

# *Erythrina zeyheri* in the grasslands of the Eastern Highveld

by Charles Craib

The ploegbreeker, breaker of ploughs, *Erythrina zeyheri* is a magnificent caudiciform species found in the summer rainfall grasslands of the South African interior. The flame orange or reddish orange flowers appear in the late spring and early summer from mid-October to mid-November. The plants often flower when the grasslands are turning brown after the winter drought or in the blackened veld after dry season grass fires.

*E. zeyheri* has dwindled greatly in numbers since the advent of crop farming particularly maize and sunflowers. The decline in numbers of plants has continued in recent decades with urban expansion, the development of large informal settlements, mining and pollution of the grasslands with garden and industrial refuse. I have studied these plants in some detail on the Eastern Highveld for the last twenty years and the account which follows concerns the species in the Balfour, Bethal, Delmas, Ermelo, Highveld Ridge and Kriel districts.

The present day distribution of plants in these districts is, as elsewhere in the interior grasslands of eastern South Africa, very fragmented. Prior to extensive crop farming and open cast coal mining on the Eastern Highveld, *E. zeyheri* inhabited moist short grassland around the banks of streams, seepage areas near sheets of rock and rocky outcrops. A habitat particularly favoured by these plants consisted of deep loamy soil in water retentive, seasonally moist depressions. Huge amounts of this habitat are now under crops or open cast mines.



The extremely rare, salmon pink-flowered *Erythrina zeyheri* with typical flame orange flowered plants in the background. Photo: Connall Oosterbroek.



*Erythrina zeyheri* growing on the outskirts of suburbia. Plants in the foreground are healthy whilst those near the rocks in the background are largely smothered by invasive alien Kikuyu grass *Pennisetum clandestinum*. Photo: Connall Oosterbroek.





A plant of the summer rainfall grasslands, the ploegbreeker, *Erythrina zeyheri* in full flower in late spring. This shows one of the habitats most favoured by the species: level ground adjacent to a stream. Visible in the background is an extensive monoculture of maize, which has destroyed most of the plant's habitat on the Eastern Highveld. Photo: Connall Oosterbroek.

The largest populations are found growing in the open grasslands that still remain in suburbia. These are usually adjacent to marshes or streams and unsuitable for housing developments. Smaller populations are found in railway line reserves and along watercourses with broad level banks. Large populations consisting of scattered groups of plants are occasionally found on rocky hills such as those south-west of Morgenzon.

#### **Plants on stream banks and near seepage areas**

The Bronkhorstspruit and its associated tributaries probably have some of the most extensive remaining populations of *E. zeyheri* on the Eastern Highveld. The plants occur in scattered groups of a few to several hundred plants along an area of about 10 km of the river and its tributaries. This unusual set of circumstances has been brought about by the topography of the riverbanks, which are elevated well above the water, making them unsuitable for colonization by marginal water plants such as the reed *Phragmites australis* and bulrush *Typha capensis*. The soil is deep and moist and rarely inundated for long periods of time. *E. zeyheri* is not a marsh plant and avoids depressions or riverbanks that are flooded for several days or weeks after rainfall.

Plants growing near seepage areas are rarer than those growing around streams. This habitat is usually limited to an area of some 2-4 m in width. The plants are unable to expand into new niches as the surrounding ground is either too rocky or too moist.

#### **Plants in areas with deep loamy soil**

*E. zeyheri* has enormous tubers when these have the opportunity to develop fully. The Afrikaans name ploegbreeker (plough breaker) epitomises the size of the tubers and their tenacity when well rooted in the soil. In one area there is a scattered colony of *E. zeyheri* numbering over 1 000 individual plants. These plants have big deep-seated tubers that are capable of flowering well in years with a dry spring and early summer. The success of *E. zeyheri* in areas with deep loam is related not only to the depth of the soil but also to the conditions necessary for the germination of seeds. Seeds require moisture retentive soil for at least two weeks whilst they are germinating. These conditions are best provided by water retentive, loamy soil, partly shaded by the new grass blades; which are well established by February - the seeding month.

#### **Plants on rocky hills and outcrops.**

*E. zeyheri* is normally scarce on rocky outcrops but these are usually the

only places where it occurs in heavily cultivated or mined areas. The tubers contort and twist themselves amongst rocks to take advantage of what little soil there is underneath. The largest clumps of plants occur in areas where the soil is deepest. Near Morgenzon the plants grow on rocky hills together with various other bulbs, caudiciforms and succulents. At one place they occur together with enormous numbers of the dwarf *Nerine rehmannii*.

#### **Seeding and seedling development**

*E. zeyheri* flowers profusely after the first few rainstorms of the summer. The brilliant flowers attract a wide range of insects particularly honey bees and flying beetles. Pollination is always best when the grass cover is shortest. This is usually in the summer following a winter grass fire. The fires clear the habitat of dead, dry grass and render the flowering plants more conspicuous amongst the much shorter green grass blades.

Pollination is very variable from one year to the next. Seeds on pollinated flowers fail to develop if the early part of the summer is very dry. At one large colony near the border of western Mpumalanga with Gauteng a good seed set has so far been observed about once every eight years. Even in years when the plants do seed well the young seeds



in the ripening pods are eaten by insect larvae. In some years virtually no seeds escape parasitism.

The general problems the species has with producing quantities of viable seeds are further complicated by the environmental requirements the plants need for germination at seeding time. Seeds ripen in the first three weeks of February. The seed pods, which resemble dry brown beans, require direct sunlight to split open and release the seeds. Seeds are most viable shortly after release as they are able to absorb moisture fairly rapidly at this time. (The seed coat becomes very hard and water resistant if it is exposed to successive days of hot dry weather). Fresh seeds that land on moist ground absorb moisture after rainfall and swell to twice their normal size. A root is pushed into the soil within two to three days of the seed swelling. Should the soil be too dry at this stage the young root shrivels and the seeds fail to germinate.

In some years February is a month of continual rainy weather on the Eastern Highveld. In these circumstances the beans fail to open properly and many seeds germinate in their pods. These germinating seeds are all lost when the dry weather returns.

It is very rare to find conditions with just the right weather during February when the full seed crop is ripening. The number of seeds that do germinate successfully, recruiting new plants to the population, is usually very low.

Seeds that fail to germinate in February and March usually lie dormant in the winter grassland until the following summer. Many seeds get burnt in winter grass fires or shrivel completely during the rainless winter.

Seeds that germinate in the late summer are capable of developing a tuber within as little as a month. The rains usually decrease in duration and frequency during April and by this time the young plants are sufficiently well established to survive the winter drought and grass fires.

#### Variation in flower colour

*E. zeyheri* occasionally has small populations of salmon pink flowers. These are exceedingly rare but when they do occur, they are usually close to or alongside plants with the usual flame orange flowers. The salmon pink flowers, which are very beautiful, only seem to appear in areas where *E. zeyheri* still occurs in a wide range of adjacent habitats. It may be that the pink flowered

plants are remnants of a much larger gene pool that was able to express itself before the advent of agriculture, mining and urbanization.

#### Cultivation.

*E. zeyheri* should be grown in large deep containers with plenty of room for the huge tubers to develop fully. Tubers are very powerful during active growth and usually split open containers that are too small for them.

The plants require direct sunlight or very light dappled shade in order to grow well. They should be planted in a

well drained medium and thoroughly watered about once every two weeks during the spring and summer growing season. The tubers should be kept completely dry from the time the leaves wither in the autumn until the following spring when the new foliage pushes through the ground.

This species has ornamental, fissured, tan and dusky brown tubers, which may be exposed above the surface of the soil. The exposed tubers make for interesting ornamental features in large terracotta containers... but see the following article. 🌱

#### What does that mean?

**caudiciform** The swollen stem base of certain herbaceous perennials; for storing water.

**dormant** Lying inactive, waiting for a cue to resume active growth.

**parasitism** A relationship between two species in which one obtains food and shelter at the expense of the other.

**tuber** A swollen root.



The spectacular flowers of the ploegbreeker, *Erythrina zeyheri*.  
Photo: Connall Oosterbroek.