboa Park'.

In 1972 the zoo started accessioning¹ its collection and has worked closely with NTBG and Waimea Valley to increase and diversify its holdings. Since 2002, Powell has worked in the zoo's nursery with Michael Letzring, Horticulture Collections manager. She says that typically *Erythrina* are grown from cuttings because they're more reliable than seeds for preserving genetic integrity.

The zoo's collection is well-known in botanical communities and valued as a resource for researchers studying the medicinal properties, specific alkaloids, and other important facets of the tree. It also serves as a genetic back-up to collections in Hawai'i and elsewhere.

In the case of *Erythrina*, this was none too soon. When a destructive wasp² began to rapidly decimate trees across Hawai'i and other parts of the world in 2005, the zoo decided to broaden its efforts to obtain undamaged plant material and turned to NTBG for help. Powell and Letzring visited the Garden in 2007 where they worked with staff to gather targeted *Erythrina* species to grow *in vitro* using the Garden's micropropagation lab and take back to San Diego to act as a safeguard against a 'worst-case scenario'.

1 creating and keeping records on a plant's botanical name, origin of the individual plant, and other data important to its scientific research value

2 erythrina gall wasp (*Quadrastichus erythrinae*)

“We were thinking we’d be hit¹ [by the wasp] shortly after Hawai‘i so we tried to really accelerate our conservation efforts, especially of those species that were wild-collected,” Powell says, explaining that many of the trees in NTBG’s McBryde Garden came from collections made in the 1970s.

“A lot of that material cannot be reproduced because those areas are no longer accessible or there has been habitat destruction.” Overall, 16 species of *Erythrina* are on the IUCN Red List², mostly from the neotropics and Africa. Of those, nine are grown in NTBG’s gardens, the zoo, and Waimea Valley.

The zoo’s erythrina are being protected, studied, and enjoyed, but are also providing vital habitat, shade, and food for animals. Although most erythrina seeds are toxic and the trees are not used extensively as ‘browse’ (animal feed), they are home to the native Californian orchard oriole which feed on the nectar.

In addition to partnering with NTBG for plant conservation, the zoo has the country’s largest browse program, for which it grows many species of *Bambusa* (bamboo), *Eucalyptus*, *Ficus*, and *Acacia* used to feed giant pandas, koalas, elephants, giraffes, and hoofstock like zebras, donkeys, and camels. This plant material is also used to provide food for animals in other zoos which may not be able to grow the same plants.

Beyond collaboration with the Garden, the browse program, and other botanical research projects, the zoo’s Institute for Conservation Research has a plant ecology division, restores native habitat and operates a seed bank in partnership with Kew’s Millennium Seed Bank.

¹ Fortunately, the erythrina gall wasp was never documented as causing tree damage in California.

² a global list rating plant and animal species that are at great risk of extinction

When thinking about zoological gardens, most people tend to focus more on animals and less on the gardens, but the cooperative efforts between NTBG and the San Diego Zoo illustrate how humans are coming together with shared goals, a common vision, and the recognition that the health of this planet, and all humans, animals, and plants on it, are inextricably interwoven. To save one living creature is to improve the standing of all, while the extinction of any plant or animal diminishes the well-being of everything else left behind.



▲ This "Hawaiian blue" butterfly (*Udara blackburni*), one of only two butterflies native to Hawai'i, lands on an endemic māmane (*Sophora chrysophylla*).
Photo by Ken Wood