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Horticultural distribution and subsequent naturalization of Queen Palms (*Syagrus romanzoffiana*) in south-eastern Australia

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Abstract: Introduced to Australia in the 1860s, Queen Palm (*Syagrus romanzoffiana*) (family Arecaceae) became a popular ornamental plant in indoor and outdoor settings in the late 19th Century. Queen Palms saw a revival in popularity being heavily promoted in the 1960s and 1970s, resulting in extensive plantings commonly associated with new housing developments and business premises. The propensity of the species to fruit liberally, and its potential in being dispersed by the Grey-headed Flying Fox (*Pteropus poliocephalus*), has led to the plant being declared an environmental weed in some parts of New South Wales and Queensland.

Drawing on data derived from a geographically structured image survey of real estate listings, this paper presents the first distribution map of horticulturally planted and maintained Queen Palms in south-eastern Australia. A comparison with the distribution of naturalized Queen Palms permits us to characterize the biogeographical parameters that circumscribe the horticultural limits of the plant in Australia and the parameters that define its naturalized range.

Keywords: naturalization; weed potential; palms; biogeography; Google™ methodology

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Introduction

Queen Palms (*Syagrus romanzoffiana*) (synonyms *Cocos plumosa*, *Arecastrum romanzoffianum*), also known as Cocos palm, (family Arecaceae) are plants with pinnate leaves, native to the Atlantic and semideciduous forests of Brazil, Paraguay, Uruguay, and Argentina (Noblick, 2017, p. 180ff). They entered the horticultural trade soon after their discovery as plants of interest (for European eyes) in 1815 with a formal description in 1822 (Choris, 1822, pl. 5–6 and text). Queen Palm are regarded as one of the hardiest of the tropical-looking palms and are suitable to be planted in the USDA plant hardiness 9B (Broschat, 2013) (= Australian zone 3, Dawson, 1991). From the early 1860s onwards, Queen Palms became a popular ornamental plant in Australian outdoor settings, first in Queensland (Hill, 1868), and then in New South Wales (Anonymous, 1870) and Victoria (Anonymous, 1880). The propensity of the species to fruit liberally, creating ‘messy’ lawns and garden beds (Hortulanus, 1907), saw the popularity of the palm wane in the early 1900s and be eclipsed by the Canary Islands Date Palm (*Phoenix canariensis*) (Spennemann, 2018a, 2018b, 2019). Queen Palm saw a revival in popularity being heavily promoted in the 1960s and 1970s (Anderson, 1964; Seale, 1970, 1974, 1977), resulting in extensive plantings commonly associated with new housing developments and business premises until the 1990s.

Queen Palms had been identified as naturalized and possible sleeper weeds in Australia as early as 1990 (Randall, 2001; Stanley & Ross, 1989, p. 270). Since then, evidence of naturalization of Queen Palm has been documented in Australasia for tropical and south-eastern Queensland (Batianoff & Butler, 2002; Stephens, 2011; Werren, 2003a), for north-eastern NSW (NC LLS, 2021), as well as on the North Island of New Zealand (Cameron, Sullivan, & Whaley, 2002). At present, there are no confirmed records of naturalisation in South Australia or Western Australia (the record in ALA is a horticulturally planted specimen).

Their dispersal into remnant bushland is facilitated by “flying foxes and other animals” (NSW DPI, 2020) with seeds reputedly readily germinating in riparian areas (Werren, 2003b) and even in dry eucalypt forests (DAF, 2020). Even though classed as a low priority weed (Downey, Scanlon, & Hosking, 2010), some local government areas in south-eastern Queensland and north-eastern NSW have formally identified *S. romanzoffiana* as a weed in their communities (Ballina Shire, s.d.; BCC, 2020; DAF, 2020; NSW DPI, 2020; Gold Coast, n.d.; Logan City Council, 2020; RIC 2019), and/or as a weed of concern (e.g. GS LLS, 2021; NC LLS, 2021). With only two exceptions, the first historical and commencing in 2014 (NSW DPI 2014) but later repealed by the NSW *Biosecurity Act 2015* (a Class 3 [suppression] declaration on Lord Howe Island), and a current local declaration around Bundaberg (Bundaberg Regional Council 2020), local governments have not formally declared the species to be controlled.

A recent observation of Queen Palm drupes consumed, and its seeds dispersed by a Grey-headed Flying Fox (*Pteropus poliocephalus*) (Spennemann, 2020a, 2020b) prompted an assessment of the vectors responsible for dispersal, as well as a need to establish the distribution of the palm species in south-eastern Australia. The Atlas of Living Australia, which relies on data supplied by herbaria, government-agency driven flora surveys as well as crowdsourcing (via iNaturalist for example) suggests a naturalised distribution mainly found in southern Queensland and along the NSW coast as far south as the Ulladulla area (ALA, 2020) with a concentration of observations in the Sydney Basin (Figure 1). It can be expected that the distribution of the plant in horticulturally managed outdoor settings is much greater than its naturalized range.

The aim of this paper is to examine the correlation between the distribution of horticulturally planted and maintained *S. romanzoffiana* and the distribution of the palm species in their naturalized state.

Methodology

Since, at least in southern New South Wales, Queen Palms are commonly associated with residences and businesses erected in the late 1970s to 1990s (pers. obs.), the distribution of the Queen Palm in managed horticultural settings (public and private gardens, landscaping of commercial properties) was assessed using a rapid image survey of real estate listings and other evidence.

To identify the presence or absence of Queen Palm in a given locality, the rapid survey used the Google™ image search function (<https://images.google.com>, accessed between 12 May and 12 June 2020). The town names to be searched were selected from inspection of regional maps (using Google-Maps™), with an emphasis on a broad regional coverage. A preliminary search for a few towns using the keyword combination “name of town + palm” noted a high prevalence of images of residential properties with palms published as part of listings by real estate agents. Thus, the main search logic employed was the keyword combination “name of town + real estate” with the combination “name of town + palm” used as a fall back. If images were located, the associated link was followed, the palm verified as to the desired species, and the respective street address extracted. The coordinates of each observation were determined by entering the street address into GoogleMaps™ and extracted from there. A single record of presence sufficed for locational verification.

Some of the searches brought up imagery of properties with Queen Palm in localities that had not been specifically targeted (for example where a street name contained the name of the community searched). These opportunistic observations were added to the data set.

Where the presence of Queen Palm was not obvious in the initial searches, additional searches were carried out using the keyword combination: “name of town + motel | hotel |

caravan [park].” Experience in initial searches yielded many images of motels (esp. motel pools) and caravan parks with Queen Palms.

Where the presence of Queen Palms could still not be determined but was likely, given the presence of such palms in surrounding communities, Google StreetView™ was used for a virtual drive-through of residential neighbourhoods, with priority given to suburbs established during the 1980s and 1990s (if they could be identified as such from the Satellite View). The data search was carried out between 12 May and 12 June 2020. As far as it is known, the use of location-focussed Google images searches to Google StreetView™ is a methodological first for compiling a plant distribution map.

Results

In total 319 locations were assessed, with 60 locations returning no evidence of Queen Palm. The locations where the occurrence of Queen Palm could not be confirmed are shown as small dots in the distribution map (Figure 2). While the naturalized occurrences of Queen Palm are confined to the eastern seaboard (Figure 1), horticulturally maintained specimens can be found throughout subtropical and warm temperate regions of south-eastern Australia (Figure 2). The observed horticultural distribution far exceeds the area where Queen Palm have been found to be naturalized.

Discussion and Conclusions

The distribution of naturalized *Syagrus romanzoffiana* in south-eastern Australia is confined to a narrow coastal strip from southern Queensland and along the NSW coast as far south as the Narooma area (Figure 1) (The ALA record for Eden is an outlier and may represent a cultivated example). Climatologically, this coincides with areas in SE Australia that exhibit more than 1000 mm annual rainfall (Bureau of Meteorology, 2023b) and where mean temperatures do not drop below 12°C (Bureau of Meteorology, 2023a).

The species is absent in the arid and semi-arid areas of New South Wales, South Australia and Queensland. An exception occurs in a suburban garden in Broken Hill, where the water requirements are apparently met artificially. It shows that the Queen Palm can survive in areas which experience less than 200 mm annual rainfall (Bureau of Meteorology, 2023b) and that exhibit average summer temperature maxima above 30°C (Bureau of Meteorology, 2023a).

The distribution map shows some areas where Queen Palm are absent, even though they are, on a regional scale, surrounded by locations where such palms are present. Some of these absences seem to be true reflections of climatological constraints (e.g. Southern Tablelands, Australian Alps or Tasmania). The data show that *S. romanzoffiana* is cold-

intolerant and is absent in areas where mean temperatures drop to 6°C or below (Bureau of Meteorology, 2023a).

Other absences are likely to be false negatives from a biogeographical perspective because the absence cannot be readily explained by climatological constraints and palms are known from horticultural settings in nearby places. This particularly applies to the Southern Volcanic Plain bioregion of southwest Victoria. Given that the search method was the same and given that climatic factors can be ruled out, it can be surmised that the absence is due to socio-economic or cultural factors. The mapping is based on the presence of horticultural plantings at residential properties or commercial premises, which are driven by a property-owner’s personal interest, which in turn is influenced by architectural fashion and landscape design. Thus, the absence of Queen Palm in the smaller rural farming communities in the central part of southwestern Victoria may be an artefact of different community expectations. It may also reflect socio-economic or cultural conditions prevailing in these regions, which saw the palm craze of the 1970s to 1990s pass them by, and suggests a fruitful avenue for further work, exploring the intersection of the planting of ornamental palm species (Queen Palms, Canary Islands Date Palms etc) with the socio-economic and cultural fabric of communities in rural and regional Australia.



Figure 1. Distribution of *Queen palm Syagrus romanzoffiana* in south-eastern Australia: naturalized occurrences. Data: Atlas of Living Australia. (ALA, 2020).

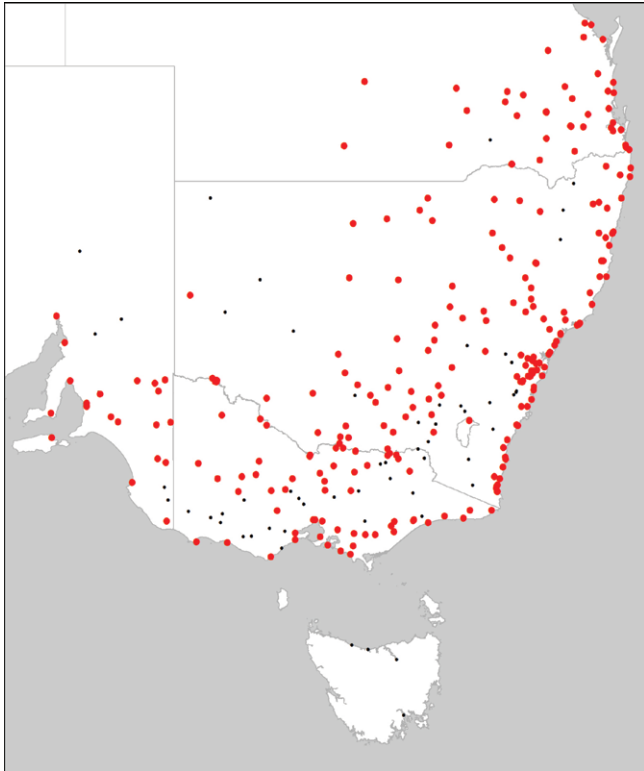


Figure 2. Distribution of Queen Palm *Syagrus romanzoffiana* in south-eastern Australia: horticultural settings. Small dots indicate locations where no *S. romanzoffiana* could be located during the on-line searches.

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References

ALA. (2020). Atlas of Living Australia. *Syagrus romanzoffiana* (Cham.) Glassman. URL: <https://bie.ala.org.au/species/https://id.biodiversity.org.au/node/apni/2910096>. [Retrieved on Apr 28, 2020]

Anderson, R.H. (1964, Jun 24). Choose the best palms for indoors and gardens. *Australian Women's Weekly*, 32(4), 69.

Anonymous. (1870, May 20). Sydney Botanic Gardens. *Sydney Morning Herald*, 61(9983), 3 col. a-c.

Anonymous. (1880, Aug 16). The Botanic Gardens. *Argus (Melbourne)* (10658), 3 col. c.

Ballina Shire. (s.d.). Environmental Weed Alert – Cocos Palm or Queen Palm *Syagrus romanzoffiana* /*Arecastrum romanzoffianum*. URL: <https://ballina.nsw.gov.au/files/EnvironmentalWeedAlert-CocosPalm.pdf?v=1209828983>. [Retrieved on Apr 13, 2023]

Batianoff, G.N., & Butler, D.W. (2002). Assessment of invasive naturalized plants in south-east Queensland. *Plant Protection Quarterly*, 17(1), 27-34.

BCC. (2020). NSW WeedWise. Cocos palm (*Syagrus romanzoffiana*). Brisbane, Brisbane City Council. URL:<https://weeds.brisbane.qld.gov.au/weeds/cocos-palm>. [Retrieved on Apr 28, 2020]

Broschat, T.K. (2013). *Syagrus romanzoffiana*: Queen Palm (Vol. ENH 767). Gainesville, FL: Institute of Food and Agricultural Sciences, University of Florida.

Bundaberg Regional Council. (2020). Pest plants. Bundaberg: Bundaberg Regional Council. URL [Retrieved on May 1, 2020]

Bureau of Meteorology. (2023a). *Average annual & monthly maximum, minimum, & mean temperature (based on 30 year climatology 1961–1900)*. Canberra, ACT: Australian Bureau of Meteorology, Australian Government. URL: http://www.bom.gov.au/jsp/ncc/climate_averages/temperature/index.jsp?mctype=6&period=an#maps. [Retrieved on Feb 20, 2023]

Bureau of Meteorology. (2023b). *Average annual, seasonal and monthly rainfall (based on 30 year climatology 1981–2010)*. Canberra, ACT: Australian Bureau of Meteorology, Australian Government. URL http://www.bom.gov.au/jsp/ncc/climate_averages/rainfall/index.jsp. [Retrieved on Feb 20, 2023]

Cameron, E.K., Sullivan, J.J., & Whaley, K. (2002). A new palm naturalises in Auckland. *Auckland Botanical Society Journal*, 57, 123-124.

Choris, L. (1822). Voyage pittoresque autour de monde: avec des portraits de sauvages d'Amérique, d'Asie, d'Afrique, et des îles du Grand océan; des paysages, des vues maritimes, et plusieurs objets d'histoire naturelle; accompagné de descriptions par le Baron Cuvier, et A. de Chamisso, et d'observations sur les crânes humains, par m. le docteur Gall. In. Paris: Imprimerie Firmin Didot.

DAF. (2020). Cocos or Queen palm *Syagrus romanzoffiana* [fact sheet]. Brisbane: Department of Agriculture and Fisheries, State of Queensland.

Dawson, I. (1991). Plant Hardiness Zones for Australia. *Australian Horticulture*, 90, 37-39.

Downey, P.O., Scanlon, T.J., & Hosking, J.R. (2010). Prioritizing weed species based on their threat and ability to impact on biodiversity: a case study from New South Wales. *Plant Protection Quarterly*, 25(3), 111.

Gold Coast. (n.d.). Environmental Weeds and Native Alternatives. *City of Gold Coast*. Gold Coast, Queensland.

GS LLS. (2021). *Greater Sydney Regional Strategic Weed Management Plan 2017 - 2022 - Revised July 2021*. Penrith: Greater Sydney Local Land Services.

Hill, W. (1868, Aug 20). The Brisbane Botanic Gardens. *Brisbane Courier*, 23(3,399), 3 col. f-g.

Hortulanus. (1907, Oct 26). Garden Notes. *Brisbane Courier*, 64(15535), 15 col.d-e.

Logan City Council. (2020). Cocos Palm. URL: <https://www.logan.qld.gov.au/cocos-palm>. [Retrieved on May 1, 2020]

NCLLS. (2021). *North Coast Regional Strategic Weed Management Plan 2017-2022*. 2nd edition. South Grafton: NSW North Coast Local Land Services.

NSW DPI. (2014, Feb 28). Noxious Weeds (Weed Control) Order 2014 under the Noxious Weeds Act 1993. *New South Wales Government Gazette*, 734–845.

NSW DPI. (2020). NSW WeedWise. Cocos palm (*Syagrus romanzoffiana*). Sydney: NSW Department of Planning, Industry and Environment. URL: <https://weeds.dpi.nsw.gov.au/Weeds/Details/295>. [Retrieved on Apr 28, 2020]

Noblick, L.R. (2017). A revision of the genus *Syagrus* (Arecaceae). *Phytotaxa*, 294(1), 1-262.

Randall, R. (2001). Garden thugs, a national list of invasive and potentially invasive garden plants. *Plant Protection Quarterly*, 16(4), 138–171.

RIC. (2019). *Environmental Weeds of Redlands Coast*. Capalaba, Qld: Redlands Indigiscapes Centre.

- Seale, A. (1970, Dec 30). Palms are 'in' again. *Australian Women's Weekly*, 38(31), 35.
- Seale, A. (1974, Dec 11). The graceful palms. They bring tropic island glamor to the garden, and a pretty softness indoors. *Australian Women's Weekly*, 42(28), 110.
- Seale, A. (1977, Jan 26). Return of the potted palm. *Australian Women's Weekly*, 44(34), 49.
- Spennemann, D.H.R. (2018a). Canary Island Date Palms (*Phoenix canariensis*) in the Australian media until World War II. *Palms & Cycads* (140), 16–27.
- Spennemann, D.H.R. (2018b). Canary Islands Palms (*Phoenix canariensis*) in Australia: introduction and early dispersal. *Palms*, 62(4), 185–201.
- Spennemann, D.H.R. (2019). Canary Islands Palms (*Phoenix canariensis*) as ornamental plants. The first thirty years of the horticultural trade. *Huntia*, 17(2), 79–102.
- Spennemann, D.H.R. (2020a). Drupes of *Syagrus romanzoffiana* consumed by *Pteropus poliocephalus*. A photographic data sheet Albury, NSW: Institute for Land, Water and Society, Charles Sturt University. DOI: 10.13140/RG.2.2.29527.29604
- Spennemann, D.H.R. (2020b). *Pteropus poliocephalus* dispersing seeds of the Queen Palm (*Syagrus romanzoffiana*) in Albury, NSW. *Proceedings of the Linnean Society of NSW*, 142, 49–54.
- Stanley, T. D., & Ross, E. M. (1989). *Flora of Southeastern Queensland* (Vol. 3). Brisbane: Queensland Department of Primary Industries.
- Stephens, K. (2011). Comparative floristic analysis of vegetation on the Dune Islands of South-East Queensland. *Proceedings of the Royal Society of Queensland*, 117, 141.
- Werren, G.L. (2003a). A bioregional perspective of weed invasion of rainforests and associated ecosystems: Focus on the Wet Tropics of north Queensland. In A. Grice & M. Setter (Eds.), *Weeds of rainforests and associated ecosystems. Workshop Proceedings 6-7 November 2002* (pp. 9–18). Cairns: Cooperative Research Centre for Tropical Rainforest Ecology and Management and Cooperative Research Centre for Australian Weed Management.
- Werren, G.L. (2003b). *Environmental Weeds of the Wet Tropics Bioregion: Risk Assessment & Priority Ranking*. Rainforest CRC.

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