Wallumetta

The Newsletter of Ryde-Hunters Hill Flora and Fauna Preservation Society Inc.

FEBRUARY 2020 - No. 279

PRESIDENT'S NOTE

In the last edition of *Wallumetta* I noted the findings reported in the on-line journal *The Conversation** about bushfire seasons being associated with major weather systems such as El Niño and La Niña and the Indian Ocean Dipole (IOD).

Historically, the most severe Australian bushfire seasons and droughts occurred when IOD combined with El Niño to reinforce dry conditions. Both these climate drivers influence Australian rainfall and soil moisture, with the driest conditions over the southeast, but more broadly across most of the country (with the notable exception of coastal NSW).

A recent article in *The Conversation* ("Some say we've seen bushfires worse than this before") now notes that as Australia's climate continues to warm, a range of scientific sources suggest some established relationships between historical drivers of Australian climate and their impact on rainfall and temperature may be breaking down.

Although Australia's hottest years on record were historically associated with El Niño events, global warming means even traditionally cooler La Niña years are now warmer than many El Niño years of the past. This suggests natural variability may be increasingly swamped by human influences on the climate.

For example, the current catastrophic bushfires are occurring in the absence of El Niño conditions and the current drought is affecting areas such as coastal NSW which have not historically been influenced by positive IOD and El Niño events.

Contents:

What might happen to the Australian landscape the next time an El Niño hits?

It is clear to experts that natural variability and human influences on the climate system are now interacting to generate extremes that may have no parallel in Australian history. Unless there are global reductions in greenhouse gas emissions, temperatures will continue to rise, increasing the risk that catastrophic bushfire conditions become Australia's future.

Frank Breen
President

**Thanks to the on-line journal* The Conversation *for the information in this note.*

UNDERSTANDING THE IMPACT OF THE 2019-20 FIRES

The National Parks Association (NPA) Executive is preparing a strategic response to the NSW fire crisis and shared an information package from the New South Wales Department of Planning, Industry and Environment (NSWDPI&E) summarising the impact of fire on parks and threatened species. It includes a map showing the locations of the fires and provides an indication of the intensity of damage to vegetation. The unabridged package may be viewed at

https://www.environment.nsw.gov.au/topics/parks-reserves-and-protected-areas/fire/park-recovery-and-rehabilitation/recovering-from-2019-20-fires/understanding-the-impact-of-the-2019-20-fires

NPA reports that the information in the package is truly sobering and puts beyond doubt the exceptional scope and intensity of this fire season. 55 reserves have been more than 99% burnt. There has never been so much natural landscape impacted by high intensity fires in a single season. Our challenges will be to ensure that the parks that don't burn this season are protected from overzealous reaction, and that the fire-affected landscapes are afforded the very best chance of ecological recovery.

The NSWDPI&E report reveals that the 2019-20 bushfires in NSW have been unprecedented in their extent and intensity. As of 10 January 2020, the fires in NSW had burnt 5.128 million hectares (6.4% of the state), including 2.539 million hectares in national parks (34.5% of the state's national park estate). Some fires remain active across NSW (as of 16 January 2020).

The period immediately after a fire is critical for the survival of injured animals and for threatened species. Priority is to support the recovery of injured wildlife and burnt areas.

Scientists are collecting data on fire extent and severity to build up-to-date maps, ensuring that the best available information is provided to decision makers as quickly as possible. This information is shared across emergency response agencies like NSW Rural Fire Service (RFS) and with environmental organisations to support conservation decisions and actions.

Area affected by fires in New South Wales

In NSW, the fires have been concentrated in the Great Dividing Range and adjacent tablelands, and on coastal environments. Based on current data:

- 5.128 million hectares (6.4%) of NSW has been affected by the wildfires.
- More than 35% of the national park estate has been impacted. In key bioregions, the figure is well over 40%.
- More than 80% of the World Heritage listed Greater Blue Mountains Area and 54% of the NSW components of the Gondwana Rainforests of Australia World Heritage property have been affected by fire.
- The most affected ecosystems are rainforests (35% of their statewide extent), wet sclerophyll forests (41%) and heathlands (53%).
- More than 60 threatened fauna species have been affected by the fires, including 32 species for which 30% or more of all recorded locations occur in the burn areas.
- Many individual national parks have been seriously impacted:
    - 55 parks or reserves have had more than 99% of their area affected by fire
    - 70 parks or reserves have 75-99% of their area affected
    - 29 parks or reserves have 50-74% of their area affected.

Impact on New South Wales biodiversity

As at 10 January 2020, the bushfires had impacted on the habitat of at least 60 threatened species listed under the NSW *Biodiversity Conservation Act 2016*.

The intensity of the fires has varied widely, burning the understorey and some of the canopy, the canopy only, or all vegetation.

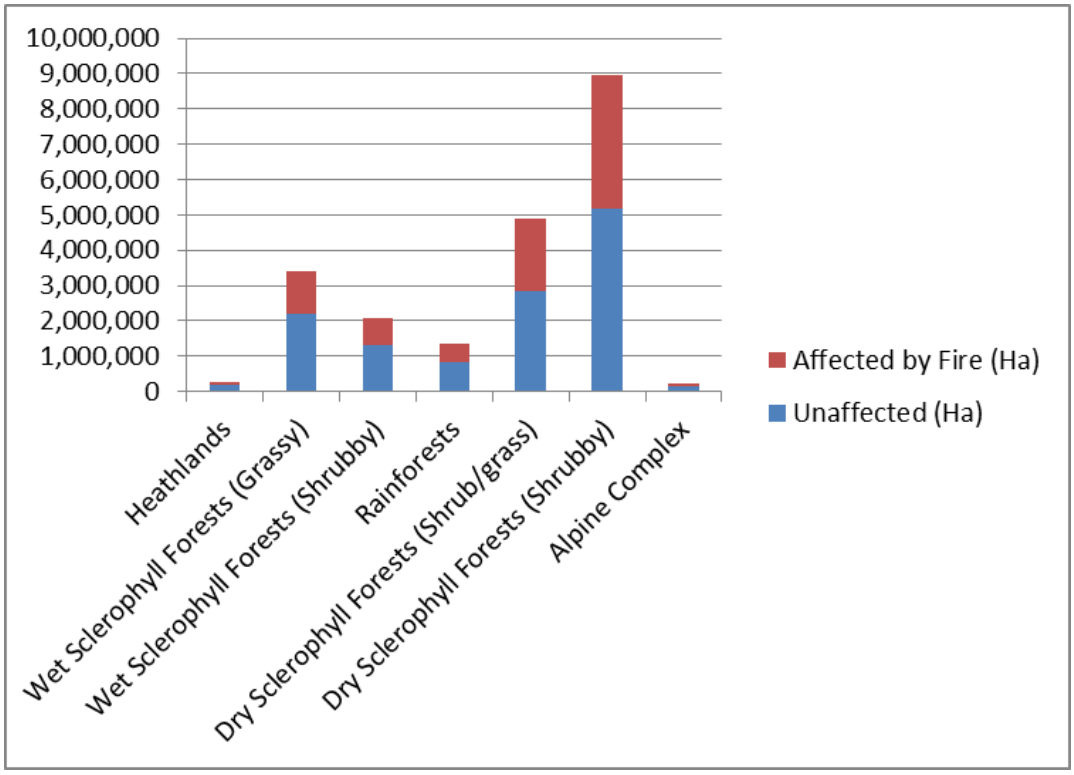
As of 10 January 2020, fires have burnt in the following areas:

- 70% of the bushland where six threatened animal species were previously sighted. These include the *Long-footed potoroo, Philoria pughi* (a frog), *Hastings River mouse* and *Brush-tailed rock-wallaby*.
- 30% of the bushland where 32 threatened animal species were previously sighted.
- 5% of the bush areas where 114 threatened animal species were previously sighted.

As of 6 January 2020, more than 24% of all koala habitat in eastern NSW was within fire-affected areas. The total area of high or very high suitability koala habitat affected by fire in eastern NSW was more than 19%.

More than 95% of recorded locations for threatened plants have been impacted.

This graph (6 January 2020 data) indicates the impact of the fires on major habitat types:



The population of Wollemi pines in Wollemi National Park remained safe from impacts of fires.

Matt Kean (our courageous NSW Environment Minister) is yet again showing his support and congratulating, in particular, the National Parks & Wildlife Service for an astonishing feat in preventing no more than a certain amount of scorching to the pines.

Matt's intention is to return resources to the NPWS and to also urgently implement “the best ever post-fire control campaign” in culling pest species to help save the native animals recovering in the unburnt bushland and wilderness areas.

WHAT TO DO FOR INJURED WILDLIFE

If you come across an injured native animal, the best way to save its life is to first call your nearest accredited Wildlife Carer. Rescue organisation Nearest to Ryde – Hunters Hill area is **Sydney Metropolitan Wildlife Services:** *ph.***(**02)94134300, w*eb:* www.sydneywildlife.org.au

The Wildlife Information and Rescue Service (WIRES) is the largest wildlife rescue organisation in New South Wales. Phone: 1300 094 737 (13 000 WIRES)

While waiting for a rescuer or before taking an injured animal to a vet:

- Cover the animal with a towel or blanket and remove from danger.
- **Do not touch a bat or snake** - wait for expert assistance.
- Keep the animal calm and safe in a ventilated cardboard box, covered cage or similar. (We have a box available in the Visitor Centre, specially prepared for this purpose.)
- Keep the animal in a warm, quiet, dark and undisturbed place.
- Do not offer any food or water, unless advised by a vet or wildlife carer.
- Contact a wildlife care service. If this isn't possible, take the injured animal to a nearby vet as soon as possible. Nearest to Field of Mars is Gladesville Veterinary Hospital, 449 Victoria Road (between Monash and Tennyson Roads) – phone 02 9817 5758 – open 7 days 8am-5pm.
- If you see a dead marsupial, always check the pouch for a living joey.

Acknowledgement: Information provided by the Foundation for National Parks and Wildlife.

CLIMATE STRIKE ORGANISER'S 99.15 AUSTRALIAN TERTIARY ADMISSION RANK (ATAR):
"No point having a good education without a good future to use it in."
- report by Mary Ward in *The Sydney Morning Herald, 18 December 2019*

Over the past year, critics including the Prime Minister berated Varsha Yajman for skipping school. But Varsha Yajman, the 17-year-old High School graduate who was part of the organising team for September's Sydney School Strike 4 Climate, doubts she jeopardised her education too much.

With a 99.15 ATAR, Varsha will study arts (majoring in government) and law at the University of Sydney next year. She said involvement with the climate strike movement shows your HSC year can be about "balance and doing things that show your values".

"It was kind of frustrating when people said we should be in school instead," she said, "because there's no point having a good education without a good future to use it in."

Varsha spent three to four hours a day after school organising the strikes, balancing her HSC workload with logistics meetings and media interviews. She says the experience inspired her to study harder and shaped her preferences for university study.

AUSTRALIA AT FOREFRONT OF BLUE CARBON ECONOMY

Published in Nature Communications, https://www.ecu.edu.au/news/latest-news/2019/10/new-research-puts-australia-at-forefront-of-blue-carbon-economy a paper published by Dr Serrano of Edith Cowan University shows Australian seagrass, mangrove and salt marshes absorb 20 million tonnes of carbon dioxide each year, which remains locked up in their soils for millennia. That's about the same as the annual emissions of more than 4 million cars.

Estuarine Salt Marsh and Estuarine Mangrove Forest have been found to mitigate Climate Change because of their strong capacity to absorb carbon dioxide to offset carbon emissions. Edith Cowan University researchers and an international team of collaborators quantified the greenhouse gases ('*Blue Carbon'*) being absorbed and emitted by Australian marine ecosystems.

It is becoming self-evident that mangroves, sea grasses and salt marshes are critical to mitigating Climate Change that has seen so much of Eastern Australia destroyed by the catastrophic fires.

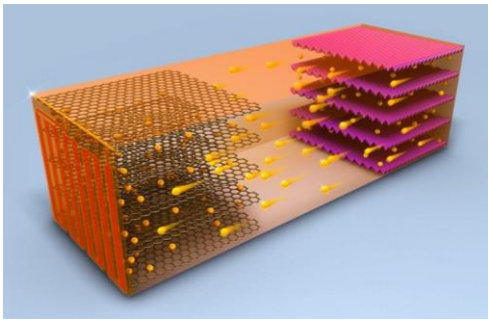
And they can be very valuable in a Carbon Trading scenario. The research shows there is money to be made in the restoration and protection of blue carbon ecosystems in Australia. Based on a carbon trading price of $12 per tonne, the authors see potential for Blue Carbon projects worth tens of millions of dollars per year in payments from the Australian Emission Reduction Fund and voluntary carbon markets.

"Projects could take the form of replanting seagrass meadows, restoring mangroves by reflooding or by preventing expected losses through environmental management," Dr Serrano said.

CHARGE AN ELECTRIC CAR IN JUST 10 MINUTES

According to a report published in on-line magazine *Joulé* on 30 October 2019, the Xiao-Guang Yang group of Pennsylvania State University developed a lithium ion (Li-ion) battery that can be charged sufficiently in 10 minutes to power an electric car to cover more than 350 kilometres. The secret lies in elevating the temperature to increase reaction rate then cooling it during discharge. Electric vehicles will only be truly competitive when they can be charged as fast as refilling a gas tank. The US Department of Energy has set a goal of developing extreme fast charging (XFC) technology that can add 200 miles of driving range in 10 min. A critical barrier to XFC is Li plating, which usually occurs at high charge rates and drastically deteriorates battery life and safety.

The team at Pennsylvania State University developed an asymmetric temperature modulation (ATM) method that charges a Li-ion cell at an elevated temperature of 60°C Using industrially available battery materials, their high-energy Li-ion cell charged with the ATM method retains 91.7% capacity after 2,500 XFC cycles (equal to 800,000 kilometres of driving range).



Fast-charging battery - Xiao-Guang Wang Group

THE COAL HARD FACTS: YOU CAN'T FILL PITS WITH WATER UNLESS IT RAINS

Précis of an article by Dr Elizabeth Farrelly, Sydney Morning Herald 28 December 2019.

The NSW government proposal to drought-proof parts of NSW by turning open-cut coal pits into reservoirs sounds like a vision of hope, especially for the Hunter Valley, a fertile landscape now desecrated with coal mines and ravaged by drought.

Greg Story, director of the Hunter Valley Lakes Corporation, proposes a model based on the Upper Lusatian biosphere in the former East Germany. Lusatia has a huge area of lakes, ponds, heathlands and wetlands, some of which are flooded former mines. The biosphere includes a designated UNESCO reserve, and 58 villages practising sustainable food production.

Like the Upper Hunter Valley, Lusatia was ravaged for decades by coal mining. The two areas have similar annual rainfall, a significant consideration for rain-filled lakes. There are also differences…

One is climate. Lusatia's average summer temperature is lower and its rainfall is increasing. In the Upper Hunter large watery expanses mean evaporation, so they should be shaded and planted.

The other difference is ancientness of culture. Lusatia's 2000-odd hectares of ex-mines sit within 30,000 hectares of what was once marshland, cultivated since the 7th century with productive fishing ponds, heath farming and other eco-sensitive food generation. This human-nature balance between ecology and economy embodies a European intelligentsia in making good things happen.

But, in the words of Dr Farrelly, "**our politicians treat our intelligentsia like lepers**. In an area less than half the size of NSW, Germany has 16 UNESCO-designated biospheres. We have one: Kosciuszko. There were two, but after our disgraceful maltreatment of the Barkindji (Darling River) it was de-listed last year – at the same time as when Germany closed its last black-coalmine, on track to their pledge of 100% renewable energy by 2050." Other considerations are:

- Water quality: the mines are likely to be acidic and contain toxic minerals;
- Evaporation;
- Impact on availability of water suitable for farm irrigation.

Dr Farrelly concluded:

"And of course there's this. Rain running into old mine pits is rain not going to the river. City run-off might head to sea, but country rain hydrates soil and feeds rivers. What we need is more rain, period. So yes, plant the lakes, beautify them. But don't think these flooded pits give coal some kind of retrospective redemption. Better than planting anew is not clear-felling in the first place. And better than filling holes with water is not mining coal, henceforth. At all."

WHAT'S IN A (SCIENTIFIC) NAME – 6: On the Acropolis? *Epacris* and the Ericaceae

No, plants of the genus *Epacris* do not grow naturally on the Athens Acropolis, or anywhere else in Europe, but the name has a connection.

Epacris, like many names in botanical Latin, is actually pseudo-Greek, made up of two Greek words, *epi* or *ep',* meaning "on", and *akros*, meaning "highest", "topmost". Hence the Acropolis is the "high town", the fortified citadel overlooking the city, and *Epacris* means "on hilltops", "on high places". As Robinson says in the *Field Guide to the Native Plants of Sydney,* this is "hardly a precise name".

Older books, such as Robinson's, regarded *Epacris* and its close relatives as forming a separate family, the Epacridaceae. However, research in recent decades has concluded they should be placed in the Heath or Heather family, Ericaceae, a vast conglomeration with world-wide distribution, which includes many superficially very different plants such as azaleas, rhododendrons, and blueberries. Hence they are listed under Ericaceae in the authoritative *NSW Flora Online* www.plantnet.rbgsyd.nsw.gov.au

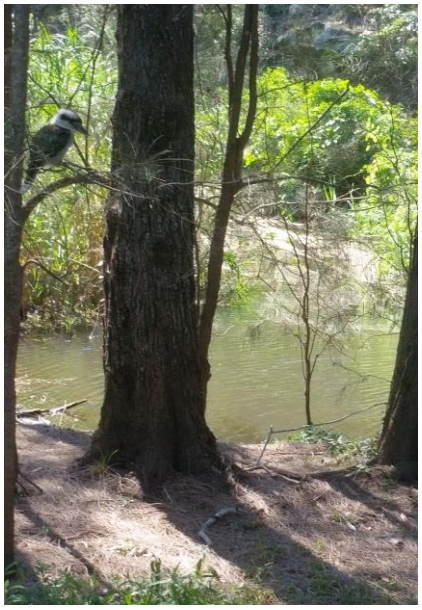
The name Ericaceae is derived from Latin *erice,* a name of Greek origin referring to the plant "heath" or "broom". The genus *Epacris* is represented in our area by, among others:

- *Epacris pulchella,* the NSW Coral Heath, whose species name means not exactly "beautiful", *pace* Robinson, but more like "pretty". The adjective *pulchellus* (-a, -um) is a diminutive of *pulcher (-ra, -rum),* "beautiful", which gave us English *pulchritude.*

• *Epacris purpurascens* is less common. Its species name means "becoming purple". (Though "pinkish" would be closer to the colour.) Latin *purpura* was a loan-word from Greek, used for a costly purple dye and for the shellfish from which it was manufactured. This species has subdivisions (subspecies); the plant seen in our area is actually *Epacris purpurascens* ssp. (or subsp.) *purpurascens.* Repetition of the name identifies this particular subspecies is identified with the "type", the specimen of the species originally described in botanical terms.

Very familiar in our area is another member of the Ericaceae:

• *Woollsia pungens,* Snow Wreath. It belongs to a genus with no other members, named after William Woolls, a nineteenth-century clergyman, teacher and botanist in Sydney and Parramatta. *Pungens* is not "pungent", i.e. "smelly"; on the contrary it has a fine fragrance. The meaning is "prickly"; the same Latin verb, *pungere,* "prick", gives us "puncture" (*punctura*), and even, via Old French, "point", meaning a sharp end. *W. pungens* is extremely common in the Field of Mars, and its long-lasting white flowers form the effect of a light sprinkling of snow over a wide area.



NEWS FROM THE FIELD OF MARS – Impact of Extreme Weather

At the time of writing we remain fortunate that there have been no bushfires in the Field of Mars Reserve this summer. Water in Buffalo Creek near the Visitor Centre had been stagnating and a mass of algae was floating in the tidal zone; in the photo you can see the tide has just washed it upstream into the channel on the opposite side.

Another interesting impact has been the death of exotic weeds, like this kikuyu near the eastern corner of the cemetery.

Even the invasive *Ehrharta erecta* grass weeds died where native plants like *Xanthorrhoea australis* (grass tree) managed to survive but not thrive:

Bushcare

Most bushcare sites in the Field of Mars have been in recess for the summer holiday period; exceptions being the Cemetery Creek 2 site where we are controlling invasions of weeds and plastic flowers from the cemetery, and the Visitor Centre site (which is actually across the creek near the National Tree Day planting sites). At both sites we work early in the day, finishing well before the midday heat. We are presently targeting weeds holding viable seeds, along with *Anredera cordifolia* (madeira vine) and *Salpichroa origanifolia* (pampas lily-of-the-valley) which survive with tubers and underground runners.

Visitor Centre

Records for 2019 have been collated, revealing the total annual number of visitors to the centre on days we opened decreased slightly to 1607 in 2019. Factors affecting the result included:

- Council works which limited access while they were in progress during autumn;
- Tally did not include visitors who were involved in several special events arranged by the City of Ryde Council at the reserve; notably the crowd who attended on National Tree Day (If these numbers were added, there would have been a net increase for 2019 over 2018);
- On two days we did not open because of extreme weather conditions.

Approximately ¼ of all weekend visitors to the Field of Mars Reserve called in to the Visitor Centre for maps, track information, refreshments and information about our history and environmental issues. Visiting members of the public (and of our Society) appreciate our volunteers' hospitality.

Members are always welcome to join our team of volunteers to keep the Visitor Centre open on weekends. We do four-hour shifts. No special skills are required, and Alfred will happily provide the small amount of training needed. Frequency and times of each person's shifts are negotiated individually, according to preferences and availability. If you are interested please phone Alfred on 02 9879 6067.

COMING EVENTS

- Sunday 8 February 2020 – **Brush Turkey Workshop** 1.30pm-3pm at the Field of Mars Environmental Education Centre; organized by City of Ryde Council; see https://www.ryde.nsw.gov.au/Events/Listing/
- Saturday 29 February 2020 – **Water Sensitive Garden Workshop** organized by City of Ryde Council; see https://www.ryde.nsw.gov.au/Events/Listing/
- Sunday 1 March 2020 – **Clean Up Australia Day** at Field of Mars for members only – contact site coordinator Alfred on 02 9879 6067.
- Saturday 21 March 2020 – **RHHFFPS ANNUAL GENERAL MEETING (AGM)** from 2pm.
- Saturday 11 April 2020 – **Bird Walks with Cathy Goswell**, 8.30am and 10.30am

ANNUAL GENERAL MEETING

Annual General Meeting of Ryde Hunters Hill Flora and Fauna Preservation Society is to be held at the Field of Mars Visitor Centre, 220 Pittwater Road, Gladesville, Saturday 21 March 2020 starting at 2.00pm. Agenda will include annual reports and election of Committee for the coming year.

Win this bright Yarnknit* rug!

Tickets $2 each / 3 for $5

available at the Field of Mars Visitor Centre.

* **Rug hand-knitted and kindly donated to RHHFFPS by the Holy Spirit Yarnknit Group of North Ryde.**