

Springbrook Rescue Restoration Project

Progress Report 2022



Australian Rainforest Conservation Society Inc.

March 2023

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Cover photo: Recovery of canopy in Upper Springbrook between 2008 (top) and 2022 (bottom)

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Introduction

Australian Rainforest Conservation Society Inc (ARCS) has been providing annual reports on Springbrook Rainforest Restoration Project (SRRP) since 2009.

The Project is based on facilitated natural regeneration. This approach to restoration has been increasingly recognised since we began the Project and can be considered as supporting what is now referred to as proforestation. That term was coined by environmental scientist William Moomaw when he realised “that the most effective thing that we can do is to allow trees that are already planted, that are already growing, to continue growing to reach their ecological potential, to store carbon, and develop a forest that has its full complement of environmental services”.

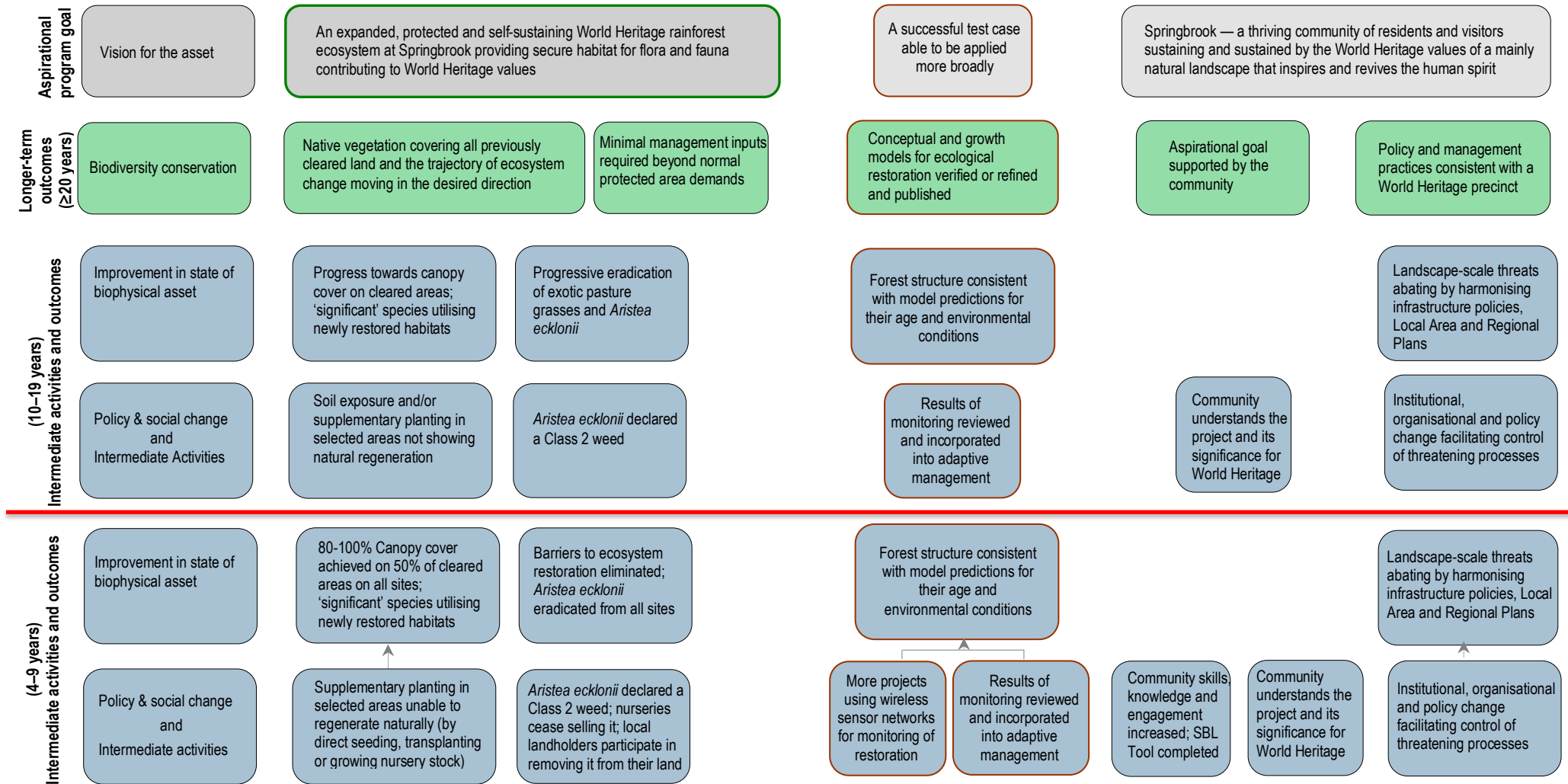
Proforestation is now recognised as a more effective, immediate and low-cost method for removing and storing atmospheric carbon in the long-term than tree planting.

Because the majority of the Springbrook Plateau was cleared in the early 1900s, much of the forest still has decades to go before it reaches maturity. The addition of significant areas of forest to the national park providing legal protection and allowing them to continue to grow towards maturity is an excellent example of proforestation. The Springbrook Rainforest Restoration Project, being carried out in areas adjoining the existing regenerating forest, not only allows the forest to expand but also provides a degree of environmental protection and will in decades come to deliver benefits for biodiversity and climate change.

As discussed at a previous meeting of the Steering Committee, the nature of the project, being based on assisted natural regeneration, is such that annual reporting is not altogether appropriate as there is usually not a lot of regeneration occurring over such a short time. The exceptions are (a) when there is a mass flowering, fruiting and new recruitment event and/or (b) roots of young recruits reach the water table; and climatic conditions unusually are maximally favourable to growth.

We have therefore taken the decision to again provide a relatively short report simply covering activities during 2021 and 2022.

Program Logic 2018–2028



Progress report for the years 2021 and 2022

Progress in the years 2021 and 2022 is described in relation to the properties where work has been undertaken.

Warblers

Natural regeneration

Natural regeneration continues to progress across the property. At this time, more than 90% of the property supports relatively advanced regrowth vegetation. This compares with less than 20% at the beginning of the project.

ARCS employs Kevin Delahoy for four days per week to manage the property (as well as other properties). Kevin lives on site while at Springbrook. We benefit greatly from his multiple skills in restoration, bird monitoring and maintenance.

The main barrier to natural regeneration on this property in the early days of the project was a dense layer of introduced grass. Kevin mows regularly such that grass remains short to allow seedlings to generate. New seedlings are marked and protected. When they reach small shrub size, grass around them is killed with herbicide to reduce competition and facilitate growth. The image below shows the property in September 2022. There is prolific regeneration at the seedling stage which is not visible at the scale of the photo.



Figure 1. Warblers property at September 2022

Aristea ecklonii

Early in the project, the introduced weed, *Aristea ecklonii*, was present over all of the property inhibiting natural regeneration. Extensive areas had a dense cover of large, mature plants.

Currently, all advanced plants have been removed. The only significant occurrence of *aristea* is currently in an area of around 30m by 40 m in the northeast corner.

However, seedlings continue to appear. As we have reported previously, it is clear that the seeds survive in the soil for years. On much of this property there have been no mature plants and hence no seed production for many years, but seedlings continue to appear. These are controlled using herbicide which is effective on seedlings.

It is not possible to say when *aristea* will be eradicated because the long-term viability of soil seed stores is not definitively known. All we know so far is the minimum estimate.

As noted in our 2018 report, ARCS has made repeated approaches to Biosecurity Queensland in an attempt to have *Aristea ecklonii* declared a Class 2 weed. Biosecurity Queensland carried out a risk assessment of the plant and published a report in 2008. The report is available at https://www.daf.qld.gov.au/__data/assets/pdf_file/0014/63005/IPA-Blue-Stars-Risk-Assessment.pdf.

The report currently states that it was updated in 2016. However, it refers to the specimen collected on the Warblers property by Aila Keto and lodged with the Queensland Herbarium in October 2007 and states “To date, this is the only documented site for this species”. That is despite the fact that Queensland Herbarium holds records for specimens lodged in 2010, 2011, 2014 (2 records) and 2015. Currently Queensland Herbarium holds 13 records for *A. ecklonii*: Springbrook (3 records), Beechmont (several “dense roadside infestations”), Sundown National Park, Mudgeeraba, Macleay Island, Redland Bay, Burbank (“large population”), Bulimba Creek, North Stradbroke Island, Montville and Cooroy. The Australian Virtual Herbarium holds 18 records from NSW ranging from Nambucca River (“locally common”) to Bega (“many patches established”), 26 records from Victoria and 1 record from Tasmania (150 m infestation on a road verge in the Huon Valley, recorded December 2016).

The following is a quote from the risk assessment:

A. ecklonii is in an early stage of invasion in Queensland and could become a significant pest within suitable habitats after its population has had sufficient time to develop.”

If Biosecurity Queensland updated its assessment in 2016 as claimed, it clearly should have recognised that this weed was spreading and becoming established over a range of environmental conditions from moist mountain tops to coastal lowlands and Moreton Bay islands.

The Biosecurity Queensland report has not been updated since 2016.

ARCS will continue to press for formal recognition of *A. ecklonii* as a Class 2 Declared Plant. This classification makes it an offence to possess, sell or release the plants.

Habitat recovery

Kevin's avifaunal records monitoring of habitat recovery now over a period of almost eight years are invaluable and unprecedented. He documents weekly observations generally cumulative over four to five days per week for 45 to 49 weeks of successive years. He is able to do this during field work on restoration. The results are credible given his acknowledged skills as a member of Birds Queensland. Funding such a project conducted traditionally would be prohibitively expensive (current value \$1.4 million). We believe this will be an important longitudinal study on rainforest habitat recovery.

Recovery of the avifauna is described in detail at the end of this report.

Electricity infrastructure

We have repeatedly discussed with Energex/Energy Queensland the option of providing underground supply to the two communication towers on the southern edge of the plateau via one line rather than two separate lines as currently occurs. This would make the supply across Warblers unnecessary, thereby eliminating the need for annual vegetation trimming under the lines in the national park. Energy Queensland has advised that this option is very likely to proceed but will take two years. Obstacles include obtaining agreement of the owner of the towers to provide an easement across their property for the underground supply line. We have had no update on this project.

Equipment

It has been necessary to purchase a new zero-turn ride-on mower for work on Warblers and Ashmiha. The original Dixon mower was purchased in 2007 and has become too expensive to maintain.

We are also progressively replacing our existing equipment with battery versions as part of decarbonising our activities.

Road Reserve along Bilbrough Court bordering Ashmiha

The MOU with the Gold Coast City Council allowing ARCS to be primarily responsible for management of the road reserve between Warblers and Ashmiha has allowed us to progressively remove previously significant infestations of *Aristea ecklonii*. This would otherwise have spread throughout Springbrook via their vehicles and equipment.

Significantly, it has also aided almost complete development of canopy connectivity between Warblers and Ashmiha – essential for achieving landscape connectivity. GCCC management was based on maintaining a grassy road verge via frequent mowing and brush-cutting.

Ashmiha

Natural regeneration

As shown in our 2018 report, natural regeneration is occurring on Ashmiha. There is still, however, a large part of the property that is covered with introduced pasture grasses, mainly *Setaria sphacelata* and *Pennisetum clandestinum* (Kikuyu).

Rather than working on the whole property at one time, the grass is being regularly mown in sections as can be seen in the image below (September 2022).

In the mown sections, regenerating seedlings are appearing and are marked and protected.

In our 2019 report, we proposed to attempt to accelerate seedling establishment by removing grass and exposing soil over plots located near existing vegetation which will provide the seed source for further regeneration. A rotary hoe has been purchased to be attached to our tractor. The existing attachment for the tractor is a slasher which will be used to cut areas of grass to a low height before using the rotary hoe to remove the grass and disturb the soil.



Figure 2. Ashmiha property September 2022

Aristea ecklonii

Prior to purchase of this property by the Queensland Government, the previous owners discovered a weed which they had identified as aristeia (identified by Bunnings who recognised the plant because at the time they were selling it).

There has been a considerable amount of work done towards eradicating aristeia. Early in the project there were many large clumps around the northern part of the property and these have essentially been removed. As is the situation on Warblers, seedling regeneration continues to occur, requiring ongoing herbicide treatment.



Figure 3. Proposed rotary hoe treatment areas on Ashmiha

Pallida

Natural regeneration

As shown in our 2018 report, natural regeneration is continuing to progress on Pallida. There is still, however, around 5 hectares of the 32-hectare property that is dominated by introduced pasture grass, mainly kikuyu (*Pennisetum clandestinum*) and dactylis (*Dactylis glomerata*).

These dense matt-forming grasses which occur on the lower, flatter northern part of the property are inhibiting natural regeneration. This is due to the dense thick matts denying regenerated native seedlings essential resources (light, water, nutrients). Regular slashing and mowing was continued in 2021 and 2022 to control these grasses.

As for Ashmiha, in 2023 we will be removing grass and exposing soil over plots located near existing vegetation which will provide the seed source. Figure 5 shows the areas that will be treated in 2023.



Figure 4. Pallida property at September 2022.

Security

As previously advised, in November 2018 there was a break-in to the machinery shed on the property and equipment to the value of \$38,000 was stolen.

In our 2019 report, we reported the range of security measures that have been undertaken including cameras, additional locks on doors and machinery and GPS trackers on the tractor and ride-on mower. These measures remain in place.



Figure 5. Proposed rotary hoe treatment areas on the northern section of Pallida where pasture grasses dominate.

Evidence of avifaunal habitat recovery.

The overall aim of the Springbrook Rainforest Restoration project was to expand habitat for flora and fauna, especially those that contribute to World Heritage values. The three properties covered in this report all have connectivity with the Gondwana Rainforests World Heritage Area.

SRRP Properties

ARCS has commissioned flora and fauna surveys by Lui Weber on SRRP properties (note: not from SRRP funds) which add to the Outstanding Universal Value that these properties represent.

Analysis of 7-year Bird Surveys on Warblers

Background

The 3-ha Warblers property (17 Bilbrough Court, in the Mundora Creek subcatchment) was purchased by the Queensland Government in late August, 2007 and is key to achieving both north-south and east-west critical habitat recovery and landscape connectivity in the cloud forest zone (≥ 800 m AHD).

The property was essentially fully cleared at the time of purchase and densely and almost completely covered with *Aristea ecklonii* (family). Restoration activities started in December 2007 i.e. 16 years ago with Photopoint Monitoring, marking of all regrowth and Plant Growth Plot Monitoring.

Avifauna Monitoring

Comprehensive monitoring of avifauna recovery associated with habitat recovery was started in 2015 and continues as a key component of our scientific monitoring program.

Method

The method is based on monitoring changes in bird species diversity on a weekly basis throughout each year. All bird species seen or heard during each week throughout the year are recorded as present. The method does not consider abundances. It does, however, note reproductive activity (nest building, successful hatching). Some of the records may reflect species presence beyond the immediate property boundaries given positive presence involves sighting and confirmed auditory records. Records are in the form of hardcopy, spreadsheets and databases.

The study is significant for a number of reasons:

1. It provides an indication of the habitat suitability of site for a wide range of bird species as regeneration progresses;
2. It provides a record of the progressive on-site recovery of both rare and threatened species including those underpinning the Outstanding Universal Value of a key refugium of the Gondwana Rainforests of Australia World Heritage Area;
3. It also reflects recovery of landscape integrity of the broader region that the overall project intended to achieve;
4. It is unprecedented in terms of its longevity (8 years and ongoing), and comprehensive weekly and seasonal coverage.

The value of the project to date is estimated to be **\$1.4 million** in resources and total person hours.

Summary of Results

The total number of bird species recorded over the 8 year period to date (2015-2022) is now 115, whereas the annual number fluctuates between 70 and 88 (79 ± 9) reflecting the balance between increasing and decreasing records of weekly presence of each species.

The following tables analyse the long term trends in species persistence.

Twenty species show clear trends of increasing persistence, whilst eleven species are demonstrably declining. The remaining species have either a stable persistence or occur only rarely.

Table 1: Species showing increasing trends

Bird species (Common Name)	Analysis of trends over the 7-year recording period
Australian Brush Turkey (ABTU)	• More than trebled over the past 7 years of recordings • Difficult to explain definitively as ABTU is omnivorous • But, increasing proportion of fleshy-fruited rainforest species and dry-fruited species in the 15-year old maturing vegetation may be.
Glossy Black-cockatoo (GBCO) (Vulnerable)	• GBCO (Vulnerable) has continued to be detected in significant numbers only since 2020 — often in groups of 2-8 • Its critical habitat requirements are adequate water (+), mature food trees (<i>Casuarina/ Allocasuarina</i> exclusively, 1 ha minimum), suitable resting and/or nesting sites (old hollow-bearing trees — none on site); It's unlikely Warblers has become a permanent site but it does have mature food trees in the near vicinity which may have been important in the aftermath of the 2019-2020 bushfires.
Yellow-tailed Black-Cockatoo (YTBC)	• more than doubled since 2019 – flock numbers were not noted; YTBC is fairly regularly heard along the escarpment forests of the Springbrook plateau • Whilst not listed as threatened, concerns exist about significant declines in the East Coast • Less of a specialist than GBCO, it feeds on seeds especially of banksias, hakeas and casuarinas as well as extracting insect larvae from wattle branches and trunks • The doubling since 2019 may be a consequence of habitat loss elsewhere from the 2019-2020 bushfires
Shining Bronze-Cuckoo (SBCU)	• A migratory, parasitic bird; the persistence of a continuous weekly seasonal presence has essentially progressively doubled • SBCU is essentially insectivorous with a preference for caterpillars especially of beetles and ladybirds • It parasitises nests of especially thornbills and gerygones and as the population numbers of these increase so will SBCU
Noisy Pitta (NOPI)	• trebled over the past 2 years (2021-2022) — a very significant result • a ground-dwelling, territorial rainforest specialist • It is omnivorous • It's preferred nesting sites are unlikely to occur on site until large buttressed trees are present.
Green Catbird (GRCA)	• increasing over past 2 years after a decline 2016-2020 • another obligate, territorial rainforest dweller • mainly frugivorous (preference for figs) but occasionally more omnivorous consuming invertebrates, frogs and even nestling birds • Its increasing presence is indicative of good rainforest recovery
Variegated Fairy-wren (VFFW)	• a significant trebling over the past 3 years • They prefer dense thick undergrowth • the structural complexity developing as part of rainforest recovery probably explains the persisting recent increases
Yellow-throated Scrubwren (YTSC)	• a significant quadrupling over last 4 years • another rainforest specialist especially at higher altitudes • Mainly insectivorous; mostly foraging on the forest floor • the same explanation as above — progressive recovery of rainforest habitat
Large-billed Scrubwren (LBSC)	• more than trebled since 2016 • Another territorial rainforest specialist • Arthropodivorous; With their (rare) upturned bill, specialising on gleaning arthropods from under bark by spiralling upwards to ~10 meters

Bird species (Common Name)	Analysis of trends over the 7-year recording period
	• same explanation of increasing habitat suitability with progression of rainforest recovery
Brown Gerygone (BRGE)	• a sustained progressive 7-fold increase since 2016-2017 • mainly a rainforest inhabitant • mainly insectivorous; busily gleaning insects from rainforest shrubs and trees • same explanation as above for increasing and sustained presence
White-throated Gerygone (WTGE)	• levels oscillate biennially since first appearances in 2020 • Feeds on insects and arthropods
Noisy Friarbird (NOFR)	• still at low levels but promising increases in 2022 • Habitat includes wet forests • Omnivorous – nectar, pollen especially; berries, insects etc • Increasing size and maturity of regeneration is expected to lead to increased sustainability of preferred habitat
Varied Triller (VATR)	• first single appearance in 2021 continuing into 2022 • Typical habitat includes rainforest with a preference for regions between open and closed forests • omnivorous (gleaning foliage for insects and fruit) • same explanation for records as above
Crested Shrike-tit (CSTI)	• first appeared in 2019, absent in 2020 and 2021, with substantial numbers in 2022 • More common in eucalypt forest (mature forest occurs on the northern boundary) • Mainly insectivorous feeding on spiders and other invertebrates (occasionally fruit and seeds) at all forest strata • Same explanation relating to maturing regeneration
Australasian Figbird (AUF1)	• Rare first occurrence in 2022; maybe passing through as there are no mature fruiting fig trees on site or on neighbouring properties • frugivorous (specialist fig feeder)
Rufous Fantail (RUFA)	• The Rufous Fantail has moderately increased its persistence by about 33% after a steady baseline over the 2017-2019 period • a migrant arriving in Spring for Summer at humid, densely vegetated environments including rainforest • Arthropodivorous • Same explanation as above based on maturing regeneration
Bassian Thrush (BATH)	• 3-fold increase over last two years • may only represent longer-term fluctuations • a ground-dwelling species specialising on invertebrates (mainly earthworms) in the leaf litter and moist surface soil where good canopy development exists.
Russet-tailed Thrush (RTTH)	• doubled since 2018 • a ground-dwelling species specialising on invertebrates in the leaf litter and surface soil where good canopy development exists.
Mistletoebird (MIST)	• progressive significant increase since 2019 • mainly frugivorous, especially on mistletoes which do occur on Warblers

Table 2: Species showing decreasing trends

Bird Species (Common Name)	Analysis of trends over the 7-year recording period involving full 12 months
Australian Wood Duck (AWDU)	• current records are a fifth of levels in 2016 and most likely relate to the diminishing size of the two farm dams on the land; the top dam is all but dried up. Access for the ducks is increasingly difficult c.f. mown grass in previous years
Pacific Black Duck (PBDU)	• absence for the last two years is most likely related to the

Bird Species (Common Name)	Analysis of trends over the 7-year recording period involving full 12 months
	diminishing size of the two farm dams on the land
Bar-shouldered dove (BSDO)	• always uncommon on the site, but totally absent for the past 4 years • BSDOs mainly eat seeds of grasses, herbs and sedges; Warblers no longer provides sufficient suitable habitat
Sulphur-crested Cockatoo (SCCO)	• Their recorded numbers have progressively decreased four-fold, and are now rarely observed. • Their diet is mainly grass seeds, nuts, roots, berries, leaf buds and insects; they feed commonly in small to large flocks • Little suitable habitat remains on site
Brush Cuckoo (BRCU)	• Always rarely observed but absent for the last 4 years • An insectivore with a preference for hairy caterpillars, usually foraging in the high forest canopy
Southern Boobook (SOBO)	• Always uncommon, occurrences have reduced to at least a quarter of those recorded in 2016 • A carnivore but this does not explain the fluctuations • Further monitoring over years should reveal the basis of observed patterns
Sacred Kingfisher (SAKI)	• Always rare, SAKI has not be recorded in the past 3 years • Feeds on invertebrates (insects, spiders), small crustaceans, fish sometimes, frogs, small rodents and reptiles • commonly found at edges of water bodies (on Warblers, the small dams are diminishing in size due to expansion of forest.
Yellow-faced Honeyeater (YFHO)	• records are diminished from a peak of 14 in 2017 to 1 in 2022. • Considered a generalised omnivore feeding on nectar, pollen, fruit, seeds and insects • The decrease is not explicable on the basis of preferred habitat or food resources. Changes may be due to broader environmental influences beyond Warblers. Results may simply reflect broader fluctuations.
Scarlet Honeyeater (SCHO)	• Records have dramatically collapsed in the last 3 years (2020, 2021, 2022) • mainly nectivorous, occasionally insects and fruit • The dramatically diminishing records is unexplained as tall flowering eucalypts exist along the northern boundary and beyond.
Grey Butcherbird (GRBU)	• very uncommon (absent for 6 of the 8 monitoring years) c.f. the Pied Butcherbird records of which have remained unchanged • absence is likely more related to competition between the Grey and Pied Butcherbirds
Golden-headed Cisticola (GHCI)	• records fluctuate but have essentially halved over the last 7 years. • Its preferred habitat of 'grassy' swampy land is diminishing due to regenerating forests 'encroaching' on the two farm dams on the property. Eventually these artificial dams will disappear. The northern dam floor has been breached for unknown reasons.

Discussion

Frugivorous species are increasing and persisting due to the increasing proportion of rainforest species successfully regenerating and maturing.

Examples of genera (listed in order of families) in which rainforest species are increasing include:

Araceae (*Pothos*), Araliaceae (*Polyscias*), Celastraceae (*Celastrus*, *Denhamia*), Dilleniaceae (*Hibbertia*), Ebenaceae (*Diospyros*), Elaeocarpaceae (*Elaeocarpus*), Ericaceae (*Trochocarpa*), Euphorbiaceae (*Homalanthus*), Eupomatiaceae (*Eupomatia*), Lauraceae (*Cryptocarya*),

Laxmanniaceae (*Cordyline*), Meliaceae (*Synoum*), Menispermaceae (*Carronia*), Monimiaceae (*Palmeria*, *Wilkiea*), Moraceae (*Trophis*), Myrtaceae (*Acmena*, *Decaspermum*, *Lenwebbia*, *Pilidiostigma*, *Rhodamnia*), Oleaceae (*Olea*), Pittosporaceae (*Hymenosporum*, *Pittosporum*, *Primulaceae* (*Ardisia*, *Myrsine*), Proteaceae (*Persoonia*), Ripogonaceae (*Ripogonum*), Rutaceae (*Acronychia*), Solanaceae (*Duboisia*, *Solanum*), Symplocaceae (*Symplocos*), Vitaceae (*Cissus*), Winteraceae (*Tasmannia*).

Nectivorous bird species are increasing as the regenerating species (both rainforest and eucalyptus plant species etc) reach reproductive maturity.

Omnivorous species are likely to persist with little change or else increase as specialist habitat requirements are met.

Regardless of the reason, the records for the Vulnerable Glossy Black Cockatoo are significant

In Summary, the objectives of the restoration project are substantially and increasingly being achieved (critical habitat and landscape integrity recovery) as successional changes accelerate.