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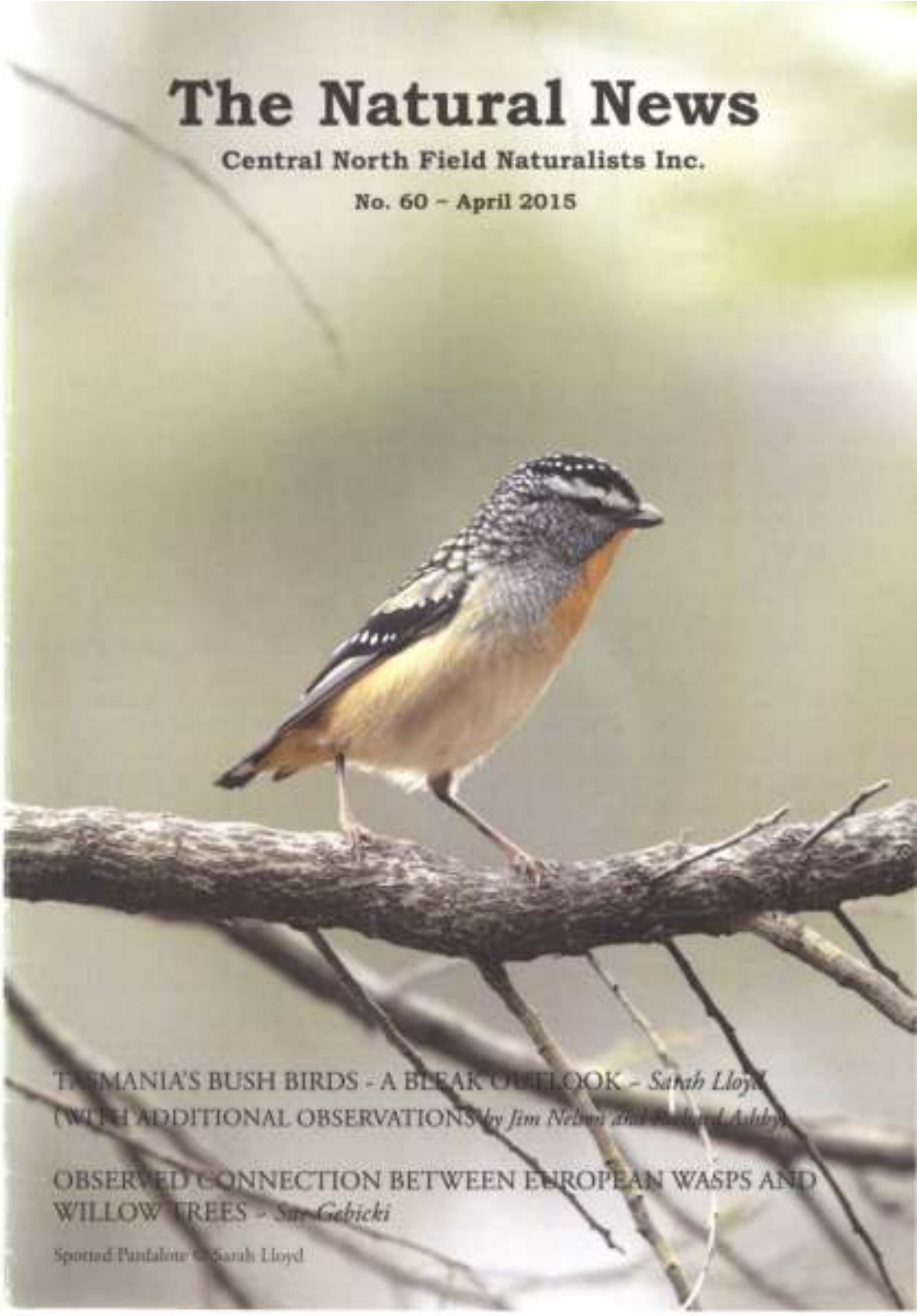

TASMANIA'S BUSH BIRDS - A BLEAK OUTLOOK - *Sarah Lloyd*
(WITH ADDITIONAL OBSERVATIONS *by Jim Nelson and Richard Ashby*)

OBSERVED CONNECTION BETWEEN EUROPEAN WASPS AND WILLOW TREES - *Sue Gabicki*

Spotted Pardalote © Sarah Lloyd

Tasmania's bush birds - a bleak outlook

Sarah Lloyd

It's hard not to be pessimistic about the state of bush birds in Tasmania. There are undoubtedly numerous factors leading to their decline with different species affected differently depending on their feeding strategies, habitat preferences and lifestyles.

Anyone familiar with the Tasmanian landscape even a decade ago will have noticed significant changes – some of us have been living here nearly all our lives. Forty years ago the drive south from Burnie along the Murchison Highway passed through corridors of Gondwanan rainforest, the largest remaining tract of cool temperate rainforest in Australia. Now it is a patchwork of industrial-scale plantations of pine and eucalypt as far as the eye can see. Increased irrigation and the push to double agricultural production to make Tasmania the 'food bowl of Asia' (are poppies and eucalypts really that tasty?) has changed the rural landscape from one of small and large patches of bush interspersed with paddocks and 'rough pasture' to vast cleared areas that from the air resemble interlocking crop circles where irreplaceable paddock trees have been sacrificed to make way for pivot irrigators. Other areas of native vegetation have been selectively logged (removing centuries-old habitat trees in the process), clearfelled, burned and 'converted' to plantations of shining gum (*Eucalyptus nitens*), or they have been fragmented, invaded by weeds, grazed or subjected to frequent burning. I believe these changes are affecting many species with some extremely worrying trends.

Farm surveys

For the past nine years I have been surveying birds at a large property south of Cressy at the base of the Great Western Tiers in Northern Tasmania. I met the landowner at a field day of invited community members to discuss Forest Stewardship Council (FSC) accreditation for logging operations on the southern slopes of the Tiers. I represented Birds Tasmania. The landowner generously allows researchers on his property to study everything from its rich history to the botanical riches that abound in the grassy woodlands. Thus far the birds had not been surveyed but the landowner expressed interest.

Relatively large areas of native vegetation (mostly grassy woodland) remain at the Cressy property of approximately 17 000 hectare

'Direct and indirect impacts of land clearing on the biota'

'Many animals maintain territories or strict home ranges that they defend against conspecifics. They are unable to move to other areas when their habitat is cleared and therefore often perish … Animals that succeed in moving to an adjacent area are often unable to compete with the individuals that have already established a territory there … so these animals also die. A recent study by Cogger et al. (2003) estimated the direct impacts of clearing on several groups of invertebrates … [He] calculated that about 2 million mammals, 8.5 million birds and 89 million reptiles die each year as a direct result of land clearing. They are killed at the time of vegetation removal or die soon after from predation or starvation. Notably, these estimates do not include impacts that have a longer time lag time, such as the so-called extinction debt … whereby small non-viable isolated populations in remaining habitat fragments go extinct long after clearing has ceased.' (Lindenmayer and Burgman 2005)

(half of this extends up the forested slopes of the Tiers). In 2006 five 2-hectare survey sites in vegetation of varying extent and condition were established on the farmland and four in the forests of the Tiers. They are surveyed using standard methodology i.e. 20 minutes surveys as early in the morning as possible noting all bird species seen or heard.

Surveying the Cressy farm was an exciting prospect—at least initially. The property encompasses large and small areas of remnant bush; paddocks with old, hollow-bearing trees; permanent waterways and dams of various sizes; plantations of pine and eucalypt; and more recently, crops watered with pivot irrigators. When the surveys began the birdlife was varied with many different species of waterbirds, three species of robin and all four migratory cuckoos that occur in Tasmania. Aerial feeding insectivorous species such as Dusky Woodswallow, Tree Martin and Welcome Swallow were 'in abundance', according to my first report. But nine years on some of these species have declined or no longer occur on the property. This is particularly worrying given that Tasmania was in the grip of severe drought when the surveys began and there was an expectation that things would improve not worsen. Of particular concern are the species generally regarded as common especially three medium-sized birds: Grey Shrike-thrush, Golden Whistler and Yellow-throated Honeyeater. Grey shrike-thrush were recorded at two of the five search areas in 2006 and 2007 but have not been recorded since 2008.

The endemic Black-headed Honeyeater has not been recorded at the Cressy property.

The farmland at Cressy is a mixture of extensive patches of native woodland, cleared pasture for grazing and irrigation, paddock-edging windbreaks, large farm dams and plantations of *Eucalyptus nitens*.

Golden Whistlers were recorded at two search areas in 2006 and one was recorded near a search area in 2009. During the nine years of surveying there have only been two records of the Yellow-throated Honeyeater near one search area and the 'common' endemic Black-headed Honeyeater, a bird of dry forests and woodlands, has never been recorded on the property during the surveys.

The absence of these birds had me baffled for some time, after all there's plenty of what looks like 'quite nice bush'. Two people, a landowner and a bureaucrat with little knowledge of birds suggested that they may never have occurred there; a top government botanist questioned the value of bird surveys because birds 'just fly around'. But anyone who has ever conducted bird surveys knows that bush birds have quite a small home range, especially during the breeding season, and just about every woodland or forest site in Tasmania—even small bush remnants—should support the common and very vocal Grey Shrike-thrush, Yellow-throated Honeyeater, Golden Whistler and Black-headed Honeyeater. During my previous farm surveys these species were present at almost every site. (My previous experience includes surveying three farms in the Meander Valley for two years for Birds Australia's Birds on Farms project; 15 properties on the northwest coast and 20 on King Island for the 'Biodiversity Indicators for Sustainable Farm Management' project initiated by Richard Donaghey and several sites at Murrayfield, Bruny Island.)

To conduct the surveys my partner Ron Nagorcka and I camp for two days at 'Red Hill', one of the five search areas on the farm, and the one that is the richest for birds. (It has no threatened plant species and therefore no formal protection.) It is adjacent to an extensive area of native vegetation and because the aforementioned birds are extremely vocal, especially during spring and early summer, they would certainly be detected if they were in the area. Why where they not there? A visit to another grazing property east of Ross suggests a possible reason for their absence.

In January 2010 I approached the owner of

A continuous ungrazed almost impenetrable layer of saggs and braken fern at the Eastern Tiers may contibute to the richness of the site.

the Ross property after reading a report in the Examiner that described measures to protect large areas of land in the Ross/ Campbelltown area (The Examiner December 30 2009). I expressed my concerns that conservation covenants and management regimes focus on botanical values and threatened plants with limited consideration of the rest of the biota. I proposed setting up sites on the property and to undertake regular bird surveys. My suggestions were greeted positively and I have subsequently surveyed the property on three occasions.

In November 2014, a month after surveying birds at Cressy, we set up camp in the Eastern Tiers at a site of relatively open dry grassy woodland adjacent to thicker bush with an impenetrable (at least to us) understorey layer of bracken fern and sagg. And what a relief and joy it was to hear the familiar songs of Grey Shrike-thrush and Yellow-throated Honeyeater not long after we arrived!

The property is different from the Cressy property in several respects. There is a clear delineation between the farmed areas and the

Golden Whistler ♂

Why the *viminalis*?

On Sunday April 5th CNFN members walked the track surrounding King Solomons Cave, Mole Creek. The vegetation is mostly wet forest with several different eucalypts species of which many were dead or dying. This sparked some discussion about the deteriorating health of white gums statewide, especially as other eucalypt species around them seem healthy.

I remember attending a field day with ornithologist Richard Donaghey who pointed out the 'vims' and informed the gathered crowd that *Eucalyptus viminalis* is in the *Eucalyptus* sub-genus *Symphomyrtus* and a useful mnemonic is 'a symphony of birds'.

Observe for a day some tall viminalis in an extensive area of healthy forest. Many forest birds visit—and depend—on the trees because they provide habitats for more invertebrates than other eucalypt species. Flocks of Strong-billed Honeyeater forage on the bark; Black-headed Honeyeater forage on twigs and small branches; pardalotes are specialised to feed on psyllid insects and an associated exudate called lerp that sometimes occur in massive outbreaks causing leaf loss and eventual death. Yellow-throated Honeyeater feed on the trunks and large branches; and depending on the season, Grey Shrike-thrush and Grey Currawong will also be trying to dislodge the bark to access hiding insects. Loud chattering often accompanies the feasting—a veritable symphony!

Birds need *Eucalyptus viminalis*
– and vims need birds!

conservation areas, and the climate is usually considerably drier. In 2014 the cleared farmland was drought affected, but in stark contrast, the bush in the Eastern Tiers looked remarkably healthy with bird populations of some species flourishing. (For approximately 200 years the Eastern Tiers was used as 'run country', a practice that has been widely viewed as a relatively benign use of the bush.) In my 2014 report I noted:

the number of birds and species present at the survey sites in 2014 is remarkably similar to those found in November 2011. For instance, Flame Robin and Satin Flycatcher were again recorded at or near Site 3 and a family of Superb Fairy-wren was found at Taylor's Hill - in almost exactly the same place!

Numbers of some species, most notably Yellow-throated Honeyeater, Striated Pardalote, Grey Shrike-thrush, Yellow Wattlebird, Black-headed Honeyeater and Eastern Spinebill seem to have increased. This can possibly be attributed to the recovery of the vegetation since sheep were excluded in the summer of 2007/08 and the favourable (wetter than usual) conditions of the subsequent four years. It was interesting to observe that the honeyeaters were not foraging on the black peppermint flowers, but were searching for invertebrates on the foliage of the white gums.

Vegetation structure

After several days of observation in the Eastern Tiers it was not hard to conclude that the absence of some species at the Cressy property could be attributed to the absence of large continuous tracts of suitable dense mid story and understorey vegetation where birds can nest, roost and take refuge from inclement weather and predators. There is certainly not a lack of understorey and midstorey vegetation, but it is sparse and there are few (if any) areas that have not been regularly grazed by cattle, sheep and/or feral deer whose activities continually degrade and fragment the understorey. The fragmentation of bush at a landscape scale is often discussed, but my observations suggest that fragmentation of the understorey on a much smaller scale is also detrimental to certain species.

Discussions with the Cressy landowner indicate that 'light' grazing by cattle or sheep to control the growth of grass usually occurs annually. (We encountered cattle at two survey sites during the 2014 surveys and all areas had evidence of recent grazing.) This may actually favour some threatened plant species as it eliminates grassy competitors. However, it fragments, albeit gradually, the continuous layer of vegetation so essential to the survival of some birds. It makes you wonder about the efficacy and value of conservation covenants – are they there to protect threatened species, particularly plants and vegetation communities, or are they established to maintain and possibly enhance biodiversity? It seems this very much depends on the commitment of the landowners, how much they understand the issues and how they manage their properties as a result. Management for flora without the consideration of effects on fauna will not conserve biodiversity in the long run.

The lack of extensive areas of understorey vegetation may explain the absence of Yellow-throated Honeyeater, which nests in the understorey, but the absence of Golden Whistler which has not been recorded on the farm since 2009, nor in the recovering production forest on the slopes of the Great Western Tiers OR at the Eastern Tiers in 2014 where it was recorded at two survey sites in 2011 - may point to more sinister causes.

Chemicals

The Golden Whistler is a very vocal species but the birds themselves are rarely seen because

male birds usually forage for invertebrates high in the canopy foliage of eucalypt, and the females usually forage lower in the canopy or in the midstorey vegetation.

As mentioned above, there are few remaining large tracts of untouched native vegetation outside National Parks in Tasmania. The Eastern Tiers, Great Western Tiers, Birralee and Frankford, Weegena, Mathinna, Fingal and north Scottsdale—to name but a few—are now a mosaic of native vegetation interspersed with plantations of mostly shining gum at various stages of maturity. At some stage in their cycle these trees are sprayed to 'protect … from severe defoliation by native insect pests' including eucalyptus leaf beetles *Paropsisterna* spp., Eucalypt weevil *Gonipterus scutellatus*, autumn gum moth *Mnesampela privata* and gum leaf skeletoniser *Uraba lugens*. The chemical most often used is Alpha-cypermethrin, listed by the FSC as a 'highly hazardous' pesticide'. In fact it is so hazardous that there is a 14 day exclusion period prohibiting entry by forestry workers to plantations that have been sprayed.

Alpha-cypermethrin is an indiscriminate chemical that also kills beneficial invertebrates such as the zig-zag ladybird *Cleobora mellyi*, plague soldier beetle *Chauliognathus lugubris* and no doubt numerous others. Not only does this drastically reduce insect numbers forcing birds to forage over a greater area to fill all their dietary requirements, but it is likely that birds that glean insects from the foliage of eucalypts in the plantations and/or in adjacent bush will be adversely affected when they ingest insects that have been sprayed.

Crops such as tomatoes, lettuce, cereals, corn, soybean, rice, beans, sunflower, canola, lucerne, pasture, field peas and lupins are also sprayed with Alpha-cypermethrin. The chemical is 'dangerous to bees' and should not be spray when there are plants in flower where bees are foraging. It is also 'dangerous to fish' and should not contaminate any waterways or water

Brown Thornbill

bodies. This chemical, and no doubt numerous others, could adversely affect all insectivorous bush birds including foliage gleaners such as Golden Whistler and ground foraging birds such as robins.

Understorey vegetation: gorse and small birds

When the surveys in 2006 began Ron and I camped at 'The Pond', another of the survey sites on the Cressy property. The Pond is a large dam that over the years has had an entertaining variety of waterfowl, and a deafening chorus of frogs. It had scattered live and dead eucalypts, small copses of regenerating silver wattle with patches of gorse forming a dense but patchy understorey. The ground layer vegetation had a mix of native and introduced grasses, small herbaceous plants and numerous orchids. Eight bird species were recorded on the site in 2006; by 2014 only four species were recorded.

In 2006 Superb Fairy-wren, Yellow-rumped Thornbill and Brown Thornbill were using the gorse for nesting, sheltering and foraging and numerous skinks were basking in the sun close to the plants only to retreat to the prickly shelter whenever I approached. By 2000 the gorse had been sprayed and left *in situ* but by the following year all dead plants had been

removed. This not only eliminated habitat for the birds it probably also (albeit indirectly) lead to the deteriorating health of the surrounding bush. By 2014 the wattles had been completely defoliated by insects, a situation probably exacerbated by the absence of the small birds, especially Brown Thornbill that favour foraging on the feathery foliage of bipinnate wattles.

There were 10 Yellow-rumped Thornbill, at the site in 2006, two in 2007 and 2008, one in 2009, 2010, 2011 and 2012 but none have been seen there since.

It is admirable that landowners are vigilant about the elimination of weeds on their properties. However, in the absence of suitable native vegetation this sometimes provides important habitat for small birds, invertebrates and reptiles. My observations at The Pond well illustrates, albeit at a very small scale, that if you eliminate habitat the birds (and other fauna) are unable to persist. Most birds are not fussy about whether the vegetation is native or weedy – they just need it to be present.

Understorey and Feral Deer

One of the surveys sites on the Cressy property is a fenced area with a conservation covenant. In 2006 when my surveys began Noisy Miner dominated the site and there were few other birds around. This native honeyeater favours areas with no or little understorey and aggressively chases most other birds from its territory. Because the area had been fenced to exclude stock grazing not long before my study began I anticipated that the understorey of orchids and herbaceous and woody plants would recover and the site would no longer be favoured by Noisy Miner. In my first report I recommended (unrealistically given the cost involved) that the bush at the base of nearby foothills be linked to the fragments of native vegetation on the property via natural gullies by fencing off to encourage natural regeneration.

Noisy Miner dominate areas with little or no understorey vegetation.

By the second year of the surveys this had effectively happened although not quite as I had envisaged. Rather than a mixture of local provenance trees and shrubs, extensive plantations of shining gum surrounded the search area. This resulted in slightly fewer bird species near the search area the following year because several large old hollow-bearing eucalypts were sacrificed to make way for the plantations thus eliminating nesting sites for Striated Pardalote, Welcome Swallow and Tree Martin. Nevertheless the plantations had the desired effect of overcoming the isolation of this patch of native vegetation. And the fencing also had the desired effect because it allowed the understorey to recover.

In 2012 Yellow Wattlebird, Brown Thornbill, Spotted Pardalote, Grey Fantail and Shining Bronze-cuckoo were recorded in the plantation adjacent to the native bush. But they were not entering the survey site which was still dominated by Noisy Miner. The understorey had not continued to recover as predicted but had deteriorated considerably with all the wattle and eucalypt seedlings and woody shrubs that were flourishing in the early days of the surveys damaged or destroyed by feral deer.

Fallow deer have increased in recent decades

and now number approximately 30 000 animals. They were first introduced in 1836 to provide a resource for hunters and were subsequently introduced on a number of occasions in the districts around Interlaken, Ross/ Campbelltown and Deddington/ Blessington, with satellite populations becoming established throughout the northeast mainly as a result of either escapes or animals being released from unviable deer farms. Culling is limited and there is a strict bag limit with the aim of keeping the resource genetically viable and of good quality for trophy hunters. In A Statement of Current Management Practices for Tasmanian Wild Fallow Deer (Feb 2011) it is stated that 'Landowners can apply to the department for crop protection permits outside the recreational season for deer that are causing damage to crops or pastures.' There is no mention about the widely reported damage to native vegetation on conservation properties where landowners have invested time and money to protect flora and fauna on their land.

Irrigation, paddock trees & farming practices

As noted above, in 2006 aerially feeding birds were 'in abundance' – as were numerous centuries-old hollow-bearing paddock trees. These trees, essentially irreplaceable in our lifetime, are important for many species because they provide stepping stones in the landscape and numerous nest sites and foraging opportunities on their foliage, trunks and branches. Sadly, many of these trees were felled to make way for the plantation and two enormous dams. These practices are occurring across the rural landscape.

Migratory birds

The migratory Dusky Woodswallow, Tree Martin and Satin Flycatcher have also declined or completely disappeared from some sites at the Cressy property and are in very low numbers near Ross. Migratory species that breed in Tasmania are likely to be particularly vulnerable because they are dependent on two different habitats, one where they breed and one where they spend the winter.

The White-throated Needletail is a trans-equatorial migrant. It faces habitat alteration in two hemispheres and well illustrates the issues facing all migratory birds.

When we first arrived at Black Sugarloaf in December 2008 I vividly remember my ten year old son excitedly pointing to the hundreds of 'swifts' circling high above our property, occasionally swooping low between the trees with an audible whoosh of their wings. In early 2014 we witnessed another flock behaving in a similar manner, but this time there were only about 30 or 40 birds.

White-throated Needletail (previously known as Spine-tailed Swift) have declined in Australia by approximately 50% since the 1950s. This has partly been attributed to the clearing and/ or modification by changed fire and grazing regimes of forests and woodlands in eastern Australia over the past 60 years that has lead to a reduction in the abundance of invertebrate food and loss of roosting habitat.

The use of insecticides has also decreased the abundance of invertebrates leading to birds foraging over a wider area to fulfil their dietary requirements. Furthermore, the birds may be affected by secondary poisoning by insecticides that accumulate in sub-lethal doses in their prey.

Alteration to their breeding ground, the vast Boreal forests of Siberia, is the main cause of their decline. The clear felling of these Tiaga forests has increased alarmingly with 50% being logged illegally since the break up of the USSR. Over 2 000 000 m^3 of timber a year has been taken from the forests with some estimating that the forests will be destroyed in the next 20- 30 years. White-throated Needletail nest

in solitary hollows in large deciduous or coniferous trees usually at the edge of clearings. The breeding season is brief and the birds must get enough sustenance not only for themselves but also to sustain the rapid growth of their two to seven young.

Fire and urban development

In 2008 'A sound Idea', a project to monitor acoustically Tasmania's bush and forest birds was initiated. More than 90 people made recordings at over 160 locations across Tasmania between and including Tasman Island and King Island, with many participants making seasonal recordings at particular sites. Consequently, we have some idea of the species that are able to persist in areas that have thus far not been surveyed for birds.

The project involved volunteers recording for twenty minutes in their backyard or local bush using a small digital sound recorder. Volunteers needed no bird identification skills but simply the ability to follow instructions and an interest in assisting in a project they felt was worthwhile. The recordings were listened to, a large database of records was amassed and participants received a list of the birds they recorded.

Monitoring projects that rely on volunteers inevitably result in more surveys being conducted in well-populated rather than remote areas. This is one project that has benefitted from such a bias. The recordings indicate that areas close to human habitation, especially bush on the edges or within the boundaries of towns and cities, support many of the native species (Grey Shrike-thrush, Golden Whistler and endemic honeyeaters) that are no longer persisting in some areas of the rural landscape.

Unfortunately for the birds, these bush areas are likely to be cleared for industrial or residential development and/or subjected to frequent fuel reduction burns. These activities will be at the expense of native wildlife.

Feral cats and European Wasps

The impact of feral cats is difficult to gauge but anecdotal evidence suggests that cat numbers are increasing. A dead Australasian Bittern was found in a garden near St Helens and the evidence indicates that it was carried into the garden when dead and ripped apart. In the same garden, 2 small passerine species were also found dead within a 2 week period after 2 kittens were observed with an adult feral cat. It is speculated that cats could or did kill these birds. (Liz Znidersic personal communication)

The article on page 12 by Sue Gebicki describes the activities of European wasps whose voracious appetites for native invertebrates is likely to be affecting many native species.

For this article with references check:
www.disjunctnaturalists.com/articles.htm

Jim Nelson's comments

There was an unusual absence of larger birds this past summer (2015) at my place in Weegena. I heard a few (Kookaburras) occasionally in the distance, but many I considered common have not been seen. There has been a nice diversity of small resident birds but in the 40 years I have been here I have never seen such a change.

There are always species changing over, such as the noisy miners who moved in. But even the miners are gone this year. The most remarkable absences are the starlings and swallows, both of which have been returning here and nesting for the forty years that I have been here.

The Yellow Wattlebirds were the last larger birds I had here this year, and they exited in Spring as they usually do (but quite late this year), presumably to go to the higher country. They are normally only winter residents. The local black cockatoos visit to eat the pine nuts

down in my tree grove, but I haven't seen them congregate in favoured trees nearer to the house, which is unusual. They do fly overhead on occasions. The first apples are getting close to being ripe, so I can only imagine the cockies will soon be amongst them.

Another bird which I don't usually see much of but can normally hear monotonously calling in season is the Striated Pardalote. I didn't see or hear a single one here this year.

I can't put the absence of these birds down to anything, and I'll just have to wait and see what happens next. There may well be a change when the apples ripen, as the ripe fruit always attracts a number of birds.

I don't know that birds have necessarily declined in this district, although my impression is that they certainly seem to be fewer in numbers. But why so many have failed to even visit my place this year is a mystery.

I must say that the fairy-wrens, fantails and the spinebills seem to enjoy having the place to themselves and have bred up this year.

I AM getting 4 white cockatoos visiting, which doesn't thrill me. But I haven't seen a single raptors in the sky since Spring. We had a pair of brown falcons nesting close by for the last decade or more, but not this year. No Swamp Harriers patrolling in the sky. Nor have I spotted the Peregrines that nest over on the cliffs at the river. I have been close to their nest/roost site a few times and haven't spotted them hawking up and down the river as I usually do. They weren't around at our AGM and I have been over since without seeing them. However, I need to chase that one further because they are usually there or nearby and I perhaps just missed seeing them.

It has been an unusual summer weather wise, and also, it seems, bird wise. Every year is different, but this one seems to have been remarkably so. I'm wondering whether people in other areas may have noticed similar changes?

Richard Ashby's email

I survey several pieces of seemingly healthy woodland on at least a monthly basis up the Blythe River at Heybridge, in the eastern section the Rocky Cape National Park at home in Sisters Beach, the Inglis River in Wynyard and the Detention River estuary [...]

I see no diminution whatever (subjectively) of Grey Shrike Thrush, Golden Whistler, Yellow-throated Honeyeater, Satin Flycatcher or Scarlet Robin but Dusky Woodswallows are certainly thinner in recent years. White-Throated Needletails have all but disappeared and I think I see fewer Tree Martins than before although they've never been in big numbers up this way. By never I mean the last 35 years. I get quite excited when I see or hear a Blue-winged Parrot these days and Swift Parrot numbers have certainly plummeted. I used to see flocks of 20-25 in blue gums in Wynyard, now it's one or two birds usually passing through in Spring.

I can't think of any other woodland birds whose numbers have declined noticeably, perhaps Ground [Bassian] Thrush, presumably displaced by Blackbird.

A dozen or more Little Pied Cormorants used to roost in riparian vegetation up Sisters Ck, much fewer now since we got town sewage rather that septic tanks but apart from a little seepage into the creek I can't imagine how that would affect this species. Wood-duck, Hardhead and Great Egrets are commoner in the NW in the last 10 years but they're not bushbirds. Palearctic shorebirds are another matter.

Observed connection between European wasps and willow trees

Sue Gebicki

A few years ago we had a terrible European wasp plague. The air was thick with them, the carcasses on the road were yellow with them. Very few other insects could be found—my brassicas were completely free of cabbage moths and their larvae and the march flies and blowies were absent, but tragically everything else had gone too. I began a personal vendetta, locating nests and poisoning them. I lost count after the 70th nest.

More recently, I have noticed that the two large cricket-bat willows (*Salix alba 'Caerulea'*) around our house are swarming with European wasps. Closer inspection revealed that the trees are completely infested with aphids, which on research have been found to be *Tuberolachnus salicis*, a very large black aphid which feeds exclusively on willow trees. These aphids exude a black sticky substance which provides an excellent source of carbohydrate for the wasps.

European wasps (*Vespula germanica*) start a new nest in early spring, with a lone mated queen that has sheltered throughout winter in any available crevices or holes. She feeds on carbohydrates while looking for a suitable spot for a nest where she builds a few small cells from chewed wood fibre, in which she lays eggs. She tends these, and when the larvae hatch she feeds them protein through several stages of growth until they emerge as workers. By early summer the workers have taken over enlarging the nest, building more cells and then tending and feeding the larvae. The queen drops all other tasks and concentrates on laying eggs. In autumn the workers commence building larger cells in which hundreds or even thousands of queens and males are reared. The new queens and males leave the nest, mate, and the young queens then find suitable winter shelter. In warmer areas the nests may survive the winter, however in Tasmania they tend to die.

The workers live 3-4 weeks, and there is high variability in sequence and diversity of tasks performed. To a limited extent they follow 'temporal polyethism' in the nest. This is a mechanism of worker specialization in which workers concentrate on tasks in sequential order throughout their life. The typical order is first, nest duties, second, pulp foraging, third, carbohydrate foraging and the fourth, protein foraging. This ensures that the older expendable workers are performing the more dangerous tasks.

European wasps are opportunistic predators

Willow branch with aphids.

Ladybird (*Cleobora harmonia*) and small native wasp sharing the willow branch with aphids. Only a very small number of ladybird larvae was found, possibly indicating predation by wasps.

and scavengers, and their flexibility in foraging behaviour is a key factor in their rapid colonization. After hibernating queens arrived in New Zealand in 1945, they had infested 80,000 sq. km within 6 years. (They came to Australia more recently.) Research conducted on the diets of European wasps in New Zealand beech forests found that 15% of returning foragers carried animal prey, 8% wood pulp and 68% clear sugar liquid in their crops. These figures varied a small amount in scrubland, where they carried a smaller proportion of both animal prey and wood pulp. The animal prey was mostly crickets and grasshoppers (Orthoptera) and large bees, ants, and wasps (Hymenoptera). On the north island the wasps carried 0.8 million prey loads/ha/season, on the south 4.8. The researchers calculated that the biomass of these loads was 1.4 kg/ha in the north and 8.1 kg/ha in the south. **They also found that the weight of animal prey taken on the South Island equalled that taken by native insectivorous bird fauna.** The carbohydrate was 78 and 343 litres/ha respectively.

Another New Zealand study in a different areas found that the highest proportion of species caught were true flies (Diptera), followed by butterfly and moth larvae (Lepidoptera) then spiders (Arachnida).

A South Australian study also counted the number of animal prey brought back to nests. They found that those most frequently brought back were flies (35%) followed by bees, ants and wasps (mostly *Apis mellifera*, honey bees 9%), moths and butterflies (4%) and spiders (3%). Other prey items included grasshoppers, crickets, amphipods, beetles, lacewings, leafhoppers, dragonflies, and unidentified items. There were no records of aphids having been found among the prey. Twenty-two percent of all items were so badly masticated that they could not be identified. Interestingly wood pulp accounted for 19%, a much greater proportion than that found in New Zealand. The South Australian researchers surmised that the differences in proportions of prey collected reflected the proportions available, confirming that the wasps are opportunistic foragers.

My own observation of the wasps indicates that they are carrying water back to the nest on warm days, as they alight at water sources in great numbers then travel immediately back

to their nests. They have also unfortunately prospered greatly from the carcasses of roadkill. The wasps work very long days, they are active in the willows well before sunrise and continue long after the sun has gone and are undeterred by heat or cold until late autumn. Research has shown that they become much less active below 10 ° Celsius and above 35 ° (although I don't expect that is an issue here in Tasmania).

Being inspired to find more evidence of wasps using willow aphid secretions as a valuable food source, I examined crack willows along the Meander River from Westbury to Deloraine, and found the same aphid and wasp activity as at home. I have also found a difference in infestations in different willow species. We have a tortured willow, *Salix babylonica var. pekinensis 'Tortuosa'*, which has very few aphids, and my shrub willows, *Salix alba 'Britzensis'* have none. I have not investigated these trees and shrubs in any other sites.

Tuberolachnus salignus, the giant willow aphid, is very large with a body length of 5.0–5.8 mm. Colonies consists of both winged (Alates) and wingless (Apterae) individuals. Adults give birth to miniature adults called nymphs, and each alate produces, on average, 34.3 nymphs. Time to maturity is dependant on temperature and species of willow, ranging from17 to 12.21 days. Adults continue to live post-breeding.

Colonies continue feeding and reproducing on willows after leaf fall, which is unusual for aphids. It is not yet known where they go from winter until summer.

Early season colonies appear in summer and are situated at the base of willow trees, moving up the stems with increasing numbers. In summer alates disperse from other infestations, starting higher up the stems. By late summer the colonies can contain tens of thousands of individuals.

Back to our willows. Since the removal of a large number of mature crack willows from our local creek by a 'work for the dole' team several years ago there has been a dramatic decline in the local annual summer infestation of wasps. However inspection of the crack willows (*Salix fragilis*) re-growing along the creek revealed a very heavy load of the willow aphids, and an annually increasing wasp population. One of my cricket bat willows has now been turned into excellent mulch, the other is soon to follow and I will resume my hobby of locating and destroying wasp nests.

Footnote: On my most recent foray into the bush looking for wasp nests, I was eaten alive by march flies. My brassicas are again holey from cabbage moth larvae, although the blue wrens are consistently working on them. I am trying to see these as good signs ...

References

Tuberolachnus salignus the giant willow aphid Ian McIvor Plant and Food Research, Palmerston North, March 2014

Collaborative Research Program on the Control of the European Wasp in South Australia Adelaide Research and Innovation reference Z 0120 September 2002

European Wasp is here to stay! Steve Davidson, Ecos Magazine

Australian Museum http://australianmuseum.net.au/european-wasp

Wikipedia viewed 24.02.15

European wasp collecting aphid secretions from willow leaf.

Prey Diets and Population Densities of the Wasps *Vespula vulgaris* and *V. germanica* in Scrubland-Pasture R.J. Harris, Manaaki Whenua – Landcare Research, Ruakura Agricultural Centre and E.H. Oliver, Plant Protection Group, Ruakura Agricultural Centre

(Photographs of wasps, aphids, ladybird and silvereyes by Sue Gebicki.)

Silvereye parent on nest. Sadly, a few days later I responded to alarm cries and arrived in time to find an empty nest and the tail of a tiger snake receding

Newly hatched silvereyes (the fourth egg had been punctured and soon hatched). The nest was in the raspberry patch (bit like raising children in a restaurant?) and a minimum of materials (including dried grass, dandelion down and dog hair) were used – the raspberry leaves can be seen through the nest.

CNFN Walks

May 3 Dooleys Hill, Latrobe Genevieve Gates and David Ratkowsky will lead a fungi walk. Meet at 10.00 at the carpark at Bells Parade near the Axemans Hall of Fame.

June 7 Lemonthyme Lodge. A walk on the nature trail near the Lodge. Meet at 10.00 at the Lodge carpark, 770 Dolcoath Rd, Moina; Lemonthyme Lodge signposted off the Cradle Mountain Road south of Moina. Afternoon tea will be available at own expense after the walk.

July 5 Winter get-together at Jim Nelson's Place 68 Dynan's Bridge Road Weegena. Jim will fire up the pizza oven and prepare the base. Please bring toppings.

August 2nd Reserve on Birralee Road north of Westbury. Meet at 10.00 am at the car park at the southern end of the bridge over the Meander River.

September 6th – Celebrate spring with a visit to the intriguing Guide Falls, West Ridgley. From Burnie take the Ridgley Highway south to Ridgley PO, then go a further 800 m to the junction with West Ridgley Road (C104) where you turn right for another 2.5 km. The falls are clearly signposted. Meet at the lower car park at 10.00. A visit to Fern Glade, near Burnie, may be possible in the afternoon.

October 4th – Ulverstone: Goat Island & Reid Street Reserves. Meet at 10.00 am at the Goat Island Reserve, opposite the Blue Wren Tea Room on the coast road between Ulverstone and Penguin. We will spend the morning observing sea birds and looking at the rock pools and the afternoon in the Reid Street Reserve (see article The Natural News, December 2014).

November 1 Badger Head. Philip Milner will lead a walk at one of his favourite places along the Badger Head track. Wildflowers and orchids should be close to their best. Meet at 10.00 at the carpark at the end of Badger Head Road.

December 6 AGM at John and Lynn Hayward's property at Hawleys' Rd. Weegena.
Meet at 10.00 for a walk followed by a BBQ lunch at 12.00 (bring food to share). The AGM will start at 1.30. As in previous years we will be voting on an audit exemption.
Hawley's Rd is the 2nd turn to the left after Kelly's Cage Rd. Jim will put tape at the turnoff and at the gate into the property (third turnoff to the right). Drive through the property until you come to the cabin. There is a toilet, running water, cutlery etc at the cabin.

For Arbor Week activities during May check http://www.tasmanianarboretum.org.au/

Ecological Restoration Community Symposium 23 May 2015 9:15 am to 5:00 pm Tidal Waters Resort, St Helens - http://www.northeastbioregionalnetwork.org.au/

Note to members:

Please email your email address to secretary Ron Nagorcka (ron@ronnagorcka.id.au) so that a complete email list of all members can be compiled.

Deadline for next newsletter 30 July 2015

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