

Rusted on and fired up: a collaborative effort to save the Scrub Turpentine

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Background

South East NSW is host to a handful of predominantly Australian native botanic gardens and until recently not much, if any, collaboration took place between them. But around six years ago the initiative was taken to form a collaborative network between those gardens, a network to become known as the SE NSW Bioregion Working Group. The group was established predominantly as a means to further plant conservation in SE NSW. The founding members include the Australian Botanic Garden Mount Annan (ABGMA), the Australian National Botanic Gardens (ANBG), Wollongong Botanic Gardens (WBG), Eurobodalla Regional Botanic Gardens (ERBG) and the Booderee Botanic Gardens (BBG). The then NSW Office of Environment and Heritage (OEH), and Grevillea Park at Bulli soon joined the group. Recently the Shoalhaven Heads Native Botanic Garden too has become part of the group.

The Group has successfully worked on a number of projects over the past few years, with a conservation effort directed at the Scrub Turpentine (*Rhodamnia rubescens*) now underway, and described in this article.

Booderee rescue

The Scrub Turpentine is one of several hundred species in the Myrtaceae family which is affected by Myrtle Rust (*Austropuccinia psidii*). Scrub Turpentine is a medium-sized tree which occurs naturally in and around rainforest margins in coastal areas north from Batemans Bay in NSW through to Bundaberg in Qld. It was until a few years ago thought of as just another common plant species, but the emergence of Myrtle Rust in 2010 has now brought it to the forefront of plant conservation. It has, along with three other species, recently been listed as Critically Endangered in NSW due to Myrtle Rust causing a rapid decline in health and vigour, often leading to death. Field observations over the past few years have generally been depressing; foliage deformed and sparse, and seed set almost never observed. Trees which on previous site visits were alive will on following visits turn out to be dead; as experienced at Booderee National Park three years ago. The species was known to occur naturally at two locations in the Park and had been monitored regularly since Myrtle Rust was first observed on individual trees in approximately 2012.

In 2017, on-site inspections found one of the two populations to be completely dead. A stand of maybe 20 trees had gone from being somewhat affected by the rust, to having kicked up their heels within just 12 months. This instigated a rapid and targeted emergency action by the Booderee National Park and Botanic Gardens. Plant material was collected and propagated with the aim to establish an *ex situ* collection of the remaining population, in case those plants too should perish. Pleasantly, this was achieved with four plants subsequently established at the BBG nursery. The near Booderee extinction got staff thinking: what was happening beyond Booderee and the NSW South Coast? It was known, from talking to colleagues in the industry, that such events were commonplace throughout the species' range, but what was being done to address the rapid decline? We understood the OEH was working hard to address the situation, but lack of funding seemed to be an issue. The following year, 2018, saw publication of the draft action plan on Myrtle Rust in Australia, but again, there was no funding to go with it. It was then that Booderee and other members of the SE NSW Bioregion Working Group decided to act.

Gene pooling

The Group has always had extensive experience in propagation and horticultural maintenance, and it seemed obvious that we could address one of the actions out of the Myrtle Rust plan: germplasm capture. The alternative was to sit on our hands and watch the wild populations disappear without having at least tried. We weren't willing to accept that. The ERBG at Batemans Bay and the BBG at Jervis Bay are both conveniently located to access the very southern extent of the species, and it seemed only natural for the two partners to get directly involved. We teamed up with ex NSW NPWS officer Phil Craven, who from previous employment had vast knowledge of the area, so it was with confidence we entered Murramarang National Park in June 2019. A number of sites were visited but the general health of plants wasn't good, with various degrees of Myrtle Rust visible at all sites. However, we collected cuttings from no less than eight different locations, in the hope propagation might succeed despite the less than perfect material. A further two sites in the Tomerong area, close to Jervis Bay, were later visited and cuttings collected.

As a matter of caution, all material was divided equally between the two botanic gardens, in efforts to mitigate unforeseen threats and failures at either garden. To our great pleasure more than 50 cuttings at Booderee struck roots after a few months, and Eurobodalla likewise had good success (Figure 1). Importantly we now had *ex situ* plants representing every one of the 10 sites we had sampled from.

Fire

Enter December 2019; ferocious fires were burning throughout most of Australia's east coast, and it was now time for the NSW South Coast to bear the brunt. We soon learned that fire, known as the Currowan Fire, had hit the Murramarang National Park and burnt most of the sites we had visited only six months earlier. And further disaster struck; New Year's Eve 2019 was one of the worst fire days on the South Coast, not least for the ERBG. The Gardens were completely overrun resulting in much infrastructure and most of their living collections being lost, including Scrub Turpentine in the nursery. Only three small plants survived. 10 months later, and with limited access still in place for the Murramarang National Park, it is difficult to get a full picture of the fire's impact on the species. Only two small trees, on a site previously occupied by in excess of 100 plants, have been observed with epicormic growth (Figure 2).



Figure 1. *Rhodamnia rubescens* cuttings at the Booderee Botanic Gardens' propagation facilities. Photo: Stig Pedersen

Ex situ pays dividends

Having set out to create an *ex situ* conservation collection due to the Myrtle Rust threat, it seems a good dose of luck had played into our hands. Had we not collected plant material before the fires; had we not collected from the southern extent of the species; and had we not shared plant material, it is quite possible a sizeable gene pool would have been lost for good. As it is, the BBG is currently the only place where it can be said with certainty that genetic material is available.



Figure 2. *Rhodamnia rubescens* at Murramarang National Park with epicormic growth in October 2020 following December 2019 fires. Photo: David Cunningham

Now and into the future

A second round of propagation from nursery stock is proving successful this spring. In addition, the nursery stock flowered well this winter resulting in good fruit set (Figure 3). Further work this winter had us team up with NSW conservation officers and the WBG, this time collecting cuttings between Nowra and Austinmer, north of Wollongong (Figure 4). Provided the latest propagation efforts prove fruitful we will now have *ex situ* collections representing plants from 15–18 sites between Sydney and Batemans Bay. All the while liaising with partners with the aim to share plants and seeds to further secure the southern extent, as we await developments on action plans and funding.

Acknowledgements

Phil Craven. Formerly NSW National Parks and Wildlife Service.
David Cunningham. NSW National Parks and Wildlife Service.

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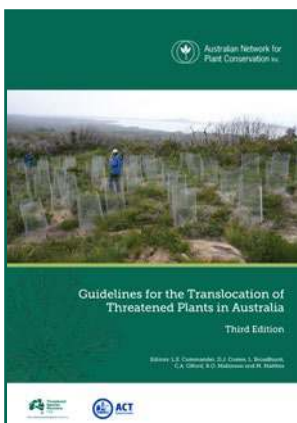
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Figure 3. Fruiting *Rhodamnia rubescens* at the Booderee Botanic Gardens' nursery. Photo: Stig Pedersen



Figure 4. Collecting *Rhodamnia rubescens* at Austinmer, winter 2020. Photo: Julianne Noble



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