

18 April 2016

Committee Secretary
Senate Standing Committees on Environment and Communications
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**BirdLife Australia submission to the Senate Standing Committee on
Environment and Communications, Inquiry into**

**“Response to, and lessons learnt from, recent bushfires
in remote Tasmanian wilderness”.**

BirdLife Australia welcomes this opportunity to provide the Committee with a submission to its inquiry into the recent Tasmanian bushfires.

As the nation’s pre-eminent ornithological organisation, our submission will focus on the threat from fires to endangered and endemic birds in the Tasmanian wilderness, and the potential loss of global avian biodiversity values that we propose to be as significant as the currently recognised Outstanding Universal Values within the World Heritage Area.

There is the very real potential to permanently lose Outstanding Universal Values, such as the Orange-bellied Parrot and other biodiversity values forever unless adequate resources and capacity are provided with a concomitant commitment from both the Australian and Tasmanian Governments to manage and conserve the TW WHA for present and future generations.

BirdLife Australia has provided the Committee with copies of the two scientific papers cited in this submission, and would welcome the opportunity to appear before the Committee to expand upon this submission if this would assist the Committee in its efforts.

Yours sincerely

Summary of Recommendations

Recommendation 1. BirdLife Australia urges the Australian Government to recognise the Important Bird and Biodiversity Areas (IBAs) present around Australia for their contribution to global biodiversity, and the threats posed to these IBAs and their biodiversity values from climate change.

Recommendation 2. BirdLife Australia urges the Australian Government to recognise bird values inside IBAs (eg endemic species, biome-restricted species) as equivalent to Outstanding Universal Values (OUVs) of the Tasmanian Wilderness World Heritage Area (TW WHA).

Recommendation 3. BirdLife Australia urges the Australian Government to formally recognise Important Bird and Biodiversity Areas (IBAs) in Australia as a Matter of National Environmental Significance under the EPBC Act (1999) to ensure appropriate protection to these areas of significant global biodiversity.

Recommendation 4. BirdLife Australia urges the Australian Government to formally recognise the threat to global biodiversity arising from climate change, including the recent increased fire frequencies and intensities within the TW WHA, noting that these are predicted to increase, resulting in ever-increasing threats to all floral and faunal values, including endemic and biome-restricted species present within IBAs.

Recommendation 5. BirdLife Australia urges the Australian Government to facilitate the Tasmanian Government's development of an holistic, evidence-based fire management plan for TW WHA, explicitly recognising the fire sensitivities of alpine, conifer and other vegetation communities with the extreme fire sensitivities as previously identified.

Recommendation 6. BirdLife Australia urges the Australian Government to engage with the Tasmanian Government to increase Tasmania's capacity to respond to dry lightning fires in the TW WHA and other remote regions to minimise the loss of biodiversity values, including bird values inside IBAs.

Recommendation 7. BirdLife Australia urges the Australian Government to formally support long-term ecological research to quantify the impacts of fires and resultant habitat loss on key biodiversity values within the TW WHA. This research should initially prioritise the vegetation communities identified as having extreme and very high fire sensitivities.

Recommendation 8. BirdLife Australia urges the Australian Government to formally establish long-term ecological monitoring sites to provide quantitative scientific data on the rates of recovery of key biodiversity values to inform future management of the TW WHA. In the absence of government-funded monitoring, BirdLife Australia urges the Australian Government to support community-based efforts to obtain the quantitative scientific data.

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1. Introduction to BirdLife Australia

BirdLife Australia is the nation's oldest conservation organisation, and was founded in 1901, the year of Federation. The organisation is recognised around the country and around the world for its strong voice and highly developed and professional expertise in the conservation of Australia's birds and their habitats.

BirdLife International is the world's largest nature conservation partnership, with 120 partner organisations worldwide, including BirdLife Australia. BirdLife is widely recognised as the world leader in bird conservation. Globally, the partnership has more than 13 million members and supporters, of which more than 75,000 are present in Australia.

BirdLife Tasmania is a State Branch of BirdLife Australia. With more than 470 members, BirdLife Tasmania has one of the highest *per-capita* Branch memberships in Australia, clearly demonstrating a widespread community interest in Tasmania's birds and their conservation and management.

BirdLife Tasmania has a significant profile with the Tasmanian community, with strong links with all three NRM agencies in the State and with DPIPW, many Local Government Councils and numerous community land and coastal 'care' groups around the state.

BirdLife Tasmania strongly supports evidence-based management and the application of the Precautionary Principle to ensure the highest chance for the conservation of Tasmania's birds and their habitats for future generations.

2. Birds as bio-indicators

The paradigm of canaries providing an early warning signal to miners of the presence of toxic gases and of an unsafe environment is equally applicable to Tasmania, Australia and the rest of the planet today.

Since the 1960s, when the environmental impacts of intensive DDT use around the world were manifested in bird populations decreasing rapidly due to eggshell thinning to the current day, birds have been and continue to be recognised as excellent indicators of ecosystem health around the world. As top-order predators in nature, bird populations reflect the integrity of ecological food webs and ecosystem processes of their environments.

Conversely, the increasing frequency of threatened species (ie those listed as *Vulnerable*, *Endangered* and *Critically Endangered* by the IUCN) is indicative of the presence and persistence of threatening processes and/or disturbance to natural processes, arising almost exclusively from the impacts of human activities.

Each conservation category is associated with an increased risk of extinction of the species in the wild. Governments, NGOs and communities around the world, including BirdLife Australia, are working to prevent such extinctions.

With one in eight of the world's 10,000 bird species (12%) now globally threatened, birds are providing a clear, compelling and unequivocal indication of the critical need to protect remaining natural habitats globally to minimise the possibilities of the loss to extinction of these species. Of greatest priority for conservation are intact ecosystems that remain unmodified and undisturbed by human activities.

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In Tasmania, more than 10% of the State's bird species are formally listed as Threatened, with 37 bird species and sub-species recognised by the Tasmanian Government as *Rare*, *Vulnerable* or *Endangered*. Unfortunately, three species and sub-species are Extinct.

As highly conspicuous and audible components of the environment and ecosystems, birds also provide robust indicators or proxies to the biodiversity of an area. The broad diversity of prey species of many birds (for example, insects, other invertebrates and flowering plants) allows for their use as indicators or proxies of ecosystem biodiversity.

As highly visual and vocal species, birds are typically the most conspicuous elements of an ecosystem, providing a relatively easy to obtain metric on ecosystem diversity and other metrics. Consequently, birds are also the easiest species in the environment from which to obtain data on their presence/absence and abundances.

Changes in the abundance and/or distribution of birds indicate potential changes to ecosystem structure/function/processes from natural ecological changes (ie no human influence or involvement) such as drought or vegetation succession. Environmental changes are reflected in the changes in the bird species and communities present.

Changes from human-influenced events are much more rapid, often resulting in the breakdown of ecosystems as natural processes and functions are unable to respond in the shorter time scales between events or to the increased intensity of events. Species' extinctions and the collapse of ecosystem processes and functions are typical consequences.

This significant role of bio-indicator of environmental health by birds is recognised by their inclusion in numerous State of the Environment Reports around the World. National reports, regional and continental syntheses draw heavily on bird population numbers, trends and distributions to infer status and trends in other species for which data are lacking, and to provide an insight into the efficacy of management and the integrity (or otherwise) of natural environments.

We are fortunate in Australia to have completed two continental-scale Atlases of birds – in the late 1970s and the late 1990s, with ongoing surveys and monitoring continuing into the future. Australia is the only continent to have undertaken such an effort. With long-term bird data from parts of Australia dating from the mid-1800s following European settlement, we have the capacity and opportunity to use birds as biological indicators based on scientific data over a wide range of temporal and spatial scales.

Birds are used to assess the efficacy of management plans and recovery strategies for species and habitats. Monitoring data are collated to provide indicators at national, regional and global scales, including Ramsar Convention and the Convention on Biological Diversity.

Woodland birds are often the top of any food web in woodland areas, and their population size and trends reflect ecosystem health and processes. Birds provide highly visible and accurate snapshots of local, national and global ecosystem health.

3. Important Bird and Biodiversity Areas (IBAs)

An international program to identify areas of importance to birds was initiated by BirdLife International using standard, internationally agreed and internationally-applied criteria for all area assessments. The Important Bird and Biodiversity Area (IBA) Programme identifies, monitors and protects a global network of IBAs for the conservation of the world's birds and other wildlife.

IBAs are areas around the world recognised internationally for the biodiversity values present

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within them, and the critical roles they provide to conserve global biodiversity.

Although bird faunas define each IBA in the network, the conservation and appropriate management of these areas will ensure the survival of a high number of other animal and plant species. IBAs are the sites critical to ensure the survival of viable populations of most of the world's bird species.

IBAs also support a large and representative proportion of other biodiversity, providing a holistic approach to conservation rather than the species-based approach that is more often used.

IBAs overlap with Ramsar sites in their criteria for selection, but the IBA selection criteria include all species of birds, not just waterbirds. Briefly, the criteria used to identify IBAs are:

1. **Globally threatened species** (where the site is known or thought regularly to hold significant numbers of a globally threatened species, or other species of global conservation concern),
2. **Restricted-range species** (where the site is known or thought to hold a significant component of a group of species whose breeding distributions are constrained, such as endemic species),
3. **Biome-restricted species** (where the site is known or thought to hold a significant component of the group of species whose distributions are largely or wholly confined to one biome), and
4. **Congregatory species** (where the site supports >1% or >20,000 individuals of congregatory species of waterbirds, seabirds or terrestrial species).

To date, approximately 12,000 IBAs have been identified around the World, and they represent the largest global network of important sites for biodiversity. Full details and descriptions are available at <http://www.birdlife.org/datazone/info/ibacritglob>

The identification of Australian IBAs was undertaken by BirdLife Australia and all state branches, applying the international criteria to existing survey data. Full details of the project are available at <http://birdlife.org.au/projects/important-bird-areas>

As of 2014, 314 IBAs have been identified in Australia, of which 40 are located in Tasmania (Figure 1). Eight of these IBAs overlap the Tasmanian Wilderness World heritage Area (hereafter TW WHA), Figure 1, comprising four terrestrial and coastal IBAs and four maritime island IBAs.

The four terrestrial and coastal IBAs are Cradle Mountain, Melaleuca to Birchs Inlet, North-west Tasmanian Coast and South-east Tasmania, and the four maritime island IBAs are Maatsuyker Island Group, Mewstone, Pedra Branca and Port Davey Islands.

Details of the Australian program were published by Dutson et al. (2009) available at <http://birdlife.org.au/documents/othpub-IBA-supp.pdf>

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4. Tasmania's endemic and endangered bird species in the TW WHA and Tasmanian IBAs

The four terrestrial and coastal IBAs that overlap the TW WHA (Cradle Mountain, Melaleuca to Birchs Inlet, North-west Tasmanian Coast and South-east Tasmania) support breeding populations of 11 of the 12 species of Tasmanian endemic birds (Table 1).

The South-east Tasmania IBA overlaps the TW WHA in the far southeast, close to Southport Lagoon and Recherche Bay, and supports the global population of Forty-spotted Pardalotes, but they are not present in the TW WHA.

The Melaleuca to Birchs Inlet and North-west Tasmanian Coast IBAs support the entire global population of the Critically Endangered Orange-bellied Parrot, with fewer than 70 individuals remaining in the wild (Table 2).

The Cradle Mountain, Melaleuca to Birchs Inlet, North-west Tasmanian coast and South-east Tasmania IBAs all support breeding populations of six Endangered Tasmanian bird species (Orange-bellied Parrot, Swift Parrot, Grey Goshawk, Wedge-tailed Eagle, Azure Kingfisher and Masked Owl). These species are present in numbers that are internationally significant (Table 2).

While not currently recognised in Australian or State legislations, the Convention on Biological Diversity Aichi Target 11 directs us to ensure that, *“By 2020 at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, **especially areas of particular importance for biodiversity** and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures”*.

		Terrestrial and coastal IBAs			
		Cradle Mountain	Melaleuca to Birchs Inlet	North-west Tasmanian Coast	South-east Tasmania*
Endemic Species	Tasmanian Native Hen	X		X	X
	Green Rosella	X	X	X	X
	Dusky Robin	X	X	X	X
	Tasmanian Thornbill	X	X	X	X
	Scrubtit	X	X	X	X
	Tasmanian Scrubwren	X	X	X	X
	Yellow Wattlebird	X			X
	Yellow-throated Honeyeater	X	X	X	X
	Black-headed Honeyeater	X	X	X	X
	Strong-billed Honeyeater	X	X	X	X
	Black Currawong	X	X	X	X
	Forty-spotted Pardalote				X

Table 1. Endemic species of Tasmanian birds in the four terrestrial and coastal IBAs, based on BirdLife Australia data, available from <http://www.birddata.com.au/iba.vm>

* The South-east Tasmania IBA does not overlap the TW WHA.

IBAs are key biodiversity areas of international significance, and the incorporation and inclusion of these internationally-assessed and internationally-recognised IBAs and their values that overlap the TW WHA is critical for the future management regime and conservation effort of the TW WHA.

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Because the same methods used globally to identify IBAs elsewhere on the planet were used by BirdLife Australia, the IBAs have identified internationally-significant areas of conservation significance, placing the onus on the Tasmanian and Australian Governments to recognise these internationally-significant values and incorporating appropriate management regimes in the TW WHA Management Plan to ensure their continued persistence into the future.

BirdLife Tasmania believes that while their designation currently has no legal basis, there exists a strong scientific basis to justify immediate conservation action in the conservation of all IBAs identified within Australia, including those that overlap with the TW WHA.

Recommendation 2. BirdLife Australia urges the Australian Government to recognise bird values inside IBAs (eg endemic species, biome-restricted species) as equivalent to Outstanding Universal Values (OUVs) of the Tasmanian Wilderness World Heritage Area (TW WHA).

Recommendation 3. BirdLife Australia urges the Australian Government to formally recognise Important Bird and Biodiversity Areas (IBAs) in Australia as a Matter of National Environmental Significance under the EPBC Act (1999) to ensure appropriate protection to these areas of significant global biodiversity.

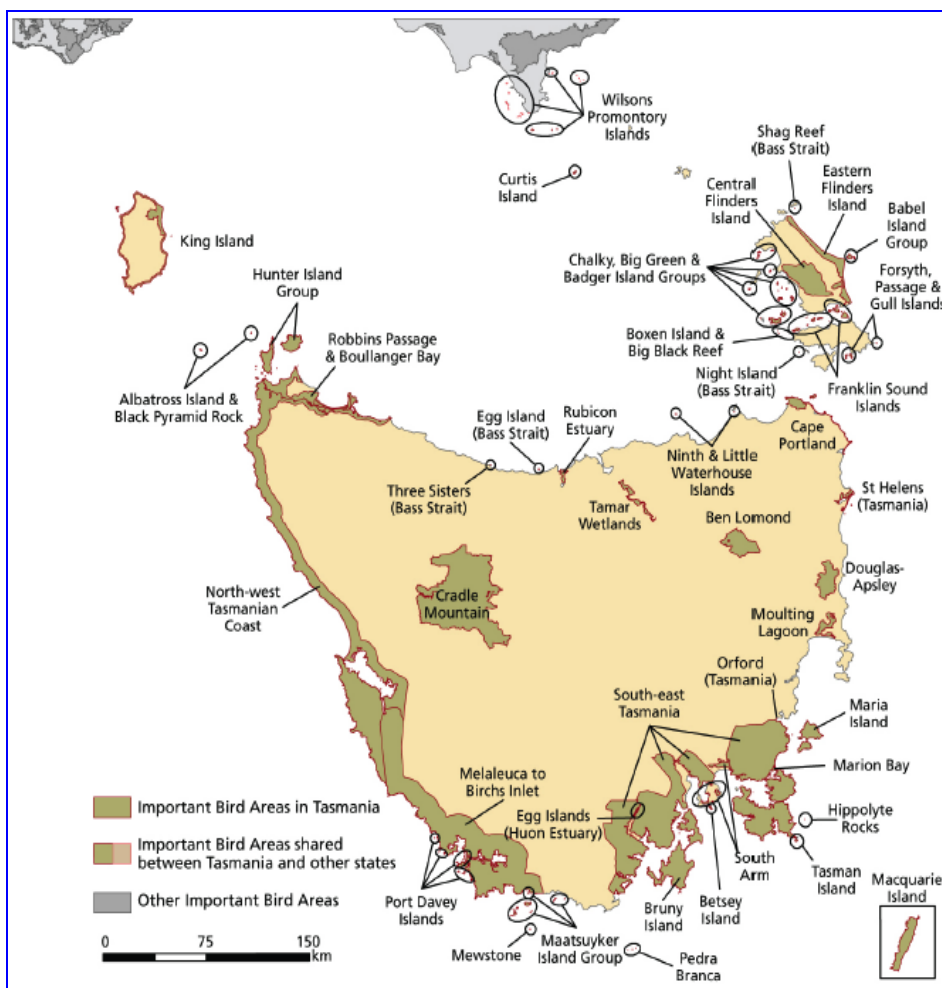


Figure 1. Important Bird and Biodiversity Areas (IBAs) in Tasmania
(source: <http://birdlife.org.au/projects/important-bird-areas/iba-maps>).

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Threatened Species	Conservation Status	Terrestrial and coastal IBAs			
		Cradle Mountain	Melaleuca to Birchs Inlet	North-west Tasmanian Coast	South-east Tasmania
Orange-bellied Parrot**	Endangered		X **	X **	
Swift Parrot*					X
Grey Goshawk		X	X	X	X
Wedge-tailed Eagle		X	X	X	X
Azure Kingfisher		X	X	X	X
Masked Owl			X	X	X

Table 2. Presence of six species and sub-species of Endangered Tasmanian birds within the four terrestrial and coastal IBAs that overlap the TW WHA, based on BirdLife Australia data, available from <http://www.birddata.com.au/iba.vm>

* The Swift Parrot is listed as *Critically Endangered* by the IUCN and *Endangered* by the Australian Government.

** It is critical to note that the entire global population of Orange-bellied Parrots in the wild is found in the Melaleuca to Birchs Inlet and North-west Tasmanian Coast IBAs during their breeding and migration.

** The Orange-bellied Parrot is listed as *Critically Endangered* by the Australian Government and the IUCN.

5. Fires, IBAs and bird values of the TW WHA

Current observations support the significant increase in the frequency of dry lightning strikes and associated fires in the TW WHA since the beginning of the 21st Century. Anecdotal and preliminary evidence for the 2015/16 summer indicates that the number of lightning strike fires was an order of magnitude greater than any previous year in the period 1993/94 - 2012/13. Before 2001, fires arising from dry lightning strikes were considered to be rare in the TW WHA.

While there is no empirical scientific evidence yet available to link the increased frequency of dry lightning strikes and concomitant fires in the TW WHA with contemporary changes in our climate, the relationship is consistent with our current understanding and earlier predictions of increased frequency and intensity of extreme events associated with climate change.

Changes in the fire frequency and intensity, and critically, fire locations, pose serious and significant risks to bird (and other fauna and flora) values in the TW WHA not exposed to fire as a natural ecological process for many 100s of years or longer.

Fires in TW WHA pose threats to the biodiversity values of the TW WHA, the IBAs that overlap the WHA, and the biodiversity of Australia. The current rainforest, conifers and alpine heathland and the bird species (and other fauna dependent upon them) are the surviving representatives of historical extents that were far greater in the past than today.

Alpine and conifer vegetation communities have extreme fire sensitivities, indicating that any fire will cause either irreversible or very long-term (>500 years) damage (Pyrke and Marsden-Smedley 2005). The authors indicated that the appropriate fire management regime for these vegetation communities was the suppression of all fires.

Evidence-based management, and the application of the Precautionary Principle in the absence

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of scientific data, is critical to all aspects of fire management in the TW WHA to conserve the remaining stands of rainforest, conifers and alpine heathland and the bird species dependent upon them. This will reduce the potential loss of biodiversity from the TW WHA, Tasmania and Australia.

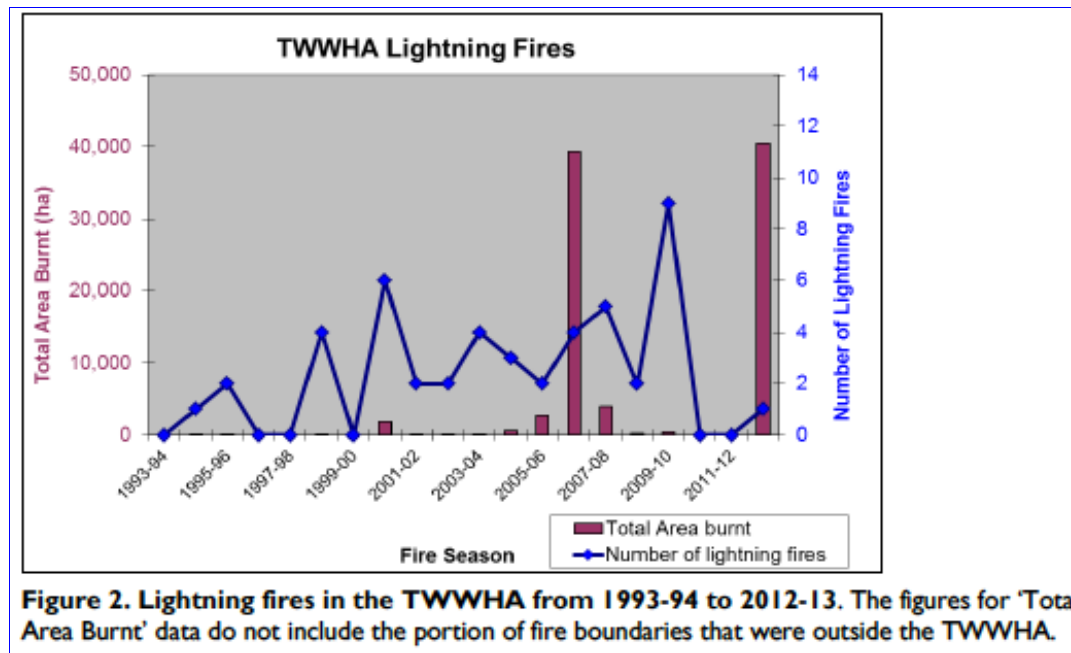


Figure 2. Lightning fires in the TW WHA 1993/94 – 2012/13 (taken from Pyrke and Jones 2013). Data for the period 2012/13 – present are not in the public domain.

Fire is an issue for the island IBAs inside the TW WHA. The four island IBAs within the TW WHA are all vegetated, and are equally at risk from fire as the mainland IBAs. All islands support significant seabird populations, and fires on these islands pose risks to breeding seabirds and their nesting habitat.

Pyrke and Marsden-Smedley (2005) categorised the vegetation community "*Seabird rookery complex*" as having a *Very High* fire sensitivity. Even a single fire in this community will cause significant change to community structure for 50 – 100 years, and will increase the probability of subsequent fires changing the community more permanently.

Large breeding populations of burrowing seabirds, such as penguins and shearwaters are present on these islands during the spring and summer months. Fires on these islands can kill breeding birds if the fire occurs during the breeding season (ie summer months) but also alter the vegetation, reducing the capacity of the island to support breeding seabird populations.

The 2015/16 Tasmanian bushfires burnt areas of the North-west Tasmania Coast and Cradle Mountain IBAs, in addition to areas of the TW WHA (Figure 3, Table 2).

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Species	Common Name	Tas	EPBC	AR	GC	LM	M C
<i>Accipiter novaehollandiae</i>	Grey Goshawk	EN		X		X	X
<i>Aquila audax fleayi</i>	Wedge-tailed Eagle	EN	EN	X		X	X
<i>Ceyx azureus diemenensis</i>	Tasmanian Azure Kingfisher	EN	EN	X		X	
<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle	VU		X	X	X	
<i>Lathamus discolor</i>	Swift Parrot	EN	EN			X	
<i>Neophema chrysogaster</i>	Orange-bellied Parrot	EN	CR	X			
<i>Tyto novaehollandiae castanops</i>	Masked Owl	EN	VU	X			

Table 3. Threatened bird taxa previously recorded from within four areas burnt during the 2015/16 bushfires. Abbreviations used: Tas – status under the Tasmanian Threatened Species Act, EPBC – status under the Federal EPBC Act: EN = Endangered, VU = Vulnerable, CR = Critically Endangered. Fire area codes: AR Arthur River, GC Griffith Creek, LM Lake Mackenzie and MC Mount Cullen. A buffer zone of approximately 5km was used around the fires' extents.

The Lake Mackenzie fire was within the Cradle Mountain IBA, and the Arthur River and Griffiths Creek fires were within the North-west Tasmania Coast IBA. The Lake Mackenzie and Mount Cullen fires were within the TW WHA but did not overlap with an IBA.

A total of seven formally-listed Threatened bird taxa have been previously recorded from within or immediately adjacent to the areas burnt during the 2015/16 bushfires (Table 2). One species is listed as Critically Endangered (Orange-bellied Parrot), five species and sub-species as Endangered (Grey Goshawk, Wedge-tailed Eagle, Azure Kingfisher, Swift Parrot and Masked Owl), and one species as Vulnerable (White-bellied Sea-eagle).

The Lake Mackenzie, Arthur River, Griffiths Creek and Mount Cullen fires destroyed breeding and feeding habitats for these seven formally-listed Threatened bird taxa, six of which are Endangered or Critically Endangered under State and/or Australian legislation.

The loss of breeding and feeding habitats for these Threatened species represents additional pressures on these species already at risk of extinction. If individuals survived the fire, the birds associated with the vegetation that was permanently destroyed by the fires must now find alternative nesting and feeding habitats – if they are available. In many cases, “empty” breeding territories and “unused” feeding habitats do not exist, and the displaced birds do not survive.

The surviving birds that have been displaced from their specialised habitats have been forced to enter sub-optimal or alternative habitats looking for new feeding and nesting habitats. These may not provide the necessary resources as much of Tasmania is presently experiencing abnormally dry conditions and can be described as highly stressed habitats. Consequently, the displaced birds do not survive.

The increased frequency and intensity of dry-lightning fires in IBAs poses a risk to the persistence of Endangered species within them, and the concomitant biodiversity values present. Any loss of biodiversity within IBAs reduces Australia's contribution to global biodiversity conservation, and is unacceptable to BirdLife Australia.

The Lake Mackenzie, Arthur River, Griffiths Creek and Mount Cullen fires destroyed breeding and feeding habitats for 11 species of endemic birds (Table 4). Tasmania's 12 endemic bird species are unique, and found nowhere else in the world, and the loss of breeding and feeding habitats for these species represents additional pressures on these species.

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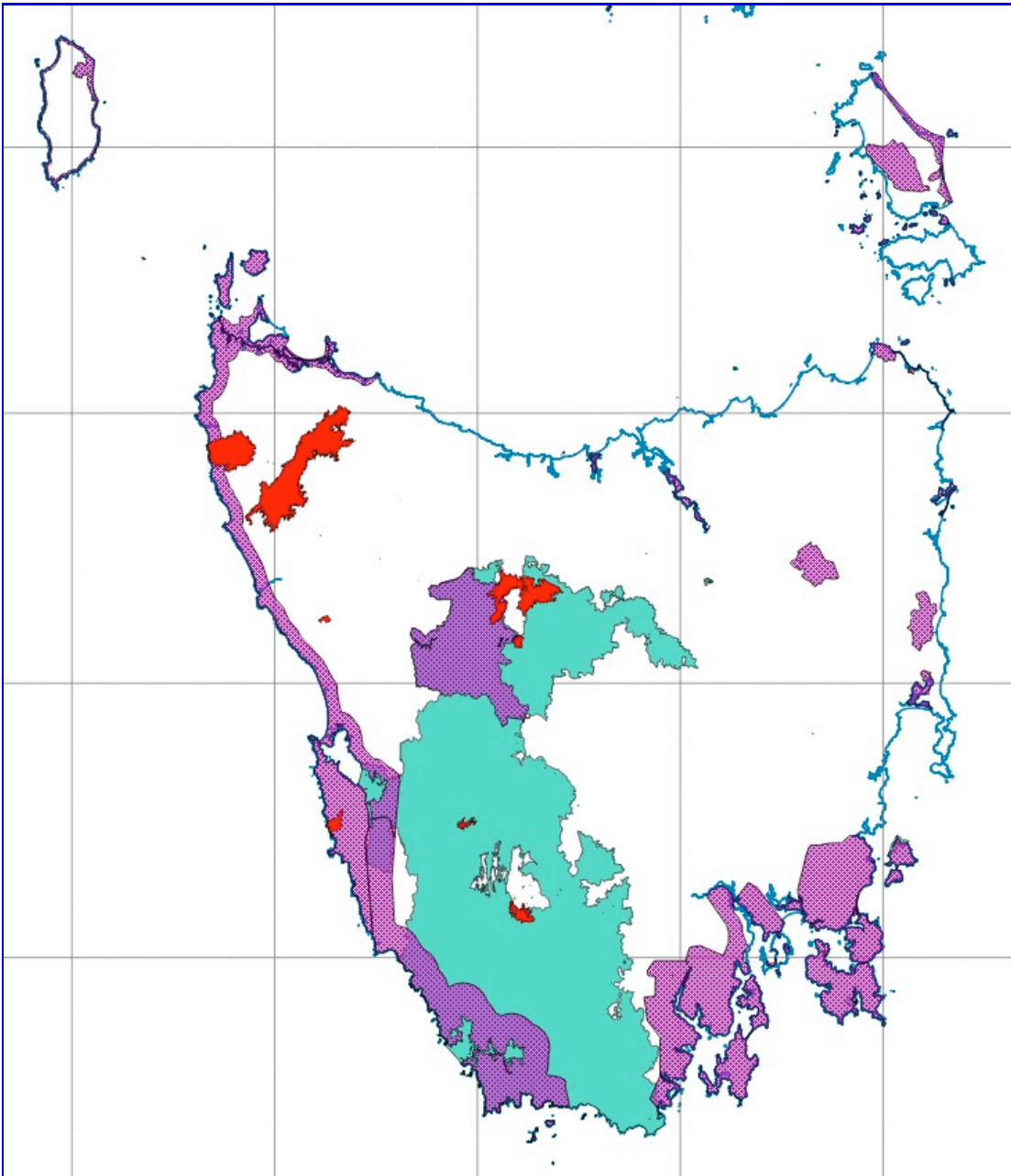


Figure 3. Map showing IBAs (purple), World Heritage Areas (aqua) and the 2015/16 bushfires (red). Bushfire GIS data courtesy of Prof D Bowman, University of Tasmania.

While the endemic bird species are not confined to the TW WHA, any loss of breeding and feeding habitat for these species poses additional and unnecessary risks and threats to the species. The extinction of an endemic species is irrevocable.

The Australia Government's State of Environment Report 2011 recognised the lack of an outcomes indicator for biodiversity. The Australian Government subsequently helped BirdLife Australia fund the development of Australia's first bird indices in the State of Australia's Birds (SoAB) report in 2015. The report is available at <http://birdlife.org.au/education-publications/publications/state-of-australias-birds>

Birds are universally used as biodiversity indicators throughout the world, and scientific data on the impacts of fires on biodiversity can be obtained from dedicated bird surveys and monitoring.

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Common name	Scientific name	AR	GC	LM	MC
Black Currawong	<i>Strepera fuliginosa</i>	X	X	X	X
Black-headed Honeyeater	<i>Melithreptus affinis</i>			X	
Dusky Robin	<i>Melanodryas vittata</i>	X		X	X
Forty-spotted Pardalote	<i>Pardalotus quadragintus</i>				
Green Rosella	<i>Platycercus caledonicus</i>	X	X	X	X
Scrubtit	<i>Acanthornis magnus</i>	X		X	X
Strong-billed Honeyeater	<i>Melithreptus validirostris</i>	X		X	X
Tasmanian Native-hen	<i>Tribonyx mortierii</i>	X		X	
Tasmanian Scrubwren	<i>Sericornis humilis</i>	X	X	X	X
Tasmanian Thornbill	<i>Acanthiza ewingii</i>	X		X	X
Yellow Wattlebird	<i>Anthochaera paradoxa</i>			X	
Yellow-throated Honeyeater	<i>Lichenostomus flavicollis</i>	X	X	X	X

Table 4. Endemic bird taxa previously recorded from within four areas burnt during the 2015/16 bushfires. Fire area codes: AR Arthur River, GC Griffith Creek, LM Lake Mackenzie and MC Mount Cullen. A buffer zone of approximately 5km was used around the fires' extents.

The predicted increase in the frequency and intensity of dry-lightning fires in the TW WHA and IBAs dictates the need for rigorous scientific research efforts, with appropriate resourcing and capacity, to provide managers and the Tasmanian and Australian Governments with the scientific data critical to apply evidence-based, scientifically valid principles in management and conservation of the TW WHA and IBAs.

In the absence of such data, the application of the Precautionary Principle must be the sole alternative, rather than current policies.

Recommendation 4. BirdLife Australia urges the Australian Government to formally recognise the threat to global biodiversity arising from climate change, including the recent increased fire frequencies and intensities within the TW WHA, noting that these are predicted to increase, resulting in ever-increasing threats to all floral and faunal values, including endemic and biome-restricted species present within IBAs.

Recommendation 5. BirdLife Australia urges the Australian Government to facilitate the Tasmanian Government's development of an holistic, evidence-based fire management plan for TW WHA, explicitly recognising the fire sensitivities of alpine, conifer and other vegetation communities with the extreme fire sensitivities as previously identified.

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6. Concluding remarks

The Australian Government, as signatory to the World Heritage Convention, has the ultimate responsibility for the conservation and management of the TW WHA. The TW WHA was inscribed on the basis of a remarkable and unique suite of values. Climate change and associated increases in the frequency and intensity of events such as lightning strikes poses serious risks to the values of the TW WHA, including the area's biodiversity.

There is the very real potential to permanently lose the Outstanding Universal Values, such as the Orange-bellied Parrot and other biodiversity values forever unless adequate resources and capacity are provided with a concomitant commitment from both the Australian and Tasmanian Governments to manage and conserve the TW WHA for present and future generations.

References cited (PDFs provided with submission)

Pyrke A, Jones G 2013. Case study — Fire management in the Tasmanian Wilderness World Heritage Area; Monitoring and Reporting System for Tasmania's Parks and Reserves. Hobart: Parks and Wildlife Service, 17pp.

Pyrke AF, Marsden-Smedley JB 2005. Fire-attributes categories, fire sensitivity, and flammability of Tasmanian vegetation communities. *Tasforests* 16, 35-46.

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Appendix 1. Senate Environment and Communications References Committee Inquiry Terms of Reference

Response to, and lessons learnt from, recent bushfires in remote Tasmanian wilderness

On 17 March 2016, the following matter be referred to the Environment and Communications References Committee for inquiry and report by **30 May 2016**:

The response to, and lessons learnt from, recent fires in remote Tasmanian wilderness affecting the Tasmanian Wilderness World Heritage Area, with particular reference to:

- a. the impact of global warming on fire frequency and magnitude;
- b. the availability and provisions of financial, human and mechanical resources;
- c. the adequacy of fire assessment and modelling capacity;
- d. Australia's obligations as State Party to the World Heritage Convention;
- e. world best practice in remote area fire management; and
- f. any related matter.

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