The Natural News

Central North Field Naturalists Inc.

No. 79 ~ August 2021

Mysterious Marshes ~ Philip Milner
Identifying sun Orchids ~ Robin Garnett & Phil Collier
Keystone species ~ Sarah Lloyd

Australian Reed Warbler at Northdown. Photo: Donna Evans

Mysterious Marshes
Philip Milner

Phragmites australis (generally known as Southern Reed, Reed Grass or Cane Grass) is a tall reed-like grass which can form extensive reed beds in swamps, marshlands and the alluvial margins and flood plains of rivers, streams and lagoons. It is a true grass in the Poaceae family, and is similar in appearance to a fine stemmed bamboo with its tall robust hollow-stemmed canes up to 3 metres high. *P. australis* is a keystone species within these extensive wetland/grassland communities providing critical habitat for numerous species of fauna including some specialized and elusive species.

A highlight of CNFN'S June 2021 outing to Linda Barker's property on Finger Point within the Rubicon estuary was the large patch of *Phragmites* growing along the south facing shoreline of the point. The patch is nestled between the salt-marsh dominated by Sea-rush *Juncus kraussii* which is extensive around the estuary shoreline, the higher, drier sandy slopes where wooded vegetation predominates, and an adjacent patch of Paperbark *Melaleuca ericifolia* Swamp Forest.

Phragmites was in its winter dormant state when we visited and was reduced to a mass of dry cane-like stems and brown shrivelled leaves. In season it will be a dense mass of leafy rich green foliage. Individual leaf blades can be 20 – 60 cm in length and 1.0 – 4.5 cm wide and the grass can spread vigorously over large areas with stout creeping rhizomes which can penetrate to a soil depth of 5 metres in some situations.

The flowers are plume-like in upright feathery panicles, brownish/grey initially, whitening as they mature, and then nodding at full maturity. Its flower resembles a more slender Pampas Grass although *Phragmites* is a true native and not an introduced weed.

Phragmites australis was once included within the bamboo genus *Arundo*, as *Arundo phragmites* but it is now recognized in its own genus. The name *Phragmites* comes from the Greek *phragma* meaning hedge or screen, and refers to its dense hedge-like growth; *australis* refers to its southern distribution.

As a floristic community *Phragmites* grassland is widespread in Tasmania and across southern temperate Australia but it also occurs on other lands in the southern hemisphere. *P. communis* is found in the temperate zones of the northern hemisphere.

The community can be found in a range of wetland environmental niches but it is most extensive in the freshwater and brackish zones of upper river estuaries such as the

Fingerpoint, Rubicon Estuary. Drone image: Andrew Milner

Tamar Island Wetlands near Launceston and the Derwent River Marshes between Grantton and Boyer. It is also extensive across the floodplains and associated marshes of inland rivers on the mainland such as the Macquarie Marshes in western NSW. One of the other important marsh locations in Tasmania is the Apsley Marshes on the inland side of Moulting Lagoon on the east coast, which are both recognized Ramsar sites, i.e. wetlands of national and international significance.

The community can also be found in waterlogged soils, seasonally inundated sites or growing in water to a depth of about a metre, in localized soakages and around the margins and shorelines of rivers, creeks, lakes and dams especially in locations of accumulated alluvium, as well as along drainage lines and irrigation channels. It is not a salt-marsh plant but it will grow on brackish sites with up to 2% salinity which would explain its occurrence on Finger Point in the Rubicon estuary.

The cycle of flooding and associated deposition ensures that most wetland habitats are rich in nutrients, along with ample water. However, inundated and saturated soils have little if any oxygen, an element essential for normal root growth. Plants in these environments have evolved various anatomical features to overcome this limiting factor. In the case of *Phragmites* its hollow stems store the oxygen which then diffuses down into the roots in order to overcome this deficiency and to allow active root growth.

Such nutrient-rich environments can support and sustain an abundance of invertebrates, amphibians, birds and mammals. Freshwater marshlands and swamps in all of their formations are keystone habitats across Australia, but many are under threat from drainage schemes for agriculture, upstream dams which deprives the wetlands of essential water and seasonal flooding, depletion of aquifers with bores for irrigation, impacts from inappropriate stock grazing and urbanization in some locations, drought and climate change to name just a few.

Left: *Phragmites* at Fingerpoint Right: *Phragmites* flowers are plume-like in upright feathery panicles, brownish/grey initially, whitening and nodding at full maturity. Photos: P. Milner

Habitat for birds

Where it occurs in reed beds or as patches within a marshland mosaic with other species of wetland plants, *Phragmites* provides important habitat for some of our most secretive and elusive birds. The Australian Reed Warbler migrates to Tasmania from the mainland each spring for the breeding season. It is a reed bed specialist in sync with the annual growth cycle of *Phragmites*. It is secretive and difficult to observe in the dense reed beds but it is extremely vocal throughout the breeding season which can indicate its presence. It forms a deep cup-shaped nest which is attached and woven around the reed stems. There are very few records in Tasmania but that is likely because of its elusive nature rather than its rarity. It is known from the Tamar Island Wetlands and has been observed in the riparian reed beds along the Macquarie River at Longford, (Sarah Lloyd, pers. comm.) and around the coastal lagoons at Northdown, (Donna Evans, pers. comm.) Michael Sharland's *Tasmanian Birds* (1958) considered the species common in the north, particularly along the North Esk River near Launceston, so it is possible that the species has declined over the decades. He also states that it will call at night.

Another reed and rushland specialist is the Little Grass Bird, a smaller bird than the Reed Warbler. Both are brownish, but the grassbird has striations on the breast and a rather stiff tail which is sometimes held upright a little like a wren. Like the Reed Warbler it is reclusive and can be difficult to observe but it has a distinctive, mournful three note call. It is a year round resident and is more likely to be seen than the warbler as it does inhabit the more narrow reedy margins of farm dams as I have observed near my property at Lower Barrington as well as within the larger reed beds. It has also been observed around the well vegetated margins of Founders Lake in the Arboretum at Eugenana. Michael Sharland considered this species had become uncommon in 1958 and noted that cats were largely responsible for its decline around the edges of marshes.

The other group of birds which inhabit the reed beds, marshes and swamplands are the rails and crakes. All are relatively small hen-like birds with short tails and wings. They are all shy, secretive birds which live and nest within the dense cover of the reed beds but at times will venture out to feed around the more open margins, but like the Reed Warbler and the Little Grass Bird they are difficult to observe. The Lewin's Rail, Australian Crake and the Spotless Crake are all considered to be Tasmanian residents. There is a recent observation (May) of the Spotless Crake from the lake at the Arboretum, (Julie Serafin pers. comm.) and it is also present around the Northdown lagoons (Donna Evans pers. comm.)

Mysterious as they may be, and under-appreciated as key environments, we certainly need to value and protect our diverse wetlands in all of their formations and in all of their remaining locations. Most importantly, to preserve the diversity of wildlife that are dependent on these habitats, and also because they are the natural filters in the water cycle and critical for the overall health of our rivers and waterways.

Acknowledgements

Thank you to Linda Barker for hosting the CNFN outing to her property on Finger Point which prompted the writing of this article; to Julie Serafin, Donna Evans and Sarah Lloyd for sharing their important bird observations and to the photographers Donna Evans, Jill Colgrave, Andrew Milner and Alan Fletcher who have generously provided the photos to illustrate the article.

References

Curtis W. M. & Morris D. I. 1994). *The Student's Flora of Tasmania*, Part 4B.
Lamp C. A., Forbes S. J. & Cade J. W. (2001). *Grasses of Temperate Australia, A Field Guide.*
Harris S & Kitchener A. (Editors) ((2005) From Forest to Fjaeldmark, Descriptions of Tasmania's Vegetation.
Aston H. I. (1977). Aquatic Plants of Australia
Keith D. (2004) *Ocean Shores to Desert Dunes, The Native Vegetation of New South Wales and the ACT.*
Thorp V. (Comp) (1999) *Restoring Wetlands and Waterways, A Guide to Action.* Tasmanian Environment Centre Inc.
Pizzy G & Knight F. (8th Edition 2007) Edited by Menkorst P. *The Field Guide to the Birds of Australia*
Sharland M. (1958) *Tasmanian Birds*

Lewins Rail, Derwent Marshes
Photo: Alan Fletcher

Spotless Crake, Tamar Island Wetlands
Photo: Jill Colgrave

Little Grassbird, Gould's Lagoon, Granton
Photo: Alan Fletcher

Spotted Crake, Tamar Island Wetlands
Photo: Jill Colgrave

Identifying Sun Orchids

Robin Garnett and Phil Collier

Sun orchids, *Thelymitra* species, are generally true to their name and their flowers only open in the morning of warm, still, sunny days. A bushland scene that looked green and brown at 8 a.m. may be studded with little blue *Thelymitra* flowers by 11 a.m. if the habitat and weather conditions are right. And those opening days are crucial for identification, as their key distinguishing features are found in the centre of their opened flowers. We were lucky enough to live at Rubicon Sanctuary (now owned by the Tasmanian Land Conservancy) from 2008 until 2018, which is a hot spot for Sun orchids: 21 of Tasmania's 38 described *Thelymitra* species are found there. Two of these, the Plum sun-orchid, *T. mucida* and the Bluestar sun-orchid, *T. holmesii,* are listed as threatened, although additional species might also be worthy of listing. Living on site meant that we were prepared and ready for those four or five special days in the year when the full spectacle of opened flowers took place. To help distinguish the *Thelymitra* taxa at Rubicon Sanctuary, we have developed a written key, a pictorial key and guidelines for the Rubicon Sanctuary Sun orchids. These can be found on the disjunctnaturalist website (see link below).

Plume sun-orchid *Thelymitra mucida*
Photo: Phil Collier

Bluestar sun-orchid *Thelymitra holmsii*
Photo: Phil Collier

These materials were developed with reference to the latest published taxonomy. Twenty one are described species and the twenty second is very distinctive but undescribed. We have also added commentary to some groups where we feel that the published taxonomy or our interpretation is unclear. Our views have changed over time, partly as a result of observing a greater range of specimens, and partly through re-reading species descriptions and matching them to plants on the ground. The keys are specific to Rubicon Sanctuary and not comprehensive for Tasmania, nevertheless we think that many Central North Field Naturalists will find them useful especially in the north-west. The keys are a work-in-progress and we welcome any feedback.

https://www.disjunctnaturalists.com/articles3/identifying-sun-orchids.htm

Keystone species
Sarah Lloyd

Keystone species are defined as species whose removal from a community would precipitate a reduction of species diversity or produce significant changes in community structure or whose presence or abundance has a disproportionate effect on the processes of an ecosystem. In other words, a keystone species is one whose impact on its community or ecosystem is larger and greater than would be expected from its relative abundance or total biomass.

Several keystone species have been identified in the northern hemisphere including the American beaver (*Castor canadensis*), an animal that American Indians referred to as the "sacred centre" of the land because of their amazing engineering feats. Beavers' dams create important wetlands that are used by a range of other animals including mammals, fish, frogs, waterfowl and other birds, including the American Bittern.

Australia is the only continent (apart from Antarctica) that has no woodpeckers or other members of the Picidae family. Sapsuckers and flickers. Most are equipped with powerful neck muscles and strong bills with which they excavate their roosting and nesting sites: hollows in living or dead trees.

Extensive research on their habits and habitat requirements concluded that Red-naped Sapsuckers are "double-duty" keystone species. They drill a series of holes in living trees. The sweet liquid that accumulates in the wells attracts many species including the Orange-crowned Warbler, two species of hummingbirds, chipmunks, the occasional red squirrel, vespid wasps and several species of fly. Each year the sapsuckers excavate a new nesting cavity (they rarely reuse old hollows). Old nesting hollows were used by a range of species including Swallows, House Wrens, Mountain Bluebirds, Mountain Chickadees, Northern Flickers and Williamson's Sapsuckers.

Wolves and coyotes

Large predatory animals such as wolves and coyotes influence the balance of species at lower levels of the food chain. Their disappearance from some regions, either inadvertent or deliberate through active management that allows deer to thrive and provide a source of game for recreational hunters, has had a marked effect on forest ecology.

Long term monitoring has revealed that the loss of top predators such as wolves, coyotes and grizzly bears has an impact on the understorey plants, migratory birds, litter production in forests and soil nutrient dynamics. The removal of top predators causes an increase in prey species such as the herbivorous moose, elk or deer. An increase in herbivorous animals affects the woody plants in a forest and the recruitment of seedling plants. The plant community influences distribution, abundance and competitive interaction within groups of birds, mammals and insects. This affects litter production and soil nutrient dynamics. Thriving seedlings and understorey plants provide habitat and shelter for small bird species.

The keystone species concept was first introduced by American zoology professor Robert T Paine in 1969 and has become a cornerstone concept in the principals of conservation biology. The persistence of keystone species is seen as vitally important to ecosystem function and it is therefore imperative that they be identified and every effort made to retain their habitats.

The situation in Australia is very different to that in the United States. Australia has

no extant large carnivorous mammals, no primary excavators such as woodpeckers and no landscape engineers like beavers. Consequently keystone species, or highly interactive species as they are sometimes known, may be a little more difficult to identify here.

Often it is only when species decline to the extent that the effect of their absence is apparent (as in the case of the wolves and coyotes) that their importance to a properly functioning ecosystem can be appreciated.

Tasmanian Devil

The decreasing numbers of Tasmanian Devils may already be having an effect on the environment. The absence of a carnivorous animal which is primarily a scavenger results in a build up of carrion, an abundant food source for other carnivorous animals. It is possible that quolls and Forest Ravens are increasing where devil numbers have decreased and feral Cats and dogs could also be increasing in devil deficient areas with implications for other fauna including birds and small mammals. Devils are not predators, but they probably do take live animals, particularly unhealthy wallabies and possums – thereby minimising the risk of disease outbreaks.

Macropod numbers have increased in recent decades, probably because of changes to the landscape (they graze in pasture adjacent to patches of bush where they shelter). However, the decline of a carnivorous marsupial (along with the decline of other top predators such as Wedge-tailed Eagle, Grey Goshawk etc) may be leading to further increases in herbivorous animals with similar impacts as the removal of predators from north America, i.e. increased grazing pressure on native plants and a simultaneous decline or deterioration in breeding and foraging habitat of native bird species.

Tasmanian devil

Semi arid zone

In the semi arid lands of mainland Australia, it has been hypothesized that the almost complete loss of small ground-foraging marsupials shortly after European settlement contributed to the rapid deterioration of soil health and associated changes to communities of plants and animals.

The role of small marsupials, fungi (especially mycorrhizal species) and soil health was observed in a suite of small mammals including bettongs, potoroos, bilbies and bandicoots, at the feral-proof Scotia Sanctuary in far western New South Wales. Like the case of the Tasmanian Devil, it is the demise of these small animals and the consequent changes that have occurred that reveals their importance to ecosystem function.

The landscape before settlement

Anyone who visits the semi arid region of mainland Australia will see a degraded ecosystem continuing to deteriorate. Topsoils are hard and compacted, trees are old and dying and there is little or no regeneration of native vegetation. Early historical accounts describe a very different landscape with extensive tracts of productive, species-rich grasslands and scrublands with soft friable absorbent soils. Rather than being caused primarily by land clearing, the introduction of hard-hoofed domestic livestock, pests such

as rabbits and changed burning practices as is so often asserted, the deterioration could be attributed to the decline and extirpation of small ground dwelling marsupials such as bettongs, potoroos, bilbies and bandicoots.

Australia's soils are old, weathered, shallow and infertile which makes the biological activity near the upper surface vitally important. This is mostly undertaken by small mammals, especially in areas of low rainfall where they search for food (fruits, seeds, roots, invertebrates, tubers and fungi) by scratching and digging. They incorporate plant material with the mineral layer, spread mycorrhizal fungi and seeds and improve conditions for water retention and absorption. The depressions in the soil resulting from their scratching are nutrient-rich germination sites.

As soil is worked, the organic matter is broken into smaller particles and mixed with the soil. Smaller pieces of organic matter have a larger surface area and are more easily broken down by soil biota such as bacteria, fungi, nematodes, alga and slime mould amoebae which recycle the nutrients thus increasing soil fertility. Breaking up and mixing organic matter into the soil may reduce the accumulation of combustible material, and reduce the risk of wildfires

The tragic disappearance of these marsupials is attributed to the fox, feral cat, herbivores including rabbits, sheep and cattle, habitat destruction and changed fire regimes. There are very few early accounts of their distribution and abundance, mainly because of their nocturnal habits. Nevertheless, some descriptions suggest that where they were locally abundant they had a marked impact on their environment. Fir instance, the Burrowing bettong (*Bettongia lesueur*), or rat kangaroo, occurred in such large numbers in some areas that their diggings covered several acres of ground:

'before the spread of the fox, rat kangaroos were so numerous that settlers often had to take measures to safeguard their crops and haystacks" (Troughton 1946)

Burrowing bettongs are the only macropod that regularly shelter in burrows with one hundred animals sometimes sharing extensive warrens. Studies of relict burrows suggest that their density could have reached seventy animals per square kilometre.

Observation of the activities of brush-tailed bettongs (*Bettongia penicillata*) has lead researchers to calculate that they dig between 20 and 100 times a night and may turn 6 tonnes of soil per annum. Other digging animals perform similarly, though this will vary depending on the species. At Black Sugarloaf recently we have observed the results of the nocturnal activities of an unknown marsupial, possibly a southern brown bandicoot, whose diggings resulted in a soft friable soil that resembled the work of a mechanical tiller.

The decline of small ground dwelling marsupials early in the days of European settlement may have had an impact on Australia's biota disproportionate to the size of these diminutive animals and perhaps they too were (and still are where they occur) keystone species.

Southern Brown Bandicoot

After researching for this article I have concluded that it is doubtful whether the keystone species concept could have been conceived in Australia.

An online abstract "On the Nature of Keystone Species" (Vanclay 1999) gives further food for thought:

"There is an unfortunate tendency to nominate large and conspicuous creatures as likely keystone species playing pivotal roles in ecosystems. Particular favorites in the tropics include fig trees (*Ficus* spp.), large apes, and colorful birds, but such claims are rarely supported by empirical evidence. … I am sceptical; I suspect that inconspicuous organisms may be the ultimate arbiters of ecosystem function and appearance. Mycorrhizae play a critical, possibly pivotal, role in many forests, and they and other fungi may be more realistic candidates for the title of keystone within forest communities. Similarly, experience in Australia suggests that insects such as the Cactoblastis moth (*Cactoblastis cactorum*) and insect vectors of Myxomatosis have a greater influence on pasture dynamics than do the more conspicuous herbivores. I suspect that the roles of most organisms in ecosystems may be matters of degrees rather than absolutes such as "pivotal" (and conversely, "redundant"). I advocate caution in promoting these concepts without further evidence to support such claims."

References

Brennan, W. (2007) The cascade effect. In The Tasmanian conservationist, Number 311, Hobart.

Ehrlich, P.R. & Daily, G.C. (1993) Sapsuckers, swallows, willows, aspen and rot. In Handbook of Bird biology (S. Podulka, R. Rohrbaugh, Jr., & Bonney, R. (eds). The Cornell lab of ornithology. Ithaca, New York

Martin, G. (2003) The role of small ground-foraging mammals in top-soil health and biodiversity: implications to management and restoration. Reprinted in Newsletter of Citizens wildlife corridor, Armidale, NSW. (First appeared in Ecological Management & Restoration Vol 4 No 2 August 2003)

Troughton, E. 1957. Furred animals of Australia.

Vanclay, J. 1999. On the nature of keystone species. Conservation Ecology 3(1): r3.

[online] URL: http://www.consecol.org/vol3/iss1/resp3/

Clematis aristata

This article appeared in a previous edition of TNN. I included it in this edition because I have been considering the important role of Native Clematis *Clematis aristata* in the environment. Philip's article clearly demonstrates the importance of *Phragmites* as a keystone species, there's no doubt that wiping out *Phragmites* would have an enormous impact on the fauna it supports.

I doubt if the removal of *Clematis* would result in a system collapse, but it has attributes that are probably unknown by many.

At Black Sugarloaf *Clematis* vines attain great heights and resembles tropical rainforest lainas. In fact, I have never seen liana-like growth of *Clematis* anywhere else in Tasmania. When a member of another field nats group visited recently, he asked what is was!

The vines can reach 10 cm diameter at the base. They wind their way to the canopy foliage of blackwood, eucalypts and dogwood, and often their weight causes trees and vines to fall. Tangles of *Clematis* provide dense habitat for nesting birds, especially fairy wrens. Strong-billed honeyeaters use the feathery seed heads to line their nests, and I once found a nest (possibly Eastern Spinebill) made entirely of these soft seed heads.

Clematis seedings are often widespread and conspicuous with leaves that are differ-

ent to those of adult plants. Considering the large number of seedlings that appear and the few plants that reach maturity it is very likely that they are eaten. We've observed well-established adult plants browsed to Bennets wallaby height, and no doubt other macropods relish the foliage.

Dead *Clematis* stems are a hotspot of slime mould activity, with some species, including *Badhamia panicea, Perichaena vermicularis* and *Comatricha brachypus*, not occuring on any other substrate. Whether the dead stems act as a conduit for bacteria, on which slime mould amoebae feed, is impossible to determine, but the behaviour is certainly intriguing to observe.

Strong-billed Honeyeater collecting *Clematis* seeds

Funga recognised!

After concerted lobbying by mycologists, in mid August the IUCN Species Survival Commission called for the due recognition of fungi as major components of biodiversity in legislation and policy.

It fully endorses the Flora Fauna Funga initiative and asks that the phrase 'animals and plants' and 'fauna and flora' be replaced with 'animals, fungi and plants' and 'fauna, flora and funga'.

Badhamia panicea

Perichaena vermicularis

Comatricha brachypus

Walks and other events

Bring food, water, clothes for all weather, hand lens, binoculars, note book & curiosity

September 5th — Kelcey Tier Reserve, Devonport. Meet at 10 am at Allison Track Carpark, Durkin's Rd. Spreyton Leader: June Hilder (0424350183)

October 3rd — Turners Beach (am) and Henslow Park (pm). Meet at 10 am at the Boat ramp, Forth River (eastern end), Turners Beach. Leader: Patricia Ellison (0497585362)

November 7th — Coastal walk from Badger Head. Meet at 10 am at the shack settlement of Badger Head. Leader: Philip Milner (0417 052 605)

December 5th — Quamby Bluff. Meet at 10 am at the Quamby Bluff trailhead carpark. Leader: Sue Gebicki (0400860651)

January 16th — *Note date change* Knole Plain, Waratah. Meet at 10 am in the parking area opposite Council buildings in Waratah. Leader: Ian Ferris (040143408) Please contact Ian to confirm your attendance, as he will be checking the track condition before the day.

President Bob Read / **Secretary** Peter Lawrence
Treasurer Martha Howell / **Walks coordinator** Martha McQueen
Committee member Philip Milner, June Hilder, Mary McConnell and Judy Wilson
Natural News editor Sarah Lloyd / **e-news editor** Rod McQueen
Patrons Dr Peter McQuillan and Jim Nelson
email disjunctnaturalists@gmail.com **website** disjunctnaturalists.com

A family of Australian Reed Warblers at Northdown. Photo: Donna Evans