



Date of Publication:
September 2022

Cunninghamia

A journal of plant ecology for eastern Australia



The Royal
BOTANIC GARDEN
Sydney

ISSN 0727-9620 (print) • ISSN 2200-405X (Online)

Survey and demographics of *Homoranthus floydii* (Myrtaceae), including conservation assessment and comparison with other rare or threatened of the Clarence Sandstones Subregion

Paul R. Sheringham

Department of Planning & Environment, Locked Bag 914, Coffs Harbour NSW AUSTRALIA

Abstract: *Homoranthus* is an endemic Australian genus of 31 shrubs in the family Myrtaceae with most species occurring in sandy soils in north-eastern New South Wales and south-eastern Queensland. Most *Homoranthus* species have restricted distributions and many are listed as rare or threatened plants.

Homoranthus floydii is a restricted shrub endemic to the Clarence Sandstones Subregion, South-East Queensland Bioregion and was surveyed across its known distribution during August 2019 - November 2021 when 311 new *Homoranthus floydii* clusters were recorded during 16 survey days. As of December 2021, 1061 *Homoranthus floydii* individuals have been recorded from four localities: 1) Waihou Plateau, Sherwood Nature Reserve, 2) Hutleys Knob, Sherwood Nature Reserve 3) Walters Creek, Tallawudjah Nature Reserve and 4) McGills Road.

Homoranthus floydii grows in the North Coast Dry Sclerophyll Forest vegetation class in shrubby woodland to open forest on outcropping Kangaroo Creek sandstone. Too frequent fire is the most significant threat to *Homoranthus floydii*, which is a fire sensitive, obligate seeding species. The primary juvenile period for *Homoranthus floydii* is estimated to be three years, based on the field observations post 2019/2020 wildfire. The species and its habitat are likely to require minimum intervals of at least seven years to prevent declines in populations (NSW Scientific Committee 2022). Other ongoing threats to *Homoranthus floydii* include disturbances associated with road works through known sub-populations, and modification and clearing of suitable habitat outside conservation reserves, and potentially Myrtle Rust infection.

A conservation assessment of *Homoranthus floydii* found that it qualified for threatened species listing, based on its restricted geographic extent, number of locations (<10) and small population sizes (<2500). A Final Determination was made to list *Homoranthus floydii* as a Vulnerable species in July 2022 (NSW Scientific Committee 2022).

The knowledge contribution of our field survey on the conservation status of *Homoranthus floydii* is compared with that of other rare species on the Clarence sandstones, some of which need similar work and perhaps subsequent alterations to their conservation listing.

Cunninghamia (2022) 22: 059–069
doi: 10.7751/cunninghamia.2022.006

Introduction

Homoranthus is an endemic, Australian genus of 31 shrubs in the family Myrtaceae with the majority of species occurring in sandy soils in north-eastern New South Wales and south-eastern Queensland (Craven & Jones 1991; Copeland *et al.* 2011). The genus has a predominantly Northern Tablelands, Central Western and North Western Slopes distribution. *Homoranthus floydii* is one of only two species with a coastal distribution.

Most *Homoranthus* species have restricted distributions and many are listed as rare or threatened. Of 14 *Homoranthus* species in New South Wales, the following are listed on Commonwealth and State Threatened species lists: *Homoranthus binghiensis* (EN), *Homoranthus bebo* (EN), *Homoranthus bruhlii* (CE), *Homoranthus croftianus* (EN), *Homoranthus darwinioides* (VU), *Homoranthus elusus* (CE), *Homoranthus lunatus* (VU) and *Homoranthus prolixus* (VU). The Tablelands and Slopes species are threatened by too frequent fire, drought, weeds (Coolatai Grass- *Homoranthus bebo*), browsing by feral goats, damage by feral pigs and small population sizes. Too frequent fire is the most significant threat to *Homoranthus floydii* and other ongoing threats include disturbances associated with road works through known sub-populations, and modification and clearing of habitat outside conservation reserves. The species may be potentially impacted by Myrtle Rust. In-kind conservation actions have been commenced for *Homoranthus floydii*, including ex-situ collection of seed from populations in Sherwood Nature Reserve.

Homoranthus floydii is a restricted, endemic coastal species growing between 100–410 m elevation in Kangaroo Creek sandstone environments of the Clarence Sandstones Subregion, South-East Queensland Bioregion (Thackway & Creswell 1995). It is a few-stemmed, erect shrub to two metres high with short linear, incurved, opposite leaves with solitary or paired flowers with a yellow perianth (Craven & Jones 1991). Craven & Jones (1991) assessed the species conservation significance as 2RC-t, on the criteria of Briggs & Leigh (1996), indicating that the species had a distribution of less than 100km, there was no identifiable threat, its entire population was reserved, but the total population size was unknown. Species are often listed on State and Commonwealth threatened species lists with incomplete knowledge of their distribution and abundance. Post-listing, surveys often reveal species to be more widespread and abundant than known at the time of listing. As no prior survey had been undertaken for *Homoranthus floydii*, a survey was undertaken to enable a more accurate conservation assessment, and to better inform the species nomination to the NSW Scientific Committee.



Figure 1. *Homoranthus floydii* flowering adult

Methods

Existing *Homoranthus floydii* records held in the NSW Bionet Atlas database were checked for location accuracy and record duplication (Table 1); there were 20 records, 9 were duplicates of the same location or have poor location accuracy, 11 were used to guide the field work (Appendices 1 and 2).

Field surveys involving 16 survey days (August 2019 - November 2021) was undertaken across the distribution as indicated by the database, in conjunction with surveys for other sandstone endemics (Sheringham, in prep). Random traverses were done in *Homoranthus floydii* habitat at known locations and in predicted habitat. When the species was encountered a GPS waypoint was taken, the number of plants recorded, and if they were flowering, in bud, immature, or seedlings. The health of plants was observed. A photo of the variation in vegetation habitat was taken at selected sites, and the dominant species in upper, mid and lower vegetation strata were recorded. A conservation assessment against IUCN criteria was completed, and a comparison of the abundance and threat status made with other listed Clarence Sandstone endemic species.

Results

The survey found the species has a very restricted distribution with only four locations known (Figure 2),

- 1) Waihou Plateau, Sherwood Nature Reserve
- 2) North of Hutleys Knob, Sherwood Nature Reserve
- 3) Tallawudjah Nature Reserve.
- 4) McGills Road Private property

Our site surveys recorded 311 new *Homoranthus floydii* clusters and as of December 2021, 1061 *Homoranthus floydii* individuals have been recorded including both survey records and NSW Bionet Atlas data. Two new populations were found during the survey on the Conglomerate Trail, Sherwood Nature Reserve and above Walters Creek, Tallawudjah Nature Reserve. A population on private property at McGills Road was accessed, way-pointed, more fully documented, including population counts, and observations of post fire response.

Two of the known localities at McGills Road and Tallawudjah Nature Reserve were burnt in the 2019/2020 wildfires and observations confirmed *Homoranthus floydii* to be an obligate seeder species, as noted for other species in this genus.

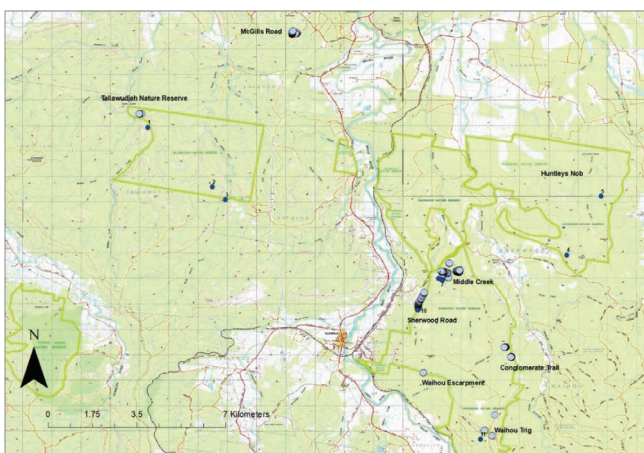


Figure 2. *Homoranthus floydii* populations and sub-populations. Dark blue dots, NSW Bionet atlas records and pale blue dots survey waypoints.

Table 1. Number of plants of *Homoranthus floydii* from Atlas and survey records

Site	Sub-population	Atlas	Survey	Total
Hutleys Knob, Sherwood Nature Reserve		19		19
Waihou Plateau	Middle Creek		521	521
	Sherwood Road		83	83
	Sherwood Road South		76	76
	Conglomerate Tail		75	75
	Waihou Bluff	22	7	29
Waihou Trig		2	2	
Walters Creek, Tallawudjah Nature Reserve		50	15	65
McGills Road			191	191
		91	970	1061

1) Waihou Plateau, Sherwood Nature Reserve

There are five sub-populations occurring on the Waihou plateau, Sherwood Nature Reserve.

Sub-population 1. The largest sub-population, 521 plants, is found in the Middle Creek area upslope of Scouts Falls between 130-260 m elevation. (Figure 3) in woodland of *Eucalyptus planchoniana*, with a lower layer of taller shrubs including *Leptospermum trinervium*, *Banksia serrata* and *Angophora robur*. There is a second dense layer of *Pultenaea rostrata*, *Banksia oblongifolia*, and *Lambertia formosa*. The ground covers included *Caustis recurvata*, *Lepidosperma laterale*, *Dillwynia trichopoda*, *Mirbelia rubiifolia* and *Pultenaea robusta* (Figure 4). The site occupies a gentle south-west facing slope. This sub-population did not burn in the 2019/2020 wildfires.

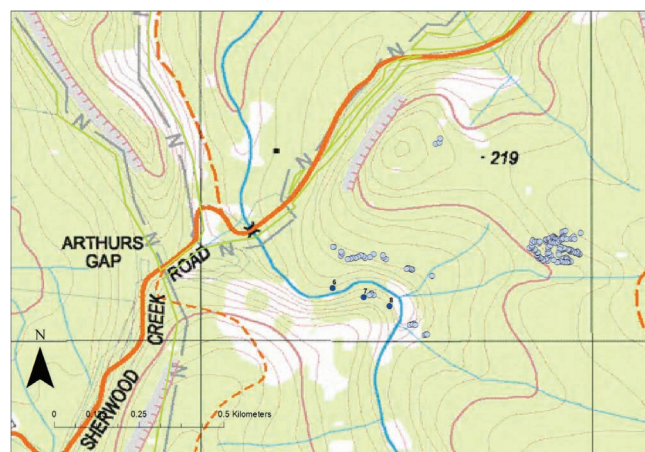


Figure 3. *Homoranthus floydii* locations Middle Creek. Dark blue dots, NSW Bionet Atlas records. Pale blue dots, survey waypoints.



Figure 4. *Homoranthus floydii* Middle Creek Habitat

Sub-population 2. About 1.2 km south of Arthur's Gap on Sherwood Road between 210–260 m elevation (Figure 5). 83 plants were counted in low woodland with *Eucalyptus planchoniana*, *Eucalyptus baileyana*, *Corymbia gummifera*, and *Eucalyptus pyrocarpa*, shrubs *Leptospermum trinervium*, *Lambertia formosa* and *Monotoca scoparia* and a ground layer of *Caustis blakei*, *Lomandra glauca* and *Ptilothrix deusta*. The site slopes up to the north and the *Homoranthus* sub-population follows the edge of a west facing cliff with large sandstone outcrops. This sub-population did not burn in 2019/2020 wildfires.

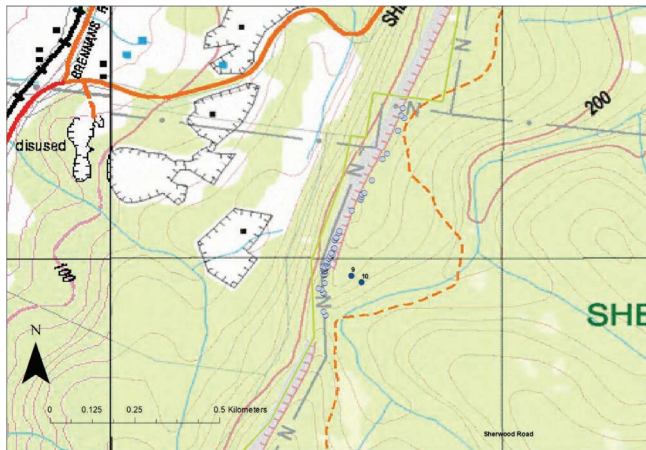


Figure 5. *Homoranthus floydii* – Sherwood Road. Dark blue dots, NSW Bionet Atlas Records. Pale blue dots, survey waypoints.

Sub-population 3. A population of 76 plants on the Sherwood Road verge, 550 m north of the Waihou Trig access road on a flat ridge top (Figure 6). This sub-population did not burn in the 2019/2020 wildfires. The plants are being impacted by road grading activities.

Sub-population 4. Located near Waihou Trig at 410 m elevation, seven (7) plants were recorded in the current (2019–2021) survey (Figure 6) compared to 22 plants seen by G.J. Harden and D.W. Harden at this locality in 1993 (NSW277565), but had declined in February 2022. This sub-population did not burn in the 2019/2020 wildfires.

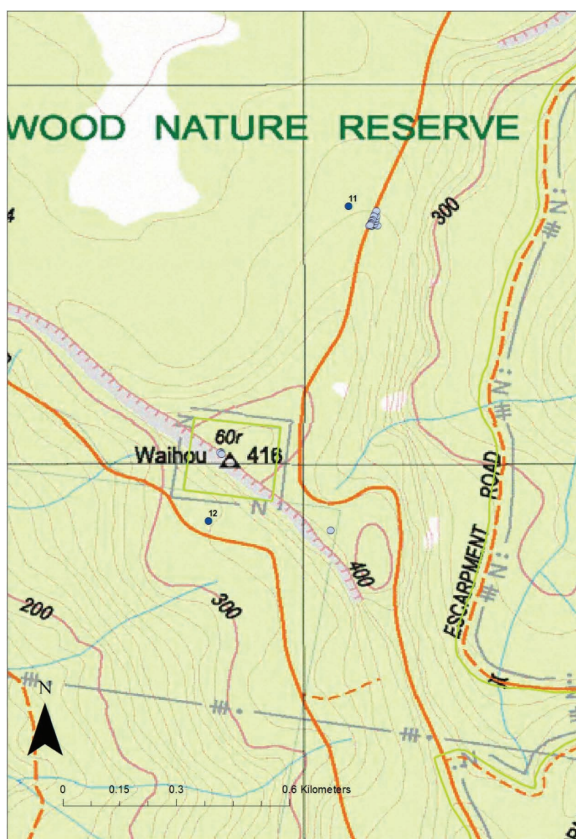


Figure 6. *Homoranthus floydii* Sherwood Road and Waihou Trig. Dark blue dots, NSW Bionet Atlas records. Pale blue dots, survey waypoints.

Sub-population 5. Found off the Conglomerate Trail on the eastern side of the Waihou Plateau between 260–280 m elevation (Figure 7). A population of 75 individuals was recorded, associated species include an overstorey of *Eucalyptus planchoniana*, and a sparse mid shrub layer of *Hakea laevipes* subsp. *laevipes* (Figure 8). The site is a north-east facing hill crest. This is a new sub-population located during the survey, and did not burn in the 2019/2020 wildfires.

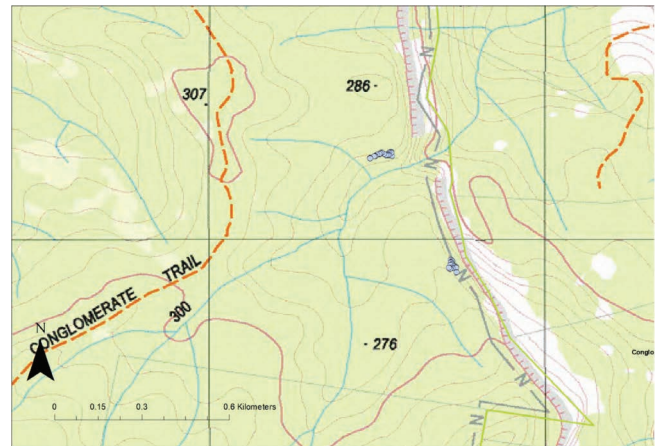


Figure 7. *Homoranthus floydii* Conglomerate Trail. Pale Blue dots, survey waypoints.



Figure 8. *Homoranthus floydii* habitat Conglomerate Trail

Sub-population 6. A small sub-population of only two plants, located during this survey on the escarpment south of Waihou Bluff at 320 m elevation. It did not burn in the 2019/2020 wildfires.

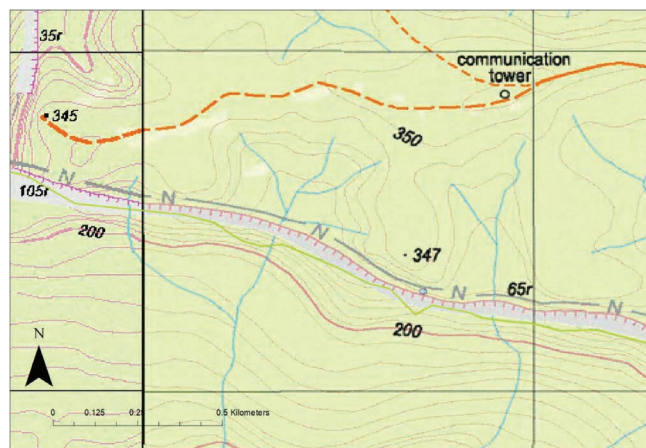


Figure 9. *Homoranthus floydii* Waihou Escarpment. Pale blue dots, survey waypoints.

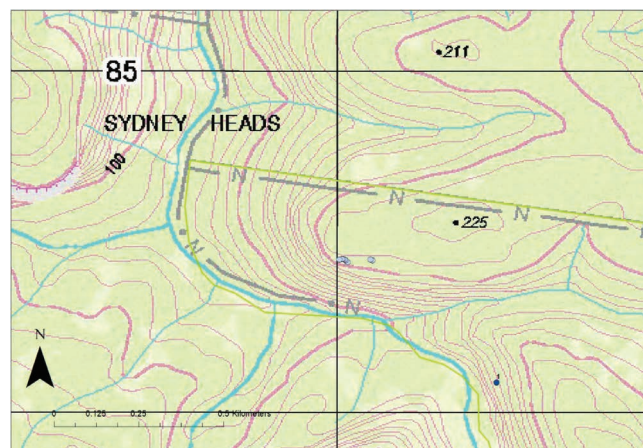


Figure 10. *Homoranthus floydii* Sydney Heads, Tallawudjah Nature Reserve. Dark blue dots, NSW Bionet Atlas records. Pale blue dots survey waypoints.

2) Hutleys Knob, Sherwood Nature Reserve

Harden in 1993 recorded 19 plants here but the site is yet to be accessed in the current surveys. This sub-population did not burn in the 2019/2020 wildfires.

3) Tallawudjah Nature Reserve

A new population with 15 plants encountered in this survey (2019) on the sandstone bluff above Walters Creek, opposite the Sydney Heads area between 200–210 m elevation (Figure 10). Associated species included *Eucalyptus pyrocarpa*, *Corymbia gummifera* and *Eucalyptus planchoniana*. There is a smaller tall shrub small tree layer of *Leptospermum trinervium* and *Angophora robur*. A dense small shrub layer of *Banksia oblongifolia*, *Lambertia formosa*, *Leptospermum polygalifolium*, *Xanthorrhoea* sp. and a ground layer of *Lomandra glauca* (Figure 11). The sheltered escarpment rim had better shrub development and provided protection to *Homoranthus floydii* plants. This populations burnt in January 2020, and the site has not been visited since.

Additional remote records in Tallawudjah Nature Reserve that have not yet been surveyed. Benwell (LPXEI0211762-Bionet sighting number) reports a population of 50 individuals on a slope above Walters Creek. John and Patricia Edwards (SJJSI0049436, SJJSI0049435-Bionet sighting numbers) found *Homoranthus floydii* at two locations in the southern section of Tallawudjah Nature Reserve, but population sizes are not known.



Figure 11. *Homoranthus floydii* habitat, Tallawudjah Nature Reserve

4) McGills Road

The McGills Road population occurs at 100-110 m elevation on freehold land with a conservation agreement on title. Other populations in this freehold landscape of small, subdivided blocks may be impacted by clearing and disturbance from fence construction and land clearing (Figure 12).

Field inspection recorded 191 *Homoranthus floydii* seedlings, many only recently emerged, confirming *Homoranthus floydii* as an obligate seeder species. A small proportion of plants were in bud and expected to flower in October 2021, suggesting a primary juvenile period of 2-3 years. However, it is anticipated that it will take up to 5 years or more for the species to reach peak flower and seed production, essential to replenish the soil-stored seed pool.

The seedling cohort remains vulnerable to more frequent and intense fire, and drought, conditions predicted under human induced climate change. The fire requirements of this fire sensitive species needs more investigation.

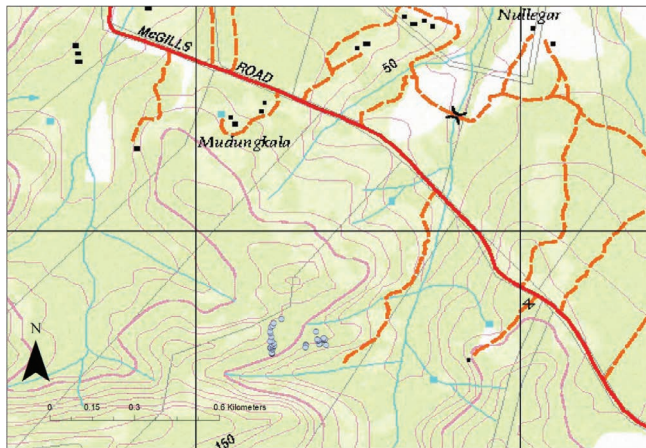


Figure 12. Map of *Homoranthus floydii* McGills Road. Pale blue dots, survey waypoints.

Discussion

Habitat similarities with other Homoranthus species

Homoranthus floydii grows in the North Coast Dry Sclerophyll Forest Vegetation class (Keith 2004), which relates to PCT3568- Clarence Sandstone Stringybark Heathy Woodland. (DPIE 2022). The habitat vegetation structure is a shrubland, woodland to open forest, growing on outcropping Kangaroo Creek sandstone. Dominant trees include *Eucalyptus planchoniana*, *Eucalyptus baileyana*, *Corymbia gummifera*, *Eucalyptus pyrocarpa* and *Angophora robur*. There is a taller shrub of *Leptospermum trinervium*, *Leptospermum polygalifolium* and *Banksia serrata*, and a dense lower shrub layer of *Banksia oblongifolia*, *Pultenaea rostrata*, *Banksia oblongifolia* and *Lambertia formosa*. Ground covers include *Caustis blakei*, *Caustis recurvata*, *Lepidosperma laterale*, *Dillwynia trichopoda*, *Mirbelia rubiifolia*, *Lomandra glauca* and *Pholothrix deusta*. *Homoranthus virgatus* the only other coastal species, is distributed in *Banksia aemula* shrublands on coastal dunes.

Homoranthus floydii shares this open forest to shrubby woodland structural vegetation type and low nutrient sandstone soils with *Homoranthus* species of the Central and North Western Slopes. *Homoranthus cernuus* occurs in sandstone woodland or heath in Wollemi National Park (Copeland *et al.* 2011). *Homoranthus bebo* is an endemic North Western Plains species restricted to Dthinna Dthinnawan State Conservation Area, in woodlands on deep sandy soils over Warialda sandstone (Copeland *et al.* 2011). *Homoranthus darwinioides* occurs in shrubby woodlands with thin sandy soil on sandstone outcrops and sloping ridges. (Craven & Jones 1991; Copeland *et al.* 2011). *Homoranthus flavescens* is a widespread species of shrubby woodlands occurring on Pilliga sandstones (Copeland *et al.* 2011).

Homoranthus species of the Northern Tablelands grow amongst lower statured heathlands, shrublands, herbfields and shrubby woodlands on granite outcroppings of the New England Batholith. *Homoranthus biflorus* occurs in Community 5a: Kings Plains Shrublands (Hunter & Clarke 1999). *Homoranthus bruhlii* is associated with *Eucalyptus campanulata*, *Eucalyptus scoparia* shrubby woodlands (Copeland *et al.* 2011). *Homoranthus croftianus* occurs in Community 4a: Bolivia Hill Shrublands (Hunter & Clarke 1999). *Homoranthus binghiensis* is recorded in Community 3c, *Eucalyptus andrewsii*, *Eucalyptus prava* shrubby woodlands and Community 7a. – *Eucalyptus prava*- *Callitris endlicheri* outcrop woodlands (Clarke *et al.* 1998; Hunter & Copeland 2001), which is analogous to community 4c Torrington Woodlands (Hunter & Clarke 1999). *Homoranthus prolixus* occurs on granite, in Flaggy Range Herbfields, Warrabah herbfields, Ironbark Shrubland and Howell Shrublands (Hunter & Clarke 1999) on the western Northern Tablelands and North Western Slopes.

Fire response

Homoranthus floydii is an obligate seeder species. Adult plants are killed by fire and seedlings recruit from the soil seedbank after fire. Two sub populations of *Homoranthus floydii* have burnt in recent wildfires. The largest population of the species, in Middle Creek, Sherwood Nature Reserve, has burnt less frequently than other populations on the Waihou Escarpment, where plants numbers are lower suggesting that more frequent burning regimes will cause a decline in this species. Based on field observations post 2019/2020 wildfire, the primary juvenile period (to first seeding) is estimated to be about three years, but the species is likely to require minimum intervals of at least seven years to allow adequate seed buildup, with recurrent fires at frequencies less than this likely to cause declines in populations (NSW Scientific Committee 2022).

Myrtle Rust susceptibility

The susceptibility of *Homoranthus floydii* to Myrtle Rust is not yet known but seven *Homoranthus* species are recorded as hosts for the pandemic strain of *Austropuccinia psidii*; *Homoranthus papillatus* and *Homoranthus prolixus* with susceptibility rated medium, and *Homoranthus croftianus*, *Homoranthus flavescens* and *Homoranthus melanostictus*, with susceptibility: but not yet rated (Makinson pers. comm., Pegg *et al.* 2014). Whilst the health of *Homoranthus floydii* individuals was good, and no evidence of disease or infection was observed, the species is potentially susceptible and monitoring of the presence/absence and the susceptibility of *Homoranthus floydii* to Myrtle Rust is required as part of future site-management of the species.



Figure 13. *Homoranthus floydii* seedling

Conservation Assessment and comparison with other listed species

Pre-survey data for *Homoranthus floydii* was based on a few herbarium records, and NSW Bionet sightings. Estimates of population size were not available at most locations.

Incorporating our extensive field survey and documentation, a conservation assessment for *Homoranthus floydii*, based on its restricted geographic extent, number of locations (<10) and small population sizes (<2500), recommended its listing as a Threatened species, (Table 3). Final Determination to list *Homoranthus floydii* as a Vulnerable species was made by the NSW Scientific Committee in July 2022 (NSW Scientific Committee, 2022).

Table 3. IUCN Conservation Assessment for *Homoranthus floydii*

<i>Homoranthus floydii</i>	Value	Status
A1- reduction	-	DD
B1 EOO	119	EN
B2 AOO	69	EN
B2a Locations	4	EN
3 Population	1061	EN
Threats	Fire, Road grading, habitat clearing	VU

However, because of lack of knowledge of our native flora, particularly on the low nutrient Clarence Sandstone substrates, since the establishment of the NSW *Threatened Species Conservation Act* in 1995, species have been listed with very limited data compared with *Homoranthus floydii*. These include *Acacia rupprii*, *Angophora robur*, *Eucalyptus tetrapleura*, *Grammitis stenophylla*, *Grevillea banyabba*, *Grevillea quadricauda*, *Lindsaea incisa*, *Prostanthera spinosa (sejuncta)*, *Hibbertia marginata*, *Melichrus hirsutus*, *Olax angulata*, and *Quassia* sp. Moonee Creek (King s.n., Nov 1949).

In contrast, other endemics such as *Olearia stillwelliae* are not listed and *Homoranthus floydii*, just listed, is rarer than many listed sandstone species (Sheringham, in prep.) (Table 4). However, in 1991 when Craven and Jones first described *Homoranthus floydii* as endemic to Sherwood Nature Reserve, they assessed the conservation significance as 2RC-t, (criteria of Briggs and Leigh 1996) i.e. as total population conserved, and therefore no case for listing as Threatened. Over 30 years on, with further professionally collected field data the situation has now changed. For *Grevillea banyabba* (VU) and *Angophora robur* (VU), listed in 1995, the original descriptions of these species, included Endangered/Vulnerable conservation status recommendations, which would have influenced listing as these authors would have had the greatest relevant expertise at the time (Johnson & Hill 1990; Olde & Marriot 1994).

This highlights the need for targeted exploration and research to review the NSW *Biodiversity Conservation Act 2016* listing status of many species. For example, in 2005, *Boronia hapalophylla* was understood to be restricted to a small population in the Shannon Creek Dam catchment and listed as Endangered (Duretto *et al.* 2004; NSW Scientific Committee 2005a), but recent surveys show it to occur in seven localities across the Clarence Sandstones Subregion, represented by large populations in several conservation reserves, and comprises a predicted population of over 20,000 plants (Sheringham in prep.).

Prostanthera spinosa (now *Prostanthera sejuncta*) listed as Vulnerable in 2005, was then understood to occur in only five populations in Banyabba Nature Reserve/Fortis Creek National Park. Available information suggested that each population comprised tens to hundreds of individuals, although not all individuals were thought to be mature (NSW Scientific Committee 2005b). Surveys have since revealed *Prostanthera sejuncta* to be an abundant species in Banyabba Nature Reserve and Fortis Creek National Park and a Travelling Stock Reserve on Fortis Creek. A population of 18 000 plants has been recorded, in >10 populations (Sheringham, in prep.), and a population > 50,000 plants is predicted. *Prostanthera sejuncta* is an obligate seeding species with a relatively short primary juvenile period (< 2 years). A large proportion of plants were mature flowering individuals, and were not burnt in the 2019/2020 fires. Recruiting plants in burnt areas were observed to be flowering two years post-fire and would now be considered mature (Sheringham, in prep.).

Ancistrachne maideni is a grass species listed as Vulnerable on the NSW Biodiversity Conservation Act 2016 (NSW Scientific Committee 1999). The species was believed to be restricted to seven small populations in the Sydney Area but is now known from 13 localities across NSW including the Clarence Sandstones Subregion, where it is common in several nature reserves; large populations have been observed in areas of skeletal sandstone habitat (Sheringham, in prep).

Lindsaea incisa, listed as Endangered, is a site-managed species in the Saving our Species Program (SOS). A population of 800 plants is estimated (SOS Database) at two SOS sites (Banyabba Nature Reserve and Fortis Creek National Park). It is uncertain whether these estimates represent ramets of clones. Recent data indicates *Lindsaea incisa* occurs in 14 localities from Port Macquarie to the Queensland border, occurring in eight conservation reserves, where it is abundant particularly in Fortis Creek National Park and Yuraygir State Conservation Area. A population of over 90 000 fronds is known (Sheringham, in prep.).

While these results do not suggest that these species, given their limited distributions and existing threats, should not have been listed at the time; historically there has been limited resources for surveys for rare plants, and the very listing has often stimulated search interests by local professional and amateur botanists. Perhaps listed species should be re-evaluated every 10 years or so, with adequate fieldwork not a desk survey.

To avoid a data deficient listing for *Homoranthus floydii*, a pre-nomination survey was carried out to improve knowledge for management, and to better inform the conservation assessment and subsequent IUCN recommendation. The IUCN listing status of a species influences conservation priority and resource investment under programs such as Saving our Species (SOS), and Commonwealth bushfire funding programs. As discussed above, a review of conservation priority and adjustment of IUCN status, or removal from listing, is required for some listed Clarence Sandstones Subregion species. Also needed is conservation assessment and nomination of high conservation omitted species (*Olearia stilwelliae*, *Isopogon mnoraifolius*), newly described species (*Philotheca papillata*) or undescribed species, (*Prostanthera* “Hutleys Pass”, *Prostanthera* “Tallawudjah Nature Reserve, *Phebalium* sp. Banyabba Nature Reserve; *Prasophyllum* sp. aff. *odoratum*)(Wilson *et al.*, in prep; Copeland & Backhouse, 2022). Collection of species data will also assist conservation assessments looking to align State and Commonwealth listings (Department of Agriculture Water and Environment 2022; Auld *et al.* 2020, Gallagher *et al.* 2021).

Table 4. Abundance of a selection of listed Clarence Sandstone species (Sheringham, in prep)

Species	Population size (estimated)	Current Status (BC Act (NSW))
<i>Lindsaea incisa</i>	90000 (fronds)	EN
<i>Hibbertia marginata</i>	50000+	VU
<i>Eucalyptus tetrapleura</i>	32000	VU
<i>Angophora robur</i>	20007	VU
<i>Boronia hapalophylla</i>	18299	EN
<i>Prostanthera sejuncta</i>	18008	VU
<i>Acacia ruppiae</i>	13511	EN
<i>Quassia</i> sp. Moonee Creek (King s.n., Nov 1949)	10947	EN
<i>Oxalys angulata</i>	9556	VU
<i>Melichrus hirsutus</i>	3058	EN
<i>Grevillea banyabba</i>	2891	VU
<i>Homoranthus floydii</i>	1039	Final determination VU
<i>Olearia stilwelliae</i>	719	Not listed

Acknowledgements

John Edwards is thanked for organising and assisting with a field visit to McGills Road private property to assess a previously recorded population of *Homoranthus floydii*. The property owner Jeanette Davidson is thanked for allowing access to the population on her property. Thanks to the editorial committee, and referee, Lachlan Copeland, for comments which helped improve the final manuscript.

References

- Auld, T.D., Mackenzie, B.D., Le Breton, T., Keith, D.A., Ooi, M.K.J., Allen, S. & Gallagher, R.V. (2020). Preliminary assessment of the impact of the 2019/2020 fires on NSW plants of National Significance.
- Bell, S. & Sims, R. (2018a) Extensive populations of *Dracophyllum macranthum* (Ericaceae) in Coorabakh National Park suggest a review of threat status. *Australasian Plant Conservation* 27, 11–14.
- Briggs, J.D., & Leigh, J.H. (1996). *Rare or Threatened Australian Plants*. CSIRO Publishing.
- Clarke, P.J., Copeland, L.M., Hunter, J.T., Nano, C.E., Williams, J.B. & Willis, K.E. (1998). The vegetation and plant species of Torrington State Recreation Area.
- Copeland, L.M., & Backhouse G.N. (2022). *Guide to Native Orchids of NSW and ACT*. CSIRO Publishing.
- Copeland, L. M., Craven, L. A., & Bruhl, J. J. (2011). A taxonomic review of *Homoranthus* (Myrtaceae: Chamelaucieae). *Australian Systematic Botany* 24: 351-374.
- Craven, L.A. & Jones, S.R. (1991). A taxonomic review of *Homoranthus* and two new species of Darwinia (both Myrtaceae, Chamelaucieae). *Australian Systematic Botany* 4(3): 705-710.
- Department of Agriculture Water & Environment (2022). Consultation on Species Listing Eligibility and Conservation Actions *Hibbertia marginata* (bordered guinea flower).
- Department of Primary Industry & Environment (2022). Bionet Plant Community Type data.

- Duretto, M.F., Edwards, J. & Edwards, P. (2004). *Boronia hapalophylla* (Rutaceae), a new and restricted species from North-eastern New South Wales. *Telopea* 10(3): 705-710.
- Gallagher, R. V., Allen, S., Mackenzie, B. D. E., Yates, C. J., Gosper, C. R., Keith, D. A., Merow, C., White, M. D. Wenk, E., Maitner, B. S., He, K., Adams, V.M., & Auld, T.D. (2021). High fire frequency and the impact of the 2019–2020 megafires on Australian plant diversity. *Diversity and Distributions* 27: 1166-1179.
- Hunter, J.T., & Clarke, P.J. (1998). The vegetation of granitic outcrop communities on the New England Batholith of eastern Australia. *Cunninghamia* 5(3): 547-618.
- Hunter, J.T. & Copeland, L.M. (2001). *Homoranthus binghiensis* (Myrtaceae: Chamaelaucieae), a new species from the North Western Slopes of New South Wales. *Telopea* 9(2): 431-433.
- Keith, D.J. (2004). *Ocean Shores to Desert Dunes: The Native Vegetation of New South Wales and the ACT*. NSW Dept of Environment & Conservation.
- Johnson, L.A.S., & Hill, K.D. (1990). New taxa and combinations in *Eucalyptus* and *Angophora* (Myrtaceae). *Telopea* 4(1): 37-108.
- NSW Scientific Committee (1999). *Ancistrachne maidenii* (a perennial grass) - Vulnerable Species listing.
- NSW Scientific Committee, (2005a). *Boronia hapalophylla* (a shrub) - Endangered Species listing.
- NSW Scientific Committee (2005b). *Prostanthera spinosa* (a shrub) - Vulnerable Species listing.
- NSW Scientific Committee (2022). *Homoranthus floydii* Craven & S.R.Jones – Vulnerable Species listing - Final Determination.
- Olde, P.M., & Marriot, N.R. (1994). A taxonomic revision of *Grevillea arenaria* and *Grevillea obtusifolia* (Proteaceae). *Telopea* 5(4): 711-733.
- Pegg, G. S., Giblin, F. R., McTaggart, A. R., Guymer, G. P., Taylore, H., Irelande, K. B., Shivasf, R. G. & Perrye, S. (2014). *Puccinia psidii* in Queensland, Australia: disease symptoms, distribution, and impact. *Plant Pathology* 63, 1005–1021.
- Sheringham P. R. (in prep.). Rare or threatened, endemic and disjunct vascular plant species of the Clarence Sandstones Subregion.
- Thackway, R. & Cresswell, I. D. (1995). *An interim biogeographic regionalisation for Australia: a framework for establishing the national system of reserves, Version 4.0*. (Canberra: Australian Nature Conservation Agency).
- Williams, M.L., Drinnan, A.N. & Walsh, N.G. (2006). Variation within *Prostanthera spinosa* (Lamiaceae): evidence from morphological and molecular studies. *Australian Systematic Botany* 19(5): 467-477.
- Wilson, T.C., Taseski, G. & Sheringham, P.R. (in prep). Two new species of *Prostanthera* (Lamiaceae) from the Clarence Sandstones Subregion of North coastal New South Wales.

Manuscript accepted 15 July 2022

Appendix 1- Bionet records for *Homoranthus floydii* retained for the survey

Map No.	Sighting Key	Species	Date	Observer	Easting	Northing	Locality
1	SPXEI0212835	<i>Homoranthus floydii</i>	26/09/1997	Andrew Benwell	491300	6683900	Steep slope above Walters Ck 1/2 km east of Middle Ck junction. (Site no:ivune01224g)
2	SJJSI0049435	<i>Homoranthus floydii</i>	29/10/2005	P & J Edwards	493955	6681063	Tallawudjah Nature Reserve
3	SJJSI0049436	<i>Homoranthus floydii</i>	29/10/2005	P & J Edwards	493508	6681567	Tallawudjah Nature Reserve
4	SPXEI0212956	<i>Homoranthus floydii</i>	17/09/1997	Andrew Benwell	506800	6681200	Tributary of Snake Ck, 2km west of Dundoo Ck (Site no:ivune01214b)
5	NSW277602	<i>Homoranthus floydii</i>	4/09/1993	G.J. Harden, D.W. Hardin	505625	6678893	NW of Hutleys Knob
6	NSW4189244	<i>Homoranthus floydii</i>	23/10/2000	'none provided' Unknown	501312	6677940	100 m west of Middle Creek, 400 m upstream of bridge on Upper Corindi Road, Sherwood Nature Reserve
7	SPRS97021801	<i>Homoranthus floydii</i>	23/04/1995	Paul Raymond Sheringham	501500	6677400	Middle Creek, above Falls on eastern side, Waihou Flora Reserve
8	NSW4189306	<i>Homoranthus floydii</i>	23/10/2000	'none provided' Unknown	501312	6677940	100 m west of Middle Creek, 400 m upstream of bridge on Upper Corindi Road, Sherwood Nature Reserve
9	SPXEI0249815	<i>Homoranthus floydii</i>	9/01/1994	Paul Raymond Sheringham	500510	6676760	3 km east-north-east of Glenreagh, on broad spur above cliff. Waihou Flora Reserve (Site no:RP10004)
10	NSW4205289	<i>Homoranthus floydii</i>	23/10/2000	'none provided' Unknown	501312	6677940	100 m west of Middle Creek, 400 m upstream of bridge on Upper Corindi Road, Sherwood Nature Reserve
11	NSW277565	<i>Homoranthus floydii</i>	5/09/1993	G.J. Harden, D.W. Hardin	502677	6671661	Waihou Trig.

Appendix 2 - Bionet records for *Homoranthus floydii* excluded from the survey

Sighting	Species	Date	Observer	Easting	Northing	Locality	Reason for exclusion
SJJSI0049431	<i>Homoranthus floydii</i>	25/06/2005	P & J Edwards	501232	6677967	Sherwood Nature Reserve	Duplicate
SJJSI0049432	<i>Homoranthus floydii</i>	25/06/2005	P & J Edwards	501378	6677914	Sherwood Nature Reserve (Waihou Flora Reserve)	Duplicate
SPRS97021801	<i>Homoranthus floydii</i>	23/04/1995	Paul Raymond Sheringham	501500	6677400	Middle Creek, above Falls on eastern side, Waihou Flora Reserve	Duplicate
SSLSI0004522	<i>Homoranthus floydii</i>	4/10/2004	Alexander G Floyd	502998	6672492	T Tree Rd., Sherwood N.R.	Low accuracy
NSW228678	<i>Homoranthus floydii</i>	27/08/1976	A.G. Floyd	498393	6675663	8 km E of Glenreagh,	Low accuracy
NSW277566	<i>Homoranthus floydii</i>	5/09/1993	G.J. Harden, D.W. Hardin	501606	6671969	SE of Waihou Trig, about halfway between trig and next ridgetop,	Low accuracy
NSW4177255	<i>Homoranthus floydii</i>	23/10/2000	'none provided' Unknown	500536	6676740	150 m north of second ford on Sherwood Road from northern end. Sherwood Nature Reserve	Duplicate
NSW4205295	<i>Homoranthus floydii</i>	23/10/2000	'none provided' Unknown	500536	6676740	150 m north of second ford on Sherwood Road from northern end. Sherwood Nature Reserve	Duplicate
NSW541556	<i>Homoranthus floydii</i>	7/09/1996	J.B. Williams	503213	6673815	New South Wales: North Coast: Waihou Flora Reserve, Waihou Trig, East of Glenreagh.	Low accuracy

