

Mordialloc Bypass Project

Report of Ian John Smales

1 Introduction

I have been engaged by Clayton Utz Lawyers on behalf of the Major Road Projects Victoria in my capacity as an expert in the field of ornithology.

I have been asked to review the Environment Effects Statement (**EES**) and draft Planning Scheme Amendment prepared for the Mordialloc Bypass Project (**Project**) to the extent relevant to my area of expertise.

I have also been instructed to review and respond to the public submissions in respect of the EES and draft Planning Scheme Amendment relevant to my area of expertise.

Further, I have been asked to review an alternative road interchange design set out in a memo dated 31 January 2019 from Peter Kelly of WSP, entitled *EES – Alternative Lower Dandenong Road / Mordialloc Bypass Freeway interchange Arrangement*.

2 Qualifications and experience

Appendix A contains a statement setting out my qualifications and experience, and the other matters in accordance with Planning Panels Victoria's 'Guide to Expert Evidence'.

A copy of my curriculum vitae is provided in Appendix B.

3 Background to assessment for significant birds

I note that the project was referred to the Australian Government under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The delegate for the Commonwealth Minister for the Environment and Energy determined on 30 January 2018 that the project is a 'controlled action', as it may have a significant effect on the following matters of national environmental significance (MNES), which are protected under Part 3 of the EPBC Act:

- Ramsar wetlands (sections 16 and 17B);
 - listed threatened species and communities (sections 18 and 18A); and
 - listed migratory species (sections 20 and 20A)
- I note that, the *Scoping Requirements for Mordialloc Bypass Environment Effects Statement* ('EES Scoping Requirements') includes draft evaluation objectives for biodiversity to avoid, minimise or offset potential adverse effects on native vegetation, listed migratory and threatened species and communities, as well as habitat for other protected species.

Of relevance to birds and/or their habitats, the EES Scoping Requirements lists the following key issues:

- Direct loss of native vegetation and any associated listed threatened flora and fauna species and communities known or likely to occur in the project site, such as Plains Grassy Woodland, Damp Sands Herb-rich Woodland/Heathy Woodland Mosaic, Plains Grassy Wetlands, Creekline Grassy Woodland and Swamp Scrub Plains Grassy Woodland.
- Direct loss of, or degradation to, habitat for flora and fauna species listed as threatened or migratory under the EPBC Act, the FFG Act and/or DELWP Advisory Lists, including but not limited to avifauna species, in particular:
 - Australian Fairy Tern *Sternula nereis nereis*;
 - Eastern Curlew *Numenius madagascariensis*;
 - Curlew Sandpiper *Calidris ferruginea*;
 - Australasian Bittern *Botaurus poiciloptilus*;
 - Sharp-tailed Sandpiper *Calidris acuminata*;
 - Latham's Snipe *Gallinago hardwickii*; and
 - Australian Painted Snipe *Rostratula australis*.
- Indirect loss of vegetation or habitat quality, that may support any listed species or other protected fauna, resulting from hydrological or hydrogeological change, edge effects, overshadowing, habitat fragmentation, loss of connectivity, or other disturbance impacts including noise from haul trucks during construction and from potential increased traffic along Springvale Road through the Edithvale Wetland.
- Potential for adverse effects on the ecological character and biodiversity values of the listed Edithvale-Seafood Wetlands Ramsar site including, but not limited to, the bird species mentioned above.
- Potential for indirect effects on biodiversity values including but not limited to those effects associated with changes in hydrology (including surface and groundwater changes), water quality (i.e. on water dependent ecosystems), contaminants and pollutants, weeds, pathogens and pest animals.
- Potential for impacts on FFG Act and EPBC Act listed species and other protected species resulting from construction and operation activities, including but not limited to significantly increasing mortality due to road traffic, and disturbance to foraging, roosting and breeding of listed threatened species and listed migratory species due to increased lighting, noise and traffic.
- Potential for indirect significant impacts due to shading of vegetation because of the project including but not limited to elevated structures, such as the proposed bridges over Mordialloc Creek and the Waterways wetlands.
- The availability of suitable offsets for the loss of native vegetation and habitat for relevant listed threatened species, ecological communities and migratory species under the EPBC Act and/or FFG Act.

- The potential for adverse effects on biodiversity values of the Edithvale-Seafood Wetlands Ramsar site including, but not limited to Australasian Bittern and Sharp-tailed Sandpiper.

Of relevance to birds and/or their habitats, the EES Scoping Requirements requires the assessment of likely effects as follows:

- Assess likely indirect effects of the project on the ecological character and habitat values of the Edithvale-Seafood Wetlands, Braeside Park, the Waterways Wetlands and Woodlands Industrial Estate Wetlands.
- Assess likely direct and indirect effects of the project and relevant alternatives on protected fauna and their habitat, including listed (FFG Act/EPBC Act) threatened and migratory species, relative to existing hazards and risks where relevant.
- Assess likely cumulative effects on biodiversity-related values that might result from the project in combination with other projects or actions taking place or proposed nearby.

4 Investigations I have made for the EES

- I have been retained by Clayton Utz lawyers since December 2018 to provide expertise related to wetland birds for the Mordialloc Bypass EES process. Investigations of fauna, including specific studies of wetland birds, were undertaken by others and are detailed in the report *Mordialloc Bypass Flora and Fauna Impact Assessment* (WSP report number 2135645A-SE-26 ECO-REP-0001 REV 1) ('main flora and fauna report').
- I have reviewed the main flora and fauna report which includes a summary of previous reports that provide information about threatened and migratory bird species and their habitats that may be affected by the Mordialloc Bypass project.
- I have also reviewed Chapter 10 *Biodiversity* of the Mordialloc Bypass Environment Effects Statement which provides a summary of relevant information.
- I have reviewed the following appendices to the main flora and fauna report:
 - Appendix A *Supplementary Figures*
 - Appendix C *Fauna species lists and survey results*
 - Appendix D *Likelihood of occurrence assessment*
 - Appendix E *Assessment of EPBC Act listed communities*
 - Appendix G *EPBC Act Significant impact criteria assessments*
- I have also reviewed the following chapters of the Mordialloc Bypass Environment Effects Statement and attachments to it:
 - Chapter 6 *Project description*
 - Chapter 10 *Biodiversity*
 - Chapter 22 *Matters of National Environmental Significance*

- Chapter 23 *Environmental management framework* (including specific Environmental Performance Requirements (EPRs))
- Attachment I *Environmental Risk Assessment*
- Attachment III *Maps and figures*
- I have read the *Referral decision and designated proponent – controlled action Mordialloc Bypass Project, Victoria (EPBC 2017/8091)* issued by the Australian Government Department of Environment and Energy on 30 January 2018.
- I am familiar with the following policy documents published by the Australian Government Department of Environment and Energy:
 - *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (2013)*
 - *EPBC Act Policy Statement 3.21 - Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species (2015)*
 - *Conservation Advice Botaurus poiciloptilus (Australasian Bittern)* (approved by the Minister’s delegate under the EPBC Act 19 January 2019)
- I have taken into account the overall population estimates for relevant species of migratory shorebirds published on the Australian Government Department of Environment and Energy website and in the BirdLife (2016) report:
 - Hansen, B.D., Fuller, R.A., Watkins, D., Rogers, D.I., Clemens, R.S., Newman, M., Woehler, E.J. and Weller, D.R. 2016. *Revision of the East Asian-Australasian Flyway Population Estimates for 37 listed Migratory Shorebird Species*. Report for the Department of the Environment. BirdLife Australia, Melbourne.
- I note that there is a significant body of information about bird species and their usage of the network of wetlands that has been obtained over many years by external parties as a consequence of the widely acknowledged values of these wetlands that are remnants of the former Carrum Carrum Swamps system. Much of that data is documented as records maintained and available from searchable databases listed in section 3.4.1 of the main flora and fauna report. Additional sources of records are databases maintained by organisations including BirdLife Australia and eBird Australia.
- Biosis Pty. Ltd., the company I work for, undertook surveys for wetland birds on multiple dates in 2013, 2014 and 2015 including wetlands adjacent to and potentially affected by the Mordialloc Bypass. That work is reported in *Mordialloc Bypass: Flora and Fauna Investigation including habitat hectare assessment* (Biosis 2014 report number 19266 prepared for VicRoads). I did not participate in those investigations, but I note they form part of the assessment process encapsulated by the current EES documentation.
- I have first-hand knowledge of Braeside Park, Woodlands Industrial Estate Wetlands and Waterways Wetlands/Mordialloc Creek from various visits over several years. I revisited them on 19th December to re-familiarise myself with their geography and current conditions.
- Particular references I used in my assessment are:

- The California Department of Transportation. 2016. *Technical Guidance for Assessment and Mitigation of the Effects of Highway and Road Construction Noise on Birds*. June. (Contract 43A0306.) Sacramento, CA. Prepared by ICF International, Sacramento, CA, Robert Dooling, Gaithersburg, MD, and Arthur Popper, Silver Spring, MD.
http://www.dot.ca.gov/hq/env/noise/pub/caltransBirdReport_6_15_2016.
 - Rich, C. and Longcore, T. 2006. *Ecological Consequences of Artificial Night Lighting*. Island Press. Washington.
- I have been provided with a copy of a memo dated 31 January 2019 from Peter Kelly of WSP, entitled *EES – Alternative Lower Dandenong Road / Mordialloc Bypass Freeway interchange Arrangement*.
 - I have also been provided with information from an assessment of noise and noise modelling for wetland habitats adjacent to the Mordialloc Bypass undertaken subsequent to the EES reports. This includes a table of existing and projected noise levels from multiple locations in the wetlands, and a copy of WSP maps 2135645A *Predicted free-field (no façade reflections) noise levels (2031)* dated 30/01/2019. These maps show a contour layer for noise at ≥ 60 dBA, L_{10} , 18_{HR} .

5 Summary of opinions

- I consider that the information about wetland birds and their habitats in the vicinity of the Mordialloc Bypass alignment, from various sources and as detailed in the main flora and fauna report, provides an appropriate basis for the required impact assessment and I note that knowledge of threatened and migratory birds in the vicinity of the project is better than it is for many other areas of Victoria.
- I refer to species of birds listed under a category of threat (threatened, vulnerable, endangered, critically endangered) under the EPBC Act and/or the FFG Act or listed as migratory under the EPBC Act, collectively as ‘significant’ species.
- My primary frame of reference in consideration of a ‘significant impact’ is the potential for a long-term deleterious effect on the population of any threatened or migratory bird species. This ‘population’ approach is used in criteria for significant impacts set out in policy statements for the EPBC Act. It is also appropriate because the population of any species (rather than for example numbers of individual birds) is the unit of conservation concern. The populations of all relevant significant species of birds utilise habitats within distributional ranges that are continental, or even international in scale.
- I note that all listed migratory species spend a portion of each year in Australia and the great majority of individuals undertake an annual migration to the northern hemisphere. None of the migratory birds that occur in the entire complex of wetlands under consideration for the project, breed in Australia. It is worth noting that all of such species move over very long distances and that their annual sojourn in Australia is a vital period in which they feed and obtain important resources to fuel their migrations. The significant wetland birds that are not migratory are all, at least to some extent, nomadic within Australia. As a consequence of these behaviours both migratory and nomadic wetland birds have substantial capacity to move to locations where food resources are rich. The productivity of regions within Australia

may vary due to drought, major rainfall, etc. Thus there is considerable seasonal and annual variability in usage of given locations and this applies to the wetlands under consideration for the project.

- The assessment of waterbird habitats set out in section 4.5.1.1 of the main flora and fauna report provides an appropriate break-down of categories of habitat present and of the different values they offer to relevant species of birds. I agree with these findings and note that, while there will be considerable overlap in which some species may use more than one of the habitat types, the habitat variables are important because various species of wetland birds preferentially utilise different habitats within wetlands. Table 4.8 of the main flora and fauna report appropriately indicates the particular values of defined habitats for significant bird species during periods of low and high water levels. A comparison of Table 4.8 with the Figure 4.6 *Waterbird habitat mapping* usefully indicates which portions of various wetlands are of greater or lesser value to particular species. By way of example (only), the larger, north-western lakes of the Waterways Wetlands and the south-western lake of the Woodlands Industrial Estate Wetlands contain substantial areas of open water. This is generally of greater value to some species of ducks and contrasts with more heavily vegetated habitats within other wetlands that are of greater value to cryptic species like rails, crakes and bitterns.
- Section 5 of the main flora and fauna report notes that the following residual risks remain unavoidable or mitigation measures cannot completely ameliorate the risk:
 - Direct loss of some habitat likely to be occasionally used by threatened species
 - Fragmentation of habitat
 - Mortality of protected and significant fauna
 - Traffic noise (uncertainty regarding the level of impact the Project may have, even with mitigation, upon the significant bird species)

In general I agree with this assessment, but see further detail in my comments in response to submissions below.

- EES Chapter 23 *Environmental management framework* includes specific Environmental Performance Requirements (EPRs) B1 – B6 that relate to management and reduction of effects of Mordialloc Bypass on biodiversity. I consider that they provide appropriate measures that are likely to ensure that the project does not result in significant or long-term impact on the size or functioning of the population of any significant bird species.
- The EES assessment indicates that measures have been taken to avoid direct impacts on Edithvale-Seafood Wetlands. This includes a commitment that haul trucks will not use Edithvale Road through Edithvale-Seafood Wetlands during construction (EPR B4 and Appendix G *EPBC Act Significant impact criteria assessments*, Table G.1) and that hydrology of those wetlands is not likely to be influenced by the Mordialloc Bypass. On that basis, I consider that direct impacts on birds at Edithvale-Seafood Wetlands are not likely to result from the project. However, as many of the relevant bird species may use the entire complex of local wetlands, some level of indirect effect may occur as a consequence of effects on other wetlands in the complex.

- A potential alternative interchange design set out in *EES – Alternative Lower Dandenong Road / Mordialloc Bypass Freeway interchange Arrangement* (31 January 2019 from Peter Kelly of WSP), does not alter or change any of my opinions.

6 Written Submissions

6.1 Submissions received

I have read the public submissions in respect of the EES and draft Planning Scheme Amendment for the Project and identified those that are relevant to this report and my area of expertise. These include the following submissions:

8, 9, 14, 28, 54, 56, 60, 62, 68, 69, 71, 72, 75, 76, 81, 83, 84, 87, 90, 92, 97, 102.

6.2 Summary of issues raised

The submissions have raised a number of concerns relevant to my area of expertise. I consider them in section 6.3, below, under the following themes and, where applicable, relevant to construction of the Mordialloc Bypass and its subsequent routine operation:

- Effects of Mordialloc Bypass, and especially the portion of raised carriageway, on birds at Waterways Wetlands
- The potential for Mordialloc Bypass, and especially the portion of raised carriageway, to disrupt connectivity for birds between the local network of wetlands.
- Specific concerns about loss of habitat for international migratory and threatened shorebirds (waders).
- Specific concern about impacts on threatened Australasian Bittern *Botaurus poiciloptilus* and on Latham's Snipe *Gallinago hardwickii*.
- Concerns about bird collisions with vehicles that may occur during construction and subsequent operation of Mordialloc Bypass and effects of noise and artificial light on birds.

6.3 Response to issues raised

Set out below are my comments and response to issues raised by the written submissions relevant to my area of expertise:

6.3.1 Effects of Mordialloc Bypass on birds at Waterways Wetlands

Construction of Mordialloc Bypass over and through Mordialloc Creek and Waterways Wetlands will entail some disturbance of significant birds that use those wetlands. Table 4.11 of the main flora and fauna report provides a summary of BirdLife Australia records from within 500 metres of the project area. Of a total of 40 significant species recorded from that zone, seven have been documented from Mordialloc Creek and Waterways Wetlands, however this may reflect the relatively short period since these wetlands were created and different survey effort at these and other wetlands. Nonetheless, the larger lakes in the north-western portion of Waterways Wetlands contain expanses of open water and less complex vegetated habitats than are present in others of the nearby wetlands and this is likely to limit their suitability for significant migratory species that preferentially use shallow water and vegetated wetland habitats such as exist in parts of Woodlands Industrial Estate Wetlands and Braeside Park Wetlands.

During construction activity it is likely that use by birds will be reduced by disturbance, particularly in the area of the planned raised carriageway. For the majority of the alignment through Waterways Wetlands, the disturbance is likely to be confined substantially to the period of construction and I expect that bird numbers in those areas will return to present levels after that time.

The current Waterways Wetlands are substantially the result of modifications and development of these wetlands since 2000 and I consider that any post-construction rehabilitation necessary to return the majority of the wetlands to their present condition will be achievable. A permanent reduction in habitat quality is expected to occur in the portion of the wetlands that will be shaded by the raised carriageway. However, relative to the overall complex of wetlands that represents a small area of habitat and I consider that it will still function as habitat for relevant birds, albeit in a modified condition. I do not expect that these effects will have a significant or long-term impact on the size or functioning of the population of any significant bird species.

6.3.2 Potential disruption of connectivity between wetlands

Movements of birds between the various wetlands allows them to locate and use resources as these vary between the wetlands over time and in response to environmental conditions. The complex of wetlands currently exists within a modified urban and light industrial area that requires birds to fly over such areas to move between some of the wetlands. However, the Mordialloc Bypass will add a significant major road between various of the wetlands and there is potential for it to reduce connectivity for birds between them. In particular this will alter from the present situation between Woodlands Industrial Estate Wetlands; Braeside Park and the north-western lakes of Waterways Wetlands.

Mordialloc Bypass will also be positioned between Edithvale-Seaford Wetlands and all wetlands to the east of the Bypass alignment. At Mordialloc Creek and the portion of Waterways Wetlands that will be bridged by the raised carriageway I expect that movements of significant birds will be impeded at the immediate local level during construction, but that the bridge will subsequently permit the majority of bird movements to resume, particularly under the raised structure. Disruption of bird movements over the remaining portions of Mordialloc Bypass during and after construction may take the forms of disturbance and potential mortalities due to vehicle movements; and noise and artificial light associated with construction and subsequent routine operation of the Bypass. I address these specific aspects in a subsequent point, below. I expect that the construction and operation of Mordialloc Bypass will result in a small reduction in connectivity between

the various wetlands, but the inherent capacity of birds to move between isolated patches of habitat over roads and other inhospitable environments means that connectivity will be largely maintained. By way of example, the Mornington Peninsula Freeway has been built between the Seaford section of the Edithvale-Seaford Wetlands and the Eastern Treatment Plant, both of which provide substantial habitat for the suite of species under consideration here. I recognise that approach and landing distances in this example may differ from those at wetlands adjacent to Mordialloc Bypass, but nonetheless many birds routinely fly over Mornington Peninsula Freeway between those wetland areas.

Provision of multi-function barriers is included as an element of EPR B1. The barriers are intended to reduce wildlife collisions with traffic and the effects of artificial light and noise (see 6.3.5, below). All wetland birds under consideration here move between patches of habitat by flying and in the current situation fly over buildings and other man-made structures to reach the wetlands. The proposed barriers will not impede movements of wetland birds between the different wetlands.

In my opinion it is not likely that disruption of connectivity between wetlands will result in a significant impact on the functioning of the population of any significant bird species.

6.3.3 Loss of habitat for international migratory and threatened shorebirds

Table C1 of Appendix C *Fauna species lists and survey results* to the main flora and fauna report, lists 13 species of shorebirds that are protected under provisions of the EPBC Act for migratory species. Most of these are also listed as threatened or near threatened. For each of these species Table 4.11 of the main flora and fauna report provides the number of records within 5 kilometres of the project area; all BirdLife Australia records from within 500 metres of the project area (spanning up two decades for most species); and, a summary of habitat within or nearby the project area. The number of records from within 500 metres of the project area (i.e. including Woodlands Industrial Estate Wetlands; Braeside Park; Waterways Wetlands and relevant portions of Mordialloc Creek) is less than seven for all species except Sharp-tailed Sandpiper and Latham's Snipe (for further discussion of Latham's Snipe see 6.3.4). The numbers of Sharp-tailed Sandpipers has varied considerably from zero to a single recorded instance of more than 3000 of that species at Braeside Park. Table 4.11 also shows that virtually all records for all of these species are from the most suitable habitat which occurs in the shallow-water portions of Woodlands Industrial Estate Wetlands and Braeside Park Wetlands. The Mordialloc Bypass project does not entail any direct loss of those habitats. The only area of potential habitat for migratory shorebirds that will be directly impacted will be the portions of Mordialloc Creek and Waterways Wetlands that will be spanned and shaded by the raised carriageway.

The *EPBC Act Policy Statement 3.21 - Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species* (2015) defines "nationally important habitat" for migratory shorebirds as a wetland habitat that regularly supports:

- "0.1 per cent of the flyway population of a single species of migratory shorebird OR
- 2000 migratory shorebirds OR
- 15 migratory shorebird species."

On the basis of the numbers of individuals and of species known from the complex of wetlands adjacent to the project, and the lack of regularity of their occurrences, it does not appear that the wetlands, individually or collectively, meet these criteria.

I recognise that a number of migratory shorebirds are threatened widely by habitat loss, particularly from major coastal reclamation in parts of their migration stop-over locations in north Asia and that cumulative effects on these species are of genuine concern. I also consider potential indirect effects on all significant birds, including these species in my previous and subsequent points. In providing my opinion I have taken into account the overall population estimates for relevant species of migratory shorebirds prepared by BirdLife Australia (2016) and published on the Australian Government Department of Environment and Energy website and I have provided a table (Appendix C of this report) showing total population estimates from that work, with the 13 species documented from within 500 metres of the project area highlighted. By way of example for one species, 0.1% of the estimated total population of Sharp-tailed Sandpipers is 85 individuals. While there is one report of 3000 of these birds at Braeside Park on one occasion, all other counts indicate that neither Braeside Park nor any of the other wetlands regularly support 85 or more individuals of that species.

In light of the generally small numbers of migratory shorebirds recorded from the wetlands under consideration and their occasional use of them, and that the primary areas of suitable habitat for these species will not be directly impacted by the project, I consider that a significant impact on the size or functioning of the population of any of these migratory shorebird species is not likely to result from the Mordialloc Bypass project.

6.3.4 Potential impacts on Australasian Bittern and Latham's Snipe

Australasian Bittern

Table 4.11 of the main flora and fauna report provides information that BirdLife Australia records from within 500 metres of the project area includes 45 records of Australasian Bitterns over 19 years. These records are from Woodlands Industrial Estate Wetlands and Braeside Park Wetlands. Biosis (2014) includes a pers. comm. of one record from D. Cook (Australian Ecosystems) of the species at Waterways Wetlands.

An estimated total of approximately 1000-2499 mature individuals remain in Australia, New Zealand and possibly New Caledonia. The areas with the largest populations are south-eastern Australia and New Zealand (*Bitterns in rice project* website 2017: <https://www.bitternsinrice.com.au>; EPBC Act Conservation Advice *Botaurus poiciloptilus Australasian Bittern* 2019). Recent satellite tracking of Australasian Bitterns shows that some birds spend the breeding season in the NSW Riverina and fly to coastal areas of Victoria and NSW for the annual non-breeding period (from *Bitterns in rice project* website 2017: <https://www.bitternsinrice.com.au>).

Australasian Bitterns are heavily dependent on a dense cover of reeds, rushes, sedges and other plants of relatively shallow water for their foraging, roosting and breeding activities. This habitat preference is reflected in the very great predominance of records in the project areas having come from Woodlands Industrial Estate Wetlands and Braeside Park Wetlands. These areas of suitable habitat for the species will not be directly impacted by the project and I consider that a significant impact on the size or functioning of its population is not likely to result from the Mordialloc Bypass project.

Latham's Snipe

Latham's Snipe is a migratory species. The birds annually arrive in Australia between August and September and return to Japan for their breeding season in March and April. The species frequents densely vegetated shallow margins of wetlands but also forages widely in places like grassy damp paddocks and as a consequence has been documented more widely in the vicinity of damp and wetland areas in and adjacent to the project area. However, the

great majority of records have been from Woodlands Industrial Estate Wetlands; Braeside Park Wetlands and Mordialloc Creek. There are more than 70 records for Latham's Snipe from within 500 metres of the project area (Table 4.11 of the main flora and fauna report). The counts of Latham's Snipe on any one occasion have varied between 1 and 8.

The *EPBC Act Policy Statement 3.21 - Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species* (2015) describes "important habitat" for Latham's Snipe as areas that have previously been identified as internationally important for the species, or areas that support at least 18 individuals of the species. It does not appear that the complex of wetlands adjacent to the project meet these criteria. It is also the case that the areas of primary suitable habitat for the species will not be directly impacted by the project and I consider that a significant impact on the size or functioning of its population is not likely to result from the Mordialloc Bypass project.

6.3.5 Effects of vehicle collisions, noise and artificial light

The main flora and fauna report provides assessment of the potential effects of vehicle collisions, noise and lighting of Mordialloc Bypass on fauna, including wetland birds. I recognise that vehicle collisions, noise and lighting may have some effects on significant wetland birds during construction and operation of Mordialloc Bypass. It is not my contention that major infrastructure developments do not impinge upon habitats for wetland birds or that they do not have negative effects. Nonetheless, there are numerous examples in Australia and internationally of locations where such birds, including migratory shorebirds, persist in very close proximity to major infrastructure such as ports, airports, refineries, heavy industries and major roads. These indicate that, purely from a behavioural perspective, such birds routinely habituate to such modifications and they continue to use suitable habitats in such places. Examples in Australia include:

- Curtis Island, Gladstone, Qld. shorebird foraging and roosting areas exist directly adjacent to a major industrial centre with aluminium refineries and smelters, cement production works, chemical plants, a liquefied natural gas facility and Queensland's largest power station.
- Port Botany, NSW shorebird habitat beside a container terminal dock, refinery and Sydney Airport.
- Portions of Swan River Estuary, Perth, such as Milyu and Alfred Cove where shorebird habitat is immediately beside Kwinana Freeway.
- Port Kembla, NSW, shorebird habitat adjacent to steelworks and significant shipping port.
- Port of Brisbane, Moreton Bay, migratory shorebird habitat adjacent to significant shipping port.

Vehicle collisions

I note that EPR B4 restricts construction vehicle speeds to 40km per hour within construction areas, outside of existing arterial roads. Due to the generally low speeds of construction vehicles and equipment and that birds are likely to actively avoid areas of construction activity most of the time, I consider the probability that wetland birds will be involved in collisions with construction vehicles and equipment to be very low.

The project design includes measures aimed at minimising vehicle collisions by birds during operation of Mordialloc Bypass. They are summarised in Section 6.4 and elaborated in detail in Section 7.4 of the main flora and fauna report. In respect of wetland birds, the primary measures are multi-function fauna barriers in key locations, including adjacent to

all wetlands discussed here. Provision of these barriers is included as an element of EPR B1. The barriers are designed to minimise birds colliding with vehicles by functioning as flight diverters designed to encourage birds to fly above the height of vehicles and thus to avoid collisions. I note that this is important both for traffic safety and for minimisation of effects on significant birds.

The species of birds under consideration here will not be exposed to collision risk as a result of scavenging other fauna that might be road accident victims on Mordialloc Bypass, because none of them are scavengers.

The concept that significant wetland birds might mistake the surface of Mordialloc Bypass as a waterbody after high rainfall events is highly unlikely. It is not a known cause of collisions on other major roads in Victoria. In addition, the surface of Mordialloc Bypass will be designed to drain surface water rapidly, including that it will be open-graded asphalt that will facilitate rapid drainage.

In consideration of protective measures designed to minimise the potential for vehicle collisions, I consider it unlikely that the population of any significant bird species will be significantly impacted by collisions during construction or operation of Mordialloc Bypass.

Artificial light

On the assumption that the great majority of construction works will take place during daylight hours, I also do not expect that artificial lighting will significantly affect habitats of wetland birds during the construction period. Nonetheless, it will be important that any temporary construction lighting conforms to EPRs B4 and LV5 and is directional and minimises light-spill onto habitats for wetland birds.

The design of proposed fauna barriers are specifically intended to prevent vehicle lights from reaching wetlands used by significant bird species during operation of Mordialloc Bypass. In addition, light spill from road and intersection street lighting will be minimised by the barriers along with densely planted vegetation. I consider it is important that design of lights themselves conform to EPRs B2 and LV4 to minimise the potential effects of lighting on wetland birds and their habitats adjacent to Mordialloc Bypass.

In consideration of protective measures designed to minimise the potential for disturbance effects of artificial light, I consider it unlikely that the population of any significant bird species will be significantly impacted by artificial light during construction or operation of Mordialloc Bypass.

Noise

There are no statutory guidelines in Victoria that regulate effects of noise on fauna. As a consequence, my assessment is reliant on literature about effects of noise on birds and advice provided in expert assessment of noise for the Mordialloc Bypass EES.

The most recent review of international studies of traffic and road construction noise effects on birds, of which I am aware, is provided in California Department of Transportation (2016, full reference above). Amongst other things, it outlines a number of studies that show the typical human can hear a single vehicle, traffic noise, and construction noise at a much greater distance from a roadway than can the typical bird. That report says that this provides a “*valuable, common sense and easy-to-apply risk criterion*” when considering effects of noise on birds.

Multiple investigations have demonstrated that there is a strong correlation between the range of hearing in birds and the frequency spectrum of their calls, which for most birds is

in the range 1–6 kHz. It is my understanding that traffic noise from major roads has its highest energy at levels generally below that range.

California Department of Transportation (2016) provides a general guideline indicating that noise in the range of 50-60 dBA is unlikely to noticeably interfere with bird behaviours, for instance it is unlikely that in this range birds will call more loudly to overcome background noise. WSP maps 2135645A *Predicted free-field (no façade reflections) noise levels (2031)* show a contour layer for noise at ≥ 60 dBA, L_{10} , 18_{HR} . It predicts that levels greater than 60 dBA may occur across a small western portion of Braeside Park Wetlands; across much of the eastern portions of Woodlands Industrial Estate Wetlands; and across much of the Waterways Wetlands. Noise levels at receiver locations P21 and P22 in are predicated to be 61 dBA, L_{10} , 18_{HR} . Those are the two locations with in high quality wetland habitats of Woodlands Industrial Estate Wetlands and Braeside Park Wetlands, respectively, that are closest to the Mordialloc Bypass alignment. This noise level prediction is only slightly above the general guideline levels for birds and indicates that in these higher quality habit areas the noise impacts to birds will be unlikely to disturb birds. At distances beyond the ≥ 60 dBA, L_{10} , 18_{HR} mapped contour, noise levels from construction and traffic will be lower still. This suggests that noise levels reaching the wetland habitats of significant wetland birds are not likely to disturb these species.

In consideration of protective measures designed to minimise the potential for disturbance effects of noise on habitat for wetland birds, I consider that a significant impact on the population of any of these species is not likely to result from the Mordialloc Bypass project.

Declaration

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

A handwritten signature in cursive script, appearing to read "Sanjiv Kumar".

.....

Signed

Date: 15th February 2019

Appendix A Matters Raised by PPV's Guide to Expert Evidence

(a) The name and address of the expert

Ian John Smales
Biosis Pty. Ltd.
38 Bertie St.
Port Melbourne
Vic. 3207

(b) The expert's qualifications and experience

I hold the degree of Master of Science from the University of Melbourne. My Masters dissertation was on the demography of a critically endangered bird, the Helmeted Honeyeater.

I hold the position of Principal Zoologist with Biosis Pty. Ltd.

Since 1978 I have been professionally engaged in management, research and assessment of south-eastern Australia's fauna. As detailed in my CV (Appendix B), I have been a member of a number of professional bodies working for the conservation of birds in south-eastern Australia.

(c) A statement identifying the expert's area of expertise to make the report

As detailed in my CV (Appendix B), I have been a member of a number of professional bodies working for the conservation of birds in south-eastern Australia. My career has included extensive field research into the ecology and population dynamics of birds and specifically in a number of projects investigating wetland and shorebirds birds in southern Tasmania. Port Philip, Westernport, Hattah Lakes and for wind energy developments at multiple sites.

(d) A statement identifying any other significant contributors to the report and where necessary outlining their expertise

Ecologists from WSP prepared the main flora and fauna report, including investigations and assessments for wetland birds. The present statement is my own based upon information contained in that report and additional EES documentation prepared by WSP and my own knowledge of the subject species and area affected by the project.

(e) All instructions that define the scope of the report (original and supplementary and whether in writing or oral)

I have been engaged by Clayton Utz Lawyers as an expert in ornithology. A copy of the written letter of instruction is attached as Appendix

I have been asked to review the Environment Effects Statement (**EES**) and draft Planning Scheme Amendment prepared for the Mordialloc Bypass Project (**Project**) to the extent relevant to my area of expertise.

I have also been instructed to review and respond to the public submissions in respect of the EES and draft Planning Scheme Amendment relevant to my area of expertise.

I was also asked by email from Clayton Utz to review a potential alternative interchange design set out in *EES – Alternative Lower Dandenong Road / Mordialloc Bypass Freeway interchange Arrangement*. (31 January 2019 from Peter Kelly of WSP).

(f) The identity of the person who carried out any tests or experiments upon which the expert relied on and the qualifications of that person

Ecologists from WSP prepared the main flora and fauna report, including investigations and assessments for wetland birds. The present statement is my own based upon information contained in that report and additional EES documentation prepared by WSP and my own knowledge of the subject species and area affected by the project.

(g) The facts, matters and all assumptions upon which the report proceeds

The facts, matters and assumptions upon which my report proceeds are set out, as relevant in my evidence in chief, set out above.

(h) Reference to those documents and other materials the expert has been instructed to consider or take into account in preparing the report, and the literature or other material used in making the report

Reference material and literature pertinent to my opinions are detailed in Section 4, above.

(i) A statement identifying any provisional opinions that have not been fully researched for any reason (identifying the reason why such opinions have not been or cannot be fully researched)

Noting that knowledge of ecology includes uncertainty associated with general knowledge gaps and some unpredictability in natural ecological functions, I do not consider any of my opinions to be provisional

(j) A statement setting out any questions falling outside the expert's expertise

I have not addressed any questions outside my area of expertise.

(k) A statement indicating whether the report is incomplete or inaccurate in any respect

Noting, again that knowledge of ecology includes uncertainty associated with general knowledge gaps and some unpredictability in natural ecological functions, I do not consider the report to be incomplete or inaccurate in any respect.

Appendix B Curriculum Vitae of Ian John Smales

Position

Principal Zoologist, Biosis Pty. Ltd.

Qualifications

MSc. University of Melbourne

Professional associations

Member: IUCN Species Survival Commission, Re-Introduction Specialist Group

Member: Australian Society of Herpetologists

Member: Helmeted Honeyeater National Recovery Team (1989 -)

Honorary Life Member: Friends of the Helmeted Honeyeater (bestowed 2015)

Past Member: Orange-bellied Parrot National Recovery Team (1994 – 2003)

Past Member: International Wader Study Group

Past member: Scientific Advisory Panel to the South-West Victoria Brolga Research Project

Employment history

2013–present	Principal Zoologist, Biosis Pty Ltd
2003–2013	Senior Consultant Zoologist, Biosis Research Pty Ltd
1990–2003	Conservation Biologist, Conservation and Research Department, Zoological Parks and Gardens Board of Victoria
1989	Contractor to Department of Conservation and Environment, Victoria for establishment of Recovery Team for the Helmeted Honeyeater.
1978–1987	Fisheries and Wildlife Division, Victoria (subsequently Department of Conservation, Forests and Lands).

Professional Experience:

Ian Smales, Principal Zoologist with Biosis Pty Ltd has over thirty years of professional experience in wildlife research and natural resource management with the public and non-government sectors. He has been with Biosis since 2003. Ian has broad field expertise investigating the ecology, distribution and habitat requirements of Australian vertebrate fauna and has undertaken comprehensive research projects for birds and reptiles. Ian has authored or co-authored more than eighty scientific papers and consultant reports in those fields.

Ian's career has included periods with the Wildlife Management Section of Victoria's former Fisheries and Wildlife Division (1978 - 87) and as Conservation Biologist with the Zoological Parks and Gardens Board of Victoria (1990 – 2003). He has been involved with research and management for threatened fauna throughout his career and has been a long-standing member of the national recovery teams for the Helmeted Honeyeater and the Orange-bellied Parrot.

Ian has designed and managed numerous flora and fauna assessments for multiple development projects including a number of major Government infrastructure projects.

Selected publications

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Menkhorst, P., **Smales, I.** and Quin, B. 1999. *Helmeted Honeyeater Recovery Plan 1998 – 2002*. Department of Natural Resources and Environment. Melbourne.

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Appendix C Migratory shorebird population estimates 2016

Extracted from: <http://www.environment.gov.au/biodiversity/publications/revision-east-asian-australasian-flyway-population-2016>

A summary of the revised population estimates for 37 migratory shorebirds.

Common Name	Flyway population estimate	1% Flyway Population	0.1% Flyway Population
Asian Dowitcher	14,000	140	14
Bar-tailed Godwit	325,000	3250	325
Black-tailed Godwit	160,000	1600	160
Broad-billed Sandpiper	30,000	300	30
Common Greenshank	110,000	1100	110
Common Redshank	75,000-150,000	750	75
Common Sandpiper	190,000	1900	190
Curlew Sandpiper	90,000	900	90
Double-banded Plover	19,000	190	19
Far Eastern Curlew	35,000	350	35
Great Knot	425,000	4250	425
Greater Sand Plover	200,000-300,000	2000	200
Grey Plover	80,000	800	80
Grey-tailed Tattler	70,000	700	70
Latham's Snipe*	30,000	300	18*
Lesser Sand Plover	180,000-275,000	1800	180
Little Curlew	110,000	1100	110

Common Name	Flyway population estimate	1% Flyway Population	0.1% Flyway Population
Little Ringed Plover	150,000	1500	150
Long-toed Stint	230,000	2300	230
Marsh Sandpiper	130,000	1300	130
Oriental Plover	230,000	2300	230
Oriental Pratincole	2,880,000	28,800	2880
Pacific Golden Plover	120,000	1200	120
Pectoral Sandpiper	1,220,000-1,930,000	12,200	1220
Pin-tailed Snipe	170,000	1700	170
Red Knot	110,000	1100	110
Red-necked Phalarope	250,000	2500	250
Red-necked Stint	475,000	4750	475
Ruddy Turnstone	30,000	300	30
Ruff	25,000-100,000	250	25
Sanderling	30,000	300	30
Sharp-tailed Sandpiper	85,000	850	85
Swinhoe's Snipe	40,000	400	40
Terek Sandpiper	50,000	500	50
Wandering Tattler	10,000-25,000	100	10
Whimbrel	65,000	650	65
Wood Sandpiper	130,000	1300	130

Appendix D – Letter of instruction

10 December 2018

Mr Ian Smales MSc
Biosis
38 Bertie Street
Port Melbourne VIC 3027

By email: ismales@biosis.com.au

Dear Ian

Mordialloc Bypass (Freeway) Project Engagement of Expert Witness - Ecology (Ornithology)

We act for the Major Road Projects Authority in relation to the Mordialloc Bypass (Freeway) Project (**Project**).

The Project is a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and requires an Environment Effects Statement (**EES**) under the *Environment Effects Act 1978*. A draft planning scheme amendment to facilitate the Project has been included in the EES for the Project.

The Minister for Planning has appointed a combined inquiry and advisory committee, known as the Mordialloc Bypass Project Inquiry and Advisory Committee (**IAC**), to consider and report on the Project. A copy of the IAC's terms of reference is **enclosed**.

The EES for the Project is currently on public exhibition and open for public submission until **14 December 2018**.

WSP has previously prepared a technical report in respect of the Project titled "*Mordialloc Bypass Flora and Fauna Impact Assessment*" (dated October 2018) (**Technical Report**). The Technical Report has been included as Appendix C to the EES.

The IAC hearing is expected to commence on 25 February 2019, with an estimated duration of approximately 2-3 weeks.

The purpose of this letter is to formally instruct you to prepare an expert witness statement and to give evidence at the IAC hearing in respect of ecology matters.

Scope of Work

You are requested to undertake the following work:

1. Review the Technical Report and the EES to the extent relevant to your area of expertise.
2. Review the public submissions referred to you to the extent relevant to your area of expertise.
3. Prepare an expert witness statement that:
 - (a) addresses the Technical Report and any work you have carried out since the Technical Report was prepared;
 - (b) responds to the public submissions relevant to your area of expertise; and
 - (c) addresses any other matter that you consider relevant to your area of expertise.
4. Prepare a short (no more than 30 minutes) PowerPoint presentation for presenting at the hearing.

5. Attend the hearing to give evidence in relation to your report.

Please find **enclosed** the Planning Panels Victoria Guide to Expert Evidence. Please ensure to comply with this guide when undertaking your work and preparing your expert witness statement.

To provide consistency of format for the IAC, you are encouraged to use the **enclosed** template to prepare your expert witness statement.

Documents

The EES can be accessed on the Project website at <http://roadprojects.vic.gov.au/projects/mordialloc-freeway/view-the-ees>.

We will provide you with access to the public submissions on the EES, as they become available.

Timing

Based on the current hearing timetable we would be pleased to receive your draft:

- a) expert witness statement by **Friday 18 January 2019**; and
- b) PowerPoint presentation by **Friday 1 February 2019**.

We will advise you if there is any change to these timeframes.

Communications

All communications should be through Clayton Utz in the first instance. Please contact Sallyanne Everett or William Bartley if you require any further information or clarification.

Your fees

Please render your invoices to the attention of Clayton Utz.

Should you have any queries in relation to this matter, or require any further information or additional instructions, please do not hesitate to let us know.

Yours sincerely

Sallyanne Everett, Partner
+61 3 9286 6965
severett@claytonutz.com

Our ref: 80193424

Enc.

William Bartley, Senior Associate
+61 3 9286 6580
wbartley@claytonutz.com