To continue the work undertaken with the Iluka Chair, a new partnership has been formed with the Harry Butler Institute at Murdoch University. The partnership involves sponsorship of the Chair in Vegetation Science and Biogeography with a five-year term.

During 2018, we also continued a three-year project investigating the significance of damping-off which is a horticultural disease or condition caused by several different pathogens that kill or weaken seeds or seedlings before or after they germinate.

The University Of Western Australia (UWA)

Work under the Chair in Vegetation Science and Biogeography on restoration of areas of kwongan heathland at Eneabba in the Mid West of Western Australia continued during 2018. Two PhD students also completed their studies during the year.

Our Principal Rehabilitation Specialist, Mark Dobrowolski, co-authored two peer-reviewed articles published from the UWA Iluka Chair research in 2018: Community patterns and environmental drivers in hyper-diverse kwongan scrub vegetation of Western Australia¹; and Impact of ecological redundancy on the performance of machine learning classifiers in vegetation mapping².

In April 2018, our Eneabba site hosted UWA students to enable them to undertake field work measuring and sampling plants in the existing rehabilitated and undisturbed areas. The third year biology and environmental science students spent their annual field trip investigating the nutrition and water use physiology of native plants in these areas. The students were able to see the complexity of practices required to rehabilitate a mine site and better understand how scientific theory is put into practice.


Murdoch University

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During 2018, we also continued a three-year project investigating the significance of damping-off which is a horticultural disease or condition caused by several different pathogens that kill or weaken seeds or seedlings before or after they germinate.

University of Adelaide

Iluka has a strong history of supporting ecological research at J-A in South Australia, through its partnership with the University of Adelaide. The research programmes and partnerships complement the onsite rehabilitation activities and contribute to the broader understanding of revegetation in saline and arid environments.

A project investigating the seeding triggers of the local species Maireana sedifolia (pearl bluebush) continued during 2018. The researchers, in collaboration with the J-A rehabilitation team, are investigating methods for inducing regular seeding events in the pearl bluebush which is a dominant chenopod in the local vegetation association.
Iluka continues to collaborate with the Botanic Gardens and Parks Authority of Western Australia, supporting research on the critically endangered plant species *Styphelia longissima*, which occurs on Iluka-owned property at Eneabba. Iluka is also supporting research investigating the bird and insect pollination of rehabilitated native vegetation at Eneabba, an important ecosystem function to be re-established in former mine sites.

Virginia Tech

Iluka has a long history of cooperative research with the Department of Crop and Soil Environmental Sciences at Virginia Tech (Virginia Polytechnic Institute and State University) commencing in 2004.

Research has included:

- management and analysis of the crop rotation, yields and farming practices at the Carraway-Winn Research Farm as well as extensive water quality sampling around our mine sites;
- development of active mine site soil reconstruction and revegetation protocols and continued monitoring of previously installed trials and plots;
- a study to determine the effectiveness of current versus alternative deep ripping and soil reconstruction protocols for remediating adverse post-mining soil physical and chemical conditions with respect to plant rooting and water percolation; a range of studies which included water sampling to determine net effects of mining on post-disturbance water quality and levels;
- native species revegetation trials; and
- documentation of spatial distribution of soils and tailings during landform reconstruction; and a study on loblolly pine establishment and response to cultural treatments.

During 2018, Iluka and Virginia Tech focused on three primary areas: determination of net effects of tillage and soil reconstruction practices on post-mining soil productivity and associated physical/chemical properties; loblolly pine response to cultural treatments; and continued monitoring of soil reconstruction and material handling and placement activities.

Our ongoing support of research science that protects rare and endangered flora that occur on our Australian tenements continued in 2018 with our Principal Rehabilitation Scientist, Mark Dobrowolski, presenting at two conferences:

- Revegetating the Regions Seminar (Revegetation Industry Association of WA, September 2018): Revegetation practice improvements in kwongan of the Mid West; and