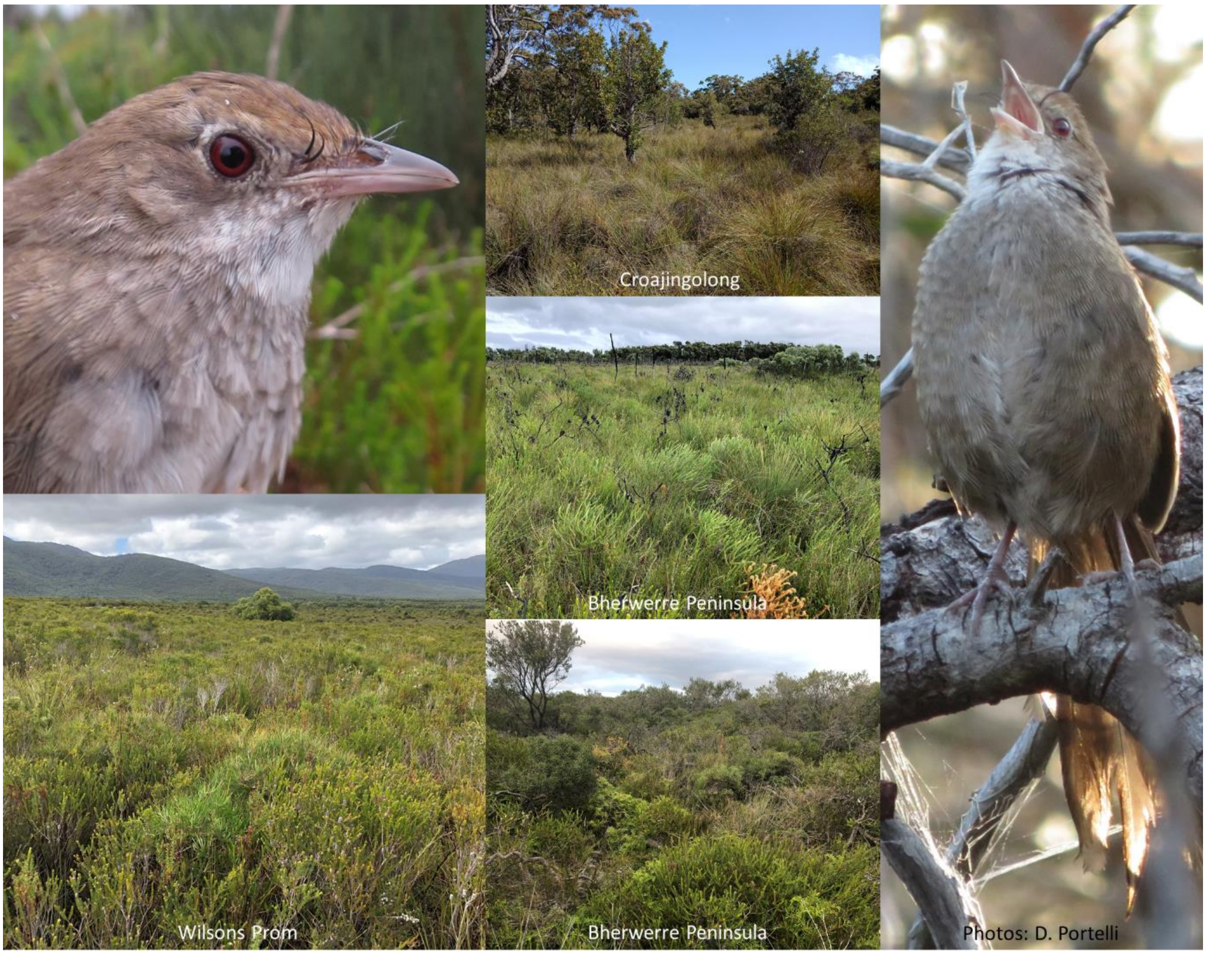
Translocation Plan

Reducing the extinction risk of the Eastern Bristlebird (*Dasyornis brachypterus*) in Victoria



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TERMINOLOGY

The following terminology is adopted in this plan to avoid confusion arising from the multiple geographic localities and spatial scales involved in the translocation (note some terms are not mutually exclusive):

- **Locations**
  - **Source location** – the *general geographic area* supporting a *population* from which individuals will be sourced for translocation
  - **Recipient location** – the *general geographic area* where translocated individuals will be released, either to establish a new *population* or augment an existing *population*
  - **Reintroduction location** – a recipient location where a *population* will be reintroduced through translocation
- **Sites**
  - **Source site** – the *local area* within the source location where an *individual(s)* to be translocated is captured
  - **Release site** – the *local area* within the recipient location where a translocated *individual(s)* will be released
- **Points**
  - **Capture point** – the *precise point in space* where an individual(s) is captured (e.g. to translocate to a recipient location)
  - **Release point** – the *precise point in space* where an individual(s) is released
- **Populations**
  - **Source population** – a population from which individuals to be translocated are sourced
  - **Recipient population** – an *existing* (naturally extant or reintroduced) population into which individuals are translocated to *supplement* that population
  - **Extant population** – a *naturally extant* population (or part thereof) occurring at a source location or recipient location
  - **Reintroduced population** – a population established or to be established through the translocation of individuals to a reintroduction location
- **Individuals**
  - **Translocated individual** – an individual translocated to establish a new population or supplement an existing population
  - **Founder** – an individual translocated for the purposes of establishing a new population
  - **Supplementary individual** – an individual translocated for the purposes of demographic and/or genetic augmentation of an existing population

1. INTRODUCTION

1.1	**Project Title**	Reducing the extinction risk of the Eastern Bristlebird (*Dasyornis brachypterus*) in Victoria
1.2	**Taxon to be translocated**	Eastern Bristlebird (*Dasyornis brachypterus*)
1.3	**Number of animals to be translocated**	60 for reintroduction to Wilsons Promontory National Park (section 5.2) 20–30 for genetic augmentation of the population within Croajingolong National Park — to be discussed in an amendment to this plan (see section 2.1)
1.4	**Proposed date of translocation**	March/April 2022–March/April 2024 (section 5.1)
1.5	**Source location or captive facility**	Primary source location: • Jervis Bay National Park (hereafter Jervis Bay NP), New South Wales -35.11°S 150.67°E • Booderee National Park (hereafter Booderee), Jervis Bay Territory -35.14°S 150.69°E (adjoins Jervis Bay NP) Secondary source location: • Croajingolong National Park (hereafter Croajingolong), Victoria -37.54°S 149.81°E Additional source locations may include (see section 3.7): • Barren Grounds Nature Reserve (hereafter Barren Grounds), New South Wales -34.68°S 150.71°E

		• Budderoo National Park (hereafter Budderoo), New South Wales -34.65°S 150.70°E
1.6	**Release location or captive facility**	Wilsons Promontory National Park (hereafter Wilsons Prom), Victoria (reintroduction location) – [redacted] Croajingolong, Victoria (recipient population) -37.54°S 149.82°E — to be discussed in an amendment to this plan (see section 2.1)
1.7	**Name of contact person**	[redacted]
1.8	**Name and Affiliation of Proponents**	[redacted]
1.9	**Nature of the Translocation**	The translocation is a <u>population restoration</u> involving a <u>reintroduction</u> to establish a population at Wilsons Prom (section 4.2). <u>Reinforcement/supplementation</u> of the extant population at Croajingolong to improve the genetic resilience of the population is currently being considered; if deemed warranted and feasible, an amendment to this plan will be submitted prior to implementing this project.
1.10	**Executive Summary**	The translocation aims to establish a self-sustaining and genetically resilient second population of the Eastern Bristlebird in Victoria, through reintroducing the species to Wilsons Promontory National Park. The reintroduction location has extensive areas of suitable habitat and is managed primarily for biodiversity conservation and ecotourism. Sixty wild individuals (ideally an equal sex ratio) will be sourced widely from across the Bherwerre Peninsula in Jervis Bay (80% of individuals) and across the core area of the extant Victorian population at Croajingolong (20%). Translocations will occur in autumn of three consecutive years with source populations alternated, commencing with 16–20 individuals from Bherwerre Peninsula in 2022. Individuals will be transported overnight by road, released directly into a large but relatively contained area of heath and monitored intensively. This translocation plan has been strongly influenced by learnings from past translocations of Eastern Bristlebirds and has a moderate to high likelihood of success.

2. JUSTIFICATION

2.1	**Need and Appropriateness**	The Eastern Bristlebird is now restricted to only three, geographically disparate regions. Individual populations are at risk of decline or extirpation due to large-scale and high-intensity fires because habitat quality is strongly influenced by fire—high vegetative cover at ground level is a critical habitat requirement—and the species is a poor disperser (Baker 1997, 2000; section 3.3). The 2019/2020 summer fires highlighted the realistic risk of a single catastrophic fire extirpating an entire population(s). Moreover, the viability of populations in two of the three regions—referred to as the southern and northern populations (section 3.2)—is compromised by small total population sizes and low genetic diversity. Conservation actions are necessary to reduce the resultant high extinction risk. The single, small and genetically depauperate population in Victoria means there is a high risk of extinction of the species in the state; unless a second, and larger, population is established, and the threat of genetic erosion is abated. The translocation has two objectives: • Establishment of a self-sustaining and genetically resilient population at Wilsons Prom in Victoria (hereafter ‘reintroduction’; see section 4.2) • Improving the genetic diversity and fitness of the small and genetically depauperate population of the only extant population in Victoria through genetic augmentation, if feasible This document presents a detailed plan for the reintroduction only. The genetic augmentation project is at an early planning stage (see Appendix 2). The two projects are nonetheless closely associated due to sharing of the same source/recipient population and are therefore

		treated as one project. An amendment to this plan will be submitted prior to undertaking the genetic augmentation component.
2.2	**Context**	**Translocation Working Group** A Translocation Working Group (TWG) was established to champion the collaborative delivery of the translocation across jurisdictions, and to provide expert advice and support to plan and implement the translocation. The TWG comprises 12 members with expertise in Eastern Bristlebird ecology and conservation management, avian translocations, biodiversity conservation and/or land management (section 1.8). Members include representatives from DELWP, Parks Victoria, Parks Australia, NSW Department of Planning, Industry and Environment, University of Wollongong and La Trobe University. The major components of the translocation have been developed by DELWP in consultation with the TWG (see Appendix 3). **Reintroduction feasibility study** A 2019 feasibility study assessed the suitability of nine candidate reintroduction locations for the Eastern Bristlebird in Victoria, based on selection criteria related to habitat suitability and availability, access, fire management, presence and control of feral predators, funding requirements and time constraints (Appendix 4). However, the selected reintroduction location and seven of the other candidate locations burned in the 2019/2020 fires. This highlighted that a single fire could potentially extirpate both insurance and extant populations if they are in close proximity. The only unburnt candidate reintroduction location was Wilsons Prom, which did not rank highly due to the possibly short time since last fire in heathland, lower certainty about the former occurrence of Eastern Bristlebirds, and the long distance from the source population (Appendix 5). A subsequent feasibility study assessed the suitability of Wilsons Prom as a reintroduction location and concluded that it was suitable—despite not ranking highly in the original feasibility study—with the caveat that an on-ground assessment of habitat was required (Appendix 6). This assessment was completed in March 2021 following selection of release sites through expert elicitation and on-ground site inspections (Appendix 7). Most of the heathland at Wilsons Prom was last burned in 2009 (~11 years post-fire) and vegetation surveys in the highest-ranking release sites indicated that the heaths at Wilsons Prom are similar to those occupied by Eastern Bristlebirds elsewhere (Appendix 7). Greater certainty of the former occurrence of Eastern Bristlebirds at Wilson Prom was attained from a comprehensive review of available evidence (section 4.2). Transport logistics were also re-examined and the long distance between source and reintroduction locations does not prohibit undertaking the translocation (Appendix 3). Wilson Prom was therefore assessed to be a suitable reintroduction location that provides ample suitable habitat to support a viable population of the Eastern Bristlebird (sections 4.1 and 4.5, Appendix 7). **Specific Needs Analysis** A ‘Specific Needs Analysis’, undertaken by DELWP in July 2020, assessed the conservation benefits against the costs for multiple translocation options and alternative conservation actions for the Eastern Bristlebird in Victoria. The analysis supported establishing a reintroduced population at Wilsons Prom using individuals sourced from southern and central populations (see section 3.2). **Wilsons Promontory Sanctuary** In July 2021, the Arthur Rylah Institute delivered a report to Parks Victoria that assessed the capacity of Wilsons Prom to serve as a sanctuary (‘safe haven’) that supports populations of threatened fauna, including those that may be established through reintroduction, under Theme 5 of *Victoria’s Bushfire Emergency: Biodiversity Response and Recovery* plan (Menkhorst *et al.* 2021). The report listed the Eastern Bristlebird as a candidate species for translocation, but only because planning for translocating this species was already well underway (since early 2020; see above). The on-ground priorities of the Wilsons Promontory Sanctuary (WPS) project until mid-2023 are threat management and construction of a feral-predator-proof fence. The strategy and planning of the WPS project is due for completion in June 2022. The Eastern Bristlebird translocation is not contingent on these activities, though it will benefit from them. To maintain momentum, capitalise on ‘seed funding’ and fulfil commitments under funding agreements, the translocation is being initiated independently of the WPS project. However, the two projects may be integrated once the WPS project has reached an advanced stage of planning, provided there is agreement between DELWP and Parks Victoria.

2.3	**Conservation Outcome(s)**	The ultimate objectives of the project are to 1) establish a large, self-sustaining second population in Victoria, which requires limited long-term management intervention and is geographically isolated from the extant population, and 2) if deemed feasible, improve the genetic diversity and fitness of the genetically depauperate extant population in Victoria through genetic augmentation. These actions will reduce the extinction risk of the species in Victoria and if successful will result in downlisting (section 3.1). The planned reintroduction will decrease the extinction risk of the species globally by increasing total population size, the number of populations, area of occupancy and extent of occurrence, and by spreading the risk of extinction across widely separated populations. Moreover, re-establishing a population at the southern extent of its former distribution may mitigate the potential long-term negative impacts of climate change on the species.
2.4	**Research Objective(s)**	The translocation is not a research project. However, the design of the translocation, and the data collected during its implementation, will afford opportunities to increase our understanding of the conservation management and ecology of the Eastern Bristlebird.
2.5	**Restrict Options**	**Source locations** The translocation will not restrict options for flora and fauna management at source locations due to the small number of birds being sourced. **Reintroduction location** *Reintroductions of other species* Establishing a population of the Eastern Bristlebird at Wilsons Prom may impact the feasibility of reintroducing (or introducing) predator species (e.g. Eastern Quoll *Dasyurus viverrinus*) as there may be unacceptable risks of predation to Eastern Bristlebirds. Potential conflicts with plans for reintroducing some proposed candidate species for reintroduction—such as King Quail (*Synoicus chinensis*) and Chestnut-rumped Heathwren *Hylacola pyrrhopygia*—may arise once a population of Eastern Bristlebirds has been established. These potential conflicts relate to maintaining appropriate fire age-classes for a suite of threatened species in heathland communities (see Menkhorst *et al*. 2021). Resource competition with proposed candidate species for reintroduction (Menkhorst *et al*. 2021) is unlikely given the ecology of the Eastern Bristlebird (sections 3.3 and 5.4). *Other management actions* Fire management is discussed in sections 4.5 and 4.6.

3. THE THREATENED TAXON

3.1	**Conservation Status**	State legislation: *Flora and Fauna Guarantee Act 1988* (FFG Act): **Critically Endangered** (formerly Endangered on the DELWP Advisory List of Threatened Vertebrate Fauna in Victoria 2013) Federal legislation: *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act): **Endangered**
3.2	**Historical and Current Distribution**	The Eastern Bristlebird formerly occurred patchily along the coast and adjacent ranges from south-eastern Queensland to eastern Victoria (Appendix 8). This distribution contracted following European settlement to three disjunct regions: • South-eastern Queensland/north-eastern New South Wales (NSW) (northern population) • Jervis Bay/Illawarra region of NSW (central population) • Coastal Victoria/NSW border region (southern population) The former occurrence of the species in western Victoria is known from c.4700-year-old subfossil material collected from Amphitheatre Cave near Nelson (Baird 1992; Figure 3.2.1). It is thought that past climatic fluctuations and Aboriginal fire regimes reduced the distribution of the Eastern Bristlebird prior to European settlement (Chisholm 1951, Keast 1957, Smith 1977).

		Land clearing and inappropriate fire regimes (increased large-scale and high-intensity fires) led to further range contractions following European settlement (Baker 1997, Chaffer 1954, Clarke and Bramwell 1998). The northern population has been described as a separate subspecies, *Dasyornis brachypterus monoides* (Schodde and Mason 1999), but phylogenetic analyses have not detected a level of divergence sufficient to treat the species as polytypic (Elphinstone 2008, Roberts *et al*. 2011). See Appendix 8 for further information on the historical distribution of the species in Victoria.
3.3	**Biology and Ecology**	**Habitat requirements** *Habitat use* Eastern Bristlebird habitat is characterised by low, dense ground and/or understorey cover, and includes sedgeland, riparian scrub, heathland, swampland, shrubland, coastal dune scrub, woodland, mallee, sclerophyll forest, and rainforest (Baker 2000, Bramwell 2008, Lindenmayer *et al*. 2009). Habitats occupied by Eastern Bristlebirds vary among the three regional populations (see below), but this is likely driven by habitat availability rather than habitat preferences. In the southern population, Eastern Bristlebirds occur predominantly in riparian scrub at Croajingolong, where they typically inhabit the thick, lower-stratum vegetation dominated by a high cover of sedges (Bramwell 2008), but also occupy wet heathland (DELWP unpubl. data) and have been observed in coastal dune scrub near Cape Howe (Bramwell 2008). In Nadgee Nature Reserve, Eastern Bristlebirds occur primarily in a range of structural formations of heathland with variable floristic composition, including taller heath with emergent shrubs, low heathland, wet heathland with emergent tall shrubs and heathland adjacent to forest (Miles 2004). On the Budderoo Plateau, Eastern Bristlebirds prefer closed heathland and closed shrubland, particularly the ecotonal habitat adjacent to woodland (Baker 2000, Bramwell *et al*. 1992). Stratification of the vegetation varies from distinct (ground, low- and tall-shrub strata) to non-existent (Baker 2000). Eastern Bristlebirds similarly prefer heathland on the Bherwerre Peninsula—which varies considerably in floristic composition and vegetation structure (Mills 1995, Williams 1995)—but also occur in a range of other habitats, predominantly wet shrubland, woodland, *Casuarina*-dominated woodland and low shrubland (Lindenmayer *et al*. 2009). The habitat within individual territories on the Bherwerre Peninsula and Beecroft Peninsula varies from relatively homogenous to highly heterogeneous with several distinct vegetation formations (D. Portelli pers. obs.). The northern population occurs primarily in ecotones between open eucalypt forest or woodland and rainforest with a dense ground cover of tall tussock grasses, but historically also occurred in montane heathland (Hartley and Kikkawa 1994, Holmes 1989, Stone *et al*. 2018). *Fire* Although Eastern Bristlebirds are regarded as sensitive to fire—in part because of their dependency on dense vegetation cover in fire-prone habitats and their limited flight capability (Baker 2000, Bramwell 2008)—they are capable of surviving even extensive fires if sufficient refugial habitat (e.g. wet depressions, drainage line and escarpment edges) is available nearby (Bain and French 2009; Baker 2000). Eastern Bristlebirds returned to burnt areas within two years after fire in the coastal heathlands of Jervis Bay (Eco Logical Australia 2019, Lindenmayer *et al*. 2009, Parks Australia unpubl. data). In contrast, Eastern Bristlebirds on the Budderoo Plateau did not start to use regenerating habitat until three years or more following fire (Baker 1997, 2000). The density of Eastern Bristlebirds on the Budderoo Plateau was positively correlated with time since fire up to about seven years (Bain and McPhee 2005, Baker 1997). In contrast, occupancy of Eastern Bristlebirds at Booderee over a ten-year period following a fire in 2003 remained unchanged at sites that burned and increased in unburnt areas (Lindemayer *et al*. 2016). However, data from long-term monitoring transects at Booderee (section 3.6, Appendix 10) suggest the opposite over the same time period: Eastern Bristlebird abundance gradually increased along transects partially or wholly burned in 2003 and decreased along transects that were not burned (Parks Australia unpubl. data). It is thus unclear if habitat quality declines in at least some habitats after a long absence of fire (Baker 2000, Pyke *et al*. 1995), as has been suggested for the Western Bristlebird *D. longirostris* (Smith 1987).

		The relationship between fire and habitat quality is complex. As other factors undoubtedly influence the rate of vegetation growth in the ground stratum, interpreting time-since-fire as a measure of habitat quality is an oversimplification (see Lindenmayer *et al*. 2016). Moreover, it is important to consider the impact of both the fire regime and individual fires on persistence of the species (Lindenmayer *et al*. 2009). *Minimum area* See section 4.5. **Socio-spatial organisation** Eastern Bristlebirds appear to be socially monogamous and occupy home ranges year-round, though boundaries possibly shift over time (Hartley and Kikkawa 1994, Holmes 1989). Males and females both seemingly defend core areas with loud song, including antiphonal duets that are male-led (Hartley and Kikkawa 1994, Holmes 1989; A. Beutel pers. comm.), although song is not strictly sex specific (Baker 1998, D. Portelli pers. obs.). Individual home ranges on the Bherwerre Peninsula were about 10 ha (Baker 2001) and overlapped extensively with neighbouring birds (Baker 1998). **Longevity and generation length** The longevity of wild Eastern Bristlebirds is at least up to 7 years (Maute 2019). At Currumbin Wildlife Sanctuary, five captive birds died when 6.5–15 years old (mean 8.5), and the oldest captive bird will be 17 years old in December 2021 (Currumbin Wildlife Sanctuary unpubl. data). Generation length was estimated to be 5 years by Garnett and Crowley (2000). Bird *et al*. (2020) calculated a generation length of 3.4–3.8 years; however, this was based on a maximum longevity of only 4.83 years and thus is an underestimate. **Reproduction** Eastern Bristlebirds in the wild breed from late winter to early summer (Hartley and Kikkawa 1994, Higgins and Peter 2002). Clutches, which typically comprise two eggs, have been recorded in central populations from August to mid-January (Chaffer 1954; Higgins and Peter 2002). Fledging success is poorly known, though it is believed that a single fledgling is common, and only one brood is reared in a season (Holmes 1989); though captive females can commence constructing a new nest within three days of fledging their brood (Beutel *et al*. 2021). Incubation length in captivity is 21–23 days with a nestling period of 15–17 days (Beutel *et al*. 2021). Juveniles begin feeding themselves at 36–42 days old and become independent at 50–60 days old (Beutel *et al*. 2021). Nesting habitat is characterised by low, dense, fine and/or blady herbaceous or grassy vegetation (Baker 2000). The domed nests are typically constructed in grass tussocks, tufts of rushes, at the base of shrubs or in sedges close to the ground (Baker 2000, Chaffer 1954, Holmes 1989, McNamara 1946). **Diet** Eastern Bristlebirds are generalist predators that locate prey visually by searching the ground and low vegetation (Gibson and Baker 2004). The diet comprises insects (Coleoptera, Blattodea, Diptera, Formicidae, Hemiptera, Mantodea, Phasmatodea), spiders, mites, tadpoles, seeds and vegetable matter (Lea and Gray 1935, Gibson and Baker 2004). Food items are obtained by surface gleaning from the ground, foliage and branches (Gibson and Baker 2004). Most of the faecal, gut flush and gut dissection samples studied by Gibson and Baker (2004)—collected at Jervis Bay and Barren Grounds Nature Reserve—consisted of the remains of invertebrates, primarily ants (ten genera from four subfamilies) and beetles, but at least 11 of the 19 individuals sampled had also consumed seeds (*Acacia* sp., *Carex* sp., *Juncus* sp., Poaceae, *Stellaria* sp.).
3.4	**Documented Recovery Actions**	The 2012 ‘National Recovery Plan for Eastern Bristlebird *Dasyornis brachypterus*’ included an objective to enhance/augment the southern population and an action (3.6) to complete a translocation strategy and site management plan aimed at establishing a second population in Victoria (OEH 2012). A draft ‘National Recovery Plan for Eastern Bristlebird *Dasyornis brachypterus*’ has been prepared by Birdlife Australia in consultation with DELWP and other government and non-government organisations and individuals. It is currently being reviewed internally by the Department of Agriculture, Water and the Environment. This draft plan includes two actions directly relevant to this translocation plan:

		• Action 1.2. Develop and implement an Eastern Bristlebird genetic rescue program for extant wild populations (northern and southern populations) • Action 1.3. Implement a revised Eastern Bristlebird translocation plan (northern and southern populations), which includes the performance criterion: A second wild population is established in Victoria and closely monitored to ensure adaptive management can occur if needed.
3.5	**Pressures/ Threats**	**Inappropriate fire regimes** Eastern Bristlebirds occur in fire-prone habitats. Consequently, inappropriate fire regimes is the main contemporary threat to the species (Baker 1997, 2000, Clarke and Bramwell 1998, Stone *et al*. 2018), particularly catastrophic fires (i.e. intense fires covering a very large area) that remove dense understory vegetation and do not leave unburnt refugia (Bain *et al*. 2008, Baker 2000, Clarke and Bramwell 1998). Management recommendations for the central population have included limiting the frequency of fire or excluding fire, burning patchily when undertaking prescribed burns, and avoiding back-burning that cuts off escape routes (Baker 1997, 2000, Lindenmayer *et al.* 2016). Adopting these recommendations may be especially important for small populations in heathland. In heaths that support large stable Eastern Bristlebird populations, maintaining fine-scale heterogeneity in post-fire age, with long inter-fire intervals within patches, may mitigate the risk of catastrophic fire by limiting the extent and intensity of fire (particularly unplanned fires) and providing critical refugial habitat during fires. **Small population size** Small population size, which increases extinction risk due to demographic, environmental and/or genetic stochasticity, is a significant threat to the northern and southern populations (OEH 2012). It is the likely cause of the apparent loss of genetic diversity evident in the southern population, which threatens the long-term viability of this population (Weeks and van Rooyen 2021). Random genetic drift and inbreeding resulting from small population size also reduces the adaptive potential of populations and increases the chance of extinction when environments change (Hoffmann *et al*. 2020). **Predation** The impact of feral predators on Eastern Bristlebirds is unknown. It has been postulated that Eastern Bristlebirds may be particularly vulnerable to feral predators following fire because fire reduces the amount of dense vegetation cover (Lindenmayer *et al*. 2009). However, evidence of population recovery after fire on the Budderoo Plateau suggests that population growth can occur at a high rate in the absence of fox control (Baker 1997). Nonetheless, precautionary control of feral predators is advisable for small Eastern Bristlebird populations. **Invasive herbivores, weeds and *Phytophthora*** High levels of herbivore activity may present a threat to Eastern Bristlebird habitat, particularly through the reduction in understory and ground cover (Davis *et al*. 2016) essential for survival and reproductive success of Eastern Bristlebirds (OEH 2012). Control of invasive deer, goat and/or pig populations may be necessary if the abundance of these herbivores continues to increase in Eastern Bristlebird habitat. Similarly, weeds and vegetation dieback due to *Phytophthora* infection may also degrade important habitat (OEH 2012). **Climate change** The potential impacts of climate change on the Eastern Bristlebird are poorly understood. Increases in the frequency of intense and extensive fires due to climate change (e.g. Bradstock *et al*. 2011, King *et al*. 2011) is a significant threat to Eastern Bristlebird populations. Sea-level rise also threatens the Croajingolong subpopulation since it mostly occurs in lowland (<3 m asl) riparian scrub behind coastal dunes (Bramwell 2008). Similarly, the low levels of genetic diversity in the southern and northern populations reduces the genetic and adaptive resilience of these populations to climate change.
3.6	**Populations**	**Global population size** The global population of the central and southern populations of the Eastern Bristlebird is estimated with low reliability to comprise 2500–3500 mature individuals (Bain *et al*. in press). Thus, the number of individuals to be translocated to Wilsons Prom (60) represents ~2% of the estimated global population.

A small captive population is maintained at Currumbin Wildlife Sanctuary and David Fleay Wildlife Park and currently comprises 22 individuals, most of which are descended from a small number of individuals from the northern population (A. Beutel pers. comm.).

Distribution and size of populations

At least six extant wild populations occur across the geographic range (Appendix 8), though some of these are fragmented into subpopulations.

Central population

The central population is by far the largest population of Eastern Bristlebirds. The remnant wild population occurs primarily as two genetically isolated populations (Weeks and van Rooyen 2021):

- Bherwerre Peninsula population which occurs primarily in Jervis Bay NP and Booderee in southern Jervis Bay and comprises an estimated 1100 mature individuals (NESP 2019; Appendix 9).
- Budderoo Plateau population which occurs within Barren Grounds Nature Reserve and Budderoo National Park and comprises an estimated 1250 mature individuals (NESP 2019).

Additional small populations occur in Red Rocks Nature Reserve and Morton National Park, but the status and size of these populations is poorly known (Bain and McPhee 2005).

Two reintroduced populations have been established (Appendix 12):

- Beecroft Peninsula population which occurs primarily in Beecroft Weapons Range. The current population size has not been estimated.
- Cataract Reservoir population which occurs in the Sydney Catchment Authority Metropolitan Special Areas and currently comprises <40 mature individuals (Maute 2020).

Southern population

The southern population occurs as two subpopulations on either side of the NSW-Victoria border:

- Croajingolong subpopulation which occurs entirely within Croajingolong National Park and is estimated (with low confidence) to comprise 140–200 mature individuals, most of which (perhaps >80%) occur within a ~800-ha area dominated by riparian scrub (‘Howe Flat’; Bramwell 2008, Appendix 8). Much of the remaining population occurs in an area of <100 ha of wet heathland a few kilometres north of Howe Flat (DELWP unpubl. data). Only ~20 ha of suitable habitat within the known extent of occurrence of the subpopulation was burned in the 2019/2020 Black Summer fires (DELWP unpubl. data).
- Nadgee subpopulation which occurs entirely within Nadgee Nature Reserve. Prior to an extensive fire in early 2020 (see below), this subpopulation was estimated to comprise 250–300 mature individuals (L. Evans pers. comm. in OEH 2012).

The availability of Eastern Bristlebird habitat between the known areas occupied by the species in Croajingolong and Nadgee Nature Reserve, and the occurrence of the species therein, are not well understood (Bramwell 2008). Genetic analyses of contemporary samples found no evidence of restricted gene flow between the two subpopulations (Weeks and van Rooyen 2021).

Northern population

Only c.45 individuals occur in the wild in the northern population (Charley *et al*. in press). A captive population is maintained at Currumbin Wildlife Sanctuary and David Fleay Wildlife Park.

Population trends

The population trends of all the central, southern and northern populations and major subpopulations are described in detail in Appendix 10 and summarised in Table 3.6.1. Fluctuations in abundance have occurred in the Bherwerre Peninsula and Beecroft Peninsula populations in response to moderately large fires, but the overall population trajectory was not significantly impacted (Eco Logical Australia 2015, Parks Australia unpubl. data).

Table 3.6.1. Trends in the central, southern and northern populations and major subpopulations.

Population	Trend	Period	Source*
Bherwerre Peninsula	Stable	2003/2004–2020	1, 2
Beecroft Peninsula	Steadily increasing	2003–2018	3
Budderoo Plateau	Stable or declining†	2006–2020	2
Cataract Reservoir	Stable	2009–2019	4
Nadgee	Unknown†	Not applicable	
Croajingolong	Stable	2014–2020	5
Northern	Stable to slightly increasing	2010s	6

* 1 Parks Australia unpubl. data, 2 DPIE unpubl. data, 3 Eco Logical Australia (2019), 4 Maute (2020), 5 DELWP unpubl. data, 6 Charley *et al*. (in press)

† see text

Although long-term monitoring data for the Budderoo Peninsula population suggests it may be in decline (Appendix 10), a gradual transition to undertaking surveys later in spring and observer bias may have contributed to the observed trend (D. Bain pers. comm.). Further interrogation of monitoring data and appropriately timed surveys in spring over the next few years are needed to evaluate the status of this population.

The Black Summer fires in February 2020 burned most of the suitable habitat for Eastern Bristlebirds in Nadgee Nature Reserve (Oliver and Malolakis 2020). Although the population survived the fire, the average abundance of Eastern Bristlebirds along monitoring transects was 84% lower than that observed in 2019 (DPIE unpubl. data).

Genetic characteristics

The Bherwerre Peninsula and Budderoo Plateau populations have a high level of genetic diversity and are strongly divergent from each other (Roberts *et al*. 2011, Weeks and van Rooyen). In contrast, the distinct northern and southern populations are genetically depauperate (Table 3.6.1), most likely as a result of contemporary and/or past small population sizes (Weeks and van Rooyen 2011).

Table 3.6.1. Estimates of genetic diversity in southern, central and northern populations of the Eastern Bristlebird estimated using 14 microsatellite loci. N_a = average number of alleles, r = allelic richness (corrected for sample size at n=15), H_O = observed heterozygosity, H_E = expected heterozygosity and F_{IS} = inbreeding coefficient. Different superscript letters indicate statistically significant differences at α = 0.01 (after corrections for multiple comparisons). (Taken from Weeks and van Rooyen 2021).

Population	Region	n	N_a	r	H_O	H_E	F_{IS}
Croajingolong	Southern	27	2.929	2.392[a]	0.415	0.407[a]	-0.048
Nadgee NR	Southern	10	2.714	2.513[a]	0.397	0.445[a]	0.073
Jervis Bay NP	Central	16	3.929	3.276[b]	0.549	0.569[b]	-0.001
Booderee NP	Central	10	3.786	3.395[b]	0.550	0.598[b]	0.036
Beecroft Weapons Range	Central	26	3.571	3.024[b]	0.538	0.543[b]	-0.003
Budderoo NP	Central	23	3.929	3.173[b]	0.529	0.564[b]	0.041
Northern Captive	Northern	15	2.643	2.466[a]	0.462	0.495[c]	0.005

Although the southern population possesses some unique genetic diversity, <3% of alleles are unique to that population (estimated for the Croajingolong subpopulation) and a high proportion (~83%) of alleles are shared with the central population (Weeks and van Rooyen 2021). In contrast, the Bherwerre Peninsula and Budderoo Plateau populations each have a relatively high proportion (14–17%) of unique alleles (Weeks and van Rooyen 2021). Curiously, the divergence between the Bherwerre Peninsula and southern populations is seemingly shallower than between the two central populations, despite the wider geographic separation (Weeks and van Rooyen 2021).

The average relatedness among individuals sampled within each population was high for the Croajingolong subpopulation and lowest in the Bherwerre Peninsula population (Weeks and van Rooyen 2021).

		Reintroduced Beecroft Peninsula population The 50 individuals translocated to establish the reintroduced population at Beecroft Peninsula effectively captured the genetic diversity present in the source population (Bherwerre Peninsula). Estimated allelic richness and expected heterozygosity were both relatively high and were not statistically significantly different from that of the Bherwerre Peninsula population (Table 3.6.1; Weeks and van Rooyen 2021). Genetic samples of the reintroduced population at Cataract Reservoir have not yet been collected (K. Roche pers. comm.).
3.7	**Source Population**	Population size, history and trends for all populations are detailed in section 3.6 (see also Appendix 10).

Selection of source populations

The Bherwerre Peninsula population and Croajingolong subpopulation have been selected as source populations for the reintroduction to Wilsons Prom. The rationale behind the selection of these populations is summarised in Table 3.7.1 (see also Appendix 3).

Table 3.7.1. Major populations of the Eastern Bristlebird and their suitability as a source population for reintroducing Eastern Bristlebirds to Wilsons Prom. Sources of information are cited in sections 3.3 and 3.6.

Population	Suitable	Reason
Northern	No	Wild population is too small (~45 wild individuals). Strong genetic divergence from the southern population.
Cataract Reservoir	No	Population is too small (<40 individuals)
Budderoo Plateau	Unclear	Population is large (>1000 mature individuals) and has high genetic diversity. Recent population trends suggest a possible decline. Stronger genetic divergence from southern population than Bherwerre Peninsula.
Bherwerre Peninsula	Yes	Population is large (>1000 mature individuals) and has high genetic diversity. Least genetically divergent from southern population. Access is excellent. Local in-kind support available. Climate and habitat more similar to Wilsons Prom than Budderoo Plateau.
Beecroft Peninsula	No	Site has stringent access restrictions (managed by Department of Defence) and suitable capture sites are relatively limited (D. Portelli pers. obs.).
Nadgee	No	Population is small as a result of extensive fire in 2020, genetically depauperate and occurs in a remote wilderness area.
Croajingolong	Yes	Genetic diversity is low, but some unique diversity is present and there may be local adaptations to a 'southern' environment.

Source locations

The biophysical environments in which the three suitable or potentially suitable source populations identified in Table 3.7.1 reside are described below.

Bherwerre Peninsula

Jervis Bay NP (~5,200 ha across several parcels), within NSW, and the adjoining Booderee NP (~6,400 ha), within the Jervis Bay Territory, are located 140 km south of Sydney, and together encompass most of the Bherwerre Peninsula on the southern side of Jervis Bay. The Parks have a relatively flat topography which supports remnant rainforests, forests, woodlands, heathlands, and coastal littoral and wetland communities (Mills 1995). There is a long history of human activity in the area. Selective logging and frequent burning have occurred in the past as well as damage from recreational activities (NSW NPWS 2011).

Booderee is jointly managed by Parks Australia and the Wreck Bay Aboriginal Community. Jervis Bay NP is managed by NSW National Parks and Wildlife Service.

Straight-line distance from Wilsons Prom: 570 km.

Croajingolong National Park

Croajingolong NP (~88,000 ha) is located in Far East Gippsland, 430 km east of Melbourne and 530 km south of Sydney. It extends as a wide tract of land along some 100 km of coast from Sydenham Inlet west to the NSW border. Croajingolong has a generally flat topography and comprises a variety of coastal landforms, adjacent low hills and largely undisturbed rivers, streams, lakes and their catchments. Broad vegetation communities include temperate rainforests, lowland and riparian forests, coast banksia woodlands, wet heathlands, coastal heathlands and sedgelands, and dune scrub. Some areas of Croajingolong have been subjected to varying levels of disturbance from past land uses, including grazing and mining, but these have generally had a low impact on its natural condition.

Croajingolong NP is managed by Parks Victoria.

Straight-line distance to Wilsons Prom: 340 km (closest source population to the reintroduction location).

Barren Grounds Nature Reserve-Budderoo National Park

Barren Grounds Nature Reserve (2024 ha) and the adjoining Budderoo NP (5746 ha) are located in the Southern Highlands region of NSW, 100km south of Sydney. The area comprises extensive areas of plateau and adjacent escarpment rising to an elevation of 600 metres. The diverse landscape predominantly supports heathland, woodland, tall open forest and rainforest. The two reserves are relatively undisturbed regions and a stronghold for multiple threatened species. Fire and invasive species have been managed to ensure habitat diversity over the past 25 years (NSW NPWS 1998).

Barren Grounds Nature Reserve and Budderoo NP are managed by the NSW National Parks and Wildlife Service.

Straight-line distance to Wilsons Prom: 600 km.

Ecological suitability

The biophysical environment of the reintroduction location, Wilsons Prom, is described in section 4.1, and the ecological suitability of different source populations is discussed in section 4.5.

Genetic suitability

The ratio of individuals in the founding population will be skewed towards Bherwerre Peninsula at a ratio of 4:1 (i.e. 80% Bherwerre Peninsula, 20% Croajingolong). A low proportion of individuals from the Croajingolong subpopulation achieves four outcomes (Weeks and van Rooyen 2021):

1) Locally adapted genetic variation that could be present in the population—which is considerably closer to Wilsons Prom than the Bherwerre Peninsula (see Figure 2 in Appendix 8)—is incorporated into the reintroduced population.
2) The majority of founders originate from a population with high genetic diversity.
3) Allelic richness and heterozygosity are increased beyond what would be achieved with one source population (albeit marginally).
4) The risk of impacts to the small Croajingolong population from removing individuals is minimised.

The addition of individuals from the Budderoo Plateau population was also investigated by Weeks and van Rooyen (2021) through simulations. A mix of 60% individuals from Bherwerre Peninsula, 30% Budderoo Plateau and 10% Croajingolong resulted in substantially higher heterozygosity, and moderately higher allelic richness, than a 43% Bherwerre Peninsula/43% Budderoo Plateau/15% Croajingolong mix and the 80% Bherwerre Peninsula/20% Croajingolong mix. However, the divergence between the Budderoo Plateau population and the Bherwerre Peninsula and Croajingolong populations is deeper than between the two last populations (Weeks and van Rooyen 2021). There is consequently a risk in combining genetic loads from three populations in the relatively small founding population at Wilsons Prom if population growth is slow (as has been observed in the reintroduced Cataract Reservoir population; Appendix 12) (A. Weeks pers. comm.). Moreover, the status of the Budderoo Plateau population warrants further investigation to adequately assess the risk of removals to that population (section 3.6). Consequently, the merit of adding genetic variation from the Budderoo Plateau population to the reintroduced population will be re-assessed after the population has been established, but within five years of the release of the final cohort to ensure that genetic augmentation remains a feasible option (i.e. before the population becomes too large).

Demographic suitability

The Bherwerre Peninsula population is one of the largest Eastern Bristlebird populations and is estimated to comprise >1000 mature individuals (NESP 2019, Appendix 9). Robust long-term monitoring data indicate the population is stable (Appendix 10). Thus, this population has the

		capacity to absorb any impact of the removal of 48 individuals (over two years; section 5.2), as was the case when 51 individuals were removed from this population in 2003–2005 (Appendix 12). The Croajingolong subpopulation is small with about 140–200 mature individuals (section 3.6). The removal of 15 individuals (eight of which were subsequently returned) during an emergency translocation in February 2020 (section 7.3) did not have a detectable impact on the population as a whole (Appendix 10). Thus, the subpopulation is sufficiently demographically resilient to absorb the impact of removing 12 individuals (6–9% of the estimated number of mature individuals) as planned here (section 5.2), especially if they are sourced over a large area (see section 7.3). **Legal status** The Eastern Bristlebird is a protected species under state or territory legislation across its entire geographic distribution. The same legal protection will be extended to any additional populations established through reintroduction. **Land tenure and accessibility** Land management for biodiversity is secure at all source populations as they are managed as National Parks or Nature Reserves in Victoria, New South Wales and Jervis Bay Territory. The Croajingolong population occurs within the Cape Howe Wilderness Area and is managed under the wilderness provisions of the *National Parks Act 1975* and relevant LCC recommendations. Jervis Bay NP and Booderee have a dense network of sealed and unsealed roads and surround the Jervis Bay Airfield. Croajingolong NP is relatively remote but has good access on unsealed roads.
3.8	**Establishing a captive or confined population (temporary or permanent)**	The taxon is not being moved into a captive facility or into a fenced predator exclosure as a confined population. Individuals may be temporarily held in captivity if they require veterinary care (section 5.6). Ultimately, all individuals that are translocated and their offspring will be free-living at Wilsons Prom.

4. THE RELEASE SITE

4.1	**Description of release site**	**Biophysical environment** Wilsons Prom covers an area of 50,460 ha in South Gippsland, 170 km south-east of Melbourne, and comprises mountains, granite headlands, sandy beaches, coastal dunes, sheltered coves and intervening lowlands (Parks Australia 2017). Broad vegetation communities include forests, fern-dominated gullies, dune scrub, heathlands and swamps (Parks Victoria 2017). Approximately one-fifth of Wilsons Prom NP is heathland with extensive areas dominating the vegetation of the north-eastern part of the Park. Heathlands at Wilsons Prom form a continuum of communities along a soil-moisture gradient (Chesterfield and Whelan 1995). Dry heaths are dominated by *Leptospermum myrsinoides, L. continentale, Allocasuarina pusilla* and/or *A. paludosa*. Low-lying, poorly drained areas support damp heath dominated by *Melaleuca squarrosa*, *Epacris obtusifolia, L. continentale, Sprengelia incarnata, Xanthorrhoea australis* and/or *Empodisma minus*, with locally wet conditions indicated by *Gymnoschoenus sphaerocephalus, Lepidosperma liliforme* and *Restio tertaphyllus*. Damp heaths often form an ecotone with the dry heath of deep, well-drained sand sheets, and the wet heaths of peaty soils in swamp depressions. Wet closed heath, dominated by *M. squarrosa, L. continentale, Baumea tetragona* and *Gleichenia dicarpa*, cover extensive areas associated with drainage lines and grade into damp heath. A closed heath of *M. squarrosa, M. ericifolia* and *L. continentale* with a wetland understorey of *Lepidosperma longitudinale*, *B. juncea, B. rubiginosa* and *Villarsia reniformis* occurs along drainage tracts. These heathland communities show marked similarities to the range of habitats occupied by Eastern Bristlebirds on Bherwerre Peninsula, Beecroft Peninsula and the Budderoo Plateau (D. Portelli pers. obs.). Other ecological vegetation communities in the northern part of the Park include heathy woodland, banksia woodland with a heathy understorey and occasionally lowland forests on

nearby fertile soils, with riparian scrubs present on the wettest sites in adjacent gullies (Parks Victoria 2003).

Ecological communities and biodiversity values

Wilsons Prom has a diversity of ecological communities and high biodiversity values, including many threatened species (Parks Victoria 2002). The avifauna recorded for the park represent around half of all bird species recorded in Victoria. Threatened bird species that have been recorded include Swift Parrot (*Lathamus discolor*), Orange-bellied Parrot *(Neophema chrysogaster*), Eastern Ground Parrot (*Pezoporus wallicus*), King Quail (*Synoicus chinensis*) and Lewin's Rail (*Lewinia* p*ectoralis*). Significant mammal species include Swamp Antechinus (*Antechnius minimus*), White-footed Dunnart (*Sminthopsis leucopus*), Long-nosed Potoroo (*Potorous tridactylus*), Broad-toothed Rat (*Masatcomys fuscus*), Feathertail Glider (*Acrobates* sp.), Eastern Pygmy-possum *(Cercatetus nanus*) and New Holland Mouse (*Pseudomys novaehollandiae*). Threatened invertebrates present include Ancient Greenling Damselfly (*Hemiphlebia mirabilis*), several caddisfly species, South Gippsland Spiny Crayfish (*Euastacus neodiversus*) and Lilly Pilly Burrowing Crayfish (*Engaeus australis*); though a significant portion of the invertebrate fauna at Wilsons Prom is data deficient or poorly known.

Heathland communities support a wide range of fauna. Species of conservation significance include White-footed Dunnart, Long-nosed Bandicoot (*Perameles nasuta*), Southern Brown Bandicoot (*Isoodon obesculus*), Long-nosed Potoroo, New Holland Mouse, Eastern Ground Parrot, Southern Emu-wren (*Stipiturus malachurus*) and Thick-lipped Spider-orchid (*Caladenia cardiochila*) (Davis *et al*. 2021, Parks Victoria 2017).

Threats

Although Wilsons Prom is well-known for its high species richness and relatively intact and diverse habitats, it was negatively impacted by invasive species and degrading land-use practices that commenced in the mid-1800s, including stock grazing, logging and large, frequent fires (Chesterfield 1998, Parks Victoria 2003, 2017). A significant investment over recent decades has been made to ameliorate such impacts and abate contemporary threatening processes.

Fire history

Wilsons Prom NP has an early history of frequent, extensive fires (Chesterfield 1998, Chesterfield and Whelan 1995). Fire burned almost the entire Park in 1908 and the northern end of the park, including the Vereker Range and Mt Vereker, were severely burned in 1913. Prior to 1950, fires were apparently lit regularly with little regard to preceding conditions. Low numbers of stock grazed the heath around Corner Basin between 1850 and 1870 and burning would have been sufficiently frequent to keep the heath short and open for cattle. Most areas of heath were burned on a regular basis from ~1850 to 1951 with probable fire intervals of 4 to 15 years in the northern part of the Park. It is plausible that this frequent and extensive burning of heath over a prolonged period was responsible for the local extinction of the Eastern Bristlebird (see section 4.2). Significant fires in heathland over the last one hundred years occurred in 1943, 1951, 1962, 1971, 1976 and 1987 (Chesterfield and Whelan 1995). After a long absence of fire, the majority of heathland in the Park burned in 2005 and 2009 (Parks Victoria unpubl. data) and is now predominantly in an early post-fire successional state (Morgan 2021).

Fire risk assessment

Most of the prescribed burning in Wilsons Prom NP is conducted primarily for ecological reasons rather than for fuel reduction in accordance with the fuel-management zoning (the Park is primarily FMZ 4 – Flora and Fauna Management). See sections 4.5 and 4.6 for more information.

Access

Wilsons Prom is readily accessible by road, with a sealed road running the full length of the western side of the park. An unsealed road, Five Mile Road, runs from the sealed road to the east coast in the northern part of the Park. The [redacted] and Yanakie Airstrip provide options for helicopter access. Other than the main roads dissecting the heathland, there are few tracks into the main expanses of heath, although much of the area near the release site can be accessed on foot. Areas to the northeast are accessible by boat.

Release site

		The release site is the [redacted] located in the north-western section of Wilsons Promontory NP (Figure 4.1.1). The site was selected using a comprehensive selection process based on 13 selection criteria—related to access, extent and spatial configuration of habitat, risk of fire, control of predators and other threats—assessed for eight candidate release sites that were identified through expert elicitation (Appendix 7). [redacted]. **Figure 4.1.1**. [redacted].
4.2	**Alignment with historic or current distribution**	Evidence of the former occurrence of the Eastern Bristlebird at Wilsons Prom at the time of European occupation is very limited. The most compelling evidence is a list of 107 bird species recorded in Wilsons Prom by a knowledgeable naturalist and Park ranger, Charles McLennan, published in 1909, which includes the Eastern Bristlebird (McLennan 1909 cited in Cooper 1975). McLennan's list notably also includes the Pilotbird (*Pycnoptilus floccosus*), a species that can be readily misidentified as Eastern Bristlebird (Clarke and Bramwell 1998). There are four additional documented records of bristlebirds in Wilsons Prom: • Possible Eastern Bristlebird calls heard in the 1960s or 1970s by an experienced observer (Roy Cooper) in the northern heathlands (Cooper 1975) • Unidentified bristlebird species recorded in coastal heath at Corner Inlet in 1950 by the then curator of ornithology at the National Museum of Victoria, W.B. Hitchcock (Hitchcock 1950 cited in Cooper 1975) • A single bristlebird of an unidentified species seen by David Morgan prior to 1975 (Cooper 1975) • Two Eastern Bristlebirds observed in coastal dune scrub—a habitat utilised by the species (but also the Pilotbird) elsewhere within the range of the southern population—near Cotters Lake in 1980 by Chris Doughty (Bramwell 2008) Collectively, these records provide plausible, albeit scant, evidence that a bristlebird species formerly occurred at Wilsons Prom. Observers that attributed records to a species identified the bird(s) they observed as an Eastern Bristlebird(s). Although other modern records of the Eastern Bristlebird were collected >150 km north-east of Wilsons Prom (Clarke and Bramwell 1998), a subfossil collected near Nelson in south-western Victoria (Baird 1992) indicates it is conceivable the species was distributed across southern Victoria in recent geological time. Assuming Eastern Bristlebirds formerly occurred at Wilsons Prom, the scarcity of records is not surprising given the cryptic nature of the species and remoteness (at least formerly) of suitable habitat within Wilsons Prom. Indeed, up until 1995 only 32 records of the species across Victoria had been collated in the Victorian Wildlife Atlas (Clarke and Bramwell 1998). It is unlikely the unidentified records at Wilsons Prom refer to the Rufous Bristlebird *(D. broadbenti*), the only other bristlebird species in eastern Australia. Despite numerous records of the Rufous Bristlebird west of Melbourne, including >25 localities where museum specimens were collected between Melbourne and Cape Otway in 1858–1980, there are no authenticated records of this species east of Melbourne. Although there are no confirmed records of the former occurrence of the Eastern Bristlebird at Wilsons Prom, the planned translocation is considered to be a reintroduction. Eastern Bristlebirds have not been recorded in the northern heathlands of Wilsons Prom during extensive fieldwork undertaken by experienced ornithologists over several decades up to the present (Bramwell 2008, P. Menkhorst and M. Clarke pers. comm.). Furthermore, autonomous recording units deployed to survey for the Eastern Ground Parrot in recent years have not detected Eastern Bristlebird vocalisations (P. Menkhorst pers. comm.). Thus, there is little doubt that the species no longer occurs at Wilsons Prom.
4.3	**Description of Facilities**	Eastern Bristlebirds will not be moved into a captive facility or semi-captive environment, rather they will be released directly into a wild environment. The provision of veterinary care in a captive environment, if required, is described in section 5.6. The provision of live food during transport is described in section 5.8.
4.4	**Current Land Use, Tenure and Management**	Most of Wilsons Prom is reserved and managed as Wilsons Promontory National Park under the *National Parks Act 1975* (Schedule Two) and includes the Wilsons Promontory Remote and Natural Area (Schedule Six). The Park is managed for recreation and biodiversity conservation, including prescribed burning and control of weeds, invasive native scrub, feral predators and deer (Parks Victoria 2017). The Wilsons Promontory Wilderness Zone is

		managed under the *National Parks (Wilderness) Act 1992*, with the general management aims including minimal interference to natural processes (Parks Victoria 2002). The release site falls outside of the three Reference Areas in the Park (Parks Victoria 2002). Land management is undertaken by Parks Victoria staff that operate out of a ranger station on site.
4.5	**Suitability of proposed release site**	**Habitat and food availability**

Habitat and food availability

Although Eastern Bristlebirds utilise a broad range of habitats (section 3.3), the most widespread suitable habitat at Wilsons Prom is heathland. Five broad heathland communities occur at Wilsons Prom, two of which dominate the ecosystems of the northern part of Wilsons Prom (Figure 4.5.1): wet heathland and sand heathland/wet heathland mosaic (Davies and Oates 1999). These communities include large areas that have not been burnt for >10 years (Parks Victoria unpubl. data).

Vegetation surveys in the [redacted] confirmed that heath communities at Wilsons Prom contain a dense ground cover—primarily dominated by sedge species—which is a key habitat requirement for the Eastern Bristlebird (Appendix 7). Moreover, most of the dominant shrub and sedge species or their congeners are also found in heathlands occupied by Eastern Bristlebirds in the central and southern populations (Appendix 7).

The [redacted] includes microhabitats similar to those that have provided refugia during or after fire in the central population (Baker 2000), including wet depressions and drainage lines. Additionally, Darby Swamp to the south and small sedgelands within the [redacted] may also provide refugial habitat in the event of a large wildfire.

Similarities in vegetation structure and floristic composition of Wilsons Prom and habitats occupied by Eastern Bristlebirds (sections 3.7 and 4.1) suggest that sufficient food resources, particularly ubiquitous ants and beetles (see section 3.3), are likely to be present at Wilsons Prom to support Eastern Bristlebirds.

Area required for a self-sustaining population

The remnant Eastern Bristlebird populations at Bherwerre Peninsula and Budderoo Plateau are large and self-sustaining (section 3.6). The reintroduced population at Beecroft Peninsula is also likely to be self-sustaining (section 3.6). The area of preferred habitat (i.e. heathland) at these locations ranges from 1915 ha to 3225 ha (Table 4.5.1), though Eastern Bristlebirds also utilise adjacent habitats (section 3.3). Given the area of contiguous or near-contiguous heathland mapped at Wilsons Prom is considerably larger (6180 ha; Figure 4.5.1), including 1050 ha within the preferred release site (Figure 4.1.1), Wilsons Prom has the potential to support a large, self-sustaining population of Eastern Bristlebirds. Indeed, assuming the heathland at Wilsons Prom can support Eastern Bristlebirds at a similar density to that on the Bherwerre Peninsula, the population has the potential to increase to >3000 individuals, given the availability of habitat at Wilsons Prom is three times greater than at Bherwerre Peninsula (Appendix 9; Table 4.5.1).

Figure 4.5.1. [redacted].

Table 4.5.1. Availability of preferred habitat (heathland) of Eastern Bristlebird at the two main populations in the central population (Bherwerre Peninsula and Budderoo Plateau), reintroduced population at Beecroft Peninsula, subpopulation in Croajingolong, northern part of Wilsons Promontory and [redacted] release site.

Location	Area of heathland	Source
Bherwerre Peninsula	1915 ha	Eco Logical Australia 2015[a]; Taws 1997[b]
Budderoo Plateau	2481 ha	Eco Logical Australia 2015
Beecroft Peninsula	3225 ha	Eco Logical Australia 2015
Croajingolong	226 ha	Davies *et al*. 2002
Wilsons Promontory	6180 ha	Davies and Oates 1999
[redacted]	1050 ha[c]	Davies and Oates 1999

[a] New South Wales
[b] Jervis Bay Territory, supplemented with Tindall *et al*. 2004 for unmapped areas
[c] comprised of 450 ha of wet heathland (EVC 8) and 600 ha of wet heathland/sand heathland mosaic (EVC 307) (Davies and Oates 1999)

Threats

		Fire The Conservation Action Plan for Wilsons Prom NP identifies application of a landscape-scale ecological fire program to improve the structural diversity and distribution of vegetation growth stages as a priority conservation strategy (Parks Victoria 2017). Ecological burning is essential for maintaining flora and fauna species diversity in heathland and higher-quality examples of heathland are associated with the presence of controlled mosaic ecological fire, as opposed to large-scale fires or the long-term absence of fire (Parks Victoria 2017). A 'Fire Ecology Strategy' is being developed for Wilsons Prom NP and aims to improve the health of heathland and other vegetation communities through applying fire in an ecologically appropriate manner, including mosaic burning in the northern heathlands. Thus, current and future management of fire at Wilsons Prom is sympathetic to the habitat requirements of the Eastern Bristlebird (sections 3.3 and 3.5); nonetheless, potential impacts to the species will be considered when planning ecological burns, especially while the population is establishing. *Feral predators* Red Foxes (*Vulpes vulpes*) and feral Cats (*Felis catus*) may have contributed to the decline of avifauna and ground-dwelling faunal assemblages in heathland and other vegetation communities at Wilsons Prom (Parks Victoria 2017). Feral predators may therefore pose a risk to Eastern Bristlebirds (section 3.5), but an ongoing park-wide fox-baiting program (1080-baiting along the road/track network since 1993; Parks Victoria 2002) and increased efforts to control cats (cage trapping) are reducing the impacts of feral predators. Moreover, dense heathland is less likely to be preferred by feral predators than other vegetation communities due to the difficulty of movement and effective hunting opportunities. *Weeds* Weed management is not a significant concern within the northern heathlands of Wilsons Prom. However, encroachment of two invasive native shrubs—Coastal Tea-tree (*Leptospermum laevigatum*) and White Kunzea (*Kunzea ambigua*)—threatens heathland at a range of locations (Parks Victoria 2003). Fire exclusion and suppression has facilitated the encroachment of these fire-sensitive shrubs, which can form dense stands and outcompete understorey and ground-layer species, profoundly altering the structure and floristic composition of heath (Parks Victoria 2003). Phytophthora *dieback* The fungal pathogen *Phytophthora cinnamoni* is widespread at Wilsons Prom (Bluett *et al*. 2003) where it causes dieback of susceptible plants followed by an increase in resistant species, usually sedges and grasses (Parks Victoria 2003). The impact to Eastern Bristlebirds is unknown, but a shift from heathland towards open sedgeland caused by *Phytophthora* dieback (Parks Victoria 2003) may have minimal negative impacts, since Eastern Bristlebirds also occur in sedgelands with dense ground cover (section 3.3). *Feral herbivores* Habitat degradation caused by feral herbivores is unlikely to have a significant impact on Eastern Bristlebirds at Wilsons Prom. Hog deer (*Axis porcinus*) rarely use heathland and Sambar Deer (*Rusa unicolor*) occur in very low abundance and heathland is not a preferred habitat. The density of European Rabbits (*Oryctolagus cuniculus*) in heathland is also low (Parks Victoria 2002). **Climate** Mean monthly maximum and minimum air temperatures (Figure 4.5.1), rainfall from late autumn to early summer (Figure 4.5.2), and mean monthly relative humidity at 9 am (Appendix 11) at Wilsons Prom are similar to, or within the range of, these climatic variables at Croajingolong, Beecroft Peninsula and near the Budderoo Plateau (Appendix 11). Notable differences between the climate at Wilsons Prom and the other aforementioned locations include: the difference in mean monthly air temperatures at 9 am and 3 pm is low across the year; rainfall is slightly more seasonal (Figure 4.5.2), and mean monthly rainfall is generally lower from mid-summer to mid-autumn (Appendix 11). Overall, there is no indication that the climate at Wilsons Prom is unsuitable for Eastern Bristlebirds, especially considering the variation in climate among currently occupied locations and the marked similarities of the climate at Wilsons Prom and Croajingolong (Appendix 11).

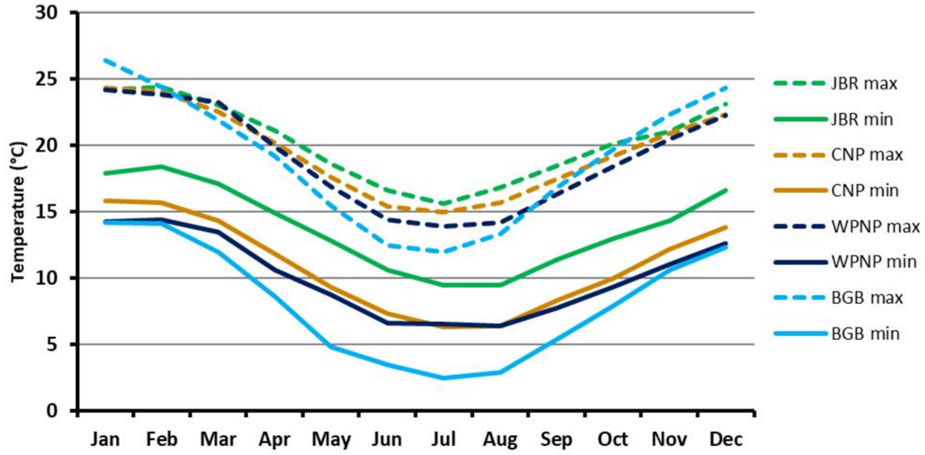

Figure 4.5.1. Mean daily maximum (dotted line) and minimum (solid line) air temperatures for each month calculated over 2013–2020 for Wilsons Promontory National Park (WPNP; Corner Inlet, Yanakie, weather station), 1993–2020 for Croajingolong National Park (CNP; Mallacoota weather station), 1991–2004 for Jervis Bay Region (JBR; Point Perpendicular Lighthouse weather station) and 2001–2021 Barren Grounds Nature Reserve-Budderoo National Park (BGB; Moss Vale weather station, ~30km north-east of BGB). Data sourced from Bureau of Meteorology.

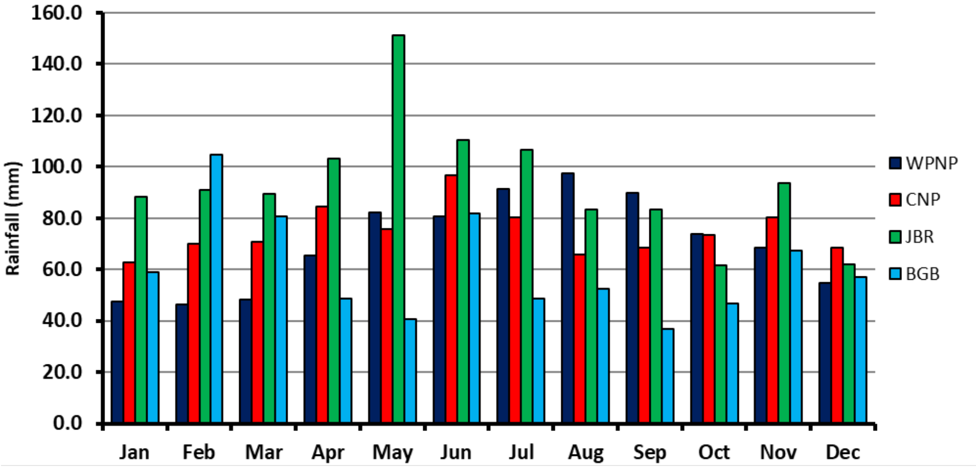

Figure 4.5.2. Mean rainfall for each month calculated over 2013–2020 for Wilsons Promontory National Park (WPNP; Corner Inlet, Yanakie, weather station), 1991–2020 for Croajingolong National Park (CNP; Mallacoota weather station), 1991–2020 for Jervis Bay Region (JBR; Point Perpendicular Lighthouse weather station) and 2001–2021 Barren Grounds Nature Reserve-Budderoo National Park (BGB; Moss Vale weather station, ~30km north-east of BGB). Data sourced from Bureau of Meteorology.

Interspecific competitors, aggressive species and predators

See section 5.4.

Site preparations

The only site preparation deemed necessary prior to the translocation is to extend fox control into the [redacted] (currently undertaken only along the Wilsons Promontory Road and Five Mile Road). Baiting will be implemented in the spring/summer of 2021 prior to releasing the first Eastern Bristlebirds in autumn 2022. Camera trapping will be used to assess use of the [redacted] by feral predators prior to and after baiting. Red Fox, but not feral Cat, have been detected on camera traps along the [redacted] in recent years (Parks Victoria unpubl. data). If warranted, an ongoing program to control feral predators at the release site may be developed by Parks Victoria and informed by monitoring of feral predators.

Control of Coastal Tea-tree, which may include the use of prescribed burning (see Morgan 2021), may be undertaken in the north-eastern section of the [redacted] prior to releasing Eastern Bristlebirds.

		Ideally, a planned ecological burn in the [redacted] (section 4.6) should be undertaken prior to the translocation to reduce the risk to released Eastern Bristlebirds.
4.6	**Land Management Implications**	**Predator control** The existing control program for feral predators will be expanded, at least in the short term, to control feral predators in the [redacted] (section 4.5). **Fire Management** The presence of Eastern Bristlebirds in the [redacted] may restrict the application of ecological burning near the release site in the short term. However, only ~20% of the [redacted] burn unit (heath west of the [redacted]) will be burnt within the next three years and the location of the planned burn will be selected to minimise impacts on the establishing Eastern Bristlebird population. In the long term, ecological burning in the northern heathlands will be essential to manage habitat condition, but the application of mosaic burning is unlikely to have significant negative impacts on the Eastern Bristlebird population (see section 3.3). **Visitor management** Impacts from visitors are expected to be minimal, though education of the birdwatching community may be necessary to reduce disturbance to birds from call broadcasting. Limiting public access during the translocation may be considered if the impact of visitors cannot be mitigated. The Prom Revitalisation Program includes a walking track that traverses through the release site, but this track will utilise existing tracks and is not expected to have high usage.

5. THE TRANSLOCATION

5.1	**Timeline**	**Staged releases** The sequence of translocations will be as follows (Figure 5.1.1): • Late March/April 2022 – Bherwerre Peninsula to Wilsons Prom (target 16–20 individuals) • Late March/April 2023 – Croajingolong to Wilsons Prom (target 12 individuals) • Late March/April 2024 – Bherwerre Peninsula to Wilsons Prom (target 28–32 individuals to achieve a total of 60 across all years) This plan may be amended if adaptive management is applied as outlined in Appendix 13. If genetic augmentation of the Croajingolong subpopulation (section 2.1) is deemed to not be feasible, the second (Croajingolong to Wilsons Prom) and third (‘top up’ Bherwerre Peninsula to Wilsons Prom) cohorts may be translocated in the same year (2023). A staged translocation over three-years will be undertaken for the following reasons: • The geographic distance between source and reintroduction locations is large, so a cautionary approach is warranted to confirm suitability of the location (see section 4.5) • The method of transporting Eastern Bristlebirds (section 5.7) has not been used for this species previously • As the risk of removals from Croajingolong is higher than for Bherwerre Peninsula, sourcing from this population should not be undertaken until the suitability of the reintroduction location has been confirmed • Logistical challenges associated with translocating from more than one source population within a year • Learnings from previous stage(s) can be applied to refine procedures, potentially improving the success of the translocation and minimising risks and costs • To accommodate potential genetic augmentation (including a trial release) of the extant population The choice of 16–20 individuals (exact number dependent on capture success) in the first year is a balance between 1) translocating a sufficient sample size to provide learnings that can be applied to subsequent translocation events, and 2) reducing the number of individuals to mitigate the potential costs if the location or transport method are unsuitable and result in high mortality. Translocating birds from Croajingolong in the second year optimises the integration of genetic diversity from this population with that of the primary source population. If Croajingolong birds

		were translocated in the final year, the integration of gene variants from this population will be reduced due to a stronger skew towards the Bherwerre Peninsula source population arising from recruitment over the two previous breeding seasons. This may be pronounced if there is any difference in fitness between source populations (e.g. inbreeding depression). **Timing of capture and translocation** The seasonal timing of translocations for the Eastern Bristlebird is limited to a short window in autumn (see Bain 2006, Pellow and Clarke 2008, Whelan and MacKay 2002) for the following reasons: • Parents may have dependent young up until late March in wild central/southern populations (section 3.3) • Birds become increasingly difficult to catch as winter approaches (D. Bain pers. comm.; DPIE unpubl. data) • Past translocations have avoided translocating at the start of, or during, the breeding season (mid to late winter) to minimise negative impacts to the population (Bain 2006, Pellow and Clarke 2008, Whelan and MacKay 2002) • Mean monthly maximum and minimum air temperatures at Wilsons Prom are considerably lower from June to August than at other times of the year (Appendix 11), which potentially poses direct (thermal stress) and indirect (reduced prey availability) risks to individuals being translocated south. A potentially significant benefit of translocating birds in autumn is that they have 2–3 months to establish a territory, find a partner and recover from the stress of translocation before the onset of the breeding season. The effect of seasonal timing of translocation on the susceptibility of translocated animals to acute and/or chronic stress (as well as translocation success) is poorly understood. As autumn coincides with the post-breeding moult of Eastern Bristlebirds (D. Portelli pers. obs.), the increased energetic costs of feather growth could increase the susceptibility of individuals to stress during or after translocation. Hormonal stress is down regulated during moult in most of the northern hemisphere species studied that have a seasonally predictable moult cycle (and breeding season) and short moult duration (Cornelius *et al*. 2011), suggesting there could be an advantage in translocating moulting birds with such moult phenologies; however, the moult phenology of Eastern Bristlebirds is poorly known (Higgins and Peter 2002). Activities associated with breeding (e.g. territoriality) may impose physiological costs—such as increased background and stress-induced glucocorticoid hormone levels (see Romero 2002)—that could increase the susceptibility of birds translocated during the breeding season to stress-induced pathology. Capture and translocation of individuals will be undertaken over consecutive days within a single week to optimise efficiency, but this period may be extended due to weather delays (Appendix 13), if capture success is poor, or if insufficient human resources are available.

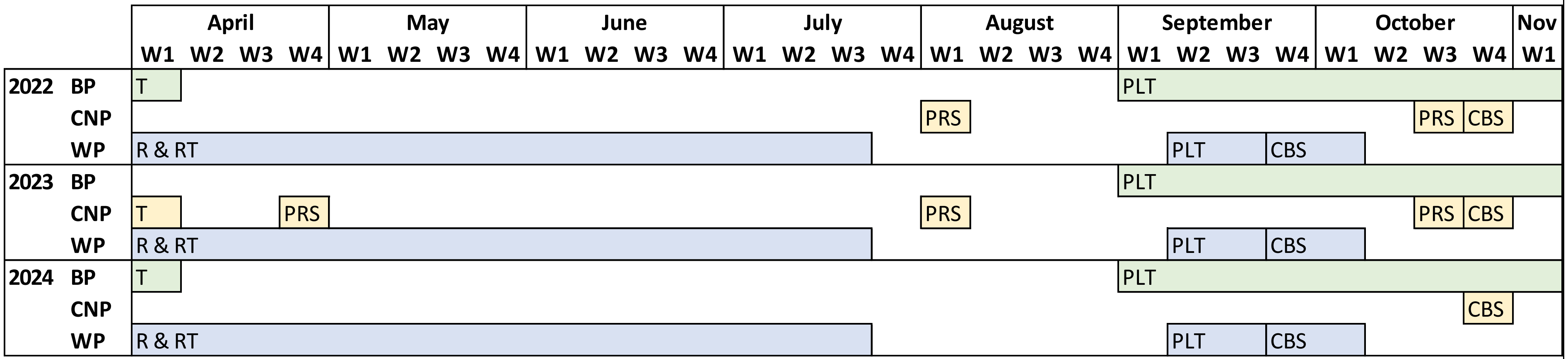

Figure 5.1.1. Indicative timeline for translocations and monitoring of the Eastern Bristlebird from Bherwerre Peninsula (BP) and Croajingolong National Park (CNP) to Wilsons Prom. CBS = call-broadcast survey; PLT = passive-listening transect surveys; PRS = pre- or post-release removal survey; R = release; RT = radio-tracking; T = translocation; W = week. Timing of surveys is indicative only. Monitoring is outlined in section 7.

5.2	**Translocation Individuals**	**Age** The age of Eastern Bristlebirds older than one year cannot be determined. The capture method relies on territory owners responding to simulated territorial incursions (section 5.5), thus capture probability is biased towards adults and the age composition of the founding population will be largely unknown. **Sex ratio** As the Eastern Bristlebird is a socially monogamous species (section 3.3) it is desirable to translocate an equal sex ratio. There is no apparent bias in the capture probability of males and females (Bain 2006, DELWP/DPIE unpubl. data), so achieving an approximately equal sex ratio in the founding population is considered likely. Although Eastern Bristlebirds are sexually monochromatic, the sex of individuals can be identified with an accuracy of 80% using body mass and head-bill length (Bain 2007). This permits manipulation of the sex ratio of the final cohort to correct any imbalance in the overall sex ratio by rejecting individuals of the undesirable sex at source points. The sex of all translocated individuals will be confirmed retrospectively through analysis of genetic samples collected at the time of capture (section 5.9). **Singletons versus pairs** A mix of pairs and singletons will be translocated as the relative advantages and disadvantages of translocating pairs or singletons are unknown, but may include: • Capturing singletons will likely reduce impacts to the source population since only one member of a mated pair needs to be replaced • Established pairs may be less likely to disperse far following release and/or more likely to breed within the first breeding season following release • As bristlebirds can be difficult to capture, capturing more than one individual at a source point is more efficient and this may be required at least at some source points to obtain the required quota of birds within the time available If pairs are caught, they will be released together at the same release point, which may permit a comparison of post-release movements of pairs vs singletons to investigate whether releasing familiar birds decreases the time taken to establish a territory and/or the distance moved following release (e.g. Armstrong 1995, Armstrong and Craig 1995). **Number of individuals** The target founding population size is 60 individuals (48 from Bherwerre Peninsula and 12 from Croajingolong). This was informed by the outcomes of the Eastern Bristlebird reintroduction to Beecroft Peninsula, taking into consideration the source and release environments were very similar in that reintroduction (section 5.3, Appendix 12). Genetic analysis of 26 individuals sampled from Beecroft Peninsula in 2021 revealed that the ≤45 genetic founders (i.e. excluding five known mortalities from the 50 translocated individuals) were sufficient to achieve a high level of genetic diversity comparable to the source population: allelic richness and expected heterozygosity were slightly lower than that of the source population but the differences were not statistically significant (Weeks and van Rooyen 2021). The ideal number of unrelated genetic founders for the reintroduction is therefore ≥40 with an absolute minimum of 20 (A. Weeks pers. comm.). **Relatedness** In order to maximise the genetic diversity of the founding population, the likelihood of capturing related individuals will be minimised by spreading source points (>500m separation) across the source population (see Weeks and van Rooyen 2021), and by capturing no more than two individuals from any source point. If an immature bird is captured first at a given source point, no further individuals will be sourced from that source point to avoid capturing a parent or sibling. If an immature bird is captured after an adult at a given source point, it will be released at the point of capture. **Source points** In addition to reducing relatedness among founders, distributing source points widely across the source population will reduce the density of territory vacancies and/or ‘widowed’ territory holders, thereby making it more likely that removed birds will be replaced and minimising the

		potential negative impact of removals upon the source population (see Bain and French 2009 and section 5.3). Five long-term monitoring transects (2.4–6.2-km long) on the Bherwerre Peninsula, where a medium to high abundance of Eastern Bristlebirds has been recorded in spring surveys of 2017–2020 (DPIE unpubl. data, Parks Australia unpubl. data), will be used as source locations (section 7.1). A maximum of 10 and six individuals will be sourced from high-abundance (>4 birds km^{-1}) and medium-abundance (2–4 birds km^{-1}) transects, respectively. An equal number of monitoring transects in high- and medium-abundance areas will not be used as source locations, thereby serving as controls to evaluate the impact of removals on the source population (section 7). If necessary, additional source points may be located in areas away from transects, but areas where the density of Eastern Bristlebirds is low will be avoided. No defined source locations will be used at Croajingolong, rather source points will be dispersed as widely as is practicable.
5.3	**Previous Work/Literature**	Two wild-to-wild translocations of Eastern Bristlebirds, each using a founding population of 50 individuals, were completed in 2003–2005 and 2008 (Appendix 12). The success of these translocations was assessed using 17 criteria that related to: project feasibility; survival during translocation, the settlement period and 12 months following translocation; population persistence at the reintroduction location at 3, 10, 20 and 50 years after translocation; evidence of social behaviour and breeding at reintroduction and source locations in the short, medium and/or long term; population size exceeding the number of translocated individuals at the reintroduction location in the long term; reoccupation of source points in the short and medium term; and complete recovery of the source population within 10 years (Baker *et al*. 2012). The translocation to Beecroft Peninsula in 2003–2005 met all success criteria that could be assessed (i.e. excluding those with timeframes ≥10 years) (Baker *et al*. 2012). In contrast, the translocation to Cataract Reservoir in 2008 met only 10 of the 13 criteria that could be assessed (Baker et al. 2012); the reasons for the partial success, and how these are unlikely to apply to the planned translocation, are discussed in Appendix 12. Two wild-to-captive translocations of Eastern Bristlebirds (with one associated captive-to-wild translocation) from the central and southern populations have also been undertaken. In 2019, four birds were translocated from Barren Grounds Nature Reserve to Currumbin Wildlife Sanctuary, where they were successfully integrated into the breeding program (Currumbin Wildlife Sanctuary unpubl. data). In February 2020, an emergency translocation of 15 individuals from Croajingolong to Melbourne Zoo was undertaken as insurance against potential loss of the population due to an approaching fire (DELWP unpubl. data); however, six birds later died due to aspergillosis (section 5.4). The likelihood of success of the translocation is considered to be moderate to high, as informed by the following: • Comprehensive feasibility studies (Appendices 4 and 5) • Rigorous selection process for identifying a suitable release site (Appendix 7) • Detailed analysis of the options for designing the translocation (Appendix 3) • Applied learnings from past translocations (Appendix 12) • Clear understanding of the genetic relationships among potential source populations (Weeks and van Rooyen 2021) Nonetheless, a cautionary staged approach is being adopted because of the long distance between source and reintroduction locations and an untested method of transport: A small number of individuals will be released in the first stage and monitored intensively to inform the planning of subsequent releases (section 5.1).
5.4	**Risks and risk management**	**Risks to Eastern Bristlebirds during translocation** Risks to Eastern Bristlebirds arising from acute and chronic stressors (see Dickens *et al*. 2010), harm or injury during capture, handling, transport and release will be reduced by: • Adopting efficient capture, handling, processing and transportation protocols used previously for this species (e.g. Bain 2006, Baker and Clarke 1999, Baker *et al*. 2012) that are undertaken only by highly experienced personnel. • Minimising environmental stressors at all stages from capture to release, including limiting handling to the capture and processing stages. • Involving a wildlife veterinarian to provide advice and veterinary care if required (see section 5.6).

		• Capturing birds in the afternoon and transporting overnight to avoid severely restricting time for foraging and limiting the acclimation period at the release site prior to roosting, which would arise with long-distance transport during the day (Appendix 3). • Providing live prey in transport boxes to compensate for any energy deficit that may arise due to impacts on foraging activity before and after translocation. • Immediately reviewing any unexpected adverse events (i.e. traumatic injury, morbidity or mortality) to identify and mitigate the cause(s) prior to capturing additional birds. See section 5.6 and Appendix 13 for further information on managing animal welfare. **Diseases, parasites and pathogens** There is currently no indication that disease is a significant concern for Eastern Bristlebirds. No research on the health of wild Eastern Bristlebirds has been undertaken, though an investigation of the presence and species identity of protozoans in the genus *Atoxoplasma* is currently underway (K. Roche pers. comm.). No significant risks of disease, pathogens or parasites that may impact Eastern Bristlebirds are known at the reintroduction location; however, thorough disease screening of wild birds has not been undertaken at these locations and it is not planned. Identified causes of morbidity and mortality within small captive populations (Currumbin Wildlife Sanctuary unpubl. data, Zoos Victoria unpubl. data) include five non-infectious-disease hazards—traumatic injury, neoplasia, squamous cell carcinoma, lymphoid leukaemia and age-related osteoarthritis—and three infectious diseases caused by *Mycobacteria* sp., *Atoxoplasma* sp. (extra-intestinal coccidia) and *Aspergillus* sp. These three pathogens occur in a wide range of wild passerines, but expression of disease is most commonly seen in individuals experiencing immunosuppression due to elevated stress or other concurrent disease. Six of the 15 birds translocated to Melbourne Zoo subsequently died from aspergillosis (Zoos Victoria unpubl. data). It is likely that chronic stress associated with suboptimal housing was a key contributor to development of the disease (A. Beutel pers. comm.; see also Dickens *et al*. 2010). Other wild-to-captive translocated birds have not developed the disease. Risks to individual birds, source locations and recipient locations posed by diseases, parasites and pathogens will be mitigated by ensuring only healthy birds are translocated (section 5.6); adopting appropriate hygiene, disinfection and biosecurity protocols; minimising acute and chronic stressors at all stages of translocation (Dickens *et al*. 2010); and appropriately managing animal welfare (see above). **Risks to Eastern Bristlebirds at the release location** See also section 4.5. *Threats* The potential impacts of climate change on Eastern Bristlebird habitat at Wilsons Prom are unknown, but the large extent and diversity of heathland communities will increase opportunities for Eastern Bristlebirds to adapt to habitat changes that result from climate change. Moreover, the reintroduction of the species to Wilsons Prom is itself a management action to mitigate the risk of climate change through expanding the geographic range of the species further south. See sections 4.5 and 4.6 for information on other threats. *Intraspecific competition* No Eastern Bristlebirds currently occur at Wilsons Prom. The large spatial extent of suitable habitat (section 4) and relatively small number of individuals that will be translocated (section 5.2) make it highly unlikely that intraspecific competition poses a risk to the translocated population. *Interspecific competition* The risk of interspecific competition is very low as few primarily ground-dwelling insectivorous birds inhabit heathland at Wilsons Prom (Cooper 1975; Victorian Biodiversity Atlas data). The most ecologically similar species that occupy heathland at Wilsons Prom—Southern Emu-wren and Striated Fieldwren *Calamanthus fuliginosus*—coexist with Eastern Bristlebirds elsewhere (DPIE unpubl. data, D. Portelli pers. obs.). Rodents and small dasyurids are unlikely to compete with Eastern Bristlebirds for food since temporal niche partitioning between them is high and dietary overlap is likely to be low (see Gibson and Baker 2004).

		Predation
		
		There is no rationale to expect that significant impacts from predation by native predators are likely.
		
		Genetics
		
		The risk of inbreeding depression is minimised by 1) skewing the ratio of founders to the Bherwerre Peninsula population which has low relatedness and high genetic diversity (sections 3.6 and 3.7), 2) sourcing individuals widely from within the source population (section 5.2) and 3) translocating a moderately large number of individuals (section 5.2).
		
		The risk of outbreeding depression (between source populations) is minimised by skewing the ratio of founders as described above and selecting source populations that share a high proportion of neutral genetic diversity (section 3.6).
		
		Translocating 60 individuals will minimise the risk of founder effects. For example, 50 Eastern Bristlebirds translocated to Beecroft Peninsula effectively captured the genetic diversity of the source population (sections 3.6 and 5.2). Genetic theory also indicates 50 founders is an appropriate number for wildlife reintroductions (Weeks *et al*. 2011).
		
		See also section 3.7.
		
		Geographic distance between source and release locations
		
		The risks associated with translocating Eastern Bristlebirds to a distant locality are unknown, but there is no clear rationale for concluding this poses an unacceptable risk to the species, particularly considering similarities in climate and habitat (section 4.5). Nonetheless, a staged release will be undertaken to mitigate this risk (section 5.1).
		
		Road mortality
		
		Eastern Bristlebirds on the Bherwerre Peninsula and Beecroft Peninsula are occasionally killed by vehicle strike along sealed roads that dissect suitable habitat (OEH 2012). The risk of vehicle strike is low at Wilsons Prom due to the short section of (unsealed) road dissecting heath and existing speed restrictions. Nonetheless, signage may be erected to warn drivers of the risk if required (as has been done at Jervis Bay).
		
		Risks to Eastern Bristlebird populations
		
		Global population
		
		The total number of individuals that will be removed from source populations represents ~2% of the number of mature individuals in the global population. Thus, if the translocation fails, the risk to the taxon will be negligible or short-lived.
		
		Source populations
		
		The two previous wild-to-wild translocations removed 2.5–5% of the source population (Baker *et al*. 2012). There was no detectable impact on the abundance of Eastern Bristlebirds in the Bherwerre Peninsula source population following the removal of 51 individuals in 2003–2005 (Bain and French 2009). Similarly, the Budderoo Plateau population exhibited signs of rapid recovery following the removal of 50 individuals in 2008 (Baker *et al*. 2012).
		
		The translocation is unlikely to have a detectable impact on the source populations (see also Appendix 13) for the following reasons:
		
		• The total number of birds that will be removed from the Bherwerre Peninsula population:
		  1. Represents <5% of the number of mature individuals in that population (Appendix 9)
		  2. Is equal to or less than the number sourced from a single population in previous wild-to-wild translocations
		• The total number of birds that will be removed from the Croajingolong population represents approximately 6–9% of the number of mature individuals in that population (Appendix 9)
		• Source points will be widely dispersed across the population (section 5.2), unlike in previous wild-to-wild translocations (Appendix 12).
		• ≤2 individuals will be captured at each source point (section 5.2)
		• Individual birds are apparently replaced rapidly (within a year) if the number of birds removed from an area is low (Bain and French 2009)

		The greatest risk to individuals not removed for translocation arises from the removal of only one member of a mated pair. In such cases, there is a risk that the remaining individual will not be able to attempt to breed in late winter to summer following the removal of their partner. This risk is reduced by undertaking removals 2–3 months before the breeding season, thereby giving 'widowed' individuals a lengthy period to find a new partner. It is highly likely that both members of a pair will be removed at some source points. Removing pairs could minimise the number of breeding pairs in the source population impacted by removals if 'widowed' singletons are unable to find a replacement mate before the breeding season. However, targeting pairs needs to be balanced against sourcing birds widely from within the population, and it can be difficult to capture both members of a pair. Disturbance to breeding activity is avoided by capturing birds outside of the breeding season (sections 3.3 and 5.1). In the event late breeding activity is suspected or observed (e.g. fledglings seen), the source point where this occurred will not be used for the translocation (i.e. the capture attempt will be aborted and the potential parent, if already captured, will be released at the source point). As a very small proportion of the source population will be removed, and individuals will be sourced from across a wide area, adverse impacts on the genetic characteristics of the source population are unlikely. **Risks to other taxa and ecological processes** *Capture of non-target species* Individuals of non-target species that are captured in mist-nets will be promptly removed (<15 minutes after capture) by an experienced bird handler (note immediate removal is not always possible as disturbance at the net can compromise the success of capturing bristlebirds.) *Prey species* It is unlikely that Eastern Bristlebirds will have a significant negative impact on populations of individual prey species or negatively impact invertebrate species of concern, given their generalist diet and opportunistic foraging mode, the generally high abundance and species richness of key prey species (ants and beetles; section 3.3), and the ubiquity of heathland habitat at Wilsons Prom (N. Porch pers. comm.). However, it is noted that the invertebrate communities of heathland at Wilsons Prom are poorly known. *Interspecific competition* See risks to Eastern Bristlebirds above. *Introduction of weeds and pests* The introduction of weeds and pests will be mitigated by: • Washing all field equipment, clothing, vehicles and transport boxes to remove seeds before entering Wilsons Prom • Inspecting vegetation to remove any seeds and invertebrates prior to adding it to transport boxes • Appropriate disposal of contents of transport boxes and disinfecting boxes prior to reuse • Using long-distance transport vehicles only along sealed roads and car parks *Spread of* Phytophthora Vehicles, footwear and equipment will be cleaned prior to entry and following exit from each location with Phytoclean (or equivalent) (O'Gara et al. 2005). *Other risks to biodiversity* It is highly unlikely that Eastern Bristlebirds will displace any taxa, pose a risk to threatened flora, or otherwise negatively influence the structure and/or composition of the ecological community at Wilsons Prom through competition. *Human disturbance* Human disturbance associated with the translocation will be minimal. **Socio-economic risks**

		Impacts to infrastructure or industry are not anticipated as Eastern Bristlebirds will be translocated to a release site within a large National Park, >10km from the Park boundary. **Site security and protection** No fencing will be erected to support the translocation. See sections 4.5 and 4.6. **Aboriginal Cultural Heritage** Liaison has commenced with local Traditional Owners and Parks Victoria Cultural Heritage Officers about the proposed translocation and any risks to cultural heritage sites of significance. The main activities of concern appear to be ground disturbance associated with the temporary pegging of mist nets and temporary or semi-permanent installation of stakes for recording devices. Risks to cultural heritage values are therefore unlikely. The Traditional Owners of the land in which the Bherwerre Peninsula source population is situated, the Wreck Bay Aboriginal Community, are regularly involved with Eastern Bristlebird monitoring, were consulted on the translocation proposal and have indicated in-principle support for the project (pending formal consideration by the Booderee National Park Joint Board of Management). **Community concerns** A Communications and Engagement Plan has been drafted for the project. Initial discussions with community and bird conservation groups has indicated there is strong support for the project.
5.5	**Capture methods**	Eastern Bristlebirds will be captured using 31 mm or 38 mm mist nets (typically 12 m long) by an A-class level III bander (authority issued by the Australian Bird and Bat Banding Authority) or a person with extensive experience mist-netting Eastern Bristlebirds. The typical capture method is as follows: • Mist nets are erected in positions where birds are likely to cross a narrow clearing or road, or fly from one tree or shrub to another, with the lowest shelf string along the ground and pegged into place if the ground is not flat • Bluetooth speakers are positioned in elevated positions on either side of the net • One operator uses the speakers alternately to broadcast Eastern Bristlebird vocalisations to encourage birds to run or fly into the net (a pulley system may be used to manually raise the lower shelf at a distance from the net) • The period over which vocalisations are intermittently broadcast will be limited to ≤40 minutes (based on past capture success with the species; DPIE and DELWP unpubl. data) and/or interspersed with long periods (≥10 minutes) of silence • A bristlebird that becomes trapped in the net is removed immediately Bristlebirds will be captured in the mid to late afternoon when they are sufficiently responsive to call broadcasting for capture success to be high (typically after 1530 hrs but earlier in heavily overcast weather). If it is raining or heavy rain is forecast for the afternoon at the source location, or if a storm is forecast at the reintroduction location on the following morning, captures will not be attempted on that day. Due to the time of day and year it is unlikely that high or extremely low temperatures will occur, but captures will not be attempted during unusually hot (>35°C) or cold (<5°C) temperatures. Visual health assessments are described in section 5.6. **Processing** Captured birds will be transported in calico holding bags to the processing team where they will be processed inside a dome tent without a fly (to prevent escape). A hood will be used to calm birds during handling (Baker and Clarke 1999, Bain 2006). Processing of all birds will be completed by last light (c.1800 hours). The following procedures will be completed: *Visual inspection* Eye colour will be recorded to distinguish adult from juvenile/immature birds (Beutel *et al*. 2021).

		See section 5.6 *Biometrics* Birds will be weighed, and standard morphological measurements taken, namely wing length, combined head-bill length, tail length and tarsus length. *Banding* A uniquely numbered size 5 alloy band (Australian Bird and Bat Banding Scheme) will be fitted to one leg (though size 4 may be more appropriate for some individuals; D. Portelli pers. obs.), and a metal band with a unique combination of colour and stamped letter will be fitted to the other leg (section 5.8). *Genetic sampling* Pin feathers will be removed (section 5.9). *Radio transmitter attachment* Radio transmitters will be attached (section 5.8). **Personnel** Capture teams will each comprise two people, including one experienced A-class bander or person with extensive experience mist-netting Eastern Bristlebirds (see above) and one field assistant (ideally with previous experience using mist nets). Five of the proponents and/or members of the TWG are experienced and highly competent in using the proposed capture method for Eastern Bristlebirds: [redacted]. Multiple capture teams will be used during a translocation event (ideally three). The processing team will comprise one person with extensive experience handling Eastern Bristlebirds [redacted] and one A-class bander. A wildlife veterinarian may assist if available. **Croajingolong source population** Capture and transport methods may be modified for the Croajingolong to Wilsons Prom translocation, based on learnings from translocating the first cohort and further investigation of transport logistics (see Appendix 3). An amendment to this plan will be submitted if required.
5.6	**Health assessments and quarantine**	**Source location** A visual health assessment of captured bristlebirds will be undertaken by experienced handlers at source points immediately after capture and during processing. Birds will be examined for signs of excessive stress upon capture and during processing, such as panting, morbidity and extreme shock moult. Individuals that are judged to be in danger of extreme stress or show evidence of poor health—evidenced by high ectoparasite load, epidermal hyperplasia, soiled cloaca/vent, nasal or ocular discharge, open wounds, poor body condition, or other clinical signs of disease—will be released immediately at the source point or veterinary care will be provided (see below). A visual examination of bristlebirds while inside their transport box (through the second, transparent sliding door; section 5.7) will be undertaken when birds are transferred to vehicles for transportation (≥10 minutes after processing). This will enable confirmation that individuals tolerate wearing the radio-transmitter harness. No further capture attempts will occur at source points where birds have been released. A wildlife veterinarian may be present during the capture and/or processing of Eastern Bristlebirds at the source location. Personnel involved in the capture, handling and processing of bristlebirds will be able to obtain advice from a wildlife veterinarian over the phone if one is not present on site. **Translocation** Bristlebirds will be translocated directly from source to release points and will not undergo any quarantine. Strict transport and biosecurity protocols will be implemented to minimise the risk of disease transmission (section 5.4). **Reintroduction location**

		A non-invasive visual health assessment will be undertaken by a captive-husbandry expert or a wildlife veterinarian [redacted], or under their direct or indirect supervision, immediately prior to release at Wilsons Prom if birds can be viewed through a transparent sliding door of the transport box (section 5.7). If birds exhibit clinical signs of ill health, such as lethargy and non-responsiveness to stimuli, they will be held for a short period of time (<1 hour) in a quiet, dark space, to allow recovery prior to a subsequent visual health assessment. If an issue with the radio-tracking harness is strongly suspected (e.g. loosely fitting or bird exhibits signs of intolerance), the bird will be removed from the box by hand and the harness inspected. If necessary, the harness will be removed. If there is no obvious issue with the harness and depending on the indicators that led to physically inspecting the bird, the bird will be released inside a dome tent without a fly (similar to those used for the delayed release of captive-bred Eastern Bristlebirds in 2008; Stone et al. 2021) to observe its movements. This procedure will be used sparingly and only if there is a compelling reason to do so. If an issue is apparent, the bird will be recaptured using a hand net by an experienced operator to remove the harness. **Veterinary care and euthanasia** In the unlikely event intensive veterinary care is deemed necessary at the source location (i.e. before transportation), bristlebirds will be taken to the Taronga Wildlife Hospital (TWH) in Sydney (<3 hours drive). If veterinary care is deemed necessary while birds are in transit to Victoria or prior to release, bristlebirds will be taken to the Australian Wildlife Health Centre (AWHC) at Healesville Sanctuary (<4 hours from Wilsons Promontory National Park; ~6 hours from Croajingolong National Park). Any bristlebird that requires euthanasia will be euthanised using methods approved under the Animal Ethics approval (to be obtained). A post-mortem examination will be conducted by a veterinarian (Healesville Wildlife Sanctuary and/or Taronga Zoo) on birds that die or are euthanised, including gross necropsy, histopathology and further disease screening as indicated. Carcasses will subsequently be donated to the state museum in the respective state or territory in which the death occurred.
5.7	**Transportation**	Overnight transport by road was chosen as the preferred transport method (see Appendix 3), primarily to avoid severe restrictions on the foraging time of translocated individuals on the day of translocation (i.e. limited foraging time in the morning prior to capture and limited foraging time in the late afternoon following release) and to reduce exposure to stressors likely to contribute to chronic stress during translocation (Dickens *et al*. 2010). Although the method of long-distance overnight travel by road has not been used for Eastern Bristlebirds, Allison Beutel (captive husbandry expert for this species) and Dr Leanne Wicker (wildlife veterinarian, Zoos Victoria), as well as members of the Translocation Working Group, consider the method to be low risk. Moreover, long-distance, overnight transport by road (2–10 hours) has been used successfully for six diurnal New Zealand bird species, including several species that are a similar size to the Eastern Bristlebird: Hihi *Notiomystis cincta* (~33 g), Fernbird *Bowdleria punctata* (~35 g), North Island Robin *Petroica longipes* (~35 g) and Tīeke *Philesturnus rufusater* (~70 g) (K. Parker pers. comm.). Analogous long-distance road transport during the day (up to 7.5 hrs) has also been successful for nocturnal bird species (C. Hartnett pers. comm., H. Ricardo pers. comm.; see Appendix 3). **Transport boxes** Transport boxes measuring 300 mm long, 200 mm wide and 200 mm high and made of plywood will be constructed specifically for the project based on specifications for boxes used by Currumbin Wildlife Sanctuary for transporting Eastern Bristlebirds (Beutel *et al*. 2021). These boxes have a dark interior, adequate ventilation, padding on the interior roof and non-slip flooring (Beutel *et al*. 2021). Birds will be transported singly in boxes. Larger boxes (640 mm long, 660 mm wide and 330 mm high) used for this species by Zoos Victoria may als be used. A second sliding door behind the first will be transparent to permit visual inspection of birds inside boxes (section 5.6). **Vehicles and temporary holding** A modern vehicle with good suspension and quiet engine will be used for transport, most likely a luxury SUV (e.g. Kia Carnival). Transport boxes will be securely fastened to minimise movement and placed on a padded surface to further dampen vibrations. Upon arrival at

		Wilsons Prom, boxes will be temporarily moved into a quiet, dark room in a suitable building (e.g. visiting staff accommodation). However, if arrival occurs within 1 hour of first light (c. 0615 hours), boxes will remain in the transport vehicle in a suitable parking location. At first light, boxes will be transferred to 4WD vehicles and driven to release points along the [redacted] (section 4.1). **Transport time** Expected transit time from Bherwerre Peninsula to Wilsons Prom is approximately 11 hours. Vehicles will depart before 1900 hours (sunset ~1850 hours) and arrive at Wilsons Prom before 0600 hours (sunrise ~0730 hours). Expected transit time from Croajingolong to Wilsons Prom is approximately 6.75 hours. Alternative transport options may be considered (see section 5.5 and Appendix 3). Eastern Bristlebirds have survived lengthy transport periods in the following previous translocations (no deaths during transport occurred): • ~3.5–4.5 hours Barren Grounds to Currumbin Wildlife Sanctuary, with up to ~9 hours from capture to release (A. Beutel pers. comm.) • ~5.5 hours Croajingolong to Melbourne Zoo with up to ~9 hours from capture to release (A. Lee pers. comm.) • ~4.5 hours Melbourne Zoo to Croajingolong with up to ~7 hours from capture to release (A. Lee pers. comm.) **Stress minimisation** Birds will be placed inside transport boxes immediately after they have been processed (section 5.8). Boxes will then be kept away from disturbance in an environment with minimal environmental stressors before being loaded into transport vehicles at c.1800–1900 hours. A small amount of vegetation (e.g. small branches with dense soft foliage) will be placed inside boxes to provide refuge (see Bain 2006, Beutel *et al*. 2021). Ambient temperate inside vehicles will be maintained at 22–24°C (A. Beutel pers. comm.) using the vehicle's air conditioning. Temperature will be regularly monitored using a Bluetooth temperature and humidity sensor placed inside or adjacent to at least one transport box during each journey. Noise and light stimuli will be kept to a minimum at all times birds are inside boxes. Live food (crickets, mealworms) will be provided in transport boxes. **Personnel** Transport teams will be comprised of a keeper from Zoos Victoria or Currumbin Wildlife Sanctuary experienced in the transportation and captive husbandry of birds and a DELWP or Parks Victoria employee. In the case of transport from Bherwerre Peninsula to Wilsons Prom, the driver (rotated over successive days) and keeper will be swapped half way along the journey at Cann River (i.e. two transport vehicles will be used but birds will remain within the same vehicle for the duration of the journey).
5.8	**Release / Tracking methods**	**Release options** Direct (hard) release has been a successful release strategy for wild-to-wild translocated Eastern Bristlebirds (Baker *et al*. 2012). For example, of the 50 birds translocated to Beecroft Peninsula, 90% survived the radio-tracking period of 1–34 days (mean 7 days): Four individuals died on the night of their release which coincided with a severe storm and another was predated (Bain 2006; Bain *et al*. 2012). No food or shelter will be provided following release. Following a visual inspection of health (section 5.6), individuals will be released by placing the box on the ground facing dense vegetation <3m away, opening the sliding door and quietly waiting for the bird to escape from the box. If handling and/or observation is required to inspect the radio-tracking harness, the bird will either be released by hand on the ground facing dense vegetation <3m away or allowed to escape from the dome tent of its own accord (see section 5.6). **Individual identification**

		The use of leg bands (section 5.5) will allow the identification of recruits in the population (i.e. unbanded individuals). As sightings of Eastern Bristlebirds may be limited to glimpses, having a leg band on each leg will allow confident identification of recruits. The use of colour-letter bands affords the opportunity to identify individuals (e.g. if sighted during call-broadcasting surveys; section 7.1). **Tracking devices** Radio transmitters (≤1.3 g; see Baker and Clarke 1999, Bain *et al*. 2012) will be fitted to all translocated individuals using adjustable wing-loop harnesses that incorporate a weak link (e.g. Kesler 2011, Wang *et al*. 2020). Battery life is expected to be 10–20 weeks (depending on the model). A trial of harness materials using captive Eastern Bristlebirds is currently being planned at Currumbin Wildlife Sanctuary and will inform the design used. Radio-tracking is described in section 7.1. **Personnel** The release team will comprise one radio-tracking technician, one wildlife veterinarian [redacted], one expert in the captive husbandry of Eastern Bristlebirds [redacted] and field assistants.
5.9	**Genetics**	Four to six pin feathers from the trunk of the body will be plucked from each individual for genetic sampling (Eastern Bristlebirds are in heavy body moult during autumn; D. Portelli pers. obs.). Previous studies have had high success with DNA yields from these samples for genetic analysis (genetic sexing, microsatellite analyses). Feather samples will be stored dry and sent to an appropriate molecular laboratory for genetic analyses.

6. PROJECT MANAGEMENT

6.1	**Governance and Operations**	The Department of Environment, Land, Water and Planning (DELWP) is the lead proponent for the project and plays a primary role in overseeing and coordinating project planning, budgeting, funding, delivery and reporting for the translocation. Parks Victoria is the principal delivery partner for the project and, as the manager of all lands involved in the project within Victoria, plays the primary role in implementing land management components of the project. Additional delivery partners include Parks Australia and NSW Department of Planning, Industry and Environment (DPIE). The governance and operating frameworks assign decision-making responsibilities and reflect the collaborative partnership between DELWP and Parks Victoria in project delivery. The governance framework requires Parks Victoria endorsement prior to implementation, whilst the operating framework has been endorsed and implemented. **Governance framework** *Executive Project Sponsors* (DELWP and Parks Victoria) represent the two agencies jointly delivering the project and have overarching responsibility for project delivery and direction—including fundamental shifts in project scope and suspension or termination of the project—and the determination of high-level decisions or recommendations made or escalated by the Project Control Group (PCG). *Project Sponsors* (DELWP and Parks Victoria) represent the two agencies jointly delivering the project and are responsible for high-level project planning, making key business decisions, and resolving obstacles or conflicts hindering project delivery that are within their delegated authority; excepting decisions and actions that warrant endorsement by the PCG or Executive Project Sponsor. Each Project Sponsor drives and champions the project within their respective agency and works closely with the Project Manager to support project delivery. *Project Control Group* (PCG) oversees the collaborative delivery of the project and has responsibility for the determination of high-level decisions or recommendations made by the Translocation Working Group. The PCG reports to the Executive Project Sponsor. PCG comprises Project Sponsors and other representatives from DELWP and Parks Victoria. PCG decision making will be escalated to the Executive Project Sponsor if unresolved or beyond their remit. **Operating framework**

		Translocation Working Group (TWG) champions collaborative project delivery and provides practical support, guidance and expert advice to plan and implement the project. The TWG reports to the PCG and comprises representatives from DELWP, Parks Victoria, DPIE and Parks Australia and scientists. *Project Manager* (DELWP) is responsible for overseeing project planning and delivery. The Project Manager is chair of the TWG and secretariat of the PCG. This position leads stakeholder management; permit/consent compliance; logistical planning; translocation implementation and monitoring; and operational decision making (within the position's remit). The Governance and Operating Framework will be consistently applied through project delivery, with a Translocation Operations Plan to be prepared detailing specific agency responsibilities during project delivery. The Governance and Operating framework and Operations Plan are critical to ensuring clarity of roles, responsibilities and decision-making authorities of all stakeholders during both translocation implementation and long-term population management. The framework will be in place for the period of translocation implementation (anticipated to be 2021/22 to 2023/24). In 2024/25, when activities transition from implementation to long-term management, Parks Victoria will have lead responsibility for the Wilsons Prom and Croajingolong populations to ensure species persistence, and DELWP will provide support as needed (e.g. species monitoring). For the Bherwerre Peninsula source population, future monitoring and management are the responsibility of interstate delivery partners, namely Parks Australia and DPIE.
6.2	**Long-term Commitment**	Project planning being undertaken in the 2021-22 year, includes determining the future commitments and requirements needed to secure the establishment and future protection of the Eastern Bristlebird population at Wilsons Prom, and any associated commitments to the monitoring of the source populations. Key future commitments are: • Achieving long-term buy in, ownership and commitment of project delivery partners – DELWP and Parks Victoria. This will be achieved through co-ownership of translocation implementation and DELWP/Parks Victoria's participation in defining future roles and responsibilities. • Participating in whole-of-species recovery planning to ensure that Victorian population priorities are included. • Incorporating Eastern Bristlebird as a biodiversity value that informs future Parks Victoria management actions (including burning and predator control) at Wilsons Promontory National Park and Croajingolong National Park. • Securing the commitment and in-kind contribution of responsible agencies/land managers at both source and reintroduction locations to support future annual monitoring requirements. • Securing funding for 2022/23 and 2023/24 translocation activities (actual and in-kind). • Securing funding to support short-, medium- and long-term project goals and activities*. • Managing risks of personnel change, including ensuring adequate record management; information and knowledge sharing; capacity building; succession planning; and distributing project tasks across team/agencies where appropriate**. *DELWP core funding will be allocated for long-term monitoring of populations at Croajingolong and Wilsons Prom. **DELWP Project Manager is employed on a fixed-term contract (aligning with available project funding). All efforts are being made to secure funds to complete years two and three of the translocation and extend the project manager position.
6.3	**Contingency Plan**	Indicators of success, contingency plans and adaptive management are presented in Appendix 13.

7. MONITORING, EVALUATION, REPORTING AND IMPROVEMENT

7.1 **Monitoring Program**

Bherwerre Peninsula

Monitoring of the Bherwerre Peninsula source population will be incorporated into the ongoing spring surveys undertaken at Jervis Bay NP (JBNP) by NSW DPIE and at Booderee NP (BNP) by Parks Australia. The survey method is as follows:

- Fixed transects are walked by skilled observers to passively listen and search for Eastern Bristlebirds
  - JBNP – 3 transects, 4.4–6.6km long
  - BNP – 10 transects, 2.4–5.4km long
- Transects are walked at a speed of 2–4 km/h (i.e. estimated up to 3.3 hours per transect) between dawn and three hours after dawn
- The locations of bristlebirds heard or seen are marked on a topographic map (JBNP) or the geographic coordinates of the observer and the distance and compass bearing of the bristlebirds from the observer are recorded (BNP)
- Calls are identified as A-song, B-song or C-call
- Each transect is walked twice within a short period (often in the same week) within each survey.

Data are analysed as counts per kilometre along transects.

As described in section 5.2, monitoring transects will be categorised as high-, medium- and low-abundance as shown in Table 7.1.1 and Figure 7.1.1. Eastern Bristlebirds will be sourced from half of the high- and medium-abundance transects, with the other half serving as control sites.

Table 7.1.1. The abundance of Eastern Bristlebirds along transects in Booderee National Park (BNP) and Jervis Bay National Park (JBNP) and the number of transects to be used as control and source sites. Abundance categories are based on the mean number of individuals per kilometre in spring surveys of 2017–2020 (DPIE unpubl. data, Parks Australia unpubl. data).

Abundance	Control sites	Source sites	Transects
High (>4 birds km^{-1})	2	2	[redacted]
Medium (2–4 birds km^{-1})	3	3	[redacted]
Low (<2 birds km^{-1})	4	0	[redacted]

Figure 7.1.1. [redacted].

Croajingolong

Call-broadcasting surveys

Monitoring of the Croajingolong source population will be incorporated into the ongoing spring (mid-October to mid-November) surveys undertaken by DELWP. The survey method is as follows:

- Eastern Bristlebird vocalisations are broadcast using a megaphone for three minutes followed by a 10-minute listening period at 33 permanent survey points with a spacing of c.400m (Figure 7.1.2)
- Survey points are visited between 15 minutes and 5 hours (occasionally up to 6.5 hours) after sunrise and accessed along four survey routes distributed across the core area where Eastern Bristlebirds occur within Croajingolong
- For each bristlebird heard or seen, the time of detection since broadcasting commenced and the compass bearing and distance from the observer are recorded
- Each point is surveyed by a team of two people on two mornings during the survey period

- Temperature, rainfall (presence/absence) and cloud cover are recorded for each visit to a survey point

Data are analysed as total count pooled across survey points using the maximum count per 1) survey point and 2) survey route (to minimise the likelihood of double counting).

Pre- and post-removal surveys

A complementary survey technique to investigate the impact of removals may be attempted as follows:

- Up to 20 individual territories will be identified early in the breeding season prior to removals, some of which will be used to source the 12 individuals to be translocated to Wilsons Prom
- Territories will be visited by an observer during the early morning and the distance and bearing of neighbouring birds will be determined by passive listening followed by call broadcasting and a second listening period (durations to be determined)
- Surveys will be undertaken in August and October prior to translocation and again in April, August and October following the removal of birds (Figure 5.1.1).

There are significant uncertainties regarding the feasibility of this method (which will be trialled in spring 2021), particularly whether replacement territory owners can be differentiated from incursions or territory extensions by neighbours, given home ranges likely overlap considerably (section 3.3).

Figure 7.1.2. [redacted].

Wilsons Promontory

The monitoring program for Wilsons Prom in the medium and long term has been adapted from successful techniques used for the Beecroft Peninsula translocation (Bain 2006, Appendix 12) and long-term monitoring of Eastern Bristlebird populations (section 3.6, Appendix 10).

Short term

All translocated individuals will be fitted with radio transmitters (section 5.8). Ground-based radio tracking will be used to determine the location of released individuals according to the schedule in 7.1.2, thereby providing data on survival and movements. Elevated positions within the [redacted] and at [redacted] will be used to locate birds not detected during ground-based tracking along firebreaks, tracks and roads.

Table 7.1.2. Tentative radio-tracking schedule for individuals released at Wilsons Prom. The frequency of obtaining location 'fixes' of individuals is indicated for different periods following release.

Weeks	Monitoring frequency
1–3	Twice daily
4–6	Once daily
7–9	Once every alternate day (~3 times per week)
10–12	Twice weekly at ~3-day intervals
13+	Once weekly until end of transmitter life

In the event a transmitter is suspected to have failed, attempts will be made to locate birds, starting in the area where they were last observed. Methods will include passive-listening along firebreaks, tracks and roads and systematic searching through the heath, potentially aided by call broadcasting to elicit vocal responses.

If an individual is suspected to have died (e.g. no change in location within or between days) transmitters will be tracked to source to locate the shed transmitter or carcass (or remains thereof).

Medium term

In the spring following release of each cohort, the full length of the [redacted] (Figure 4.1.1) and additional transects traversing the middle of the [redacted] will be surveyed using the method described above for Bherwerre Peninsula. Additionally, call-broadcasting surveys—following the methods described above for Croajingolong—will be undertaken at survey points within and near to the [redacted], and in likely dispersal corridors between them (see spatial configuration of heathland habitat in Figure 4.1.1), to locate additional individuals. A subset of these survey points will be surveyed in each spring up to three years after the final release.

Long term

		A minimum of 10 long-term monitoring transects will be established and surveyed annually in spring using the methods described above for Bherwerre Peninsula. Transects will be 1-km long, spaced ≤400 m apart (based on estimates of home range size; Baker 2001) and sited as follows: • [redacted] – four transects • [redacted] – at least one transect in the middle of the [redacted] • [redacted] – one transect in the north-east section of the [redacted] • [redacted] – at least one transect (possibly along the track to [redacted]) • [redacted] (Figure 4.1.1) – at least three transects (at least one along the [redacted]) Data from passive listening along the [redacted] collected in the medium term (see above) will be subsampled to provide comparable data for long-term monitoring. Depending on the performance of call-recognition software being developed for Eastern Bristlebirds by the Arthur Rylah Institute and Queensland University of Technology, a network of autonomous recording units (ARU) will be established following consultation with Parks Victoria and ornithologists working at Wilsons Prom. The primary objectives of the ARUs is to monitor the predicted population expansion north and east from the [redacted] and long-term monitoring of occupancy across the northern heaths. *Population genetics* At 20 years following the release of the last cohort of Eastern Bristlebirds at Wilsons Prom, genetic samples will be collected from a sample of ≥25 individuals following the procedures in section 5.9. Twenty years falls within the range of two to five generation lengths following population establishment (section 3.3). A plan for long-term monitoring of population genetics will be devised based on the results of these analyses and any genetic augmentation that is subsequently undertaken following the advice of a conservation geneticist.
7.2	**Indicators of Success**	Indicators of success, contingency plans and adaptive management are presented in Appendix 13.
7.3	**Reporting and Publications**	Reports will be prepared after each cohort is released and annually (with more detailed reports at the end of the short, medium and long terms outlined in Appendix 13) and disseminated to DELWP, Parks Victoria, partner agencies and the Translocation Evaluation Panel. In the long-term, annual reports documenting the results of spring surveys will be prepared by the agency responsible for managing these surveys (Parks Victoria or DELWP, which is yet to be determined). An article documenting the outcomes of the translocation will be prepared and submitted to a peer-reviewed scientific journal within five years of the final release of birds.

8. FUNDING AND RESOURCES

8.1	**Sources**	**Funding sources for 2021-22 are:** • Biodiversity Response Planning program (Victorian Government) [redacted] • Bushfire Biodiversity Response and Recovery program (Federal Government) [redacted] • DELWP [redacted] in-kind estimate • Other agencies combined [redacted] in-kind estimate (unconfirmed) **Proposed funding sources* 2022-23 onwards are:** • Protecting Biodiversity (Victorian Government) funding [redacted] (2022-24) • Multi-agency in-kind (including DELWP) [redacted] (2022-24) • Indicative annual budget 2024/25 onwards [redacted] * Grant options have been identified and will be thoroughly pursued to ensure there is sufficient funding for translocation activities planned for 2022–23 and 2023–24. In addition, DELWP is working closely with key stakeholders to ensure there is sufficient in-kind contributions will translocation implementation and long-term management.

8.2	**Resources Required**	A detailed summary of resources required for the 2021/22 financial year has been incorporated into the budget in Appendix 14 and is summarised below: **Personnel** • Project Manager (1.0 FTE) • Project Officer (0.7 FTE) • Translocation fieldwork activities (Total of 266 person days, includes Contractors, agencies and DELWP Project Manager/Officer time) **Equipment** • Equipment list provided on request **Food, accommodation and transport** • Total of 309 accommodation-nights to support translocation fieldwork • Daily food allocation for 281 person days to support translocation fieldwork • Vehicle and air transport; vehicle hire. **Communications and Engagement** • Financial resources to support Traditional Owner engagement • Financial resources to create a video production. Note resource requirements of years 2 and 3 (2022/23 and 2023/24) will be lower than year 1 (2021/22) as indicated in section 8.3 and Appendix 14.
8.3	**Budget**	A detailed budget for years 1, 2 and 3 is provided in Appendix 14 and has been summarised below: [redacted] The ongoing budget, from 2024/25 onwards, has not been set. However, an indicative budget of [redacted] (in-kind and actual) has been estimated to deliver annual monitoring of the Croajingolong and reintroduced populations. It is expected that a significant proportion of the activities required to ensure long-term success of the project (such as threat management) will be incorporated into annual operational budgets and in-kind contributions for conservation management of Wilsons Promontory and Croajingolong National Parks.

9. CONSULTATION AND COMMUNITY RELATIONS

9.1	**Affected and Interested Parties**	All affected and interested parties are listed in Appendix 15.
9.2	**Public Relations and Participation**	A Communications and Engagement Plan will guide public relations and participation activities. **Communication process** DELWP and Parks Victoria are joint project partners, and the development and delivery of the communications and engagement plan will be a collaborative process between the two agencies, and it is expected that both agencies will have communication activities to deliver, with Parks Victoria focusing on 'land manager' communications and DELWP focusing on 'project and species-specific' communications. As communications and engagement activities will be cross-jurisdictional, input will also be sought from other delivery partners and key stakeholders (particularly Parks Australia and DPIE). Project communication activities will inform key stakeholders and communities (Mallacoota and Wilsons Prom) of project goals and outcomes and build on existing communication and community interest in Eastern Bristlebird stemming from the emergency extraction of Eastern Bristlebirds in February 2020. Communication methods will include written information (media releases and project information sheets); verbal (radio interviews/videos) and pictorial (photos). Communication will remain cognisant of project priorities and sensitivities (including animal welfare), this will likely delay proactive public promotion of the project until after translocation and post-translocation monitoring of the first cohort is completed.

		Communication strategies
		
		The communication and engagement strategies employed in the preparation of this plan have been:
		
		• Establishment of the multi-agency Translocation Working Group (TWG) to advise on the translocation, including providing expert advice, direction and review of the Translocation Proposal. The TWG is highly productive, with five meetings convened to date.
		
		• Initial engagement focusing on inviting involvement and participation with Aboriginal Communities/Traditional Owner groups:
		
		  ○ Wilsons Promontory National Park — Gunaikurnai Land and Waters Aboriginal Corporation, Bunurong Land Council Aboriginal Corporation, and Boonwurrung Land and Sea Council
		
		  ○ Croajingolong National Park — Bidwell-Maap Nation Aboriginal Corporation, Nindi-Ngujarn Ngarigo Monero Aboriginal Corporation Snowy Cann Rivers First Peoples' Country and Waters Aboriginal Corporation, and Moogji Aboriginal Council
		
		  ○ Booderee National Park / Jervis Bay National Park — Wreck Bay Aboriginal Community Council. Rangers from Booderee NP and the Wreck Bay Community Council have expressed strong enthusiasm for assisting with the capture of Eastern Bristlebirds for translocation and monitoring of the source population within Booderee.
		
		• Engagement with intra- and interstate land managers and key stakeholders (notably Currumbin Wildlife Sanctuary and Zoos Victoria).
		
		Public relations
		
		Key public relation implications of this project are:
		
		• Eastern Bristlebird extraction February 2020 has raised the species' profile and interest from the media and the general public.
		
		• Eastern Bristlebird translocation aims to positively benefit species conservation.
		
		• Eastern Bristlebird populations (current and proposed) are relatively contained in geographic location, enabling targeted communications and engagement.
		
		• Eastern Bristlebird translocation demonstrates effective multi-agency, cross-jurisdictional partnerships working towards the same species conservation goal.
		
		All public relation matters will be managed by the DELWP Project Manager (in conjunction with key Parks Victoria operational staff) and supported by DELWP and Parks Victoria communications/engagement and media/public relations teams. In addition, DELWP and Parks Victoria will have an agreed process for contributing to and approving all formal public communications/media and escalation of public-relation issues.
		
		Public participation
		
		Public participation in the translocation is undesirable due to the secretive and shy behaviour of Eastern Bristlebirds. Volunteer opportunities will be limited to skilled observers that are selected by the Project Manager. Wide reporting of the release site will be avoided as extra visitor disturbance at the site could negatively affect establishment of birds.
		
		Social and economic benefits
		
		The establishment of an easily observed population of Eastern Bristlebirds will increase the ecotourism significance of Wilsons Promontory National Park as this will be the only easily accessible location in Victoria where the species can be observed.
		
		Resistance
		
		No resistance to the translocation is anticipated. The translocation has received wide support from intrastate and interstate government and non-government organisations with an interest in Eastern Bristlebirds and Traditional Owners that have been consulted to date.

9.3	**Stakeholders' Endorsements**	Letters of endorsement and/or in-principle support from the following stakeholders have been obtained and are reproduced in Appendix 16:

		• Department of Environment, Land, Water and Planning (Jo Andrews, Acting Regional Manager, Natural Environment Programs) • Parks Victoria (Andrews Davies, District Manager, South Gippsland) • Department of Planning, Industry and Environment (Damon Oliver, Senior Team Leader – Ecosystems and Threatened Species, South East Branch) Similar letters of support have been requested from the following stakeholders and will be supplied to the Translocation Evaluation Panel once they are received: • Currumbin Wildlife Sanctuary • Zoos Victoria • Parks Australia (pending approval of the project by the Booderee National Park Joint Board of Management which will be considered in August 2021)

10. REFERENCES

Armstrong, D.P. (1995). Effects of familiarity on the outcome of translocations, II. A test using New Zealand robins. *Biological Conservation* **71**, 281–288.

Armstrong, D.P., and Craig, J.L. (1995). Effects of familiarity on the outcome of translocations, I. A test using saddlebacks *Philesturnus carunculatus rufusater*. *Biological Conservation* **71**,133–141.

Armstrong, D.P. and Ewen, J.G. (2001). Assessing the value of follow-up translocations: A case study using New Zealand robins. *Biological Conservation* **101**, 239–288.

Bain, D. (2006). Translocation of the Eastern Bristlebird and factors associated with a successful program. PhD thesis, University of Wollongong, Wollongong, NSW.

Bain, D. (2007). Two potential sexing techniques for the Eastern Bristlebird *Dasyornis brachypterus*. *The Australian Zoologist* **34**, 92–96.

Bain, D. and French, K.O. (2009). Impacts on a threatened bird population of removals for translocation. *Wildlife Research* **36**, 516–521

Bain, D. and McPhee, N. (2005). Resurveys of the eastern bristlebird (*Dasyornis brachypterus*) in central-eastern New South Wales, 1999–2001: Their relationship with fire and observer competence. *Corella* **29**, 1–8.

Bain, D., Clarke, R.H., Oliver, D., Bramwell, M.D., MacGregor, C., Lindenmayer, D.B., Maple, D., Dexter, N., Ehmke, G., Burbidge, A.H., Menkhorst, P.W. and Garnett, S.T. (in press). Southern Eastern Bristlebird *Dasyornis brachypterus brachypterus*. In 'Action Plan for Australian Birds 2020'. (Eds S.T. Garnett and G.B. Baker). CSIRO Publishing, Melbourne.

Bain, D., French, K., Baker, J., and Clarke, J. (2012). Translocation of the Eastern Bristlebird 1: radio-tracking of post-release movements. *Ecological Management and Restoration* **13**, 153–158.

Baird, R.F. (1992). Fossil avian assemblage of pitfall origin from Holocene sediments in Amphitheatre Cave (G-2), south-western Victoria, Australia. *Records of the Australian Museum* **44**, 21–44.

Baker, J. (1997). The decline, response to fire, status and management of the Eastern Bristlebird. *Pacific Conservation Biology* **3**, 235–243.

Baker, J. (2000). The eastern bristlebird: Cover-dependent and fire-sensitive. *Emu* **100**, 286–298.

Baker, J. (2001). Population density and home range estimates for the Eastern Bristlebird at Jervis Bay, south-eastern Australia, *Corella* **25**, 62–67.

Baker, J. and Clarke, J. (1999). Radio-tagging the eastern bristlebird: Methodology and effects. *Corella* **23**, 25–32.

Baker, J., Bain, D., Clarke, J. and French, K. (2012). Translocation of the Eastern Bristlebird 2: applying principles to two case studies. *Ecological Management and Restoration* **13**, 159–165.

Barker, R.D. and Vestjens, W.J.M. (1990). The food of Australian birds. 2, Passerines. CSIRO, Canberra.

Beutel, A., Gubler, Z. and Booth, R. (2021). Northern Eastern Bristlebird *Dasyornis brachypterus monoides* husbandry guidelines. Currumbin Wildlife Sanctuary.

Bird, J.P., Martin, R., Akçakaya, H.R., Gilroy, J., Burfield, I.J., Garnett, S.T., Symes, A., Taylor, J., Şekercioğlu, Ç.H. and Butchart, S.H.M. (2020). Generation lengths of the world's birds and their implications for extinction risk. *Conservation Biology*, **34**, 1252–1261.

Bluett, V., Weste, G. and Cahill, D. (2003). Distribution of disease caused by *Phytophthora cinnamomi* in Wilsons Promontory National Park and potential for further impact. *Australasian Plant Pathology* **32**, 479–491.

Bradley, D.W., Molles, L.E., Valderrama, S.V., King, S. and Waas. J.R. (2012). Factors affecting post-release dispersal, mortality, and territory settlement of endangered kokako translocated from two distinct song neighborhoods. *Biological Conservation* **147**, 79–86.

Bradley, D.W., Ninnes, C.E., Valderrama, S.V. and Waas, J.R. (2011). Does 'acoustic anchoring' reduce post-translocation dispersal of North Island robins? *Wildlife Research* **38**, 69–76.

Bradstock, R.A., Cohn, J.S., Gill, A.M., Bedward, M. and Lucas, C. (2009). Prediction of the probability of large fires in the Sydney region of south-eastern Australia using fire weather. *International Journal of Wildland Fire* **18**, 932–943.

Bramwell, M. (2008). The eastern bristlebird *Dasyornis brachypterus* in East Gippsland, Victoria, 1997–2002. *Australian Field Ornithology* **25**, 2–11.

Chaffer, N. (1954). The eastern bristle-bird. *Emu* **54**, 153–162.

Charley, D., Stewart, D., Stone, Z.L., Roche, K., Tasker, L., Molyneux, A., Gillman, S., Baker, L., Watson, P., Maron, M., Thomas, J. and Garnett, S.T. (in press). Northern Eastern Bristlebird D*asyornis brachypterus monoides*. In 'Action Plan for Australian Birds 2020'. (Eds S.T. Garnett and G.B. Baker). CSIRO Publishing, Melbourne.

Chesterfield, E.A. (1998). Fire history: Wilsons Promontory National Park. *The Victorian Naturalist* **115**, 337–342.

Chesterfield, E.A. and Whelan, J. (1995). Conservation strategy Wilsons Promontory National Park Northern Management Area. Background document. Parks Victoria.

Chisholm, A.H. (1951). The story of the scrub-birds. *Emu* **51**, 89–112.

Clarke, R. and Bramwell, M. (1998). The eastern bristlebird *Dasyornis brachypterus* in East Gippsland, Victoria. *Australian Field Ornithology* **17**, 245–253.

Cooper, R.P. (1975). Avifauna of Wilson's Promontory. *Australian Bird Watcher* **6**, 87–102.

Cornelius, J.M., Perfito, N., Zann, R., Breuener, C.W. and Hahn, T.P. (2011). Physiological trade-offs in self-maintenance: plumage molt and stress physiology in birds. *Journal of Experimental Biology* **214**, 2768–2777.

Davies, J.B and Oates, A.M. (1999). 1:25000 ecological vegetation class (EVC) mapping of Wilsons Promontory National Park and adjacent islands. Department of Natural Resources and Environment, Gippsland, Victoria.

Davies, J.B., Oates, A.M. and Trumbull-Ward, A.V. (2002). Ecological vegetation class mapping at 1:25000 in Gippsland: Final report. Department of Natural Resources and Environment, Gippsland, Victoria.

Davis, N.E., Bennett, A., Forsyth, D.M., Bowman, D.M.J. S., Lefroy, E.C., Wood, S.W., Woolnough, A.P., West, P., Hampton, J.O. and Johnson, C.N. (2016). A systematic review of the impacts and management of introduced deer (family Cervidae) in Australia. *Wildlife Research* **43**, 515–532.

Dickens, M.J., Delehanty, D.J. and Romero, L.M. (2010). Stress: An inevitable component of animal translocation. *Biological Conservation* 143: 1329–1341.

Eco Logical Australia (2015). Biometric Vegetation Compilation. Unpublished report to South East Local Land Services. Eco Logical Australia Pty Ltd.

Eco Logical Australia (2019). Ground parrot and eastern bristlebird monitoring – Beecroft Weapons Range. Unpublished report to Spotless Facility Services. Eco Logical Australia Pty Ltd.

Elphinstone, M.S. (2008). The development and application of molecular methods for the analysis of habitat and population fragmentation in birds. PhD Thesis, Southern Cross University.

Garnett, S. and Crowley, G.M. (2000). The action plan for Australian birds. Environment Australia: Canberra

Gilmour, P. (1983). A vegetation survey of Nadgee Nature Reserve. Unpublished report for NSW National Parks and Wildlife Service.

Hartley, S.L. and Kikkawa, J. (1994). The population management of the Eastern Bristlebird (*Dasyornis brachypterus*). Department of Environment and Heritage, Queensland Parks and Wildlife Service, Brisbane.

Higgins, P.J. and Peter, J.M. (Eds.) (2002). Handbook of Australian, New Zealand and Antarctic Birds. Volume 6: Pardalotes to Shrike-thrushes. Oxford University Press, Melbourne.

Hoffmann, A.A., Miller, A.D. and Weeks, A.R. (2020). Genetic mixing for population management: from genetic rescue to provenancing. *Evolutionary Applications* **14**, 634–652.

Holmes, G. (1989). Eastern bristlebird: Draft species management plan for northern populations. Unpublished report to the Queensland National Parks and Wildlife Service and New South Wales National Parks and Wildlife Service.

Holmes, G. (1989). Eastern bristlebird: Draft species management plan for northern populations. Unpublished report to the Queensland National Parks and Wildlife Service and New South Wales National Parks and Wildlife Service.

Keast, A. (1957). Variation in the Bristle-birds (*Dasyornis*). Proceedings of the Royal Society of New South Wales **1955-56**, 43–46.

Kesler, D.C. (2011). Non-permanent radiotelemetry leg harness for small birds. *Journal of Wildlife Management* **75**, 467–471.

King, K.J., de Ligt, R.M. and Cary, G.J. (2011). Fire and carbon dynamics under climate change in south-eastern Australia: insights from FullCAM and FIRESCAPE modelling. *International Journal of Wildland Fire* **20**, 563–577.

Lea, A. H. and Gray, J.T. (1935). The Food of Australian Birds - an analysis of stomach contents. Part III. *Emu* **52**, 145–178.

Lindenmayer, D. B., Candy, S.G., Banks, S., Westgate, M., Ikin, K., Pierson, J., Tulloch, A. and Barton, P. (2016). Do temporal changes in vegetation structure predict changes in bird occurrence additional to time since fire? *Ecological Applications* **26**, 2267–2279.

Lindenmayer, D., MacGregor, C., Wood, J.T., Cunningham, R.B., Crane, M., Michael, D., Montague-Drake, R., Brown, D., Fortescue, M., Dexter, N., Hudson, M. and Gill, A.M. (2009). What factors influence rapid post-fire site re-occupancy? A case study of the endangered Eastern Bristlebird in eastern Australia. *International Journal of Wildland Fire* **18**, 84–95.

Maute, K. (2019). Monitoring report on the translocated population of Eastern Bristlebirds at Cataract SCA Metro Special Areas, 2018. Unpublished report to NSW Office of Environment and Heritage. University of Wollongong.

Maute, K. (2020). Monitoring report on translocated population of Eastern Bristlebirds at Cataract SCA Metro Special Areas, 2019. Unpublished report to NSW Office of Environment and Heritage. University of Wollongong.

Menkhorst, P.W., Stamation, K., Hollings, T.A., Brown, G.W. and Smart, A. (2021). Potential for Wilsons Promontory to provide a have for selected fauna. Client Report for Parks Victoria. Arthur Rylah Institute for Environmental Research, Department of Environment, Land, Water and Planning, Heidelberg, Victoria.

Miles, J. (2004). Permanent vegetation plots in Nadgee coastal heaths. Unpublished report to the Department of Environment and Conservation, Merimbula, NSW.

Mills, K. (1995). Natural vegetation. In ‘Jervis Bay. A place of cultural, scientific and educational value. Kowari 5’. (Eds G. Cho, A. Georges, R. Stoutjesdik and R. Longmore). Australian Conservation Agency, Canberra

Morgan, J. (2021). Vegetation Condition Assessment Wilson’s Promontory National Park. Unpublished report to Parks Victoria. Department of Ecology, Environment and Evolution, La Trobe University, April 2021.

National Environmental Science Program Threatened Species Research Hub (NESP TSRH) (2019) ‘Threatened Species Strategy Year 3 Scorecard – Eastern Bristlebird’. Australian Government, Canberra.

NSW NPWS (1998). Budderoo National Park, Macquarie Pass national Park, Barren Grounds Nature Reserve and Robertson Nature Reserve Plan of Management. NSW National Parks and Wildlife Service, Nowra.

NSW NPWS (2011). Jervis Bay National Park and Woolamia Nature Reserve Plan of Management. NSW National Parks and Wildlife Service, Department of Environment, Climate Change and Water.

OíGara, E., Howard, K., Wilson, B. and Hardy, G. (2005). Management of *Phytophthora cinnamomi* for Biodiversity Conservation in Australia: Part 2 - National Best Practice Guidelines. A report funded by the Commonwealth Government Department of the Environment and Heritage by the Centre for Phytophthora Science and Management, Murdoch University, Western Australia.

Oliver, D. and Malolakis, G. (2020). Rapid post-fire assessment of upland and coastal heaths and surrounding forest vegetation at Nadgee NR and implications for threatened heathland avifauna. Unpublished report. Department of Planning, Industry and Environment, New South Wales.

OEH (2012). National Recovery Plan for Eastern Bristlebird *Dasyornis brachypterus*. Office of Environment and Heritage, Department of Premier and Cabinet (NSW), Sydney.

Parks Victoria (2002). Wilsons Promontory National Park Management Plan. Parks Victoria: Melbourne, Australia.

Parks Victoria (2003). Wilsons Promontory National Park Environmental Action Plan. Parks Victoria: Melbourne, Australia.

Parks Victoria (2017). Conservation Action Plan for Parks and Reserves Managed by Parks Victoria. Wilsons Promontory. Parks Victoria: Melbourne, Australia.

Pellow, B. and Clarke, J. (2008). Translocation proposal for the Eastern Bristlebird. University of Wollongong, Wollongong.

Pyke, G., Saillard, R. and Smith, J. (1995). Abundance of eastern bristlebirds in relation to habitat and fire history. *Emu* **95**,106–110.

Roberts, D.G., Baker, J. and Perrin, C. (2011). Population genetic structure of the endangered eastern bristlebird *Dasyornis brachypterus:* Implications for conservation. *Conservation Genetics* **12**, 1075–1085.

Romero, L.M. (2002). Seasonal changes in plasma glucocorticoid concentrations in free-living vertebrates. *General and Comparative Endocrinology* **128**, 1–24.

Schodde, R. and Mason, I.J. (1999). 'The directory of Australian birds. Passerines'. CSIRO Publishing, Canberra.

Smith, G.T. (1977). The effect of environmental change on six rare birds. *Emu* **77**, 173–179.

Smith, G.T. (1987). Observations on the biology of the western bristlebird *Dasyornis longirostris*. *Emu* **87**, 111–118.

Spotswood, E.N., Goodman, K.R., Carlisle, J., Cormier, R.L., Humple, D.L., Rousseau, J., Guers, S.L. and Barton, G.G. (2012) How safe is mist netting? Evaluating the risk of injury and mortality to birds. *Methods in Ecology and Evolution* **3**, 29–38

Stone, Z.L., Tasker, E. and Maron, M. (2018). Grassy patch size and structure are important for northern Eastern Bristlebird persistence in a dynamic ecosystem. *Emu* **118**, 269–280.

Taws, N. (1997). Vegetation survey and mapping of Jervis Bay Territory. Unpublished report to Environment Australia. Taws Botanical Research.

Tindall, D., Pennay, C., Tozer, M., Tuener K. and Keith, D. (2004). Native vegetation map report series No. 4. Araluen, Batemans Bay, Braidwood, Burragorang, Goulburn, Jervis Bay, Katoomba, Kiama, Moss Vale, Penrith, Port Hacking, Sydney, Taralga, Ulladulla & Wollongong 1:100000 Mapsheets. NSW Department of Environment and Conservation/NSW Department of Infrastructure, Planning and Natural Resources.

Wang, A. X., Paston, E.H., Mounce, H.L. and Hart, P.J. (2020). Divergent movement patterns of adult and juvenile 'Akohekohe, an endangered Hawaiian honeycreeper. *Journal of Field Ornithology* **91**, 346–353.

Weeks, A. and van Rooyen, A. (2021). Genotyping eastern bristlebird samples and recommendations for their genetic management. Unpublished report to the Department of Environment, Land, Water and Planning. Cesar Pty Ltd.

Weeks, A.R., Sgro, C.M., Young, A.G., Frankham, R., Mitchell, N.J., Miller, K.A., Byrne, M., Coates, D.J., Eldridge, M.D.B., Sunnucks, P., Breed, M.F., James, E.A. and Hoffmann, A.A. (2011). Assessing the benefits and risks of translocations in changing environments: a genetic perspective. *Evolutionary Applications* **4**, 709–725.

Whelan, R. and MacKay, J. (2002). Translocation proposal for the Eastern Bristlebird. University of Wollongong, Wollongong.

Williams, D.G. (1995). Heaths and scrubs. In 'Jervis Bay. A place of cultural, scientific and educational value. Kowari 5'. (Eds G. Cho, A. Georges, R. Stoutjesdik and R. Longmore). Australian Conservation Agency, Canberra

11. APPENDICES

APPENDIX 1. Experts and contributors

APPENDIX 2. Knowledge gaps to resolve prior to planning genetic augmentation

APPENDIX 3. Analysis of options for the major components of the translocation strategy for the Eastern Bristlebird

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APPENDIX 5. Eastern Bristlebird translocation site selection assessment for Far East Gippsland

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12. PERMITS

Permits and approvals

The permits, licences and approvals required from each jurisdiction for this project are identified in the tables below.

Advice sought from issuing agencies has indicated that the preparation or endorsement of the Translocation Proposal is a key requirement for assessing applications for many of the required permits, licences and approvals. Therefore, applications have yet to be submitted for any permit, licence or approval.

An application will be submitted to the DELWP Animal Ethics Committee before the submission deadline of 1 September 2021. Applications for permits, licences and approvals that do not require prior endorsement of a Translocation Proposal will be submitted by the end of October 2021. All remaining applications for permits, licences and approvals will be submitted once the Translocation Proposal has been endorsed.

Victoria

Issuing agency	Legislation	Permit or approval
Animal Ethics Committee, DELWP	*Prevention of Cruelty to Animals Act 1992*	Animal Ethics Approval
OCR, DELWP	*Wildlife Act 1975*	Import permit
OCR, DELWP	*Wildlife Act 1975*	Scientific Permit
Parks Victoria	*Parks Victoria Act 2018*	Access Agreement for Environmental Works
Parks Victoria	Not applicable	Species Management Plan
Translocation Evaluation Panel, DELWP	Not applicable	Translocation Plan endorsement

New South Wales

Issuing agency	Legislation	Permit or approval
NSW National Parks and Wildlife Service	*Biodiversity Conservation Act 2016*	Scientific Licence

Commonwealth Government (including Jervis Bay Territory)

Issuing agency	Legislation	Permit or approval
Booderee NP Joint Board of Management	Not applicable	Wreck Bay Aboriginal Community Council board approval
Australian Bird and Bat Banding Scheme	Not applicable	Project Approval
Department of Agriculture, Water and Environment	*Environment Protection and Biodiversity Conservation Act 1999*	Self-assessment regarding referral for actions likely to impact Matters of National Environmental Significance (may trigger requirement for Part 7 or Part 13)
Department of Agriculture, Water and Environment	*Environment Protection and Biodiversity Conservation Act 1999*	General Permit Application for Threatened Species and Ecological Communities (section 201)

	Department of Agriculture, Water and Environment	*Environment Protection and Biodiversity Conservation Act 1999*	Supplementary Form C
	Department of Agriculture, Water and Environment	*Environment Protection and Biodiversity Conservation Act 1999*	Permit to access biological resources for non-commercial purposes in a Commonwealth area
	Department of Agriculture, Water and Environment	*Environment Protection and Biodiversity Conservation Act 1999*	Permit under Part 12 of the EPBC Regulations to undertake Scientific Research in Booderee National Park
	Department of Agriculture, Water and Environment	*Environment Protection and Biodiversity Conservation Act 1999*	Permit under Part 8A of the EPBC Regulations to collect biological resources from Booderee National Park
	Department of Agriculture, Water and Environment	*Environment Protection and Biodiversity Conservation Act 1999*	Permit under Part 13A of the EPBC Act to export wildlife

13. SIGNATURE(S)

Name(s) and Signature(s) of Proponents	[redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted] [redacted]

APPENDICES

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