Bellarine Peninsula Wildlife Ecology

Expert Witness Statement

To the Panel Hearing

Amendment C395 to the Greater Geelong Planning Scheme

By Barry Lingham

Prepared for Wendy Duncan

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Part 1. Expert Witness Details

Name and Address

Barry Lingham
49 Cuthbertson Drive
Ocean Grove VIC 3226

Formal Qualifications

Dip Electronic Eng (Ballarat Uni 1979); Grad Dip Teaching (Hawthorn 1981)
Retired Secondary School Mathematics and Science Teacher

Relevant Experience

- Ocean Grove Resident since 1989
- Life Member of the Geelong Field Naturalists Club Inc.
- Life Member of the Friends of Ocean Grove Nature Reserve
- Previous wildlife Tour Operator (Go Birding Tours)
- Extensive personal experience observing, surveying, recording and studying the birds, mammals, flora and ecological relationships within the Geelong Region for 30 years.
- I am not a professional ecologist but I have worked voluntarily to provide ad hoc advice to Parks Victoria, City of Greater Geelong Environment Unit, Bellarine Catchment Network and other environmental groups on issues relating to management of land to benefit wildlife

Any other significant contributors to the statement (if there are any), and their expertise

Mr Matt Crawley
Program Manager
Bellarine Catchment Network and Bellarine Landcare Group

Relevant experience and area of expertise

Management, conservation and environmental planning advice to Parks Victoria relating ton the Ocean Grove Nature Reserve. Surveys of bird species in the City of Greater Geelong area delivery of revegetation projects in the Bellarine area.

Scope of this Statement

I have been requested to supply information and opinion for Wendy Duncan on potential environmental and ecological threats posed by proposals for residential development of rural land in areas to the north and west of the Ocean Grove Nature Reserve.

Declaration:

'I have made all the inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the Panel.'

Part 2. A short history of wildlife extinctions on the Bellarine Peninsula and in Victoria to the present time

Wildlife populations have always been variable and species have become extinct for a variety of reasons throughout the paleontological record.

Changing Populations of Birds and Animals on the Bellarine Peninsula

Historical Perspective

- Arrival of Aboriginals to Australia around 60 000 years before present (BP).
- Megafauna begins to die out from around 30 000 to 10 000years BP.

Victoria in the late Holocene - the last 11 000 years

- At the end of the Ice Age the glaciers retreated, sea levels rose and Victoria's climate warmed. Tasmania became an island. Victoria was dominated by grassy plains with fewer woodlands.
- Bellarine Peninsula animal species included Tasmanian Devil, Tasmanian Tiger and wombat species. The Tasmanian Native-hen was common.
- Aborigines practiced mosaic burning of grasslands.
- Dingos arrived about 4000 years ago.
- About 4000 years ago, the Tasmanian Devil, Tasmanian Tiger and Tasmanian Native-hen disappear.

European Arrival 1835 to 1850

- Settlement of the Bellarine Peninsula in the late 1830s.
- Original settlers grazed the country with sheep and cattle. Wombats became locally extinct.
- Later the rich volcanic soils near Drysdale were used to grow wheat, barley, onions, peas and potatoes.

1850s to 1950s

- By the late 1850s, the white population of the Geelong region had increased dramatically. The aboriginal population was decimated though disease, displacement and direct persecution.
- More intensive industries and farming developed. The large pastoral acreages of the original settlers were sub-divided into smaller farms. Townships started to be settled. Large scale clearing of remaining forests and woodlands begins.
- The burning regime introduced by the aborigines was stopped and scrubby understory growth proliferated in areas not intensively developed or grazed.
- European trees were introduced along the borders of many properties. Wattle trees stripped of bark for the tanning industry.
- Many European animals and birds introduced by the "acclimatisation societies". Foxes, rabbits, rats, cats, mice, starlings, sparrows, goldfinches, greenfinches and blackbirds were "successfully" released.
- A wide range of non-native plants became established, either deliberately or accidentally.
- Significant linear planting of shelterbelt trees (mainly conifers) along paddock fence-lines.
- Australian Bustards, Magpie Geese and Common Wombats became locally extinct.

Fig 1. The typical rural landscape of the Bellarine Peninsula

The conifer shelterbelts are not significant habitat for most birds but they are used for food (by Yellow-tailed Black-Cockatoos) and can provide nest sites for many bird species. Importantly, the shelterbelts provide cover for passage migration of small birds.

Late 20th Century - a rapidly escalating extinction rate

By the 1950s, many small patches of isolated bushland were left disconnected from each other. Many of these remnants still harboured small native mammals.

- All fertile arable land had been committed to agricultural activity.
- By the end of the 1960s, the number of the small remnant bushlands and native grasslands declined on the Bellarine. Several isolated significant sites remained. The largest remnant bushland was purchased and became the Ocean Grove Nature Reserve in 1968.
- During the 1980s, several of the remaining woodlands in many parts of the Bellarine Peninsula were subdivided into smaller lots.
- During the last 20 years of the 20th century, six species of small native mammals became extinct on the Bellarine Peninsula.
- In the 1990s, rapid population increases occurred across the Bellarine. Township boundaries expanded, several Rural Living Zones were established and many “hobby farms” replaced the traditional broad acre farms.

Part 3. The habitat and current threatened species of the Bellarine Peninsula

Fig 2. Bellarine Environmental Vegetation Classes (EVCs) pre 1800

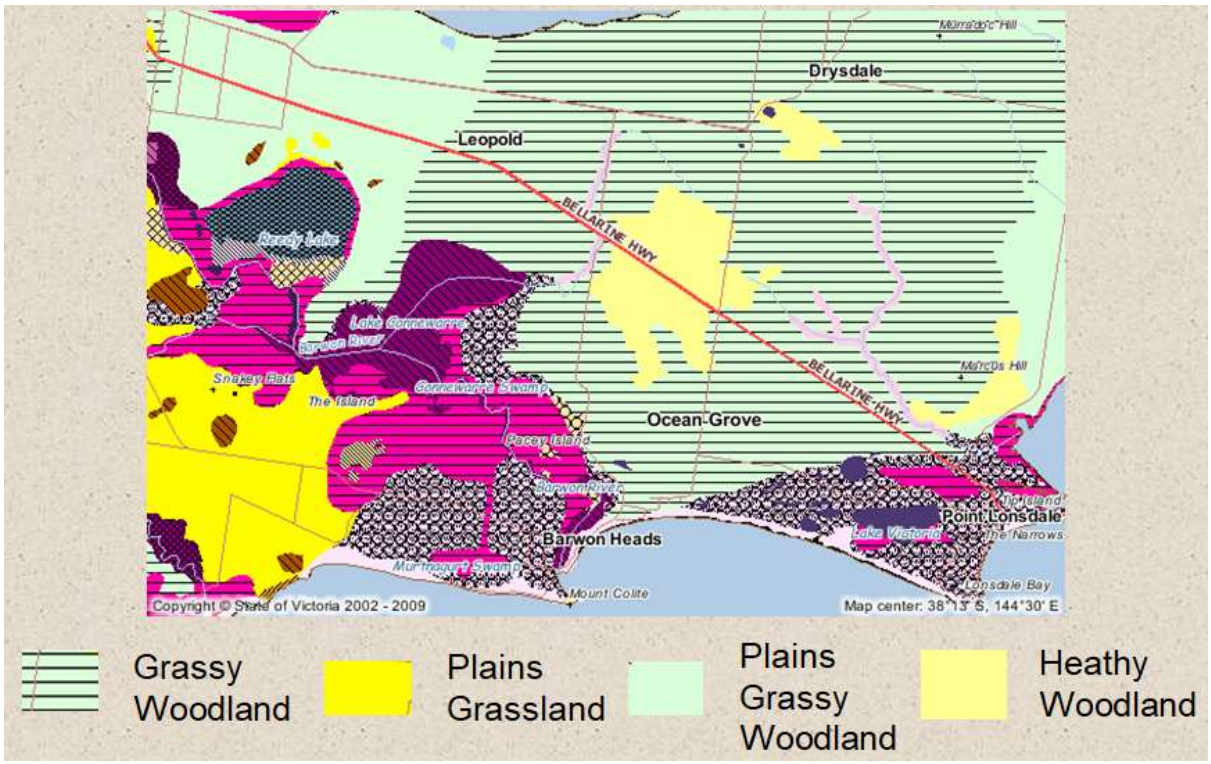
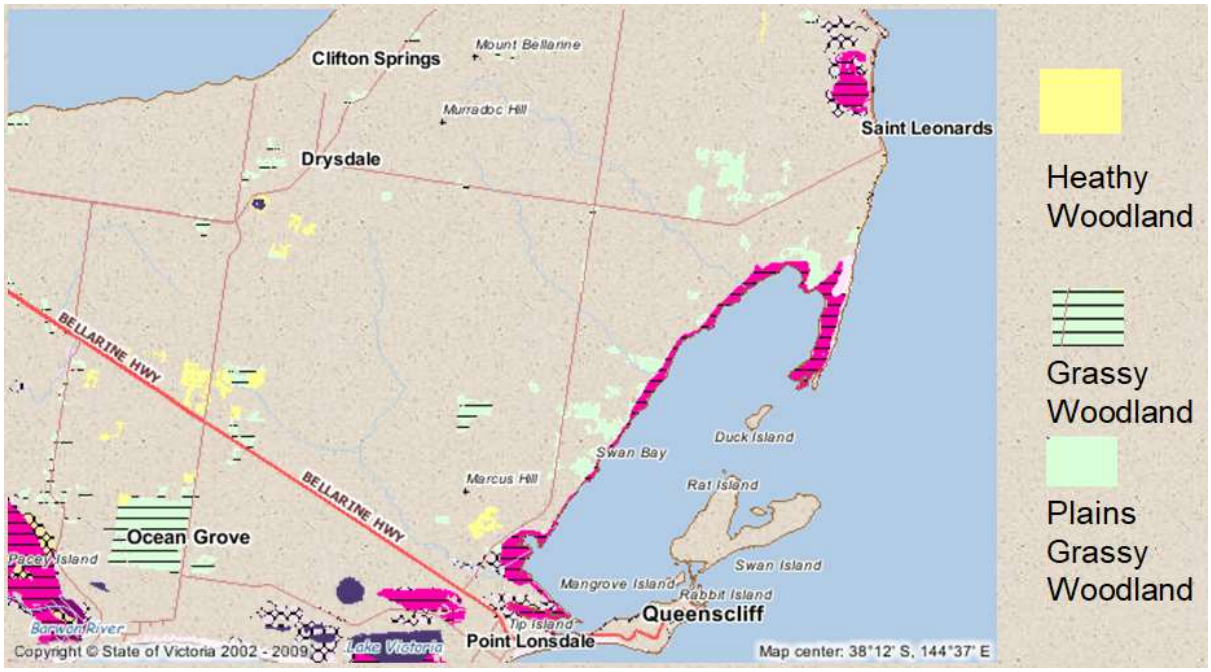


Fig 3. Woodlands of the Bellarine Peninsula – current



Source – Biodiversity Interactive Mapping Tool

Note that the vast majority of the once dominant woodlands have been destroyed. Remnant vegetation is scattered and fragmented, but opportunities still exist to re-connect them in the future via vegetation corridors and supplementary planting around small remnants to increase the size and ecological value of the remnant.

The Woodlands of the Bellarine Peninsula

Key remaining woodland areas are:

The Ocean Grove Nature Reserve
The Basin, Drysdale
Edwards Point, St Leonards
Swan Bay Road in Wallington – private land.
Buckley Park Foreshore Reserve and adjacent private land
The Yarram Creek riparian zone (private land)
Swan Island

Accelerated extinction of woodland birds of the Bellarine Peninsula - last 40 years

The following birds were once primarily found in habitats that included woodland trees – eucalypts, sheoaks, wattles and banksias. All have suffered local extinction in recent times.

In all cases they had managed to maintain reduced populations in the fragmented woodlands for many decades, but eventually succumbed to factors of isolation, predation and disturbance. The approximate decade of extinction is shown.

Grey-crowned Babbler (1970s)
Bush Stone-curlew (1990s)
White-throated Treecreeper (early 2000s)
Jacky Winter (1980s)
Varied Sitella (Late 1990s)
Rufous Songlark (1990s)
Buff-rumped Thornbill (1970s)
Bassian Thrush (Late 1990s)
Restless Flycatcher (Late 2000s)

Vulnerable Woodland Birds of the Bellarine Peninsula – low populations remaining.

Painted Button-quail ***
Blue-winged Parrot **
Yellow-tailed Black-Cockatoo***
Southern Boobook*
Barn Owl***
Tawny Frogmouth*
Laughing Kookaburra*
Yellow Thornbill***
Striated Thornbill***
Yellow-faced Honeyeater**
Brown-headed Honeyeater***
White-eared Honeyeater***
Flame Robin**
Pink Robin**
Crested Shrike-tit*
Satin Flycatcher**
Olive-backed Oriole**
Grey Currawong*
Mistletoebird**

* Birds that are sedentary
** Birds that undertake regular migrations
***Birds that make irregular nomadic movements

The Grasslands and Rural Farmland of the Bellarine Peninsula

Few native grassland areas remain, as agricultural pasture and crops were planted extensively. Roadside grassland and isolated natural grassland remnants are all that exist. Many grassland bird species have adapted to use the open agricultural farmland areas of the Bellarine.

Other bird species such as raptors require large open grassy spaces for hunting. Introduced species such as rabbits, mice and rats have become the prey of many raptors.

Vulnerable Birds of the Grassland/Agricultural land Bellarine Peninsula

The following birds are primarily found in habitat that includes significant open grassy open space such as pasture or crops. The 'paddock birds' such as various larks and quail are all ground nesting birds. Quail are seed eaters and larks are insectivorous.

Several raptor species are rural open space hunters. They tend to prey upon small birds, reptiles, rabbits and mice.

Stubble Quail
Australasian Pipit
Singing Bushlark
Brown Songlark
Wedge-tailed Eagle
Little Eagle
Brown Falcon

Extinct animals of the Bellarine Peninsula

The indigenous small mammals faced more pressure from habitat fragmentation than the birds, as they were less able to move to other sites. If sites became depopulated, the animals found it more difficult to return. After surviving the impacts of European settlement for more than a century, the following species have suffered local extinction over the past few decades,

Southern Brown Bandicoot
Brush-tailed Phascogale
Agile Antechinus
Fat-tailed Dunnart
Sugar Glider
Bush Rat

Vulnerable animals of the Bellarine Peninsula

Some local marsupials have adapted to the changes and benefitted from the addition of fruit trees or pasture grasses. Brush-tailed Possums, Ring-tailed Possums have moved into suburbia. Eastern Grey Kangaroos and Black Wallabies have thrived where they are not excluded.

The following two species face possible extinction in the near future as they have low populations.

Koala
Short-beaked Echidna

Part 4. Probable movement patterns of dispersing, migrating and nomadic birds based upon my observations and records from the Geelong Bird Reports produced by the Geelong Field Naturalists Club

- Many bird species move through the Bellarine area, mostly from the Otway region.
- Some young birds disperse from nest sites to try and establish their own territories in appropriate habitat nearby. This is an essential process to maintain viable populations.
- Some birds regularly migrate across Bass Strait via the Bellarine Peninsula. Many thousands of the Tasmanian sub-species of Grey Fantails, Striated Pardalotes and Silvereyes move through in late autumn. Some remain on the Bellarine and some move through on a journey via Gippsland to Queensland or further north during our winter. They return each spring to nest on in Tasmania.
- Endangered Swift Parrots breed in Tasmania and make nomadic movements through the Bellarine. In some years, such as 2019, they stay in this area and feed on Yellow Gum blossom. In other years they move as far as northern NSW. A small number of the remaining Orange-bellied Parrot population usually migrate from Tasmania to the Bellarine saltmarsh areas each autumn.
- Nomadic species tend to follow the flowering eucalypts at irregular intervals. Musk Lorikeets use the Bellarine Yellow Gums over winter. Many Red Wattlebirds also move onto the Bellarine area at that time. Some Yellow-faced Honeyeaters and White-naped Honeyeaters stay in the area while the bulk of the population moves though on passage elsewhere.

My understanding of the general movement of migrating/nomadic birds in autumn is shown below.

- Many species begin their journey in Tasmania.
- Others breed in the Otway area and move out during autumn.
- The reverse journey is made in early spring.

Fig 4. General Movement of Birds in the Geelong Otway Region

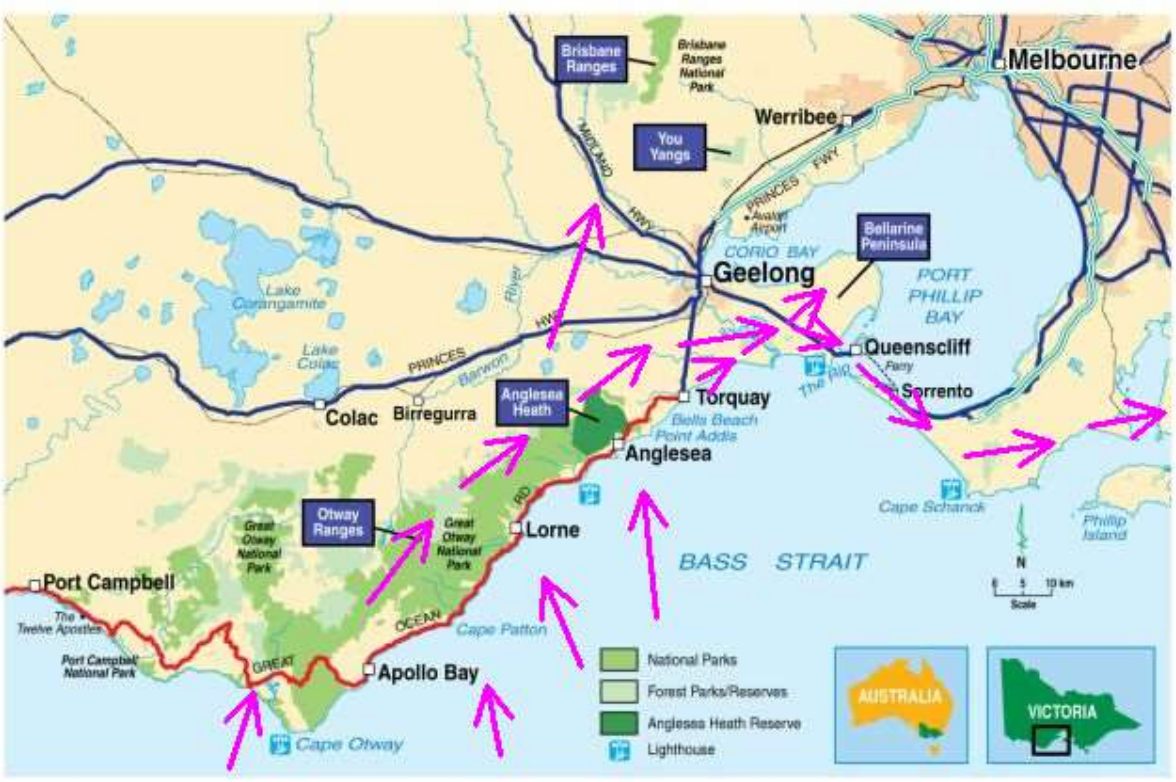


Fig 5. Movement patterns of birds around Ocean Grove and the southern Bellarine Peninsula

- Urban and Rural Living Zone boundaries in yellow
- Remnant woodlands in lime green
- Migration corridors shown by purple arrows

Different bird species tend to move in differing ways. Some birds make short flights between large trees or along shelterbelts. Those that move in flocks tend to make longer flights between woodlands. The danger faced by these migrating birds is attack from raptors such as Peregrine Falcons, Brown Falcons, Brown Goshawks and Collared Sparrowhawks.

To bypass the Ocean Grove residential area, the majority of birds use the natural valley that intersects Wallington Rd just north of the town boundary. This is a well-treed rural area, containing many mature Bellarine Yellow Gums. In recent years, Wedge-tailed Eagles successfully nested in this rural area.

This migration zone gives easy and safe access to the Ocean Grove Nature Reserve (OGNR). With an area of over 140 ha, the OGNR is the largest remaining intact woodland on the Bellarine Peninsula and forms an important destination or stopover point for many birds.

Birds will stop to feed and then move on further to disperse across the eastern Bellarine or to continue the passage across Port Phillip Heads and further east. Nearly all birds on migration stop for some time at the Ocean Grove Nature Reserve. Rufous Fantails from the Otway area move through in late March and are regularly seen at the OGNR for a period of about a month until the last of the migrating birds have left for destinations in northern Australia and PNG. Flocks of Black-faced Cuckoo-shrikes, some from Tasmania and King Island, pass through in early April. Other species that use this migration corridor include fours species of cuckoos, Rufous Whistlers and Olive-backed Orioles.

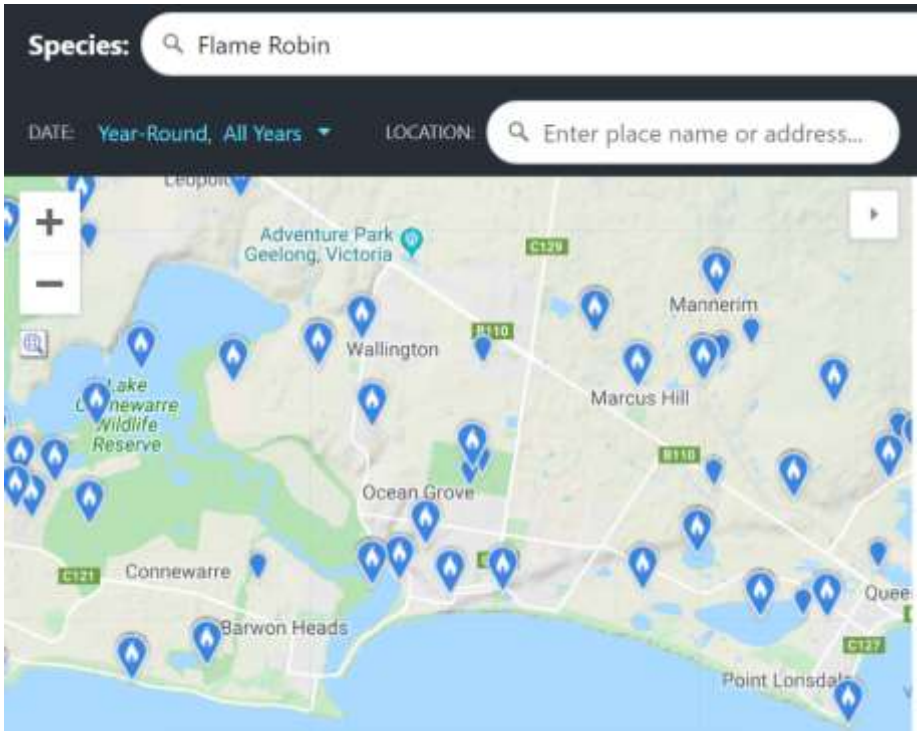
The Flame Robins move in from the Otway area during March, with some assumed to migrate from Tasmania. Some will spend the winter at the OGNR where they roost in the woodland and feed in the nearby open paddocks. Others move further east to farmlands that border woodland areas.

Male Flame Robin at the OGNR

These birds prefer to feed in open paddocks with low grass or fallow, but they rarely venture far from wooded areas where they can quickly hide to escape any predators. This species benefits from the agricultural land to the north and west of the OGNR, as the birds can be regularly seen feeding in the paddocks left fallow or sowed to cropping in autumn. After feeding, the Flame Robins return to the shelter and protection of the OGNR woodlands. High numbers of up to 105 individuals were recorded at the Ocean Grove Nature Reserve prior to 2005 but there seems to have been a steady decline in numbers observed over the past 10 years, with few observations of more than 10 birds.

A search of the eBird database shows sites where Flame Robins have been recorded. (see fig 6)
*Note that the map clearly shows nearly all records are outside the residential /RLZ zones. The Flame Robins (like many species) prefer to keep away from residential areas.

Fig 6. Distribution of Flame Robin records near Ocean Grove



The view below shows the scattered remnant trees to the west and northwest of the Ocean Grove Nature Reserve and the valley zone where most birds enter the area. Many of the trees are old Bellarine Yellow Gums that provide both food and shelter for birds moving through. The trees are also favoured nest sites for a range of parrots, raptors and some ducks. The site of the 2013 Wedge-tailed Eagle nest is shown.

Fig 7 Use of remnant trees and shelterbelts by migrating birds

The migration corridors followed by the bird species passing through the Bellarine Peninsula skirt past residential areas. Birds will move across the rural landscape using patches of woodland, along shelter belts and between isolated trees. They choose pathways that have fewer disturbances in preference to passing via residential zones.

I believe that residential areas are avoided due to significant disturbance from vehicles, dogs and cats and humans. Lighting affects any species that moves at night or at dusk, while powerlines and other man-made obstacles such as windows of houses are also detrimental to bird movements.

Part 5 The Environmental Value of the Ocean Grove Nature Reserve

- At 143 ha, this is the last remaining major stand of bush land on the Bellarine Peninsula.
- It is mostly Open Grassy Woodland type EVC. The sandier north western section is classified as Heathy Woodland, dominated by Manna Gums with a dense understorey of grass trees. The eastern section contains many Bellarine Yellow Gums (*E leucoxylon ssp bellerinensis*)

Open Grassy Woodland – Bellarine Yellow Gums and indigenous understory species

Heathy Woodland. Manna Gums and understory of Grass Trees and heath plants.

- The OGNR hosts a large number of birds (167 species recorded) and a wide variety of trees, understorey plants, herbaceous species, over 30 species of orchids and many other wildflowers. The extensive stand of Grass Trees is regionally significant.
- Animal species include Black Wallaby, Koala, Echidna, Brush-tailed possum, Ring-tailed Possum, Grey-headed Flying Fox and many species of microbats
- There are populations of at least seven reptile species and five frog species
- There are also a wide range of invertebrates including ants, spiders and butterflies

Many species of plants and some fauna found within the OGNR are rarely found elsewhere on the Bellarine Peninsula.

Potential re-introductions of species on the Bellarine Peninsula

- The protected area at Mt Rothwell has shown that there is the potential to successfully re-introduce the previously existing native mammals.
- Southern Brown Bandicoots have been reintroduced near the Mornington Peninsula and a colony could also be released at the OGNR in the future, along with dunnarts and antechinus.

Need for wildlife movement across the landscape

The long-term future viability of the management of mammal populations will require those mammals to be able to freely move between patches of suitable habitat. The OGNR cannot be treated as a 'walled enclosure' like a zoo, as that defeats the purpose of maintaining biodiversity at a landscape level.

The OGNR is a fenced reserve that currently has a population of Black Wallabies. There are several breaks in the fence that allow some movements of animals into the surrounding rural areas. Breaks in the Fence along Grub Road have been repaired to stop wallabies moving onto the road. Experience at all other fenced reserves in Victoria, such as Coranderrk Bushland Reserve managed by Healesville Sanctuary and Cranbourne Gardens which is part of the Royal Botanic Gardens, suggests that the wallaby populations will increase to the extent that they significantly damage vegetation if they are trapped in isolation. Under normal circumstances the wallabies move to new areas as food sources decline. If constrained, the wallabies eat all available vegetation including emerging tree saplings.

Similarly, echidnas require the ability to move about to meet mating partners and forage for food beyond the OGNR. If animals are restricted by barriers, inbreeding, disease and lack of food during drought can lead to the local extinction of the species.

Part 6 Threats related to extinctions

Danger to bird movements and disturbance from urban development

- Despite many recent extinctions of local bird species, a range
- of woodland and grassland bird species have managed to survive by utilising the remnant woodlands and open farmlands.
- A critical disturbance point seems to occur once large trees and open spaces are removed and urban development occurs. Many populations of small bird species quickly decline in the urban zone and from nearby areas.
- A 'choke point' for bird movement seems to have developed between the rural areas west and north of the Ocean Grove Nature Reserve and the eastern Bellarine area. The urban North Eastern Ocean Grove area and (to some extent) the Wallington Rural Living Zone form barriers to the movement of some birds.
- Any urban development west of Grubb Road has potential to create significant disruption to bird movements.
- Vulnerable bird populations have reduced "gene flow" as there is little chance of movement between remnant populations.

What has caused acceleration of extinctions in the past 30 years?

- Rapid urban expansion has further fragmented isolated remnant woodland and disrupted wildlife movement corridors.
- Large population increases during the period of Bellarine "Growth Areas" created more human disturbance and general pressure on the environment.
- Climate change has led to less rainfall, drying of soils and more extended heat waves.

Part 7. Prevention of further local extinctions

What can be done to prevent more local extinctions?

- Protect remnant vegetation.
- Connect remnant patches of vegetation with corridor plantings.
- Stop the continued expansion of urban residential areas into the fauna migration zones.
- Create new woodlands - plant trees, especially local eucalypts such as Bellarine Yellow Gum and Swamp Gum
- Maintain open farmland zones to reduce disturbance of migrating species.

Bellarine Catchment Network (BCN) Planning.

The BCN is an umbrella group that includes:
The Bellarine Landcare Group
Bellarine Bayside Foreshore Committee of Management
Barwon Coast Committee of Management
Many local "Friends of…."Groups
Strong links to City of Greater Geelong and Borough of Queenscliff Environmental and Conservation Teams

BCN Projects via Landcare programs and Local Government Projects

Current planting, on-ground works such as weed control, management of remnant vegetation or implementation of Conservation Agreements is already occurring at these sites (Source: Matt Crawley, BCN Project Manager. Oct 2019)

Fig 8. Bellarine Catchment Network previous work areas.

- The yellow zones show current focal areas where on-ground work has been concentrated.
- The diagonal line is the Bellarine Rail Trail link.
- Other work areas on private land in the east of the Bellarine are shown in red or mauve

BCN Future Revegetation Work

The BCN future plans will focus upon:

- creating links between remnant woodlands
- extending current vegetation corridors
- developing new woodland zones at critical sites across the Bellarine.

The program may take decades to complete but it will help arrest the current population decline in small woodland birds by undertaking landscape scale planning and management of woodlands and rural areas. No new residential areas should be allowed where current woodlands and rural zones are used as bird migration pathways.

We know that the current residential boundaries are still allowing bird movements. No change to existing residential boundaries should be made in the areas west of Grub Road (north of the OGNR) or to the west of the OGNR.

Part 8 Response to the CoGG Settlement Strategy Amendment 395

The CoGG Settlement Strategy

Recommends that future population growth in the Geelong Region be focussed on growth areas to the west and north of Geelong. Towns on the Bellarine will no longer be considered 'Growth Areas.'

Comment: This is sensible planning for many reasons and it will also reduce future pressure on the natural environment and wildlife of the Bellarine.

Settlement Boundaries of Bellarine Townships

The Settlement Strategy requires that permanent boundaries of Bellarine townships should be based generally on existing urban areas and areas already identified in policy. Any alteration to current boundaries should be based on significant anomalies or logical inclusions.

Comment: Restriction of residential development to the current town boundaries will help stop any further impact on local wildlife.

Greater Geelong Planning Scheme - Bellarine Peninsula. Clause 21.14-3 Strategies. Ocean Grove

- *Contain urban development within the defined settlement boundary on the Structure Plan map*
- *Ensure development avoids impacts on environmental assets including the Coast, Buckley Park Foreshore Reserve, Goandra Estate, Ocean Grove Nature Reserve, Begola Wetlands, Barwon River/Lake Conneware and the Lake Victoria Wetlands.*

Comment: I strongly agree with these strategy statements on environmental protection grounds, maintenance of regional biodiversity and protection of key wildlife movement corridors.

Any change to settlement boundaries that impinges upon the long-term survival of local wildlife becomes a compelling reason to prevent such a change.

*Specifically, there should be no move to rezone rural areas north or west of the Ocean Grove Nature Reserve.

Part 9. Final Recommendations to the Panel

- The current extinction processes will continue if urban sprawl was allowed to continue to expand the townships on the Bellarine Peninsula.
- Given the lack of detailed local studies of woodland and grassland bird, mammal and reptile populations and movements on the Bellarine Peninsula, the precautionary principle should apply to any potential development that may impact on wildlife biodiversity. Current township boundaries should become permanent boundaries.

Part 10 Sources of Information

1. Lingham B - Personal Observations
2. M Hewish, B Hart, G McCarthy, B Lingham, R McKenzie. **The Geelong Bird Report 2004** The Birds of Ocean Grove Nature Reserve.
3. Geelong Bird Reports from 2001 to 2016 published by the Geelong Field Naturalist Club.
4. Matt Crawley, Program Manager, Bellarine Catchment Network and Bellarine Landcare Group.
5. Biodiversity Interactive Map tool.
6. eBird interactive database of bird observations.
7. Coranderrk Bushland Reserve Management Strategy (2009)
8. Discussion with Friends of Cranbourne Gardens personnel