DEPARTMENT OF THE ENVIRONMENT AND ENERGY

To: Kim Farrant, Assistant Secretary, Assessments (NSW, ACT) and Fuel Branch (for decision)

Approval Decision Brief (recommendation report) –Lord Howe Island Rodent Eradication Project, NSW (EPBC 2016/7703)

Timing: 17 August 2017 - Statutory timeframe.

Recommendation/s:

1. Consider the recommendation report at Attachment A.

Considered / ~~please discuss~~

2. Consider the response to the invitation for comment on the proposed decision at Attachment B.

Considered / ~~please discuss~~

3. Approve, for each controlling provision, the action as summarised in the table below.

Approved / ~~Not approved~~

4. Agree to attach the conditions of approval as set out in Attachment C.

Agreed / ~~Not agreed~~

5. Sign the notice of your decision at Attachment C.

Signed / ~~Not signed~~

6. If you agree to 3 and 4, accept the reasoning in the departmental briefing package as the reasons for your decision.

Accepted / ~~Please discuss~~

7. Sign the letter at Attachment D advising the person proposing to take the action, of your decision.

Signed / ~~Not signed~~

Summary of recommendations on each controlling provision:

Controlling Provisions for the action	Recommendation	
	Approve	**Refuse to Approve**
World heritage properties (ss 12, 15A)	Approve	
National heritage places (ss 15B, 15C)	Approve	

Listed threatened species and communities (ss 18, 18A)	Approve	
Listed migratory species (ss 20, 20A)	Approve	

Kim Farrant, Assistant Secretary, Assessments (NSW, ACT) and Fuel Branch Date: 18-8-17

Comments:

Key Points:

Background

1. The purpose of this submission is to seek your consideration on a final approval decision under Part 9 of the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act).

2. On 3 August 2017, as recommended in the Proposed Approval Decision Brief (Attachment E) you wrote to the Lord Howe Island Board (LHIB), seeking comments on the proposed decision. Post Approvals Section and Monitoring and Assurance Section were also consulted on the proposed conditions.

3. Under ss 130 and 133 of the EPBC Act, you are now required to decide whether to approve the proposed action, and if you decide to approve, what conditions you will attach to the approval under s134 of the EPBC Act.

4. Should you approve the action the approval will have effect until 31 December 2022.

Issues/ Sensitivities:

5. On 8 August 2017, the LHIB held a teleconference with the Department to discuss the proposed conditions. Due to the issues raised in the teleconference the decision has been modified as detailed below. A track changes version of the approval is at Attachment H.

6. The intent of proposed condition 2 was to minimise the impacts on the Providence Petrel and Masked Booby by limiting helicopter flight times over their colonies to the periods when birds are least likely to be leaving or arriving at their colonies (movements are greatest shortly after dawn and in the late afternoon) and by responding to the display of unusual behaviour by these birds by modifying the baiting runs (including flying at bait dispersal altitudes that minimise unusual behaviour).

7. The LHIB stated, that by restricting helicopter operations in the southern mountains of Lord Howe Island (LHI) to the period before midday each day, the proposed condition 2 placed unnecessary restrictions on the baiting operation. The LHIB also stated, pilots avoid flying in the vicinity of seabird colonies when they are circling around, including when birds are

leaving or arriving at their colonies following foraging trips because bird strike can result in a helicopter crashing.

8. The southern mountains are often obscured by clouds and are subject to strong and variable winds. Many days will not be suitable for helicopter operations. Given that the Lord Howe Island Group (LHIG) has to be baited twice during a three month period, the LHIB was concerned that restricting baiting drops in this area to the morning period could lead to helicopter pilots taking unnecessary risks to complete the baiting program.

9. Conditions 2c and 2d required observers to provide commentary to the helicopter pilot via radio regarding *unusual behaviour* of Providence Petrels and Masked Boobies, to supplement the pilot's observations and when so informed, required pilots to take action to minimise impacts on Providence Petrels and Masked Boobies. *Unusual behaviour* was defined in the proposed conditions as being abnormal behaviour relative to an agreed baseline as defined by the pelagic seabird expert on the Technical Advisory Group. The Department and the LHIB agreed that whilst the definition appeared to be objective, establishing what was normal versus *unusual behaviour* would be difficult and too subjective to implement operationally, therefore references to *unusual behaviour* have been deleted from condition 2. Observers are still required to provide commentary to helicopter pilots about the behaviour of these species when aerial baiting is occurring and pilots are still required to take action to minimise impacts on Providence Petrels and Masked Boobies.

10. Condition 2 has been amended to address the proponent's occupational health and safety concerns and at the same time continuing to minimise potential impacts on Providence Petrels and Masked Boobies.

11. The intent of proposed condition 3 is to establish a Technical Advisory Group (TAG) that provides technical advice to the Rodent Eradication Steering Committee and is responsible for providing advice and recommendations for the development and implementation of the Monitoring and Mitigation Plan required at Condition 4.

12. The LHIB believes (and the Department agrees) that the requirement in the proposed decision for the TAG membership to include a human toxicologist is unnecessary. Human toxicology issues have been addressed through the Human Health Risk Assessment process led by the NSW Chief Scientist and Engineer (at the request of the NSW Minister for the Environment, Local Government and Heritage). The TAG's function is now targeted solely to providing advice on the Monitoring and Mitigation Plan, which deals with impacts on non-target species and the natural environment rather than human health issues.

13. Condition 3 retains the requirement that the membership of the TAG must be approved by the Department before baiting commences. The members must include, but not be limited to, an environmental toxicologist, a pelagic bird expert and an island ecologist each with relevant tertiary qualifications and suitable experience in their field of expertise.

14. Condition 3 has been amended to address the proponent's concerns without weakening the TAG's ability to provide rigorous scientific advice regarding species of concern under the EPBC Act or reducing the quality and scope of monitoring and mitigation activities.

15. The objective of the rodent eradication program is to eradicate all rodents on the LHIG by baiting LHI and all small islands, islets and rocky crags. It is possible that rodents occur on some of these outlying islands and rodents could swim to LHI re-establishing a breeding population if the eradication program on the main island is successful. Some of these islets and rocky crags are rarely if ever visited because they are extremely difficult and dangerous to access.

16. The Department was concerned that species that are extinct on LHI might occur on some of these islets and might be significantly impacted if all the outliers are baited. The Department considered that this may be an unnecessary risk if rodents were not present on some of these islets.

17. The intent of proposed condition 7 therefore, was to ascertain if rodents are present on the rocky islets and small islands in the LHIG prior to commencement of the action, to ensure that remnant populations of species of concern under the EPBC Act would not be subject to unnecessary impacts. The results of these surveys were to be provided to the Department prior to commencement of the action and aerial baiting was only to take place on those rocky islets and small islands where these surveys identified the presence of rodents.

18. During the teleconference on 8 August 2017, the LHIB advised the Department that as far as can be ascertained (based on previous visits and investigations and without endangering the lives of field staff who would have to visit these islets), no additional species of concern under the EPBC Act are likely to be significantly impacted if the rocky islets and small islands in the LHIG are baited. Furthermore, the LHIB considered (and the Department agreed) that baiting the rocky islets and small islands is essential for maximising chances of a successful rodent eradication.

19. Condition 7 has therefore been removed. Consistent with this, Condition 4a, which required the Monitoring and Mitigation Plan to describe a strategy to monitor for the presence of target species on rocky islets prior to commencing aerial baiting, has been removed.

20. Condition 4e (now condition 4d) requires the Monitoring and Mitigation Plan to include protocols to ensure systematic, targeted and effective carcass search, collection and disposal in the vicinity of the Island's settlement and other accessible areas (to avoid secondary poisoning of non-target species, but recognising that eradication of Masked Owls depends on sufficient carcasses remaining uncollected) and to specify appropriate resourcing.

21. The removal of the words "Masked Owl" from this condition inadvertently occurred during the Post Approval review. One objective of the baiting program is to eradicate Masked Owls on LHI. They eat rodents and their eradication depends on sufficient rodent carcasses remaining uncollected. The Recommendation Report details the history of Masked Owls on LHI and explains why the LHI population is not protected under the EPBC Act. The words "Masked Owl" have been reinserted in condition 4d.

22. Condition 4g (now condition 4f) required the LHIB to provide for ongoing whole-of-island census, and breeding success monitoring of Lord Howe Woodhens, Lord Howe Island Currawongs, Providence Petrel and Masked Booby populations for a period of at least 5 years following completion of aerial baiting with particular focus on Lord Howe Woodhens and Lord Howe Island Currawongs following their release from captivity.

23. The LHIB stated that the Public Environment Report and Referral concluded that the only impacts of the baiting program on Providence Petrels and Masked Boobies are likely to be helicopter disturbance and therefore these impacts are likely to be short term. The Department agrees and therefore has removed the requirement for 5 year census and breeding success monitoring of Providence Petrel and Masked Booby populations.

24. The requirement for 5 year census and breeding success monitoring of Lord Howe Woodhens and Lord Howe Island Currawongs has been reduced to 2 years, with surveys to be conducted every 6 months during this period. The Department agrees with LHIB's view

that population trends should be apparent after 2 years and if necessary appropriate remedial actions can be identified on the basis of 2 years of survey data.

25. Condition 5 has been amended to remove the specification that follow-up rodent detection, to ensure the success of the eradication efforts, be undertaken 30 days after the second baiting event. This condition was considered too specific, implying detection must start exactly 30 days after baiting. The Department considered, and the LHIB agreed, the objective of the 30 day duration was to avoid confusing rodent detection dogs with the presence of rodent carcasses. To enable operational flexibility by the rodent detection team, the 30 day duration has therefore been removed from condition 5, and 5(e). The Department considers the new condition still achieves the condition's intended objective. The LHIB confirmed their agreement with the condition (email dated 17 August 2017 Attachment B).

26. Other changes to the proposed conditions are minor edits that add clarity, such as deleting the word "continuously" from condition 5e because it implied that rodent detection dogs should operate 24 hours a day across LHI.

27. On 9 August 2017, the LHIB wrote to the Department following the teleconference of 8 August 2017, stating that they had no objections to the amended proposed approval conditions for the proposal to eradicate introduced rodents on Lord Howe Island (LHI) and its associated islands and rocky islets, and the capture and housing of Lord Howe Woodhens (*Hypotaenidia sylvestris*) and Lord Howe Island Currawongs (*Strepera graculina crissali*) (Attachment B).

28. The Department considers that impacts to matters of national environmental significance will not be unacceptable provided the action is undertaken in accordance with the recommended approval conditions at Attachment C.

29. On 11 August 2017, the Species Information and Policy Section in Biodiversity Conservation Division advised that they are not anticipating any changes in the coming six weeks to the recovery plans or threat abatement plans identified in the email at Attachment F.

Conservation Advice for the Lord Howe Woodhen:

30. The decision to uplist the LH Woodhen from vulnerable to endangered was made on 4 August 2017 under sections 184(1)(a) and 184(1)(c) of the EPBC Act. The uplisting was registered on 14 August 2017. In accordance with section 158A of the EPBC Act you are not required to take into account this uplisting when considering whether or not to approve the proposed action, but in making a decision whether to approve the taking of the proposed action you are required to have regard to the Conservation Advice for the Lord Howe Woodhen *(Hypotaenidia sylvestris)* which came into effect on 15 August 2017 (Attachment G).

31. The Conservation Advice identifies the use of rodenticides for rodent control and collision with vehicles as key threats to this species.

32. A recommended conservation and management priority in the Conservation Advice is to undertake programs to eradicate the black rat and house mouse from LHI, using tested methods combined with mitigation measures to reduce impacts to the LH Woodhen. The proposed action has been designed to achieve this objective and therefore is consistent with the conservation advice.

Consultation:

33. The outcome of consultation is outlined above and summarised in the table below and in the response to your proposed decision is at Attachment B.

	Comment
Person taking action	Agrees, subject to the points outlined above

s22

s22
Director
Northern NSW Assessments Section
Ph: s22
17/8/2017

s22
Northern NSW Assessments Section
Ph s22

ATTACHMENTS

A: Recommendation report

B: Response to invitation for comment on proposed decision

C: Notice of decision

D: Letter to LHIB

E: Copy of Proposed Approval Decision Brief (Recommendation report at Attachment A)

F: Biodiversity Conservation Division advice

G: Conservation Advice for the Lord Howe Woodhen *(Hypotaenidia sylvestris)*

H: Track changes version of the approval

RECOMMENDATION REPORT

Lord Howe Island Rodent Eradication Project, NSW (EPBC 2016/7703)

Recommendation

That the proposed action, by the Lord Howe Island Board (LHIB) to eradicate introduced rodents on Lord Howe Island (LHI) and its associated islands and rocky islets (EPBC 2016/7703) be approved subject to the conditions specified below.

Conditions	Relevant pages in report
1. To avoid and minimise impacts on the **Lord Howe Island World Heritage Area and National Heritage place** (as identified at Schedule 1) and listed threatened species and communities and listed migratory species, the action must be undertaken in accordance with the final Lord Howe *Island Rodent Eradication Public Environment Report* (**PER**) dated 10 February 2017. The person taking the action must capture and manage in captivity Lord Howe Woodhens and Lord Howe Island Currawongs in accordance with Taronga Zoo's revised *Lord Howe Island Rodent Eradication Project Captive Management Plan* (July 2017).	Pages 16-19 & Appendix 3
2. To avoid, minimise and mitigate impacts from the aerial baiting on **non-target species** and the environment of the **Lord Howe Island Group**: (a) aerial baiting can only be undertaken between 1 June 2018 and 30 August 2018 or 1 June 2019 and 30 August 2019 (b) aerial baiting in the southern mountains must not occur after midday each baiting day to minimise the possibility of helicopters colliding with Providence Petrels and Masked Boobies (c) during aerial baiting, **observers** must be at a location with clear line of sight to the Providence Petrel (*Pterodroma solandri*) and Masked Booby (*Sula dactylatra*) breeding grounds (as identified at Schedule 2). Trained **observers** must also be located within the boat observation zone (as identified at Schedule 2) and provide commentary to the helicopter pilot via radio regarding **unusual behaviour** of Petrels and Boobies to supplement the pilot's observations (d) should either species display **unusual behaviour** or become agitated during baiting flights, the pilot must take action (where it is safe to do so) to minimise impacts on Providence Petrels and Masked Boobies (e) aerial baiting in the vicinity of the Providence Petrel and Masked Booby breeding grounds must be undertaken at a bait dispersal altitude that minimises unusual behaviour by Providence Petrels and Masked Boobies (f) handling, transport, clean-up and disposal of the pesticide **Brodifacoum** must be undertaken in accordance with the Pestoff 20R label requirements and the Australian Pesticides and Veterinary Medicines Authority minor use permit.	Pages 23-24 Appendix 2

3. Within one month of the date of this approval, the person taking the action must submit to the **Department** draft terms of reference for the **Minister's** approval for the establishment of a **Technical Advisory Group (TAG).** Baiting must not commence until the membership of the **TAG** is approved by the **Department.** The **TAG** must consist of at least five members. The members must include, but not be limited to, an environmental toxicologist, human toxicologist, a pelagic bird expert and an island ecologist each with relevant tertiary qualifications and suitable experience in their field of expertise. The TAG will provide technical advice to the **Rodent Eradication Steering Committee** and be responsible for providing advice and recommendations for the development and implementation of the **Monitoring and Mitigation Plan** required at Condition 4.	Pages 18-19
4. To minimise impacts from aerial baiting on **non-target species** and the environment of the **Lord Howe Island Group**, the person taking the action must establish a **Monitoring and Mitigation Plan** based on advice from the **TAG**. The **Monitoring and Mitigation Plan** must be approved by the **Department** prior to **commencement** of aerial baiting on the **Lord Howe Island Group**. The **Monitoring and Mitigation Plan** must: (a) describe a strategy to monitor for the presence of **target species** on **rocky islets** prior to commencing aerial baiting (detailed at Condition 7) (b) provide for the monitoring of mortality and cause of death of **non-target species**, for a period of at least 4 months after the **commencement** of aerial baiting (c) establish a **Mitigation Team** Manager responsible for collection of qualitative and quantitative information on **non-target species** mortality, documenting and reporting this information and using this information to coordinate and adapt carcass search and removal operations. The **Mitigation Team** Manager must provide weekly reports to the **Department** and the **TAG** regarding **non-target species** mortality and efficacy of carcass search and removal operations. More regular reports must be provided if requested by the **TAG**. The **Mitigation Team** Manager must continuously undertake these tasks for a period of at least 4 months after the **commencement** of aerial baiting (d) include protocols and impact thresholds to stop any further baiting where the **TAG** determines that unacceptable impacts on **non-target species** are observed between the first and second aerial baiting events (e) include protocols to ensure systematic, targeted and effective carcass search, collection and disposal in the vicinity of the **Settlement** and other accessible areas; (to avoid secondary poisoning of **non-target species**, but recognising that Masked Owl eradication depends on sufficient carcasses remaining uncollected) and specify appropriate resourcing (f) include clear contingency planning and adaptive management measures where mortality of **non-target species** is recorded, with the aim of reducing further mortalities (g) provide for ongoing whole-of-island census, and breeding success monitoring of Lord Howe Woodhens, Lord Howe Island Currawongs, Providence Petrel and Masked Booby populations for a period of at least 5 years following completion of aerial baiting with particular focus on Lord Howe Woodhens and Lord Howe Island Currawongs following release from captivity.	Pages 18-20, 23

A report summarising the monitoring results collected on **non-target species** mortality in accordance with Condition 4(b&c) must be provided to the **Department** within 5 months following the completion of the final aerial baiting event. The results of the whole-of-island census and breeding success monitoring conducted in accordance with Condition 4(g) must be provided to the **Department** annually for a period of five years.	
5. To ensure the success of the rodent eradication program. The person taking the action must establish a rodent detection team. Following the decay or removal of rodent carcasses, and no more than 30 days after the second baiting event, the rodent detection team must initiate intensive rodent detection activities across the entire **Lord Howe Island Group** to identify and kill remaining **target species**, as detailed in section 2.6 Rodent Detection Monitoring in the **PER**. To avoid and mitigate impacts from rodent detection operations on **non-target species** and the environment of **Lord Howe Island Group**: (a) all detecting team members must be trained in the location of the colonies of EPBC Act listed bird species and methods for minimising impacts on these colonies, vegetation and soils (b) all dogs used to aid detection of rodent species on the **Lord Howe Island Group** must have previously undergone project-specific training and be currently accredited by the Canine Detection Certification Council after passing the Council's practical accreditation test, prior to detection operations starting (c) each handler must have a Statement of Attainment in Dog Training from the Certificate IV, Companion Animal Care and Management Course (ACM40310) from TAFE NSW or equivalent as approved in advance by the **Department** (d) when rodents are detected appropriate action must be taken to ensure rodents are eradicated at that location (e) rodent detection using dogs must begin 30 days after the last aerial baiting event and occur continuously across the island until no rodents are detected.	Pages 13, 19-21, 28
6. The person taking the action must submit for the **Minister's** approval, prior to **commencement** of the action, an **integrated quarantine/biosecurity management plan** (**the plan**) for LHI (including the airport and shipping port) to prevent the reintroduction of rodents to the **Lord Howe Island Group**. **The plan** should prescribe quarantine/biosecurity management protocols regarding visiting yachts, cruise ships, other vessels and shipwrecks and maintaining rodent free status on islets including the long-term use of rodent detection dogs. In developing and implementing **the plan** the person taking the action must seek and act on advice and recommendations from an independent biosecurity expert.	Pages 13, 21, 30, 41 & Appendix 3
7. The person taking the action must ascertain if rodents are present on the **rocky islets** and small islands in the **Lord Howe Island Group** prior to **commencement** of the action. The results of these surveys are to be provided to the **Department** within 10 days of their completion. Aerial baiting must only take place on those rocky islets and small islands where these surveys identify the presence of rodents.	Pages 7 & 19

8. To maximise the likelihood of eradicating rodents on the **Lord Howe Island Group**, the person taking the action must use their best endeavours to ensure that rodent baiting is conducted on all properties and leases on the **Lord Howe Island Group**.	1-2,7 & Appendix 6
9. Within 30 days after the **commencement** of the action, the person taking the action must advise the **Department** in writing of the actual date of **commencement**.	Administrative
10. The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement plans required by this approval, and make them available upon request to the **Department**. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department's** website. The results of audits may also be publicised through the general media.	Administrative
11. Upon the direction of the **Minister**, the person taking the action must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor must be approved by the **Minister** prior to the commencement of the audit. Audit criteria must be agreed to by the **Minister** and the audit report must address the criteria to the satisfaction of the **Minister**.	Administrative
12. If, any time after 5 years from the date of this approval, the person taking the action has not substantially commenced the action, then the person taking the action must not substantially commence the action without the written agreement of the **Minister.**	Administrative

Definitions:

Brodifacoum baits means either 5.5 mm or 10 mm cereal-based bait pellets of Pestoff 20R containing 0.02g/kg (20 parts per million) of the toxin Brodifacoum.

Commencement (where bolded in the text) means the commencement of the aerial distribution of Brodifacoum baits across the LHIG using helicopters.

Department means the Australian Government Department responsible for administering the *Environment Protection and Biodiversity Conservation Act 1999.*

Lord Howe Island World Heritage Area and National Heritage place means the area identified at Schedule 1 of the approval.

Integrated quarantine/biosecurity management plan means a quarantine/biosecurity management plan for LHI (including the airport and wharf) to prevent the reintroduction of rodents should the rodent eradication be successful.

Lord Howe Island Group means Lord Howe Island and its associated islands and **rocky islets** (excluding Balls Pyramid).

Minister means the Australian Government Minister responsible for administering the *Environment Protection and Biodiversity Conservation Act 1999.*

Mitigation Team means the team, including the **Mitigation Team** Manager, responsible for implementing relevant mitigation and monitoring activities on LHI under the **Monitoring and Mitigation Plan.**

Monitoring and Mitigation Plan means the plan to be prepared by the proponent that will guide mitigation and monitoring activities on the **Lord Howe Island Group** with the aim of minimising **non-target species** mortality from the aerial baiting as well as monitoring **non-target species** mortality, impacts on populations and population responses.

Non-target species means native flora and fauna species on the **Lord Howe Island Group**.

Observers means bird experts approved by the LHIB as being suitably qualified and/or experienced to observe and interpret the response of birds to the helicopter baiting flights.

PER means the final Public Environment Report dated 10 February 2017.

Rocky islets means any body of land of the **Lord Howe Island Group** excluding Lord Howe Island and Balls Pyramid that has permanent land above the mean high water mark and that can be safely accessed by a suitably trained person (boat or helicopter) for the purpose of setting and retrieving presence and absence monitoring equipment for **target species**.

Rodent Eradication Steering Committee means the Rodent Eradication Steering Committee established in October 2012, consisting of one representative from each of the following organisations, the Commonwealth Department of the Environment and Energy and the NSW Office of Environment and Heritage. The CEO of the Lord Howe Island Board (LHIB), an elected LHIB member and a rodent eradication expert.

Settlement means the area identified at Schedule 1 as the Settlement.

Target species means *Rattus rattus*, *Mus musculus* and *Tyto novaehollandiae castanops* (the Masked Owl Tasmanian population).

Technical Advisory Group means a group of experts with operational and ecological experience, independent of the person taking the action to provide advice and recommendations on the mitigation and monitoring of **non-target species** mortality and recovery.

Unusual behaviour in relation to Providence Petrels and Masked Boobies means abnormal behaviour relative to an agreed baseline as defined by the pelagic seabird expert on the **Technical Advisory Group**.

Background

Description of the project and location

1. The proposed action is the eradication of introduced rodents on Lord Howe Island (LHI) and its associated islands and rocky islets (EPBC 2016/7703).

2. The proposed action also includes the capturing and housing of Lord Howe Woodhens (*Hypotaenidia sylvestris*) (previously *Gallirallus sylvestris*) and Lord Howe Island Currawongs (*Strepera graculina crissali*), both of which are listed as Vulnerable under the EPBC Act, and are at risk of being poisoned, the former from eating baits and poisoned rodents, the latter from preying on poisoned rodents during the rodent eradication.

3. LHI is located 780 kilometres north-east of Sydney. It covers 1455 ha, is 12 km long, 1.0–2.8 km wide and formed in the shape of a crescent, with a coral reef enclosing a lagoon on the western side. Mount Gower (875 m), Mount Lidgbird (777 m) and Intermediate Hill (250 m) form the southern two-thirds of the island; the northern end of the island is fringed by sea cliffs of about 200 m in height.

4. A settlement of approximately 350 inhabitants is located in the northern section of LHI and covers about 15% of the island. Approximately 75% of LHI plus all outlying islands, islets and rocks are protected under the Permanent Park Preserve (PPP), which has similar status to that of a NSW national park.

5. The Lord Howe Island Group (LHIG) has been placed on the Register of the National Estate and was listed as a World Heritage Area in 1982. It is also located within the Lord Howe Island Marine Park (NSW) out to 3 nautical miles (under NSW jurisdiction) and the 110, 000 km^2 Lord Howe Commonwealth Marine Reserve.

6. The operation was originally planned for winter of June to August 2017, however, to allow for operational flexibility the proponent sought EPBC approval for the period June 2017 to December 2019. In February 2017 the LHIB advised that aerial baiting would not proceed in 2017 due to their inability to get the required approvals prior to the March meeting of the Board.

Baiting program

7. The cereal-based bait pellet (Pestoff 20R) contains 0.02g/kg (20 parts per million) of the rodent anti-coagulent, Brodifacoum and will be broadcast using:
   - helicopter dispersal using an under-slung bait spreader bucket in the uninhabited parts of the island
   - a combination of hand broadcasting and the placement of bait in trays and bait stations in the Settlement area.

8. Baiting will occur in winter when the availability of natural food is low, rodent breeding is greatly reduced and rodent populations are at their lowest. This is also when most seabirds are absent from LHI.

9. The bait will be distributed at a dose rate of 20 kg (12kg + 8kg) of bait (or 0.4 g of poison) per hectare. At this rate, a maximum of 42 tonnes of bait (containing 840 g of Brodifacoum) will be required to cover the LHIG surface area of 2,100 ha.

10. To ensure accurate and comprehensive bait coverage, helicopters will use global positioning systems (GPS) to fly along pre-determined flight lines. The details of the baiting operation such as flight paths, including height above the terrain and distance between flight paths are specified in an operational plan approved by the Civil Aviation Safety Authority. The height above the ground at which the bait is released determines the accuracy of the drop and the width of the swathe.

11. The bait will be dispersed using a broadcasting bucket fitted with a mechanised spinner slung below a helicopter. A rotating disc will throw the bait 360° to a distance of 35 m (outlier pellets may be thrown to 45 m) enabling a swathe of up to 70 m to be baited in a single pass. The arc of the distribution swathe will be restricted to 180° when baiting the edge of buffer zones and coastal areas including cliffs to minimise bait entry into the sea.

12. LHIB stated that aerial baiting will occur no closer than 30m to dwellings, by agreement with residents or if agreement is not reached, then the buffer zone will be 150 m. In these buffer zones bait will be applied by hand or in bait stations.

13. In the outdoor areas of the Settlement baits will be dispersed by hand and/or placed into bait stations. In dwellings (e.g. in ceiling spaces or floor spaces) bait trays and bait stations will be used. Bait stations will also be used around livestock pens (the dairy herd, goat and horse containment areas).

14. Hand broadcasting of bait will be conducted concurrently with aerial baiting. It will be undertaken throughout the Settlement area where agreed by residents under individual Property Management Plans and in buffer and exclusion zones (the lagoon foreshore and Ned's Beach).

15. A guide for best practice to maximise the likelihood of successful eradication was produced by the New Zealand Department of Conservation, and recommends that two applications of bait are made about three weeks apart, to ensure that any rodents surviving the first operation will encounter pellets from the second. It is likely that some juvenile rats will emerge from nests some days after the first baiting is conducted and will not encounter baits unless a second bait drop is undertaken. To minimise the risk of gaps in bait coverage, flight lines overlap by 50%.

16. Rats are able to swim considerable distances, therefore, the main island and all nearby islands and islets, other than Balls Pyramid and its associated islets, will be baited.

17. Further information and background on rat eradication programs is at Appendix 6.

Brodifacoum bait

18. According to the referral, the Pestoff 20R bait pellets are made from compressed finely ground cereal and are designed to break down following absorption of moisture from soil or precipitation. Whilst the cereal pellets disintegrate when immersed in water, Brodifacoum is highly insoluble in water. It has an estimated solubility of <10 parts per million in fresh water at pH 7 and 20^{o}C. For comparison, table salt has a solubility of 1,200,000 mg/L under similar conditions.

19. Solubility is the determining factor for the pesticide pathway in soil or water. Brodifacoum is not readily soluble in water, therefore because negligible amounts of this poison dissolve it is unlikely to be taken up by plants or at the most would be taken up in insignificant amounts. Brodifacoum in water will settle and bind to sediments and break down slowly. Being a solid it does not readily volatise or enter the atmosphere.

20. Brodifacoum is not expected to be detected in water bodies unless at high concentrations (such as the result of a spill). The one-off nature of the baiting operation will ensure that toxins do not accumulate in the environment.

21. Baits swell, crack and then crumble over time and the rate of pellet breakdown is influenced by temperature, rainfall and invertebrate activity. Mould and fungi can appear rapidly as breakdown proceeds, once this has happened baits are less likely to be eaten by non-target species.

Captive management

22. Up to 85% of the LH Woodhen population and 50-60% of the LHI Currawong population will be taken into captivity, commencing two months before baiting commences until baits

and rodent carcasses have broken down (or for a total period of up to nine months). The referral estimates that baits will be available for up to 100 days, with the rate of bait breakdown being monitored to ensure birds are not released at a time which may put them at risk.

23. The captive management facilities will be constructed by modifying existing facilities at the LHI Nursery.

24. A previous referral (EPBC 2013/6847) - *Pilot Study for captive management of LH Woodhen and LHI Currawong* was determined to not be a Controlled Action on 5 June 2013. The pilot study showed that LH Woodhens and Currawongs could be held in large numbers for long periods with no observable impact. All 20 LH Woodhens and 10 LHI Currawongs were successfully released at their individual capture sites and were subsequently monitored.

25. Captive management will be undertaken in accordance with Taronga Zoo's revised *Lord Howe Island Rodent Eradication Project Captive Management Plan* (July 2017) (CMP) at Attachment L.

General background on why the project is being undertaken

26. The natural, heritage, tourism and industry values of LHI, are being impacted by introduced species of rats (*Rattus rattus*) and mice (*Mus musculus*), despite an ongoing rodent control program. The population of rodents on LHI is estimated at around 63,000 to 150,000 for rats and 140,000 to 210,000 for mice.

27. Introduced Ship Rats (*Rattus rattus*) and House Mice (*Mus musculus*) have a significant impact on the World Heritage, biodiversity, community and economic values of LHI. Rodents have contributed to the extinction of at least five endemic birds and at least 13 invertebrates on LHI. They are also a recognised threat to at least 13 other bird species, two reptiles, 51 plant species, 12 vegetation communities and numerous threatened invertebrates on the island, 20 of which are listed under the EPBC Act.

28. Predation by exotic rats on Australian offshore islands is listed as a Key Threatening Process under the EPBC Act. The proponent claims that the eradication of rodents will assist in the recovery of EPBC listed threatened species on LHI and allow the re-introduction of species that previously inhabited the Island.

29. The impact of house mice on the biodiversity of LHI includes eating eggs of small birds, reducing seedling recruitment of some plants and competition with native seed-eating fauna. On other islands, mice have been implicated in declines of invertebrates, and in some cases this has greatly affected nutrient recycling processes.

30. Predation by rodents on Kentia Palm and vegetable crops reduces commercial production and increases rodent control costs. Rodents also impose costs on residents and tourism operators via the spoiling of food stuffs and reduced amenity associated with presence of rodent excrement.

31. According to the proponent, these ecological benefits are in the public interest, and benefit the tourism industry through protection and enhancement of World Heritage values and improved visitor experience, increased productivity for the Kentia Palm industry (as rats predate on Kentia Palm seeds and seedlings) and elimination of rodent impacts on human health and public amenity (hygiene issues and spoiling of food stuffs).

Controlling provisions, assessment approach and public consultation

EPBC Act process

32. A referral was received on 11 May 2016 (Attachment K). The action was referred by the Lord Howe Island Board (LHIB), which stated its belief that the proposal is a controlled action for the purposes of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

33. LHIB is directly responsible to the NSW Minister for the Environment and is charged with the care, control and management of LHI's natural values and the affairs and trade of LHI. It is also responsible for the care, improvement and welfare of the island and residents.

34. The Minister's delegate determined on 30 June 2016 that the proposed activity was a controlled action under the EPBC Act to be assessed by a Public Environment Report (PER).

35. The controlling provisions for the action as set out in the controlled action decision are World Heritage (s12 & s15A), National Heritage (s15B & s15C), Listed Threatened Species and Communities (s18 & s18A) and Listed Migratory Species (s20 & s20A).

36. On 15 August 2016, the delegate sought public comments on the tailored draft PER guidelines for the Lord Howe Island Rodent Eradication Project by publishing them on the Department's website for a period of 10 business days.

37. Six submissions were received. Most of the submissions were broad criticisms of the project rather than specific comments about the draft guidelines. Some amendments were made to the draft tailored guidelines in the light of comments made in the submissions.

38. On 26 September 2016, in accordance with Section 96A(4)(B) of the EPBC Act, the delegate provided the finalised PER guidelines for the Lord Howe Island Rodent Eradication Project to the LHIB and agreed to their publication on the Department's website.

39. On 7 October 2016, the proponent provided a draft PER to the Department. An adequacy review of the draft PER identified that it did not fully meet the requirements of the tailored PER guidelines. Section 98(2) of the EPBC Act states that: "The Minister can only approve the publication of the draft report if he or she is satisfied that the draft report is in accordance with the PER guidelines".

40. The Department requested further information on the following issues:

    - the success of previous attempts to breed Lord Howe Woodhens and Lord Howe Island Currawongs on the mainland (the breeding of Woodhens at Taronga Zoo was referred as part of a previous proposed action EPBC 2013/6847 which was determined to not be a controlled action. The transfer of Woodhens to Taronga Zoo did not occur).
    - the possibility of using taste inhibiting (bittering) agents in the baits laid in the vicinity of the settlement to deter human ingestion.
    - discussion of the assertion in public comments that dust from the aerial spread of Brodifacoum baits could extend up to 1 km from the drop zone.

41. The LHIB re-submitted the draft PER on 19 October 2016. The Department was satisfied that the draft PER was in accordance with the PER guidelines and that there was sufficient information to undertake an assessment of the impacts under the EPBC Act and for the public to provide comment.

42. On 31 October 2016, the proponent was directed to publish the PER. The LHIB placed the draft PER on public exhibition for a period of 23 business days from 2 November 2016 to 2 December 2016.

43. The LHIB invited the public to make written submissions on the draft PER via a letter sent to all LHI residents and a public notice in The Australian Newspaper on 2 November 2016.

44. 128 submissions were received (see public submission section below). The final PER was provided to the Department on 10 February 2017 and exhibited for public information only from 22 February 2017 to 22 March 2017.

Public Comments

45. Stakeholders had three formal opportunities during the EPBC assessment process to comment on the proposal. Public comments were sought and received on the referral, the draft PER Guidelines and the draft PER.

Submissions on the referral

46. The Department received 62 submissions and a petition during the 10 day public comment period on the referral. Of these, 53 were in favour of the eradication project. The remaining 9 submissions, representing 38 people, were opposed to the eradication project in its current form. None of the submissions were opposed to rat eradication on LHI per se, rather the opposition was to the proposed eradication method (aerial and hand baiting).

47. Many submissions stated that the ship rat (*Rattus rattus*) is known to contribute to the decline of native species of flora and fauna. The majority of the submissions supported the project as a means to improve ecological conditions for the Lord Howe Island Gecko (*Christinus guentheri*), Lord Howe Island Skink (*Oligosoma lichenigera*), Kentia Palm (*Howea forsteriana*), Curly Palms (*Howea belmoreana),* Big Mountain Palms (*Hedyscepe Canterburyana),* Little Mountain Palms (*Lepidorrhachis mooreana*), LHI Wood-feeding cockroach (*Panesthia lata*), Darkling Beetle (*Promethis sterrha*), LHI Phasmid 'Land Lobster' (*Dryococelus australis*) and the LHI Placostylus (*Placostylus bivaricosus*).

48. Twenty-six submissions considered the eradication project would benefit the Kermadec Petrel *(Pterodroma neglecta*), White-bellied Storm Petrel *(Fregetta grallaria grallaria),* LH Woodhen (*Hypotaenidia sylvestris*) (previously *Gallirallus sylvestris*), Sooty Tern (*Sterna fuscata*), Providence Petrel (*Pterodroma solandri*), LH Golden whistler (*Pachycephala pectoralis contempta*), LHI Currawong (*Strepera graculina crissalis*) and LH Silvereye (*Zosterops lateralis tephropleurus*).

49. Fifteen submissions indicated that the rodents detract from the world heritage values of LHI, with some submissions indicating the island may lose its heritage listing due to the loss of biodiversity.

50. Rats were considered to be a public health risk and one submission stated that the "uncontrolled use of poisons around the home poses a high risk of accidental poisoning of children and pets". Four submissions were concerned with public health and safety citing both the poisoning of children in the US and a review by the South Australian Department of Health which states the referral does not adequately address public health concerns.

51. The NSW Environment Protection Authority (NSW EPA) is responsible for ensuring that the LHIB complies with the conditions specified in the minor use permit issued by the APVMA. The NSW Chief Scientist and Engineer conducted a review of the potential impacts of the

proposal on human health. The *Review on the Human Health Risk Assessment (HRAA) for the Lord Howe Island's proposed Rodent Eradication Program* is Appendix 4 to this report.

i. The HRAA looked at potential exposure pathways of Brodifacoum to humans, including through soil, air (dust), sediment, surface water, tank water and food sources such as seafood and locally grown fruits and vegetables. Potential risks from these pathways were then considered for those most sensitive which included toddlers, school children, pregnant women and adults spending large amounts of time outside.

ii. A quantitative risk assessment of these exposure pathways and population groups concluded that exposure to Brodifacoum from all potential sources is below those likely to result in adverse health effects. The HRAA also assessed potential exposure due to ingestion of pellets and found that ingestion of one or two pellets by a child is unlikely to result in observable anti-coagulant effects.

iii. The HRAA report was reviewed by an Expert Panel that supported the conclusions of the report noting that identification of the major exposure pathways assists in implementing mitigation strategies.

52. Some submissions expressed concern about the impact of rodents on the tourism industry and indicated the tourism industry would benefit from increased biodiversity if rodents were exterminated. Others forecast a downturn in tourism due to the "poisoning of the island".

53. Eleven submissions indicated that the rat population decreased crop yields for both export crops and local food crops.

54. Concern was expressed about the potential for bi-kill of native; reptiles, insects, birds, fresh water and marine life. Concern was also raised that high rates of bi-kill will have multiple ecological effects, including a decline in genetic diversity and alterations to population structures, use of resources, pollination rates, seed dispersal and predation on invertebrates.

55. Some submitters thought there was a significant disease risk for captive Currawong and Wood-hens.

56. Others were concerned about impacts on the marine environment including impacts on Trevally, Bluefish and Salmon that occur in large numbers close to shore during the proposed eradication period.

57. Three submissions thought cattle might be poisoned.

58. One submission cited research that found that Brodifacoum dust generated by the aerial spread of Brodifacoum can travel one km from the drop zone and could affect the marine environment.

Submissions on the PER

59. The issues that were raised in the PER submissions included:

- It is the unlikely that rodents will be eradicated from LHI because many crevices are present (due to the island's volcanic origins) in which rodents can live and forage without feeding on baited pellets; mice have resistance to Brodifacoum; some residents will not allow baiting to take place on their properties; uncertainty exists regarding universal property access; alternative rodent food is abundant; and rodents are currently not eating Brodifacoum baits.

- Aerial rodent baiting using Brodifacoum has been less successful on islands at warmer latitudes than on sub-Antarctic, cool and cold temperate islands.
- Trickle buckets should be used in some situations on LHI to control distribution of baits.
- Potential catastrophes that could affect the remaining wild populations or captive populations of Woodhens and Currawongs include avian disease or viruses, poisoned food or a tsunami.
- Comments on the likely impacts of the proposed action on tourism and the Kentia Palm industry (noting the negative impact of competition from foreign Kentia Palm plantations on the LHI Kentia Palm industry).
- Brodifacoum might have adverse impacts on coral reefs in the vicinity of LHI, with consequent impacts on the tourism industry.
- Concerns were expressed about human health and safety, in particular the risk of accidental poisoning of children and contamination of rainwater, ground water supplies and streams.
- Possibility that carcasses of poisoned rodents and birds may accumulate on roof tops and in gutters used to collect rainwater used for cooking, drinking and washing.
- Suggestion that taste inhibiting agents be added to baits laid in the vicinity of the settlement to deter human ingestion.
- Brodifacoum may accumulate in cattle or fish that may be eaten by humans.
- Dust from the aerial spread of Brodifacoum may extend up to a kilometre from the bait drop zone.
- Swimmers, snorklers and scuba divers could be affected by Brodifacoum pellets that fall or are washed into the ocean.

State/Territory Assessment and Approval

60. A number of regulatory processes have been undertaken in preparation for the proposed action:
    - the role of the NSW EPA is to ensure that the LHIB complies with the APVMA approval conditions. The EPA also issues a chemical distribution licence to the helicopter contractors and a pesticide use license to individual ground baiting staff. The EPA does not have a role in approving the bait application methods.
    - whilst there was no legislative requirement under NSW legislation for an Environmental Impact Statement (EIS) for the proposed action, OEH is assessing the impacts on NSW listed threatened species (primarily the LH Woodhen and LHI Currawong) prior to issuing a licence under section 91 of the NSW *Threatened Species Conservation Act 1995*. The licence will permit the construction of the captive management facility and the capture and keeping of these species in captivity.

Assessment

Risks associated with Brodifacoum

61. The risks to non-target birds and other wildlife from primary and secondary poisoning by the anticoagulant rodenticide Brodifacoum, varies between vertebrate species, being particularly toxic to birds and mammals. However, all vertebrates that eat baits or poisoned prey are at risk. Brodifacoum will persist for at least six months in organs and tissues including the liver, kidney, and pancreas.

62. Vertebrate pest control programs in New Zealand using bait containing Brodifacoum have resulted in the primary and secondary poisoning and sub-lethal contamination of non-target

species including fourteen indigenous and eight introduced bird species such as the Australasian harrier (*Circus approximans*), Morepork (*Ninox novaeseelandiae*), the southern black-backed gull (*Larus dominicanus*), and kiwi (*Apteryx* spp.). Populations of three species (Western weka, Stewart Island weka and Pukeko) have been severely reduced in areas where Brodifacoum has been broadcast.

63. There are increasing numbers of reports worldwide of wildlife contamination and toxicosis after the use of second-generation anticoagulants such as Brodifacoum. Consequently all pest control activities require careful risk–benefit assessment in view of their potential to cause adverse environmental impact.

64. The Department notes that significant deaths of non-target birds have occurred, such as the death of 420 birds including between 43 and 46 Bald Eagles, 173 Glaucous-Winged Gulls and Pelagic Seabirds in September 2008 on the 2,800 ha Rat Island in the Aleutians following helicopter and ground-based broadcasting of 46 tonnes of Brodifacoum pellets in seven days. Glaucous-winged gulls nibbled on Brodifacoum pellets and died. Bald Eagles were attracted to the carcasses and succumbed to secondary poisoning. These deaths were not anticipated by the US Fish and Wildlife Service.

Risk from the hunting program

65. Aerial baiting will be followed with an immediate and extensive hunting program. Field teams working with highly trained rodent detection dogs will use a range of techniques to eliminate those rodents surviving the bait drops. Dogs will be trained and used to detect rodents, rather than to pursue and kill them. This phase of the project is essential to maximise the likelihood of eradicating all rodents.

66. LHIB indicated that disturbance from hunting parties to threatened species is likely to be sporadic and at a very low level, and is not expected to have any long-term impacts on populations or breeding habitat of threatened species. The Department believes that proposed condition 5(a) addresses these concerns by requiring all detection team members to be trained in the location of the colonies of EPBC Act listed bird species and methods for minimising impacts on these colonies, vegetation and soils.

Biosecurity risks

67. An important component of island rodent eradication is the need to ensure that once an island is free of rodents, policies and procedures are put in place to reduce as far as practical the chances of rodents being accidentally re-introduced to an island. These quarantine activities are critical for long term protection of the gains made by the successful eradication of rodents.

68. Rodents could be reintroduced to LHI on ships or airplanes and can be present in all cargo types, particularly in hay bales or stock feed imported from the mainland. Rodents can also arrive in cruise ships, yachts and from ship wrecks.

69. The Department notes the relevance of Macquarie Island biosecurity protocols to LHI.

70. Proposed condition 6 requires the LHIB to submit for the Minister's approval an integrated quarantine/biosecurity management plan for the airport and shipping port to prevent the reintroduction of rodents should the rodent eradication be successful.

71. Condition 6 also requires the plan to prescribe quarantine and biosecurity management protocols regarding visiting yachts, cruise ships, other vessels and shipwrecks including the long term use of rodent detection dogs.

Mandatory Considerations – section 136(1)(a) Part 3 controlling provisions

72. The proposal was determined a controlled action under the following controlling provisions of the EPBC Act:

- Listed threatened species and ecological communities (sections 18 and 18A)
- Listed migratory species (sections 20 and 20A)
- World heritage properties (sections 12 and 15A)
- National heritage places (sections 15B and 15C)

These controlling provisions are discussed respectively below.

Listed threatened species and ecological communities (sections 18 and 18A)

73. The Department notes that the proposed action has the potential to impact listed threatened species through:

a) mortality due to primary and/or secondary poisoning

b) bird strikes and disturbance from helicopters

c) long term changes to ecological relationships affecting threatened species following the eradication of rats and mice.

74. Of these impacts, primary and/or secondary poisoning is likely to be of most concern as it has the potential to result in mortality of threatened species. *Brodifacoum* is highly toxic to mammals, birds and aquatic species when ingested. The poison acts by inhibiting the synthesis of vitamin-K dependent clotting factors synthesised in the liver, thereby disrupting normal blood clotting processes. *Brodifacoum* has been shown to bio-accumulate in the organs of mammals and birds following sub-lethal exposure and has the potential to accumulate in aquatic species.

75. Accordingly, there is a risk that non-target threatened fauna on LHI may experience primary and/or secondary poisoning if they intercept and ingest bait or other animals containing the toxin during or following the aerial baiting phase of the proposed action. The number of bird mortalities experienced on Macquarie Island during the rodent baiting program highlights the risk associated with poisoning of non-target bird species and the need for adequate mitigation measures.

76. The PER indicated that many marine/pelagic bird species will be absent from LHI during the time that aerial baiting will be conducted. This will reduce exposure to Brodifacoum baits and carcasses and therefore the risk of primary or secondary poisoning to non-target species. However, it can still be expected that some primary and secondary poisoning will occur, as happened on Macquarie Island. It is noted that of the threatened species that inhabit Macquarie Island, only a limited range of seabird species were affected by Brodifacoum poisoning.

77. On 20 June 2016, the Department's Environment Reporting Tool (ERT) identified 45 listed threatened species and no listed ecological communities that may occur within 2 km of the proposed action. Based on the location of the action and likely habitat present in the area of the proposed action, the Department considers that impacts potentially arise in relation to the following matters.

78. The proposed action was found to have a likely significant impact on the following 7 EPBC Act listed threatened species:

- Lord Howe Woodhen (*Hypotaenidia sylvestris*) (Vulnerable)
- Lord Howe Island Currawongs (*Strepera graculina crissali*) (Vulnerable)
- Magnificent Helicarionid Land Snail (*Gudeoconcha sophiae magnifica ms)* (Critically endangered)
- Masters' Charopid Land Snail (*Mystivagor mastersi)* (Critically endangered)
- Mount Lidgbird Charopid Land Snail (*Pseudocharopa ledgbirdi)* (Critically endangered)
- Whitelegge's Land Snail *(Pseudocharopa whiteleggei)* (Critically endangered)
- Lord Howe Flax Snail (Lord Howe Placostylus) *(Placostylus bivaricosus)* (Endangered).

Land Birds

Potential impacts of the proposed action on the LH Woodhen and LHI Currawong are considered separately below followed by a joint conclusion.

Lord Howe Woodhen (*Hypotaenidia sylvestris*) (previously *Gallirallus sylvestris*) Vulnerable

Species information

79. The LH Woodhen is a flightless bird endemic to LHI with a population estimate in 1997 of 220-230 individuals and 71-74 breeding pairs. According to the referral, the LH Woodhen population has remained relatively static over the last ten years, and may have reached carrying capacity in the lowlands. The total population is now estimated to be 240-300 individuals. About 40% of the population lives in the "Settlement" area of the island.

80. LH Woodhens usually lay eggs from August until February and continue raising young until April. However, the start and finish dates of breeding can vary between years and there are breeding records for much of the year. Pairs have multiple broods during the breeding season. Over 80% of the LH Woodhen's diet is comprised of earthworms. The bulk of the remaining 20% is made up of grubs, typically found in rotting logs. Snails, arthropods, seabird chicks, rodents, plant shoots, lichen and fungi are also eaten.

81. LH Woodhens are currently impacted by rodents on LHI.

Potential impacts

82. This species is at risk of both primary and secondary Brodifacoum poisoning. According to the referral, LH Woodhens were observed eating non-toxic pellet baits during a trial conducted on LHI to ascertain what species eat Pestoff 20R baits. Blue-coloured LH Woodhen faeces was observed indicating they had been eating Brodifacoum wax blocks. Brodifacoum has been detected in the internal organs of dead LH Woodhens.

83. LH Woodhens are also known to eat rodents and birds that have been poisoned during routine ground baiting operations around the Settlement.

84. The woodhen is congeneric with the New Zealand Weka (*Gallirallus australis*). Eradications using Brodifacoum have devastated populations of Weka, so Woodhen are likely to be similarly affected.

Avoidance and mitigation measures

85. LHIB propose capturing 80-85% of the LH Woodhen population and housing them in an aviary for up to nine months (until the baits (and rodent carcasses) have disintegrated and pose no further risk). The referral states that individuals that are not captured may succumb to primary or secondary poisoning. It is not possible to calculate a mortality rate and the worst case scenario will be the death of all non-captive LH Woodhens.

86. The captive population will include both adults and juveniles and will be collected from across LHI to ensure that the broadest available gene pool is maintained. The LH Woodhen gene pool is restricted because prior to commencement of a captive breeding program the population was small and passed through an extreme genetic bottle neck (only 15 individuals survived by 1980).

87. Birds from remote parts of LHI will be transported to and from the captive facility by helicopter to minimise transport time and stress on the birds. The captive facility will be located on LHI and will be managed by experienced aviculturists, veterinary nurses and an experienced veterinarian from Taronga Zoo. Captive birds will be banded.

88. The Department notes that LH Woodhens have previously been successfully held in captivity, including 22 birds in 2013. The referral stated that at least one other captive colony will be established on the Australian mainland. The establishment of on-site and off-island captive facilities, is in accordance with recommendations made in the NPWS 2002 "Recovery Plan for the Lord Howe Woodhen *Gallirallus sylvestris*" which recommends the development of a plan for the establishment of an on-island captive-breeding facility in the event of a substantial reduction in LH Woodhen numbers and the establishment of captive populations at sites other than LHI as insurance against a catastrophe affecting the wild population.

89. In June 2017, the Department engaged the professional services of Associate Professor David Phalen from the University of Sydney to review Taronga Zoo's CMP.

a. A summary of LHIB's response to the review is at Appendix 3 to this report. The review recommended that Woodhens and Currawongs should not be housed offshore because the opportunities for insect borne infectious (particularly parasitic) diseases are too high and animals from offshore facilities could not safely be returned to LHI.

b. Taronga Zoo revised the CMP on the basis of the review's recommendations. The revised final CMP is at Attachment L to the brief.

90. LH Woodhens will be tagged and held in captivity during one breeding season. It is likely LH Woodhens will be released by December of the baiting year, approximately 100 days after the second aerial bait-drop. The birds will have up to two months of the breeding season to lay eggs. Reproductive success immediately after release may be enhanced through diet manipulation (providing woodgrubs in the weeks leading up to release).

91. The release of captive Woodhens will occur over a significant period of time at the sites where they were captured. The release of captive birds is unlikely to occur until at least 90 days after the second round of baiting (allowing time for poisoned rodent carcasses to decay to the point that they can't be consumed by the newly released birds).

92. LHIB indicated that regular surveys will be undertaken following release of the captive population to determine survival (recapture), breeding success and population trends.

93. The Department notes that LH Woodhens have been bred successfully in captivity on LHI in pair cages. The referral states that the loss of one breeding season is unlikely to have a significant effect on the LH Woodhen population given some birds have lived for 15 years. The death of most, if not all, of the non-captive LH Woodhens is unlikely to result in long-term harm to the species unless the individuals that avoid capture are the most genetically robust individuals. The death of the adult birds that are not taken into captivity will provide vacant territories for fledglings in the years following the rodent eradication. In addition, terrestrial invertebrate numbers are likely to rise following the eradication of rodents, providing additional food for LH Woodhens.

94. The Department notes that LH Woodhens will be caged in groups of 20 to 25 birds to minimise the risk of injury and stress from conspecific aggression that occurs when groups of less than five birds are caged.

Lord Howe Island Currawong (*Strepera graculina crissalis) - Vulnerable*

Species information

95. The LHI Currawong is a sub-species of the mainland Pied Currawong and is endemic to LHI and nearby islets. The current population is estimated to vary between 205 and 225 birds and appears to be stable.

96. The LHI Currawong is widespread on LHI, occurring in lowland, hill and mountain regions. It mainly inhabits tall rainforests and palm forests, especially besides creeks or in gullies, but it also occurs around human habitation and forages amongst colonies of seabirds on offshore islets.

97. It breeds in the forested hills of LHI, particularly in the south. Highest densities of nests are on the slopes of Mt Gower and in Erskine Valley. Its breeding sites are located in gullies close to water.

98. The LHI Currawong occurs singly, in pairs and family groups and, in the non-breeding season, in small flocks of up to 15 birds. It has been recorded breeding from October to December although breeding may commence in September. In autumn and winter the species forms flocks and can be found in the settlement area.

99. No information is available on the ages of sexual maturity or life expectancy. Breeding success appears to be relatively low; the only available data suggests that less than 42% of nests produce fledglings.

100. The LHI Currawong is omnivorous; its diet consisting of fruits, seeds, snails, insects, the chicks of other bird species, and rodents.

101. This species is featured in the LHI Biodiversity Management Plan which according to SPRAT is the adopted/made recovery plan for this species.

Potential impacts

102. LHI Currawongs are unlikely to eat the baits but an unknown number of LHI Currawongs will succumb to secondary Brodifacoum poisoning by eating poisoned rodents.

Avoidance and mitigation measures

103. To both reduce the LHI Currawong mortality rate and maintain genetic diversity, the referral proposes capturing as many individuals as possible (50-60%) from across the island.

104. It is expected that approximately 90% of the poisoned rodents will die in underground dens or amongst dense vegetation. The remaining poisoned rodents will be available for Currawong consumption. The referral states that it is not possible to calculate the likely LHI Currawong mortality rate but the Department considers that the population of non-captive LHI Currawongs will be significantly impacted.

105. The referral states that: '*The stability displayed in the present population size and the presence of non-breeding currawongs during the breeding season (a result of a lack of availability of unoccupied breeding territories), indicate that LHI is at carrying capacity for Currawongs. If so, the potential death of a sizeable proportion of the at-large (i.e. non-captive) Currawong population from poisoning due to the proposed rodent eradication does not, in itself, threaten the long-term viability of the population*'.

106. It is likely that increased breeding success of the wild survivors and the LHI Currawongs released from captivity will compensate for the reduction in the non-captive LHI Currawong population. The removal of rats and mice may also lead to an increase in both the carrying capacity of LHI and LHI Currawong breeding success as there will be substantially more food available for currawongs (forest fruits, seeds, invertebrates, reptiles and small birds).

107. LHIB stated that as many individuals of the LHI Currawong population as possible (approximately 50-60%) from across LHI will be captured immediately prior to baiting commencing and will remain in captivity until 30 days after last indications of rodent survival.

108. In their report to the LHIB in 2007, Carlile and Priddell (NSW Department of Environment and Conservation) note that "Adult Currawongs can be trapped in reasonable numbers only during the period June–October. Outside this period they are difficult to trap." (page ii).

109. As the aerial baiting is to take place from June to August, it may be difficult to catch 50-60% of the population in the two months preceding the baiting, due to LHI Currawongs being difficult to trap. If 50-60% of the population cannot be caught, many wild Currawongs may be subject to secondary poisoning by eating rodents. This could result in a substantial reduction in the wild population of Currawongs. If the wild population is reduced as a result of the rodent eradication project, it is likely that there will be a reduction in genetic diversity in the Currawong community, reducing viability for the ongoing survival of the species.

110. Proposed condition three requires the establishment of a Technical Advisory Group (TAG), the membership of which must be approved by the Department. The Department will ensure, at the post approval stage, that the TAG provides the Rodent Eradication Steering Committee (which in turn advises the LHIB on rodent eradication matters) with appropriate advice on the number of LHI Currawongs that must be captured to ensure sufficient genetic diversity is maintained in this species.

111. Holding the LHI Currawongs in captivity will disrupt the breeding season for one year. However, the referral considers that some breeding may occur as it is unlikely that all the non-captive LHI Currawongs will be poisoned. In addition, LHI Currawongs are long-lived so the population is likely to recover in time.

112. As noted above, the captive management facility will be located on LHI and will be managed by experienced aviculturists, veterinary nurses and an experienced veterinarian from Taronga Zoo. To ensure all husbandry protocols are appropriate, a trial involving 10 LHI Currawongs was conducted in 2013 with all birds successfully released. The trial report is attached to the referral.

113. In the absence of mitigation in the form of captive management, LH Woodhens and LHI Currawongs are likely to be significantly impacted due to the death of most, if not all, of the wild birds following direct or indirect ingestion of Brodifacoum baits. Successful implementation of the proposed Captive Management Plan will reduce potential impacts of the baiting program on these species, however, it is likely their populations will decline and breeding cycles will be disrupted in the short term. The Department believes that, with successful implementation of the proposed mitigation measures, it is highly unlikely that the proposed action will to lead to the extinction of the LH Woodhen or LHI Currawong.

114. Proposed condition one requires the person taking the action to capture and manage in captivity Lord Howe Woodhens and Lord Howe Island Currawongs in accordance with Taronga Zoo's revised *Lord Howe Island Rodent Eradication Project Captive Management Plan* (July 2017) (Attachment L to the brief).

115. The objective of proposed condition four is to minimise impacts from aerial baiting on non-target species such as the LH Woodhen and LHI Currawong. This condition requires the LHIB to establish a Monitoring and Mitigation Plan based on advice from the Technical Advisory Group (TAG). The TAG will be established under proposed condition three to provide technical advice to the Rodent Eradication Steering Committee and be responsible for providing advice and recommendations for the development and implementation of the Monitoring and Mitigation Plan required at condition four.

116. The Monitoring and Mitigation Plan must:

(a) describe a strategy to monitor for the presence of target species on rocky islets prior to commencing aerial baiting (detailed at condition 7).

(b) provide for the monitoring of mortality and cause of death of non-target species, from the commencement of aerial baiting until at least 4 months following the commencement of aerial baiting.

(c) establish a Mitigation Team Manager responsible for collection of qualitative and quantitative information on non-target species mortality, documenting and reporting this information and using this information to coordinate and adapt carcass search and removal operations. The Mitigation Team Manager must provide weekly reports to the Department and the TAG regarding non-target species mortality and efficacy of carcass search and removal operations. More regular reports must be provided if requested by the TAG. The Mitigation Team Manager must undertake these tasks from the commencement of aerial baiting until at least 4 months following commencement of aerial baiting.

(d) Include protocols and impact thresholds to stop any further baiting where the TAG determines that unacceptable impacts on non-target species are observed between the first and second aerial baiting events.

(e) include protocols to ensure systematic, targeted and effective carcass search, collection and disposal in the vicinity of the Settlement and other accessible areas; (to avoid secondary poisoning of non-target species, but recognising that Masked Owl eradication depends on sufficient carcasses remaining uncollected) and specify appropriate resourcing.

(f) include clear contingency planning and adaptive management measures where mortality of non-target species is recorded, with the aim of reducing further mortalities.

(g) provide for ongoing whole-of-island census, and breeding success monitoring of Lord Howe Woodhens, Lord Howe Island Currawongs, Providence Petrel and Masked Booby

populations for a period of at least 5 years following completion of aerial baiting with particular focus on Lord Howe Woodhens and Lord Howe Island Currawongs following release from captivity.

A report summarising the monitoring results collected on non-target species mortality in accordance with Conditions 4(b&c) must be provided to the Department within 5 months following the completion of aerial baiting.

The results of the whole-of-island census and breeding success monitoring conducted in accordance with Condition 4(g) must be provided to the Department annually.

117. Aerial baiting will be followed with an immediate and extensive hunting program. Field teams working with highly trained rodent detection dogs will use a range of techniques to eliminate those rodents surviving the bait drops. Dogs will be trained and used to detect rodents, rather than to pursue and kill them. This phase of the project is essential to maximise the likelihood of eradicating all rodents.

118. LHIB indicated that disturbance from hunting parties to threatened species is likely to be sporadic and at a very low level, and is not expected to have any long-term impacts on populations or breeding habitat of threatened species. The Department believes that proposed condition 5(a) addresses these concerns by requiring all detection team members to be trained in the location of the colonies of EPBC Act listed bird species and methods for minimising impacts on these colonies, vegetation and soils.

119. The Department is satisfied that if the proponent complies with the proposed approval conditions and implements the mitigation measures detailed in the PER, the action is unlikely to interfere with the recovery of the Lord Howe Woodhen and the Lord Howe Island Currawong and will therefore have an acceptable impact on these species.

Invertebrates

Species information

120. Four land snails (all listed as critically endangered under the EPBC Act) and one flax snail (listed as endangered) occur on LHI. The land snails are Magnificent Helicarionid Land Snail (*Gudeoconcha sophiae),* Masters' Charopid Land Snail (*Mystivagor mastersi magnifica ms),* Mount Lidgbird Charopid Land Snail (*Pseudocharopa ledgbirdi)* and Whitelegge's Land Snail *(Pseudocharopa whiteleggei).* The flax snail is the Lord Howe Flax Snail, also known as the Lord Howe Placostylus *(Placostylus bivaricosus).*

Potential impacts

121. The conservation advices for the first four snail species listed above identify predation by introduced rats as the key threat to their survival.

122. Over-collection, or illegal collection, of rare invertebrates may pose a threat to some species. Associated with the direct impacts from the loss of the individuals, is damage to habitat, due to collectors breaking up and moving rotting logs.

123. Research was conducted in 2009 to assess the vulnerability of the endangered LH Flax Snail to Brodifacoum baits. The research shows that *Placostylus* will feed preferentially on their natural diet, ignoring bait when given a choice between their natural diet and rat bait pellets. When fed only Brodifacoum baits none of the *Placostylus* died.

124. Rats prey extensively on the Lord Howe Placostylus, particularly on juvenile snails, and are considered to be a major predator of the species and a significant threat to its survival. Rats are also a major threat to New Zealand *Placostylus* species. Research on rat

predation on *P. ambagiosus* in New Zealand has demonstrated that control of rats by pulse baiting can significantly increase adult snail recruitment.

125. Other studies showed that some common garden snails fed on Brodifacoum cereal baits for two weeks survived, whereas Seychelle Island snails died.

126. The four species of critically endangered land snails on LHI are the Masters' Charopid Land Snail, Mount Lidgbird Charopid Land Snail, Whitelegge's Land Snail and the Magnificent Helicarionid Land Snail. The rarity of these species has prevented any testing of their susceptibility to Brodifacoum, or capturing and breeding the species in captivity.

127. A recommended priority action in the conservation advices for these four species is the implementation of actions and tasks identified in the draft Biodiversity Management Plan of LHI for the control and eradication of rats on LHI. Another priority action in a number of these conservation advices is increasing quarantine and surveillance measures in relation to potential introduced threats. The proposed action has been designed to achieve these objectives and therefore is consistent with these conservation advices.

Avoidance and mitigation measures

128. Neither the referral nor the PER propose any invertebrate avoidance or mitigation measures.

129. The Department believes that to maintain invertebrate species it is important to ensure that rats are not introduced to any of the offshore islands, including Blackburn Island. Proposed condition 6 requires the person taking the action to draft and implement an integrated quarantine/biosecurity management plan for the airport and shipping port to prevent the reintroduction of rodents to the LHIG.

130. The plan should prescribe quarantine/biosecurity management protocols regarding visiting yachts, cruise ships, other vessels and shipwrecks and maintaining rodent free status on islets including the long-term use of rodent detection dogs.

Conclusion

131. The LHIB concluded that the proposed rat eradication program is unlikely to have a significant impact on the four EPBC listed land snail species and one EPBC listed Flax Snail found on LHI because:

- Research conducted in 2009 to assess the vulnerability of the endangered LH Flax Snail to Brodifacoum baits did not result in the death of any individuals of this species.
- Brodifacoum is not expected to have significant effects on invertebrates as they have different blood clotting systems to mammals and birds.
- New Zealand research concluded that terrestrial molluscs and invertebrates are not susceptible to Brodifacoum poisoning.

132. Except for the LH Flax Snails no trials have been conducted on the susceptibility of LHI land snails to Brodifacoum, due to the rarity of these species. Whilst the evidence suggested it is unlikely that the proposed action will have a significant impact on these four land snail species, it is not possible to be certain that this is the case.

133. The Department notes there is lack of information about these species, including the possibility that some of these snail species may already be extinct and if they still exist there is uncertainty about where they survive. The Department also notes that these species have been reduced to the edge of extinction primarily by rat predation and it is highly likely that if rats are not eradicated on LHI these species will become extinct. It is

therefore not possible to propose any practical avoidance and mitigation measures for these species that could be incorporated in the proposed approval.

134. The Department concludes that any likely impacts to the EPBC Act listed snails known to occur on LHI are acceptable.

EPBC species (not likely significantly impacted)

135. The PER concluded the proposed action was unlikely to result in a significant impact upon the species that are discussed in Part 2 of Appendix 2.

136. On 20 June 2016, the Department's Environment Reporting Tool (ERT) identified 45 listed threatened species that may occur within 2 km of the proposed action. The Department determined that the proposed action may have significant impacts on seven of these species (discussed above). Appendix 2 to this report assesses the potential impacts of the proposed action on the remaining 38 EPBC listed species that were identified in the ERT on 20 June 2016. The Department concluded that the proposed action was unlikely to have significant impacts on these species.

137. A search of the Department's Environmental Reporting Tool (ERT) on 13 July 2017 identified an additional six listed threatened species that were not identified in an ERT search on 20 June 2016 (the same co-ordinates were used in both ERT searches), within a parallelogram that encompasses all the islands of the Lord Howe Island Group (except for Balls Pyramid) and within a buffer of 2 km from the parallelogram.

138. The following threatened species (although previously listed under the EPBC Act) were not identified by the ERT at the time the controlled action decision was made, and therefore were not considered during the assessment process:

- Red Knot (*Calidris canutus*) - endangered
- Curlew Sandpiper (*Calidris ferruginea*) – Critically endangered
- Herald Petrel (*Pterodrama heraldica*) - Critically endangered
- Pacific Albatross (*Thalassarche bulleri platei*) – Vulnerable
- Sei Whale (*Balaenoptera borealis*) – Vulnerable
- Fin Whale (*Balaenoptera physalus) - Vulnerable*

139. These species were identified in the SPRAT search of 13 July 2017 because their distributions were updated in SPRAT subsequent to the controlled action decision for this project. The Department has assessed the potential impacts of the proposed action on the above species and concluded that it was highly unlikely that they would be significantly impacted by the proposal (Appendix 2).

140. The Masked Owls on LHI were until recently believed to be the Tasmanian species *(Tyto novaehollandiae castanops),* however, genetic testing has found significant divergence of the LHI population from *Tyto novaehollandiae castanops* suggesting that hybridisation has occurred with the Southern Australian population *(Tyto novaehollandiae novaehollandiae).* Masked Owl (Southern Australia) *Tyto novaehollandiae novaehollandiae* is not EPBC listed, and therefore is not a relevant consideration to this decision.

Listed migratory species

141. The ERT identified 38 listed migratory species that may occur within 2 km of the proposed action (see the ERT report at Appendix 1).

142. The listed migratory bird species identified by the ERT include: albatross, petrels, tropicbirds, shearwaters and three migratory wetland species (Bar-tailed Godwit (*Limosa lapponica)*, Eastern Curlew (*Numenius madagascariensis)* and the Common Greenshank (*Tringa nebularia)*.

143. The migratory marine species include whales, turtles, dolphins, sharks and rays.

144. Based on the location of the action and likely habitat present in the area of the proposed action, the Department considers that impacts potentially arise in relation to the following matters.

Masked Booby (Sula dactylatra) listed migratory

145. The Masked Booby is widely distributed through the tropical and subtropical seas of the world. The breeding population on LHI is the most southerly breeding colony in the world SPRAT indicated that the LHI population is in the 100s.

146. This species remains at LHI year round but ranges widely for food and some juveniles wander before returning to breed. Young birds banded on Lord Howe Island have been recovered as far away as the Solomon Islands.

147. Masked Boobies breed on high open areas where they can take off directly into the wind. Breeding sites on LHI include King Point and Muttonbird Point on the main Island and also Ball's Pyramid, Muttonbird Island and the Admiralty Islets. Masked Boobies will be breeding when aerial rodent baiting is occurring.

148. Proposed condition 4(d) requires the Monitoring and Mitigation Plan to contain protocols that stop any further baiting where the TAG determines that unacceptable impacts on non-target species are observed between the first and second aerial baiting events.

149. Where seabird carcasses are visible or seabird numbers are declining significantly after the first baiting session due to bait intake, measures will have to be taken to avoid seabird deaths during the second round of baiting.

150. Threats to this species include predation of eggs and young by rodents at the nesting grounds. Other threats include by-catch by long-line fishing vessels; introduction of pest species to LHI (e.g. Green and Brown Tree snakes, possums, ferrets); and big headed ants - aggravating adults to the point where they abandon nests. Chicks are also vulnerable to ant predation as soon as they hatch.

151. Further details about the LHI Masked Booby population are available via links at the NSW OEH website http://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10898

152. The NSW Government has developed a targeted strategy for managing this species. Activities include control and eradication of introduced rodents; monitoring the status of the LHI breeding population and supporting measures to prevent the detrimental threats of long-line fishing on seabirds.

Avoidance and mitigation measures

153. Proposed condition two requires the LHIB to locate observers at a location with clear line of sight to the Providence Petrel and Masked Booby breeding grounds (as identified at Schedule 2 to the approval). Another observation team must be located in a boat viewing

the southern face of Mount Gower. The observers must provide commentary to the helicopter pilot via radio regarding the Providence Petrel's and Masked Booby's behaviour, to supplement the pilot's observations.

154. If Providence Petrels (or Masked Boobies) display unusual behaviour or become agitated during baiting flights, the pilot must take action to minimise impacts on Providence Petrels and Masked Boobies.

155. Proposed condition 2(e) requires aerial baiting in the vicinity of the Providence Petrel and Masked Booby breeding grounds to be undertaken at a bait dispersal altitude that minimises unusual behaviour by Providence Petrels and Masked Boobies.

Potential impacts on EPBC listed migratory species in general

156. Potential impacts of the proposed action on EPBC listed migratory species include:

- Primary poisoning from consumption of bait pellets
- Secondary poisoning from consumption of poisoned rodents or invertebrates
- Disturbance as a result of helicopter activities.

157. The PER indicates that it is unlikely that overflights by baiting helicopters will result in listed migratory bird species deserting or abandoning their nests for long periods of time, with detrimental impacts on eggs or chicks. The Department sought advice from a number of field experts, reviewed relevant scientific papers and concluded that it was unlikely helicopter overflights would adversely affect the breeding success of listed migratory birds.

158. The Department also concluded that it is unlikely that listed migratory bird species will directly or indirectly consume Brodifacoum pellets to the extent that populations of these species on LHI will be significantly impacted.

159. The referral states that any potential impacts are likely to be very localised and temporary in nature.

160. The risks the proposed action poses to these migratory species are a function of the species present at the time, their behaviour, susceptibility of these species to Brodifacoum, the composition and delivery method of the bait and the probability of direct and indirect exposure to the poison.

161. The Department notes that many of these EPBC listed Migratory or Marine bird species rarely visit LHI and the visits are made by a few individuals. These are vagrants, rare or irregular visitors. Even if the proposed baiting constituted a real threat to these individuals, no local population of the species is likely to be placed at risk by the proposed action.

162. LHIB stated that in most cases the low overall number of individuals involved, their diet or the small possibility that they will be in the vicinity of LHI during the baiting operation means that while some individuals may be at risk it is not possible for there to be any impact at a population level from the eradication.

Avoidance and mitigation measures

163. According to the referral, the main potential impact of the proposed action on EPBC listed migratory bird species that will be present during the aerial baiting operation will be the risk of collision with helicopters. To minimise interaction between seabirds and helicopters the

proponent intends taking advantage of the diurnal movements of seabirds to and from the island when scheduling helicopter flights. Various sections of LHI will be baited when the majority of seabirds are foraging at sea and away from their roosting (nesting) grounds. However, the Department notes that the impact of helicopter movements on seabirds roosting during the day is uncertain.

Recommended conditions

164. The Department has recommended a range of conditions to manage the potential impacts on listed migratory species as set out in the above section.

Conclusion

165. As noted above the ERT identified 38 listed migratory species that may occur within 2 km of the proposed action. These species include albatross, petrels, tropicbirds, shearwaters, three migratory wetland bird species and migratory marine species including whales, turtles, dolphins, sharks and rays.

166. In the assessment documentation the LHIB indicated that any potential impacts on listed migratory species are likely to be localised and temporary in nature. The LHIB also stated that only a few individuals of most of these species are likely to be on, or in the vicinity of, LHI during and immediately after baiting is carried out (ie before Brodifacoum in the bait pellets is immobilized and no longer available for biological uptake). In addition the diets and food consumption patterns of all but a few of these species are such that the likelihood that they will be exposed to Brodifacoum is very low.

167. The Department considered all these factors and concluded that whilst a few individuals of a small number of listed migratory species may be at risk there will be no impact at the population level on any listed migratory species (whales, turtles, dolphins, sharks, rays or migratory wetland species) likely to be on, or in the vicinity of, LHI during and immediately after rodent baiting is carried out, if the proposed approval conditions are implemented.

Additional migratory species identified in ERT search 13 July 2017

168. The following migratory species, although listed prior to 20 June 2016 (when the original ERT search was conducted), appeared in the ERT search for the first time on 13 July 2017 because their distributions were updated in SPRAT in March 2017.

- Curlew Sandpiper *(Calidris ferruginea)*
- Common Sandpiper (*Actitis hypoleucos*)
- Sharp-tailed Sandpiper (*Calidris acuminata)*
- Red Knot (*Calidris canutus*)
- Pectoral Sandpiper *(Calidris melanotos)*
- Sei Whale (*Balaenoptera borealis*)
- Fin Whale (*Balaenoptera physalus)*
- Common Noddy *(Anous stolidus)*
- Lesser Frigate Bird *(Fregata ariel)*
- Greater Frigate Bird *(Fregata minor)*

169. These species were identified in the SPRAT search of 13 July 2017 because their distributions were updated in SPRAT subsequent to the controlled action decision for this project. The Department recently assessed the potential impacts of the proposed action on the above species and concluded that it was unlikely that they would be significantly impacted by the proposal. This assessment is at Part 4 of Appendix 2 to this report.

170. Section 286 of the EPBC Act states a Commonwealth Agency must take all reasonable steps to act in accordance with a wildlife conservation plan. The *Wildlife Conservation Plan for Migratory Shorebirds August 2015* is currently in place under the EPBC Act (Attachment Q to the proposed decision brief). The Wildlife Conservation Plan includes 35 species of migratory shorebird that regularly visit Australia. The Plan is relevant to the majority of the migratory shorebirds potentially impacted by the proposed action.

171. The Department considers that the proposed action is unlikely to be inconsistent with the Wildlife Conservation Plan for Migratory Shorebirds provided that LHIB complies with the proposed approval conditions.

World heritage properties (sections 12 and 15A)

172. The Lord Howe Island Group was inscribed on the World Heritage List in 1982 and is an outstanding example of oceanic islands of volcanic origin containing a unique biota of plants and animals, as well as the world's most southerly true coral reef. It is an area of spectacular and scenic landscapes encapsulated within a small land area, and provides important breeding grounds for colonies of seabirds as well as significant natural habitat for the conservation of threatened species.

173. The property meets two World Heritage natural criteria:

    (vii) - to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance

    (x) - to contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

174. The Australian World Heritage Management Principles are set out in Schedule 5 of the *Environment Protection and Biodiversity Conservation Regulations* 2000. These principles state that the primary purpose of management of a World Heritage property is to identify, protect, conserve, present and, if appropriate, rehabilitate the World Heritage values of the property so they may be transmitted to future generations.

175. The principles also require opportunities be provided for continuing community and technical input in the management of a World Heritage property. To achieve this, special provisions can be made where appropriate for the involvement of those with a particular interest in the site or who may be affected by its management. Provisions for planning and impact assessment are also included in the Australian World Heritage Management Principles. While these principles do not legally apply to the management of the state-managed areas within this WHA, the LHI Board has agreed that management of the preserve will be consistent with these principles.

176. The LHIB manages the LHI Group consistent with the Strategic Plan for Lord Howe Island Group World Heritage Property, which sets out the management objectives, policies and prescriptions for the reserve, and the Lord Howe Island Permanent Park Preserve Plan of Management November 2010.

177. All activities undertaken on LHI must be in accordance with these plans. The plans include an objective to eradicate alien fauna species where this is feasible and is considered warranted by the damage being caused or likely to be caused. The loss of non-target species, including threatened species, in any eradication plan, must also be considered and the costs and benefits assessed.

178. At the referral stage, advice from the Department's Natural Heritage Section stated that the proposed action could result in adverse impacts to:

- LH Woodhens - at risk of dying from primary poisoning (direct consumption of bait pellets) and secondary poisoning (consumption of poisoned rodents and birds).
- LHI Currawongs - are unlikely to eat bait pellets but are at risking of dying as a result of secondary poisoning by eating poisoned rodents.

179. The proposed action therefore has potential to cause one or both of these World Heritage values of the property to be lost, notably altered or diminished.

180. The advice stated that the mitigation measures proposed in the referral appear appropriate for LH Woodhens whereas the action may cause the population of LHI Currawongs to be lost, notably altered or diminished. The advice refers to a NSW Department of Environment and Conservation report (2007) to LHIB that states "*Adult Currawongs can be trapped in reasonable numbers only during the period June–October. Outside this period they are difficult to trap.*"

181. The advice also stated that as aerial baiting is to take place from June to August it may be difficult to catch 50-60% of the LHI Currawong population in the two months preceding the baiting (April and May) as LHI Currawongs are difficult to trap in this period.

182. If enough of the population catch cannot be caught, many wild LHI Currawongs will be subject to secondary poisoning by eating rodents. This could result in a substantial reduction in the wild LHI Currawong population, reduced genetic diversity and reduced population viability.

183. The advice concluded that the proposed action may cause one or more of the World Heritage values to be lost, degraded or damaged, or notably altered, modified, obscured or diminished - in particular the LHI Currawong.

184. The Department therefore concluded that the proposed action was likely to have a significant impact on World Heritage Properties.

185. Proposed condition three requires the establishment of a Technical Advisory Group (TAG), the membership of which must be approved by the Department. The Department will ensure, at the post approval stage, that the TAG provides the Rodent Eradication Steering Committee (which in turn advises the LHIB on rodent eradication matters) with appropriate advice on the number of LHI Currawongs that must be captured to ensure sufficient genetic diversity is maintained in this species.

Providence Petrel

186. The Providence Petrel (*Pterodroma solandri)* is a listed marine species (but not a listed migratory species) that can be considered in this assessment under criterion (x) - to contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

187. The Providence Petrel ranges across the eastern Pacific. The only known breeding sites are at LHI and Phillip Island, offshore from Norfolk Island. This species also bred on Norfolk Island itself but was extinct there by 1800. The species was discovered breeding on Phillip Island in 1985, with at least 20 birds seen and four nesting burrows found.

188. According to SPRAT, in 2000 the total population size of the Providence Petrel was estimated to be 100 000 birds in the Lord Howe Island population (32 000 breeding pairs plus at least 20 breeding pairs on Phillip Island).

189. Providence Petrels nest on the tops of Mount Gower and Mount Lidgbird on LHI and to a lesser extent, on the lower slopes of these mountains. The nest is a grass-lined chamber at the end of a burrow, 1 - 2 metres in length.

190. Threats to the species include predation of eggs and young by rodents at the nesting grounds; predation of nests and adults by pet and feral cats; disturbance of birds and habitat by tourist activities; stochastic processes due to its small known population size and restricted distribution; and entry of unknown pathogens/exotic species to the island – which could potentially cause local extinction in a short timeframe.

191. The LHIB provided the Department with night vision video footage of rats removing eggs from Providence Petrel nests on LHI. At some sites, predation of Providence Petrel eggs by rats is the major threat to the species.

192. The Providence Petrel has been identified as a conservation value in the Temperate East Marine Region. Maps of Biologically Important Areas have been developed for Providence Petrel in the Temperate East Marine Region.

193. Further details about the Providence Petrel population are available via links at the NSW OEH website http://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10894

Avoidance and mitigation

194. Proposed management measures to avoid and minimise these impacts to species include:

- Timing of the aerial baiting between 1 June and 30 August to coincide with the most inactive period or absence of most non-target species (Condition 2(a)).
- Aerial baiting will utilise experienced pilots, satellite imagery and GPS to accurately target bait distribution and minimise contamination of water bodies.
- Adoption of Australian Pesticides and Veterinary Medicines Authority standards and *Brodifacoum* label procedures for handling, transport, clean-up and disposal of pesticides.
- Implementation of lessons from over-flight trials, aerial baiting in the vicinity of the Providence Petrel and Masked Booby breeding grounds must be undertaken at a bait dispersal altitude that minimises unusual behaviour by Providence Petrels and Masked Boobies (Condition 2(e)).
- All detecting team members must be made aware of the location of threatened bird colonies and be trained in methods for minimising impacts on these colonies, vegetation and soils.
- All dogs used for detection of rodent species on LHI must have previously undergone project-specific training and have been accredited by the Canine Detection Certification Council after passing the Council's practical accreditation test, prior to commencement of hunting operations.
- The handlers must have a Statement of Attainment in Dog Training from the Certificate IV, Companion Animal Care and Management Course (ACM40310) from TAFE NSW.

195. The Department recommends that the above management measures be applied as proposed conditions to the approval.

196. Tasmanian Parks and Wildlife Service (TPWS) advised the Department that when drafting prescriptions for the pest species eradication program on Macquarie Island they conducted helicopter trial runs over penguin colonies to ascertain a minimum height below which the birds stampeded. The EPBC approval conditions for this program specified a minimum flight path height above the ground of 160 m.

197. TPWS were less concerned about the impact of helicopters on seabird colonies such as Giant Petrels and Skuas whose response to repeated passes by helicopters could be expected to be more relevant to Providence Petrels and Masked Boobies on LHI. A great deal of uncertainty therefore exists as to how birds on LHI will respond to helicopter baiting and what passing heights are appropriate.

198. The Department recognises the operational difficulties helicopter pilots experience in mountainous terrain on an island subject to strong and variable winds when attempting to accurately spread rodent baits across the landscape and therefore has not specified helicopter flying heights. Not specifying a height provides flexibility to the helicopter crew regarding work health and safety, and enables the proponent to adaptively manage, and respond to, any observed significant disturbance to EPBC protected bird species.

National Heritage Places

199. Lord Howe Island Group (LHIG) is a National Heritage Place, listed on 21 May 2007 in recognition of its natural heritage significance in that it met four of the possible nine criteria as listed in the Commonwealth of Australia Gazette No. S 99, 21 May 2007.

200. The World Heritage values are considered as a surrogate for the Lord Howe Island Group property's National Heritage Values as the Lord Howe Island Group was one of 15 World Heritage places included in the National Heritage List on 21 May 2007 for values similar to its Outstanding Universal Value.

201. Potential impacts are therefore discussed in terms of the property's Outstanding Universal Value rather than its National Heritage values.

Conclusion

202. The Department concludes that if the proposed action is undertaken in accordance with the proposed approval conditions impacts on the Lord Howe Island Group National Heritage Place should not be unacceptable.

Considerations for Approval and Conditions

Mandatory considerations – section 136(1)(b) Economic and social matters

203. LHI generates significant economic activity through the provision of tourism accommodation and a range of tourism and recreation activities that include:

- marine activities (beach and reef walking, swimming, snorkelling, scuba diving, fish feeding, surfing, underwater photography, windsurfing, sea-kayaking, fishing, sightseeing cruises and eco tours)
- terrestrial activities (hiking, bird watching, bike riding, sightseeing and eco tours)

204. Economic activity is also generated via the propagation and sale of the Lord Howe Kentia Palm (domestically and internationally) and nursery vegetables to local businesses.

205. In 2012, the Commonwealth and NSW Governments announced a total of $9 million in funding for the planning and implementation of the project. The funding comprised of $4.5 million from the former Caring for Our Country Program (now National Landcare program) and $4,542,442 from the NSW Environment Trust.

206. Ongoing biodiversity monitoring costs will be $50,000 per year for 10 years and ongoing rodent detection (quarantine) costs of $30,000 per year. With the implementation of the project the LHIB will avoid rodent control costs of $85,000 per annum and residents will avoid private bait costs of $4,800 per annum.

207. The project will create the following employment opportunities:

- 2 full time staff and 1 part time (0.5) staff member (already engaged)
- 5-10 (casual or contract) staff for aviary construction during February – June 2018
- 30-40 (casual or contract) staff between May –September 2018 for implementation of the program and immediate follow up monitoring
- 1-2 full time staff for ongoing biosecurity post-baiting.

208. The project workforce will consist of a mix of LHI locals and mainland staff depending on actual skillsets required and resources available.

209. The PER indicates that successful eradication of rodents on LHI will create net benefits by improving biodiversity, tourism opportunities and the profits of the Kentia Palm and fresh vegetable industries. It also suggests that there will be no or minimal reduction in visitor numbers during the baiting period. Demand for accommodation for workers engaged in the eradication should more than offset any shortfalls in visitor numbers.

210. It is possible that tour operators, food and other businesses might experience some short term declines in income if the expenditure patterns of the workers are different from tourists.

211. The Department notes that successful, large-scale rodent eradication projects on inhabited islands have been integrated with programs to improve the livelihoods of residents, island biosecurity and reinvasion response programs. The Department believes that the LHIB should include future island quarantine, biosecurity and a rodent reinvasion response program into the rat eradication project.

212. The proposed approval conditions address the issues of future island biosecurity and reinvasion response programs. In particular, Condition 6 requires submission of an integrated quarantine/biosecurity management plan.

213. Whilst human health is the primary responsibility of other state and Commonwealth agencies the Department has considered human health issues as part of the assessment of socio-economic matters which are discussed in detail at Appendix 5.

Factors to be taken into account – section 136(2)(a) Principles of ecologically sustainable development

214. Under subsection 136(2)(a) and section 3A, in considering the matters discussed in this document, the Minister must take into account the principles of ecologically sustainable development and the precautionary principle respectively.

215. The principles of ESD, as defined in Part 1, section 3A of the EPBC Act, are:

(a) decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations;

(b) if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;

(c) the principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;

(d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making;

(e) improved valuation, pricing and incentive mechanisms should be promoted.

In formulating this recommendation, the Department has taken into account the principles of ecologically sustainable development. In particular:

- This report and the assessment documentation contain information on the long-term and short-term economic, environmental, social and equitable considerations that are relevant to the decision and are presented for your consideration.
- Any lack of certainty related to the potential impacts of the projects is addressed by conditions that restrict environmental impacts, impose strict monitoring and adopt environmental standards which, if not achieved, require the application of response mechanisms in a timely manner to avoid adverse impacts.
- The proposed conditions will ensure protection of EPBC listed species and communities, listed migratory species, the LHIG World Heritage Property and National Heritage Place. Those conditions allow for the project to be delivered and operated in a sustainable way to protect the environment for future generations and preserve these EPBC matters in perpetuity.

216. The Department has considered the importance of conserving biological diversity and ecological integrity in relation to all of the controlling provisions for this project, and the advice provided within this document reflects that consideration.

217. The Department's advice includes reference to and consideration of a range of information on the economic costs, benefits and impacts of the project.

Factors to be taken into account – section 136(2)(c) – public environmental report

218. In accordance with section 136(2)(c)(i), the finalised environment public environment report relating to the action given to the Minister under section 99 is at Attachment C.

219. In accordance with section 136(2)(c)(ii), this document forms the recommendation report relating to the action given to the Minister under section 100.

Person's environmental history – section 136(4)

220. In accordance with Section 136(4) the Minister may consider whether the person proposing to take the action is a suitable person to be granted an approval, having regard to the person's history in relation to environmental matters and if the person is a body corporate, the history of its executive officers and if relevant, the history of the parent company and its executive officers in relation to environmental matters.

221. LHIB provided the following information in relation to their environmental history.

222. According to the referral, the LHIB has a proven record of responsible environmental management of LHI. The LHI Board is a statutory body established under the NSW LHI Act, 1953. The Board is charged with the responsibility of administering the affairs of the Island and has the responsibility to: "manage, protect, restore, enhance and conserve LHI in a manner that recognises the World Heritage values in respect of which the Island is inscribed on the World Heritage List".

223. Environmental projects implemented by the LHIB include the eradication of cats, pigs & wild goats, eradication of African Big-headed Ants (in progress), recovery of the endemic LH Woodhen through a captive breeding programme, captive management of the LHI Phasmid, planning rodent eradication and, over the past 10 years, implementing an island wide weed eradication program targeting 68 invasive species.

224. Section 9 of the Final PER, states that; "There are no proceedings under Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the LHIB."

225. Section 6.2 of the referral, indicates that the LHIB has never been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources.

Considerations in deciding on condition – section 134

226. In accordance with section 134(1), the Minister may attach a condition to the approval of the action if he or she is satisfied that the condition is necessary or convenient for:

(a) protecting a matter protected by a provision of Part 3 for which the approval has effect (whether or not the protection is protection from the action); or

(b) repairing or mitigating damage to a matter protected by a provision of Part 3 for which the approval has effect (whether or not the damage has been, will be or is likely to be caused by the action).

227. As detailed in the Assessment section above, all recommended conditions attached to the proposed approval are necessary or convenient to protect, repair and/or mitigate impacts on a matter protected by provision of Part 3 for which this proposed approval has affect.

228. In accordance with section 134(4), in deciding whether to attach a condition to an approval the Minister must consider:

(a) any relevant conditions that have been imposed, or the Minister considers are likely to be imposed, under a law of a State or self-governing Territory or another law of the Commonwealth on the taking of the action.

229. The LHIB applied to the Australian Pesticides and Veterinary Medicines Authority (APVMA) for a "Minor Use Permit" under the *Agricultural and Veterinary Chemicals Code Act 1994* to use Brodifacoum in Pestoff 20R cereal bait pellets to eradicate rodents on LHI. A Limited Level Environmental Assessment will consider the fate of Brodifacoum in the environment (soil, air and water) environmental toxicology, bioaccumulation and potential impacts to all species. The APVMA are yet to make a decision in regard to this application, as such, there are no relevant conditions in this regard.

230. The NSW Office of Environment and Heritage is required to assess the proposal to capture and house Lord Howe Woodhens and Lord Howe Island Currawongs in a captive management facility on LHI. The NSW decision maker is yet to make a decision in regard to this application, as such, there are no relevant conditions in this regard.

231. Should either or both of these permits/licences be issued prior to the final approval decision being made under the EPBC Act the Department will provide copies of the permits/licences to the EPBC decision maker for consideration, prior to the final approval decision being made.

232. Under paragraph 134(4)(aa) of the EPBC Act, in deciding whether to attach a condition to an Approval, the Minister must consider information provided by the person proposing to take the action or by the designated proponent of the action.

233. The information provided by the person proposing to take the action has been considered. Documentation provided by the person taking the action is at Attachment C of the briefing package.

234. Under paragraph 134(4)(b) of the EPBC Act, in deciding whether to attach a condition to an Approval, the Minister must consider the desirability of ensuring as far as practicable that the condition is a cost effective means for the Commonwealth and a person taking the action to achieve the object of the condition.

235. The Department considers that the conditions proposed are a cost effective means of achieving their purpose.

Consideration of Condition-setting Policy

- The Department has considered the likely scope and severity of the impacts to MNES, and the proposed avoidance and mitigation measures, and determined that it is likely the proposed action will result in a significant residual adverse impact on Listed threatened species and ecological communities (sections 18 and 18A), Listed migratory species (sections 20 and 20A), World heritage properties (sections 12 and 15A), and National heritage places (sections 15B and 15C).

236. The State approval conditions relate specifically to the capture and captive management of LH Woodhens and LHI Currawongs. The Department considers that it is necessary and convenient to apply approval conditions to this project because a much broader range of matters of NES, than the species considered in the NSW approval, are likely to be significantly impacted by the proposed action. In applying this analysis, the Department has had regard to the EPBC Act Condition-setting Policy.

237. Compliance and Enforcement Branch provided comments on the proposed conditions (Attachment E). Their comments have been considered and the proposed approval conditions have been amended accordingly.

Requirements for decisions about World Heritage – section 137

- In deciding whether or not to approve, for the purposes of section 12 or 15A, the taking of an action and what conditions to attach to such an approval, the Minister must not act inconsistently with:

  (a) Australia's obligations under the World Heritage Convention; or

  (b) the Australian World Heritage management principles; or

  (c) a plan that has been prepared for the management of a declared World Heritage property under section 316 or as described in section 321.

World Heritage Convention

238. The World Heritage Convention is available at: http://whc.unesco.org/en/convention/.

239. The World Heritage Convention aims to promote cooperation among nations to protect heritage around the world that is of such outstanding universal value that its conservation is important for current and future generations. It is intended that, unlike the seven wonders of the ancient world, properties on the World Heritage List will be conserved for all time.

Consideration

240. The recommendations are not considered by the Department to be inconsistent with the World Heritage Convention, which aims to protect heritage around the world that is of such outstanding universal value. The Department has also given particular consideration to an appropriate combination of avoidance and mitigation measures for the management of World Heritage values potentially impacted by the proposed action.

241. The World Heritage Convention has been considered in, and is not inconsistent with, the recommended approval which requires avoidance, mitigation and management measures for World Heritage properties. The recommended approval requires information to be publicly available to ensure equitable sharing of information and improved knowledge relating to World Heritage.

World Heritage management principles

242. The World Heritage management principles are accessible at schedule 5 of the EPBC Regulations: http://www.environment.gov.au/node/19584.

243. Heritage management principles provide a guiding framework for excellence in managing heritage properties. They set the standard and the scope of the way places should be managed in order to protect heritage values for future generations.

244. These principles should be used when preparing and implementing management plans and programs. In the absence of a management plan, they should guide the management of heritage values of a property.

Consideration

245. An assessment process, which included public review, has been undertaken in accordance with the World Heritage management principles. The Department considers that approval of the proposed action with the proposed conditions attached is not inconsistent with the World Heritage management principles.

A plan for the management of the World Heritage Property

246. The Strategic Plan for the Lord Howe Island Group World Heritage Property is Attachment P to the proposed approval decision brief and is also available at http://www.lhib.nsw.gov.au/sites/lordhowe/files/public/images/documents/lhib/Tourism/lhi%20whp%20draft%20strategic%20plan%20-%20final%20draft%2014%20october%202010.pdf

247. This Strategic Plan provides a ten year framework for consistent and coordinated management of the LHIG World Heritage Property by the LHIB and the various NSW and Commonwealth government agencies with responsibilities in the area. It is intended to ensure that day-to-day management of the Property complies with Australia's obligations under the World Heritage Convention to protect, conserve, rehabilitate, present and transmit World Heritage values. The Plan is also based on the Australian World Heritage Management Principles that were agreed to by the Commonwealth, State and Territory Governments.

248. A management plan for the Lord Howe Island Group World Heritage Property has not been prepared under section 316 of the EPBC Act.

Consideration

249. The Department considers that likely impacts on the values of the World Heritage Property will be avoided and mitigated by the person taking the action to a reasonable degree under the proposed conditions. Approving the proposed action subject to the proposed conditions would therefore not be inconsistent with the management plan.

Requirements for decisions about National Heritage places – section 173A

250. In deciding whether or not to approve for the purposes of section 15B or 15C of the EPBC Act the taking of an action, and what conditions to attach to such an approval, the Australian Government Environment and Energy Minister must not act inconsistently with:

a. the National Heritage management principles; or

b. an agreement to which the Commonwealth is party in relation to a National Heritage place; or

c. a plan that has been prepared for the management of a National Heritage place under section 324S or as described in section 324X.

National Heritage management principles

251. The National Heritage management principles are accessible at schedule 5B of the EPBC Regulations: http://www.austlii.edu.au/au/legis/cth/consol_reg/epabcr2000697/sch5b.html.

252. An assessment process, which included public review, has been undertaken in accordance with the management principles. The Department considers that approval of the proposed action with the proposed conditions attached is not inconsistent with the National Heritage management principles.

Agreement or plan for the management of a National Heritage place

253. The Department considers that approval of the proposed action with the proposed conditions attached is not inconsistent with Strategic Plan for Lord Howe Island Group World Heritage Property Attachment P.

254. The Strategic Plan is not inconsistent with the requirements for National Heritage management plans in Schedule 5A and the National Heritage management principles in Schedule 5B of *the Environment Protection and Biodiversity Conservation Regulations 2000*.

Consideration

255. The Department considers that likely impacts on the values of the National Heritage place will be avoided and mitigated by the person taking the action to a reasonable degree under the proposed conditions.

Requirements for decisions about listed threatened species and communities – section 139

256. In deciding whether or not to approve for the purposes of a subsection of section 18 or section 18A the taking of an action, and what conditions to attach to such an approval, the Minister must not act inconsistently with:

(a) Australia's obligations under:

(i) the Biodiversity Convention; or

(ii) the Apia Convention; or

(iii) CITES; or

(b) a recovery plan or threat abatement plan.

(2) If:

(a) the Minister is considering whether to approve, for the purposes of a subsection of section 18 or section 18A, the taking of an action; and

(b) the action has or will have, or is likely to have, a significant impact on a particular listed threatened species or a particular listed threatened ecological community;

the Minister must, in deciding whether to so approve the taking of the action, have regard to any approved conservation advice for the species or community.

The Biodiversity Convention

257. The Biodiversity Convention is available at:
http://www.austlii.edu.au/au/other/dfat/treaties/ATS/1993/32.html

258. The objectives of the Biodiversity Convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

Consideration

259. The recommendations are not considered by the Department to be inconsistent with the Biodiversity Convention, which promotes environmental impact assessment (such as this process) to avoid and minimise adverse impacts on biological diversity. The Department has also given particular consideration to an appropriate combination of avoidance and

mitigation measures for the management of species potentially impacted by the proposed action.

260. The Biodiversity Convention has been considered in, and is not inconsistent with, the recommended approval which requires avoidance, mitigation and management measures for listed threatened species and communities. The recommended approval requires information related to the proposed action to be publically available to ensure equitable sharing of information and improved knowledge relating to biodiversity.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

261. CITES is available at: http://www.austlii.edu.au/au/other/dfat/treaties/ATS/1976/29.html

262. CITES is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

Consideration

263. The recommendations are not inconsistent with CITES as the proposed action does not involve international trade.

Convention on the Conservation of Nature in the South Pacific (APIA Convention)

264. The APIA Convention is available at: http://www.austlii.edu.au/au/other/dfat/treaties/ATS/1990/41.html

265. The APIA Convention encourages the creation of protected areas which together with existing protected areas will safeguard representative samples of the natural ecosystems occurring therein (particular attention being given to endangered species), as well as superlative scenery, striking geological formations, and regions and objects of aesthetic interest or historic, cultural or scientific value.

Consideration

266. The APIA Convention was suspended with effect from 13 September 2006. While this Convention has been suspended, Australia's obligations under the Convention have been taken into consideration. The recommendations are not inconsistent with the Convention which has the general aims of conservation of biodiversity.

Recovery Plans and Threat Abatement Plans

267. The Recovery Plans relevant to the proposed action and assessment are (Attachment F):

- NSW Department of Environment and Climate Change (NSW DECC) (2007). *Lord Howe Island Biodiversity Management Plan*. Sydney, NSW: NSW Department of Environment and Climate Change. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/recovery/lord-howe/index.html. In effect under the EPBC Act from 25-May-2008.
- NSW National Parks & Wildlife Service (2002). *Recovery Plan for the Lord Howe Woodhen* (Gallirallus sylvestris) - *2002*. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/recovery/lord-howe-wood-hen/index.html. In effect under the EPBC Act from 13-Oct-2003. as *Gallirallus sylvestris*.

268. Below is a discussion on these Recovery Plans.

269. According to SPRAT, the *Lord Howe Island Biodiversity Management Plan* is the adopted/made recovery plan for a number of EPBC listed threatened species.

270. The stated objectives of the recovery plan are:

- Objective 1: To prevent the introduction of exotic fauna, flora and pathogens to the LHIG
- Objective 2: To retain native vegetation
- Objective 3: To control the impacts of introduced pathogens on native species
- Objective 4: To eradicate (where feasible) and control existing weeds to reduce their impact on the biodiversity of the LHIG
- Objective 5: To undertake revegetation/ rehabilitation works in high conservation priority areas
- Objective 6: To eradicate (where feasible and where there is a worthwhile biodiversity outcome) or control introduced fauna and reduce their impact on biodiversity
- Objective 7: To reduce impacts of groundwater pollution
- Objective 8: To enhance positive interactions and reduce negative interactions between humans and wildlife
- Objective 9: To reduce the impact of commercial, cultural and illegal collecting
- Objective 10: To reduce human impacts
- Objective 11: To monitor consequences of climate change and develop contingency plans for 'at risk' species
- Objective 12: To encourage the conservation and protection of significant species, populations and ecological communities
- Objective 13: To promote recovery of individual threatened flora taxa
- Objective 14: To improve knowledge and management of threatened and significant fauna species
- Objective 15: To protect and enhance threatened fauna habitat
- Objective 16: To reduce impacts of fishing and marine debris on threatened sea birds
- Objective 17: To undertake recovery actions for threatened fauna species identified in existing documents
- Objective 18: To investigate the appropriateness of the reintroduction of locally extinct fauna after rodents have been eradicated
- Objective 19: To coordinate implementation of the LHI BMP and regularly evaluate the biodiversity benefits of implementation

271. The Department has considered the range of specific actions listed within the recovery plan and considers the approval of the proposed action, subject to the recommended conditions, would not be inconsistent with the plan.

272. According to SPRAT, the *Recovery Plan for the Lord Howe Woodhen* (Gallirallus sylvestris) – *2002 Recovery Plan for the Lord Howe Woodhen* (Gallirallus sylvestris) – 2002 is the adopted/made recovery plan for Lord Howe Woodhen.

273. The stated objectives of the recovery plan are:

- to maintain and where possible, increase the population of wild Woodhens on LHI;
- to establish a LHI recovery team to co-ordinate the implementation and ongoing review of the recovery plan;
- to involve the LHI community in monitoring, management, habitat rehabilitation and threat abatement;
- develop a plan for establishing and resourcing an on-island captive breeding facility in the event of a substantial reduction in Woodhen numbers; and
- to establish captive populations at sites other than LHI as insurance against catastrophe affecting the wild population.

274. The Department has considered the range of specific actions listed within the recovery plan for this species and considers the approval of the proposed action, subject to the recommended conditions, would not be inconsistent with the plan.

275. SPRAT identifies the *Lord Howe Island Biodiversity Management Plan* as the adopted/made recovery plan for *Placostylus bivaricosus*. The objectives of this plan are listed above.

276. SPRAT also refers to the NSW state recovery plan for the *Lord Howe Placostylus Placostylus bivaricosus Recovery Plan* (New South Wales National Parks and Wildlife Service (NSW NPWS), 2001. This plan is not a recovery plan that has been adopted under the EPBC Act and therefore does not have to be considered by the Minister for the purposes of section 139 of the Act.

277. The Department has considered the range of specific actions listed within these recovery plans for this species and considers the approval of the proposed action, subject to the recommended conditions, would not be inconsistent with these plans.

Threat Abatement Plans

278. This Recommendation Report provides a discussion of Threat Abatement Plans in respect of each listed threatened species to which the Threat Abatement Plan is relevant.

279. The Threat Abatement Plans relevant to the proposed action and assessment are (Attachment G):

- Department of the Environment (2015). *Threat abatement plan for predation by feral cats*. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/tap/threat-abatement-plan-feral-cats. In effect under the EPBC Act from 23-Jul-2015.
- Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008). *Threat Abatement Plan for competition and land degradation by unmanaged goats*. Canberra: DEWHA. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/tap/goats08.html. In effect under the EPBC Act from 01-Oct-2008.
- Department of the Environment and Energy Australia (2017). *Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (Sus scrofa)*. Available from:

http://www.environment.gov.au/biodiversity/threatened/publications/tap/feral-pig-2017. In effect under the EPBC Act from 18-Mar-2017.

- Department of the Environment, Water, Heritage and the Arts (DEWHA) (2009). *Threat abatement plan to reduce the impacts of exotic rodents on biodiversity on Australian offshore islands of less than 100 000 hectares 2009*. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/tap/exotic-rodents.html. In effect under the EPBC Act from 04-Jul-2009.

- Department of the Environment (2014). *Threat abatement plan for disease in natural ecosystems caused by Phytophthora cinnamomi.* Commonwealth of Australia, Canberra. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/threat-abatement-plan-disease-natural-ecosystems-caused-phytophthora-cinnamomi In effect under the EPBC Act from 31 January 2014.

280. The Department notes that whilst the *Phytophthora cinnamomi* TAP is not mentioned in SPRAT as relevant to any of the EPBC listed species of concern in this assessment, it has been recorded from one lease in the southern part of the settlement area and could potentially spread to the remainder of LHI on footwear or vehicles. This root-rot pathogen is known to affect a range of plant species on mainland Australia and it is listed as a key threatening process under the EPBC Act.

281. The Department also notes that even though feral cats, pigs and goats have been eliminated on LHI it is a legal requirement that you consider these TAPs when considering whether or not to approve the proposed rodent eradication project.

282. The *Threat abatement plan to reduce the impacts of exotic rodents on biodiversity on Australian offshore islands of less than 100 000 hectares* is of particular relevance to the proposal to eradicate rodents on LHI.

283. The plan contains three objectives and a series of actions that are required to achieve them. The objectives are to:

    - eradicate exotic rodents from high-priority islands
    - mitigate the impacts of exotic rodents on biodiversity values on high-priority islands where they cannot be eradicated
    - prevent the invasion of islands currently free of exotic rodents.

284. The rodent eradication proposal is consistent with this threat abatement plan.

285. The Department has considered all relevant Recovery Plans and Threat Abatement Plans and is of the view that approval of this action would not be inconsistent with the above obligations.

Conservation Advice

286. Subsection 139(2) of the EPBC Act requires that any decision to approve a proposed action for which listed threatened species and communities is a controlling provision must have regard to any approved conservation advice for the species or community.

287. The approved conservation advices relevant to this proposed action are (Attachment J):

    - Threatened Species Scientific Committee (2008). *Approved Conservation Advice for Gudeoconcha sophiae magnifica ms (a snail)*. Department of the Environment, Water,

Heritage and the Arts, Canberra. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/82015-conservation-advice.pdf.

- Threatened Species Scientific Committee (2008). *Approved Conservation Advice for Mystivagor mastersi (Masters' Charopid Land Snail)*. Department of the Environment, Water, Heritage and the Arts, Canberra. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/81247-conservation-advice.pdf.

- Threatened Species Scientific Committee (2008). *Approved Conservation Advice for Pseudocharopa lidgbirdi (Mount Lidgbird Charopid Snail)*. Department of the Environment, Water, Heritage and the Arts, Canberra. Available from: http://www.environment.gov.au/biodiversity/threatened/species /pubs/85279-conservation-advice.pdf

- Threatened Species Scientific Committee (2008). *Approved Conservation Advice for Pseudocharopa whiteleggei.* Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity /threatened/species/pubs/81249-conservation-advice.pdf.

288. These approved conservation advices are provided at Attachment J. You must have regard to these advices in making a decision whether to approve the taking of the proposed action.

289. These conservation advices identify predation by introduced rats as the key threat to these species.

290. A recommended priority action in the above conservation advices is the implementation of actions and tasks identified in the draft Biodiversity Management Plan of LHI for the control and eradication of rats on LHI. Another priority action in a number of these conservation advices is increasing quarantine and surveillance measures in relation to potential introduced threats. The proposed action has been designed to achieve these objectives and therefore is consistent with these conservation advices.

291. There are no approved conservation advices for the LH Woodhen, LHI Currawong or LH Flax Snail. Noting, that if the LH Woodhen is uplisted to endangered by 9 August 2017, the draft conservation advice will come into effect on that date.

Consideration

292. The Department has had regard to the approved conservation adviceS relevant to the proposed action and has given consideration to the likely impacts of the proposed action on listed threatened species and endangered ecological communities. The Department is of the view that approval of this action would not be inconsistent with the relevant conservation advices.

Requirements for decisions about listed migratory species – section 140

293. In deciding whether or not to approve for the purposes of section 20 or 20A the taking of an action relating to a listed migratory species, and what conditions to attach to such an approval, the Minister must not act inconsistently with Australia's obligations under whichever of the following conventions and agreements because of which the species is listed:

(a) the Bonn Convention;

(b) CAMBA;

(c) JAMBA;

(d) an international agreement approved under subsection 209(4).

The Bonn Convention

294. The Bonn Convention is available at: http://www.cms.int/en/convention-text

295. The Bonn Convention aims to conserve terrestrial, aquatic and avian migratory species throughout their range.

Consideration

296. The recommendations are not considered by the Department to be inconsistent with the Bonn Convention. The Department has also given particular consideration to an appropriate combination of avoidance and mitigation measures for the management of species potentially impacted by the proposed action.

297. The Bonn Convention has been considered in, and is not inconsistent with, the recommended approval which requires avoidance, mitigation and management measures for listed migratory species. The recommended approval requires information related to the approved action to be publically available to ensure equitable sharing of information and improved knowledge relating to biodiversity.

China-Australia Migratory Bird Agreement (CAMBA)

298. The CAMBA agreement can be found at: http://www.austlii.edu.au/au/other/dfat/treaties/1988/22.html

299. The CAMBA agreement list terrestrial, water and shorebird species which migrate between Australia and the respective countries. In both cases the majority of listed species are shorebirds.

300. The agreement require the parties to protect migratory birds by:

a. limiting the circumstances under which migratory birds are taken or traded;

b. protecting and conserving important habitats;

c. exchanging information; and

d. building cooperative relationships.

Consideration

301. The CAMBA agreement has been considered in, and is not inconsistent with, the recommended approval which requires avoidance, mitigation and management measures for listed migratory. The recommended approval requires information related to the trial to be publically available to ensure equitable sharing of information and improved knowledge relating to biodiversity.

Japan-Australia Migratory Bird Agreement (JAMBA)

302. The JAMBA agreement can be found at: http://www.austlii.edu.au/au/other/dfat/treaties/1981/6.html

303. The JAMBA agreement list terrestrial, water and shorebird species which migrate between Australia and the respective countries. In both cases the majority of listed species are shorebirds.

304. The agreement require the parties to protect migratory birds by:

a. limiting the circumstances under which migratory birds are taken or traded

b. protecting and conserving important habitats

c. exchanging information

d. building cooperative relationships.

Consideration

305. The JAMBA agreement has been considered in, and is not inconsistent with, the recommended approval which requires avoidance, mitigation and management measures for listed migratory. The recommended approval requires information related to the trial to be publically available to ensure equitable sharing of information and improved knowledge relating to biodiversity.

International Agreement - Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA)

306. The ROKAMBA agreement can be found at: http://www.austlii.edu.au/au/other/dfat/treaties/2007/24.html

307. The ROKAMBA agreement lists migratory species for which there is reliable evidence of migration between Australia and Korea. The Agreement provides for the protection of these species, encourages exchange of information and cooperation in relation to migratory species. The Agreement provides for endeavours to manage and conserve habitat and the environment of migratory species to which the agreement relates.

308. The ROKAMBA agreement has been considered in, and is not inconsistent with, the recommended approval which requires avoidance, mitigation and management measures for listed migratory species. The Department considers that likely impacts on listed migratory species will be avoided, and mitigated by the person taking the action to a reasonable degree under the proposed conditions. Approving the proposed action subject to the proposed conditions would therefore not be inconsistent with the International Agreement.

Consideration

309. The Department considers that likely impacts on listed migratory species will be avoided, mitigated and offset by the person taking the action to a reasonable degree under the proposed conditions. Approving the proposed action subject to the proposed conditions would therefore not be inconsistent with the International Agreement.

No approval for certain nuclear installations – section 140A

310. The proposed action is not a nuclear installation as set out in Section 140A of the EPBC Act.

Bioregional Plans section 176(5)

311. In accordance with section 176(5), the Minister is required to have regard to a bioregional plan in making any decision under the Act to which the plan is relevant.

312. Marine bioregional plans have been developed for four of Australia's marine bioregions and help improve the way decisions are made under the EPBC Act, particularly in relation to the protection of marine biodiversity and the sustainable use of oceans and their resources by marine-based industries.

313. Marine Bioregional Plans also improve understanding of Australia's oceans by presenting a consolidated picture of the biophysical characteristics and diversity of marine life. They describe the marine environment and conservation values of each marine region, set out broad biodiversity objectives, identify regional priorities and outline strategies and actions to address these priorities.

314. The Department has had regard to the Temperate East Marine Bioregional Plan (TEMBP) (Attachment O) (which includes waters surrounding LHI) in conducting the environmental assessment of the proposed rodent eradication project and in drafting this report and the proposed approval conditions.

315. The TEMBP covers the Temperate East Marine Region, which includes the Commonwealth marine area extending from the southern boundary of the Great Barrier Reef Marine Park to Bermagui in southern NSW, as well as the waters surrounding Lord Howe and Norfolk islands. The plan does not cover state or territory waters but, where relevant, does include information about inshore environments and the way they interact with species and habitats of the Commonwealth marine area.

316. The Providence Petrel has been identified as a conservation value in the Temperate East Marine Region. Maps of Biologically Important Areas have been developed for Providence Petrel in the Temperate East Marine Region.

Conclusion

317. The proposed action is unlikely to be inconsistent with the TEMBP provided that LHIB complies with the proposed approval conditions.

Conclusion

318. Rodents have been exerting a significant influence on the ecology of LHI for close to 100 years, affecting not only the structure and integrity of threatened species habitat, but also predator/prey relationships for the island's birds. Whilst the long-term ecological consequences of successful island rat eradications are so far poorly known, the removal of rodents is anticipated to have many positive effects on the ecology of LHI, including the recovery of vegetation communities and these changes, in turn, are expected to benefit many threatened species.

319. There may be both positive and negative long term ecological changes following rodent baiting. Some stakeholders suggested that a natural equilibrium had been reached between rodents and endemic species on the island. It is difficult to reach any firm conclusions about this possibility given the lack of base line data and data regarding the current situation.

320. In the long-term, it is possible that some threatened species may also be negatively impacted by the large scale changes brought about by the removal of rodents. These longer-term ecological changes are difficult to predict and other unforeseen changes are possible. However, it is considered likely that the removal of rodents will have many positive effects on the ecology of LHI that will outweigh the negative impacts.

321. The Department notes that generally, eradication of invasive species has resulted in far greater benefits to island ecosystems than the negative, short-term impacts on non-target native species. It is recognised that the action will result in the mortality of individuals of some threatened species, however it is expected that these species will not suffer a significant impact at the population level and would be expected to recover over the medium term.

322. It is likely that successful rodent eradication on LHI will result in changes to existing species populations, re- establishment of breeding areas by some marine bird species that no longer breed on LHI and recolonisation of LHI by species not recorded on LHI for many years. It is also possible that some threatened species will be negatively impacted in the long term due to large scale changes brought about by the removal of rodents.

323. Should the rodent eradication program be partially successful, any changes are likely to be short term (two to five years at the most given the rapid and prolific breeding exhibited by rodent populations).

324. The Department concluded that these longer-term, ecological changes are difficult to predict.

325. The Department therefore considers that the likely impacts of the proposed action on the controlling provisions will be acceptable, provided the action is undertaken in accordance with the recommended conditions and consistent with the mitigation and offset measures proposed by the proponent.

326. The recommended period of approval expires on 31 December 2022. This is to accommodate the five year grace period for commencement of the action.

327. In summary, given the nature and intent of the proposed action and the approval conditions that are proposed to be applied, the Department is confident that it would not result in an unacceptable impact to matters of national environmental significance. The approval conditions for this project give the Department a large amount of post-approval oversight and confidence that the negative impacts of the action can be minimised to the greatest extent that is reasonably practical.

328. Having considered all matters required to be considered under the EPBC Act, the Department recommends the proposed action be approved under sections 130 and 133 of the EPBC Act, subject to the recommended conditions.

Material used to prepare Recommendation Report

The referral documentation, including the referral, received by the Department on 11 May 2016 (Attachment K).

The Final Public Environment Report dated 21 December 2016

- Appendix A Guidelines for the content of PER
- Appendix B - Guidelines Cross Reference
- Appendix C - Author Names and Qualifications
- Appendix D - LHI Trials Package
- Appendix E - Captive Management Package
- Appendix F - Non-target Impact Management Plan
- Appendix G - Masked Owl Package

- Appendix H - Biodiversity Benefits Monitoring Package
- Appendix I - Marine Hypothetical Scenario
- Appendix J - Stakeholder Engagement Package
- Appendix K - Human Health Package
- Appendix L - LHI Ecological Studies Summary
- Appendix M - Island Eradications Using Pestoff
- Appendix N - Land Snail Survey 2016
- Appendix O - Economic Evaluation
- Appendix P - Submissions Report

The Supplement to the PER dated 10 February 2017

- Attachment 1.1a LHI EMPlan March 2016
- Attachment 1.1b Fire (Bush/Grass) Consequence Management Guide 2015
- Attachment 1.1 c Fire (Commercial Residential) Consequence Management Guide 2015
- Attachment 1.1 d Tsunami - LHI LEMC Consequence Management Guide
- Attachment 2.1 LHI Result monitoring plan discussion paper-com AS
- Attachment 2.2 Protocol_device_test_LHI_V1
- Attachment 3.1 Procedure for Access to Leasehold Land - Adopted March 2014
- Attachment 3.2 Biosecurity-Control-Order-Fact-Sheet

The Species Profile and Threats Database (SPRAT).

The database of island invasive species eradications http://diise.islandconservation.org/

LHI Rodent Eradication Project Captive Management Plans (amended and received by the Department on 3 July 2017).

Comments on Disease Risk Associated with the Temporary Captive Housing Proposal of the Lord Howe Island Woodhen and Lord Howe Pied Currawong during the Rodent Eradication Program, David N. Phalen, DVM, PhD, Wildlife Health and Conservation, Sydney School of Veterinary Science.

The Woodhen: A Flightless Island Bird Defying Extinction, Clifford B. Frith, CSIRO Publishing, 2013, 225 pages.

Attachments

Please note that the Attachments mentioned in this Recommendation Report are attachments to this briefing package and are identified in the proposed approval brief. This Recommendation Report is Attachment A.

APPENDICES

Appendix 1 – ERT report

Appendix 2 - Assessment of significance for species found on, or in the vicinity of, LHI.

Appendix 3 - Summary of LHIB response to the Phalen review of the captive management program

Appendix 4 – NSW Chief Scientist and Engineer's Human Health Risk Assessment

Appendix 5 – Assessment of human health concerns

Appendix 6 –Background information on rat eradication programs

Appendix 1 to Rodent Eradication Recommendation Report.

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 13/07/17 11:05:38

This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
Buffer: 2.0Km

Summary

Matters of National Environment Significance

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	51
Listed Migratory Species:	38

6 more Hum 20/6/16

Other Matters Protected by the EPBC Act

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	44
Whales and Other Cetaceans:	29
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	13
Nationally Important Wetlands:	None
EPBC Act Referrals:	9
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

World Heritage Properties		[Resource Information]
Name	State	Status
Lord Howe Island Group	NSW	Declared property

National Heritage Places		[Resource Information]
Name	State	Status
Natural		
Lord Howe Island Group	NSW	Listed place

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Breeding known to occur within area
Hypotaenidia sylvestris Lord Howe Woodhen [87732]	Vulnerable	Breeding likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area

6 species not identified on LEPT as of 20 June 2016

Red Knot 5 May 2016

Curlew Sandpiper 26 May 2015.

Herald Petrel 1 Oct 2015.

Pacific Albatross 3 July 2014. name change

Sei Whale 1 Oct 2015.

Fin Whale 1 Oct 2015.

Name	Status	Type of Presence
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pterodroma heraldica Herald Petrel [66973]	Critically Endangered	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Strepera graculina crissalis Lord Howe Island Currawong, Pied Currawong (Lord Howe Island) [25994]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Fish		
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat may occur within area
Other		
Gudeoconcha sophiae magnifica Magnificent Helicarionid Land Snail [82864]	Critically Endangered	Species or species habitat likely to occur within area
Mystivagor mastersi Masters' Charopid Land Snail [81247]	Critically Endangered	Species or species habitat known to occur within area

Name	Status	Type of Presence
Placostylus bivaricosus Lord Howe Flax Snail, Lord Howe Placostylus [66769]	Endangered	Species or species habitat known to occur within area
Pseudocharopa ledgbirdi Mount Lidgbird Charopid Land Snail [85279]	Critically Endangered	Species or species habitat likely to occur within area
Pseudocharopa whiteleggei Whitelegge's Land Snail [81249]	Critically Endangered	Species or species habitat likely to occur within area
Plants		
Calystegia affinis [48909]	Critically Endangered	Species or species habitat known to occur within area
Elymus multiflorus subsp. kingianus Phillip Island Wheat Grass [82413]	Critically Endangered	Species or species habitat known to occur within area
Geniostoma huttonii [56368]	Endangered	Species or species habitat known to occur within area
Lepidorrhachis mooreana Little Mountain Palm, Moorei Palm [6388]	Critically Endangered	Species or species habitat known to occur within area
Polystichum moorei Rock Shield Fern [40755]	Endangered	Species or species habitat likely to occur within area
Xylosma parvifolia [48040]	Endangered	Species or species habitat known to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area
Christinus guentheri Lord Howe Island Gecko, Lord Howe Island Southern Gecko [59250]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat likely to occur within area
Oligosoma lichenigera Lord Howe Island Skink [82034]	Vulnerable	Species or species habitat known to occur within area
Sharks		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Breeding known to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Breeding known to occur within area

Name	Threatened	Type of Presence
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Phaethon rubricauda Red-tailed Tropicbird [994]		Breeding known to occur within area
Sula dactylatra Masked Booby [1021]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale [75529]	Endangered*	Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat likely to occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat likely to occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Breeding known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur

Name	Threatened	Type of Presence within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Phaethon rubricauda Red-tailed Tropicbird [994]		Breeding known to occur within area
Procelsterna cerulea Grey Ternlet [64378]		Breeding known to occur within area
Pterodroma nigripennis Black-winged Petrel [1038]		Breeding known to occur within area
Pterodroma solandri Providence Petrel [1040]		Breeding known to occur within area
Puffinus assimilis Little Shearwater [59363]		Breeding known to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Breeding known to occur within area
Puffinus pacificus Wedge-tailed Shearwater [1027]		Breeding known to occur within area

Name	Threatened	Type of Presence
Sula dactylatra Masked Booby [1021]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche sp. nov. Pacific Albatross [66511]	Vulnerable*	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area
Fish		
Cosmocampus howensis Lord Howe Pipefish [66208]		Species or species habitat may occur within area
Halicampus boothae Booth's Pipefish [66218]		Species or species habitat may occur within area
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat likely to occur within area

Whales and other Cetaceans		[Resource Information]
Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species

Name	Status	Type of Presence
		habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat may occur within area
Feresa attenuata Pygmy Killer Whale [61]		Species or species habitat may occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia simus Dwarf Sperm Whale [58]		Species or species habitat may occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat may occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Peponocephala electra Melon-headed Whale [47]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species

Name	Status	Type of Presence
		habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat may occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Stenella coeruleoalba Striped Dolphin, Euphrosyne Dolphin [52]		Species or species habitat may occur within area
Stenella longirostris Long-snouted Spinner Dolphin [29]		Species or species habitat may occur within area
Steno bredanensis Rough-toothed Dolphin [30]		Species or species habitat may occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Lord Howe Island	NSW

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Turdus philomelos Song Thrush [597]		Species or species habitat likely to occur within area
Mammals		
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area

EPBC Act Referrals [Resource Information]

Further details about the referral or advice - including its current status if still active - are available in its PINK report; click on the title.

Referral Title	Reference	Referral Outcome	Assessment Status
Seismic Station	2007/3301	NCA	Referral Decision Made-Completed
Air Traffic Control Infrastructure Facility	2007/3872	NCA	Referral Decision Made-Completed
Survey and Sampling of Lord Howe Island Reef	2008/3986	NCA-PM	Referral Decision Made-POST-APPROVAL/COMPLIANCE
Lowering Blinky Beach Sand Dune to Comply with CASA Regulations for Runway 28, Lord Howe Island	2012/6599	NCA-PM	Referral Decision Made-POST-APPROVAL/COMPLIANCE
Pilot study - Short term captive holding of 22 LHI Woodhen & 10 LHI Currawong, Lord Howe Island	2013/6847	NCA	Referral Decision Made-Completed
Hybrid Renewable Energy (Solar & Wind Turbine), Lord Howe Island, NSW	2014/7231		Withdrawn-Completed
Lord Howe Island Solar Photovoltaic Project	2015/7544	NCA	Referral Decision Made-Close
Lord Howe Island Rodent Eradication Project, NSW	2016/7703	CA	Considering Final Decision-Assessment Decision
Lord Howe Island Renewable Energy Project - Stage 2 Wind Turbines	2016/7790	ACU	Clearly Unacceptable-Close

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-31.48138 159.07305,-31.52527 159.01055,-31.605 159.06888,-31.56305 159.13416,-31.48138 159.07305

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environment and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-Forestry Corporation of NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

Appendix 1 to Rodent Eradication Recommendation Report.

intranet
DEPARTMENT OF THE ENVIRONMENT

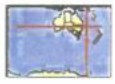
EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 20/06/16 10:37:02

This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
Buffer: 2.0Km



Summary

Matters of National Environment Significance

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	45
Listed Migratory Species:	38

Other Matters Protected by the EPBC Act

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	35
Whales and Other Cetaceans:	30
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	13
Nationally Important Wetlands:	None
EPBC Act Referrals:	8
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

World Heritage Properties		[Resource Information]
Name	State	Status
Lord Howe Island Group	NSW	Declared property

National Heritage Places		[Resource Information]
Name	State	Status
Natural		
Lord Howe Island Group	NSW	Listed place

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora (sensu stricto) Southern Royal Albatross [1072]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Breeding known to occur within area
Gallirallus sylvestris Lord Howe Woodhen [59572]	Vulnerable	Breeding likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area

Genus name change.

Name	Status	Type of Presence
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Strepera graculina crissalis Lord Howe Island Currawong, Pied Currawong (Lord Howe Island) [25994]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Fish		
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat may occur within area
Other		
Gudeoconcha sophiae magnifica Magnificent Helicarionid Land Snail [82864]	Critically Endangered	Species or species habitat likely to occur within area
Mystivagor mastersi Masters' Charopid Land Snail [81247]	Critically Endangered	Species or species habitat likely to occur within area
Placostylus bivaricosus Lord Howe Flax Snail, Lord Howe Placostylus [66769]	Endangered	Species or species habitat known to occur within area
Pseudocharopa ledgbirdi Mount Lidgbird Charopid Land Snail [85279]	Critically Endangered	Species or species habitat likely to occur within area
Pseudocharopa whiteleggei Whitelegge's Land Snail [81249]	Critically Endangered	Species or species habitat likely to occur within area
Plants		
Calystegia affinis [48909]	Critically Endangered	Species or species habitat likely to occur within area
Elymus multiflorus subsp. kingianus Phillip Island Wheat Grass [82413]	Critically Endangered	Species or species habitat known to occur within area
Geniostoma huttonii [56368]	Endangered	Species or species habitat known to occur

Name	Status	Type of Presence within area
Lepidorrhachis mooreana Little Mountain Palm, Moorei Palm [6388]	Critically Endangered	Species or species habitat known to occur within area
Polystichum moorei Rock Shield Fern [40755]	Endangered	Species or species habitat likely to occur within area
Xylosma parvifolia [48040]	Endangered	Species or species habitat known to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area
Christinus guentheri Lord Howe Island Gecko, Lord Howe Island Southern Gecko [59250]	Vulnerable	Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat likely to occur within area
Oligosoma lichenigera Lord Howe Island Skink [82034]	Vulnerable	Species or species habitat likely to occur within area
Sharks		
Carcharodon carcharias Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information] 18.

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora (sensu stricto) Southern Royal Albatross [1072]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Phaethon rubricauda Red-tailed Tropicbird [994]		Breeding known to occur within area

Name	Threatened	Type of Presence
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Breeding known to occur within area
Puffinus pacificus Wedge-tailed Shearwater [1027]		Breeding known to occur within area
Sula dactylatra Masked Booby [1021]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta (sensu stricto) Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area
Carcharodon carcharias Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat likely to occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Migratory Wetlands Species		3
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora (sensu stricto) Southern Royal Albatross [1072]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew [847]	Critically Endangered	Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Phaethon rubricauda Red-tailed Tropicbird [994]		Breeding known to occur within area
Procelsterna cerulea Grey Ternlet [64378]		Breeding known to occur within area
Pterodroma nigripennis Black-winged Petrel [1038]		Breeding known to occur within area
Pterodroma solandri Providence Petrel [1040]		Breeding known to occur within area
Puffinus assimilis Little Shearwater [59363]		Breeding known to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Breeding known to occur within area
Puffinus pacificus Wedge-tailed Shearwater [1027]		Breeding known to occur within area
Sula dactylatra Masked Booby [1021]		Breeding known to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta (sensu stricto) Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area
Fish		
Cosmocampus howensis Lord Howe Pipefish [66208]		Species or species habitat may occur within area
Halicampus boothae Booth's Pipefish [66218]		Species or species habitat may occur within area
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur

Name	Threatened	Type of Presence within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat likely to occur within area

Whales and other Cetaceans [Resource Information]

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat may occur within area
Feresa attenuata Pygmy Killer Whale [61]		Species or species habitat may occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia simus Dwarf Sperm Whale [58]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat may occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species

Name	Status	Type of Presence
		habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Peponocephala electra Melon-headed Whale [47]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat may occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Stenella coeruleoalba Striped Dolphin, Euphrosyne Dolphin [52]		Species or species habitat may occur within area
Stenella longirostris Long-snouted Spinner Dolphin [29]		Species or species habitat may occur within area
Steno bredanensis Rough-toothed Dolphin [30]		Species or species habitat may occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Lord Howe Island	NSW

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		

Name	Status	Type of Presence
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Turdus philomelos Song Thrush [597]		Species or species habitat likely to occur within area
Mammals		
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area

EPBC Act Referrals [Resource Information]

Further details about the referral or advice - including its current status if still active - are available in its PINK report; click on the title.

Referral Title	Reference	Referral Outcome	Assessment Status
Seismic Station	2007/3301	NCA	Referral Decision Made-Completed
Air Traffic Control Infrastructure Facility	2007/3872	NCA	Referral Decision Made-Completed
Survey and Sampling of Lord Howe Island Reef	2008/3986	NCA-PM	Referral Decision Made-POST-APPROVAL/COMPLIANCE
Lowering Blinky Beach Sand Dune to Comply with CASA Regulations for Runway 28, Lord Howe Island	2012/6599	NCA-PM	Referral Decision Made-POST-APPROVAL/COMPLIANCE
Pilot study - Short term captive holding of 22 LHI Woodhen & 10 LHI Currawong, Lord Howe Island	2013/6847	NCA	Referral Decision Made-Completed
Hybrid Renewable Energy (Solar & Wind Turbine), Lord Howe Island, NSW	2014/7231		Withdrawn-Completed
Lord Howe Island Solar Photovoltaic Project	2015/7544	NCA	Referral Decision Made-Close

Lord Howe Island Rodent Eradication Project, NSW	2016/7703	RD	Referral Published-Publish Case

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-31.48139 159.07306,-31.52528 159.01056,-31.605 159.06889,-31.56306 159.13417,-31.48139 159.07306

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Parks and Wildlife Commission NT, Northern Territory Government
-Department of Environment and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-Forestry Corporation of NSW
-Geoscience Australia
-CSIRO
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

Appendix 2 Assessment of significance for species found on, or in the vicinity of, LHI.

Part 1 Assessment of significance for seabird and wader species found on, or in the vicinity of, LHI.

Species	Assessment of significance
Antipodean Albatross *Diomedea antipodensis* Vulnerable	The Antipodean Albatross is endemic to New Zealand but forages in open water in the south-west Pacific Ocean, Southern Ocean and Tasman Sea, including off the NSW coast. The estimated population of mature individuals is 25,260. Antipodean Albatrosses follow weather systems, in order to exploit food resources and have been recorded as far east as the South American coast. The Antipodean Albatross is unlikely to be significantly impacted by the proposed action as it forages over the open sea, breeds in New Zealand and is unlikely to come into contact with rodent bait pellets or be subject to secondary poisoning impacts.
Gibson's Albatross *Diomedea antipodensis gibsoni* Vulnerable	Gibson's Albatross breeds on Adams Island and Auckland Island, in New Zealand's territorial waters. The principal feeding area for females is the Tasman Sea. Males forage further south and in the mid-Pacific Ocean. Non-breeding birds are usually found between the latitudes of 30° and 50°S (Lord Howe Island is at 31°S), where weather systems assist foraging. This albatross visits Australian waters while foraging and during the non-breeding season. The global population of Gibson's Albatross is approximately 40,000 individuals. Gibson's Albatross does not breed in Australia and LHI is on the edge of its foraging range. Gibson's Albatross is unlikely to be significantly impacted by the proposed action as it forages over the open sea, breeds in New Zealand and is unlikely to come into contact with rodent bait pellets or be subject to secondary poisoning impacts.
Southern Royal Albatross *Diomedea epomophora (sensu stricto)* Vulnerable	The Southern Royal Albatross breeds on Campbell, Adams, Enderby and Auckland Islands, south of New Zealand. It forages in the Southern Ocean primarily between Western Australia and South America, although it can circumnavigate the Southern Hemisphere. During the non-breeding season, the Southern Royal Albatross has a wide and possibly circumpolar distribution, ranging north to about 35°S. The Southern Royal Albatross is moderately common throughout the year in offshore waters of southern Australia, mostly off south-eastern NSW, Victoria and Tasmania. The population is between 8,200 and 8,600 breeding pairs. The Southern Royal Albatross is unlikely to be significantly impacted by the proposed action as it forages over the open sea, does not breed in Australia or on LHI and is unlikely to consume rodent bait pellets and it is highly unlikely that they would consume any organisms that had consumed Brodifacoum pellets.

Wandering Albatross *Diomedea exulans (sensu lato)* Vulnerable	The Wandering Albatross has a circumpolar distribution. It breeds on six subantarctic island groups including on Macquarie Island (Australia). It typically forages in oceanic waters (Southern Ocean), however considerable time is spent over shelf areas during certain stages of the breeding season. The current global population of the Wandering Albatross is estimated to be 55 000 individuals. According to *Australian Field Ornithology, Volume 21 Supplement 2004*, the Wandering Albatross has been recorded on five occasions in the vicinity of LHI. In 1935 a carcass was recorded on Blinky Beach. The other records were birds at sea. The species is unlikely to be significantly impacted by the proposed action because it is a rare/accidental visitor to LHI waters and if any vagrants are in the area foraging over the open ocean during the baiting period it is highly unlikely that they would consume any organisms that had consumed Brodifacoum pellets.
Northern Royal Albatross *Diomedea sanfordi* Endangered	The Northern Royal Albatross habitat includes sub-antarctic, subtropical, and occasionally Antarctic waters with its non-breeding range extends over the Southern Ocean from 36°S to 52° S (Lord Howe Island Is at 31°S). The species breeds on Chatham Island and Taiaroa Head on the South Island of New Zealand. The Northern Royal Albatross is an extremely mobile species with individuals ranging from the south west Atlantic off Argentina, the eastern south Pacific near Chile, the southern Indian Ocean and south-east Australia. The Southern Royal Albatross is unlikely to be significantly impacted by the proposed action as it forages over the open sea, does not breed in Australia or on Lord Howe Island and is unlikely to consume rodent bait pellets or consume any organisms that had consumed Brodifacoum pellets.
White-bellied Storm-Petrel *Fregetta grallaria grallaria* Vulnerable	The White-bellied Storm-Petrel forages in the Tasman Sea, the Coral Sea and the central Pacific Ocean (possibly). In the non-breeding season, it reaches and forages over near-shore waters along the Australian continental shelf. It has been recorded breeding on offshore islets and rocks (including Balls Pyramid) in the LHIG on three occasions. 1,000 breeding pairs were recorded breeding on Roach Island in March 1971. It is found in the LHIG from September to May with birds found in the burrows on Roach Island in 1971-72 between October to May. This species hasn't been recorded in the LHIG during the proposed baiting period and is unlikely to be impacted by the proposed action.
Bar-tailed Godwit (baueri), *Limosa lapponica baueri*	The Bar-tailed Godwit (baueri) is a migratory species that undertakes the longest non-stop flight of any bird (doesn't stop to forage), flying 11,680 km from Alaska to New Zealand. According to http://www.lordhoweislandbirds.com/index.php?option=com_content&view=article&id=139:bar-tailed-godwit&catid=80&Itemid=541 the Bar-tailed Godwit is a

Vulnerable	large wader that can be found on LHI for most of the year with some individuals remaining on LHI all year. They forage on grasslands near the airport and on beaches at low tide. On the mainland the species forages on estuarine mudflats, beaches and mangroves. The population on LHI is a minute proportion of the total population occurring in Australia in the Austral spring/summer. The proposed action is not likely to have a significant impact on the species even if (in the unlikely event) that some individuals consume bait pellets.
Northern Siberian Bar-tailed Godwit, *Limosa lapponica menzbieri* Critically Endangered	The Northern Siberian Bar-tailed Godwit is a shorebird species that has been recorded on LHI. The population on LHI is a minute proportion of the total population occurring in Australia in the Austral spring/summer. Critical habitats for this subspecies in Australia are estuarine mudflats, beaches and mangroves. The proposed action is not likely to have a significant impact on the species even if (in the unlikely event) that some individuals consume bait pellets.
Southern Giant Petrel *Macronectes giganteus* Endangered	The Southern Giant Petrel has a circumpolar range from Antarctica to approximately 20° S and is a common visitor off the NSW coast. The species is an opportunistic scavenger and predator, scavenging from fishing vessels and on animal carcasses on land. This species breeds on six Australian subantarctic or Antarctic islands (islands claimed by Australia). It is not known how many Giant Petrels died after Brodifacoum baits were distributed over Macquarie Island, as part of a similar aerial rodent baiting program to the current proposal because many birds probably died undetected at sea (after scavenging on carcasses). However, Giant Petrels are rare vagrants to the LHIG having only been recorded on four occasions and it is unlikely any individuals will be present during the baiting period.
Northern Giant Petrel *Macronectes halli* Vulnerable	In summer, the Northern Giant-Petrel mainly occurs in the open ocean in sub-Antarctic to Antarctic waters, between 40 and 64° south. Its range extends into subtropical waters (to 28°S) in winter and early spring. This species breeds on six Australian sub-antarctic or Antarctic islands (islands claimed by Australia). The species visits areas off the Australian mainland mainly during the winter months and is a vagrant to the LHIG. Two of the four records of Giant Petrels in the LHIG occurred prior to 1966 when Giant Petrels were split into 2 species - the Northern and Southern Giant Petrels. However, Giant Petrels are rare vagrants to the LHIG having been recorded on four occasions only and it is unlikely any individuals will be present during the baiting period.

Eastern Curlew, Far Eastern Curlew *Numenius madagascariensis* Critically Endangered	The Eastern Curlew breeds in Russia and north-eastern China but its distribution is poorly known. The global population has been estimated at *c.* 38,000 individuals that spend the non-breeding season in north, east and south-east Australia. Since 1990 Eastern Curlews have been recorded in the LHIG on at least 12 occasions. None of the records for this species in the *Australian Field Ornithology, Volume 21 Supplement 2004* have been made in the proposed aerial baiting months.
Fairy Prion (southern) *Pachyptila turtur subantarctica* Vulnerable	Fairy Prions are commonly seen offshore over the Australian continental shelf and pelagic waters. The Fairy Prion breeds on sub-Antarctic and cool temperate islands in the Southern Hemisphere (Macquarie Island, New Zealand offshore islands, Iles Crozet, Bird Island, South Georgia, the Falkland Islands and Ile St Paul). The population of the southern subspecies of the Fairy Prion is around 80,000 pairs. The species' oceanic distribution is poorly known. Given that the Fairy Prion's breeding grounds are in the southern ocean, it does not forage over land and it has only been recorded four times on LHI (carcasses washed up on beaches and a live bird that later died) it is unlikely that the proposed action will have a significant impact on this species.
Gould's Petrel, Australian Gould's Petrel *Pterodroma leucoptera leucoptera* Endangered	Gould's Petrel is a marine species, spending much of its time foraging at sea and only coming ashore to breed. The Australian subspecies breeds and roosts on two islands off NSW, Cabbage Tree and Boondelbah Islands. This species has been recorded on three occasions in the vicinity of LHI (twice at sea and a beach washed carcass). Gould's Petrel is unlikely to be significantly impacted by the proposed action as it forages over the open sea and does not breed on LHI.
Kermadec Petrel *Pterodroma neglecta neglecta* Vulnerable	The Kermadec Petrel is a seabird that occurs in tropical, subtropical and temperate waters of the Pacific Ocean. It breeds on islands, atolls and islets in the southern Pacific Ocean. 10-100 pairs nest on Ball's Pyramid. Records of this species in the LHIG are mainly from October to May. This species spends most of its time foraging at sea and is unlikely to be significantly impacted by the proposed action.
Buller's Albatross, Pacific Albatross *Thalassarche bulleri* Vulnerable	Buller's Albatross is a New Zealand species, breeding on Snares and Solander Islands. The total breeding population has been estimated at 11,000– 14,000 pairs. During the breeding season, the highest concentrations of this species occur over the shelf and slope waters off southern New Zealand. Non-breeding birds disperse to oceanic subtropical waters of the western South Pacific, or the Humboldt Current off the western South American coast. In Australian waters,

	they are frequently seen off the coast from Coffs Harbour, south to Tasmania and west to Eyre Peninsula. Buller's Albatross is unlikely to be significantly impacted by the proposed action as it forages over the open sea, breeds in New Zealand and is unlikely to consume rodent bait pellets or consume any organisms that had consumed Brodifacoum pellets.
White-capped Albatross *Thalassarche cauta steadi* Vulnerable	The White-capped Albatross is a marine species and occurs in sub-Antarctic and subtropical waters. The species is common off the coast of south-east Australia throughout the year. Breeding colonies of the White-capped Albatross occur on a number of New Zealand Islands. The global population of the White-capped Albatross is estimated at 70,000–85,000 breeding pairs. The White-capped Albatross is unlikely to be significantly impacted by the proposed actions as it forages over the open sea, breeds in New Zealand and is unlikely to consume rodent bait pellets or any organisms that had consumed Brodifacoum pellets.
Chatham Albatross *Thalassarche eremita* Endangered	The Chatham Albatross breeds on Pyramid Rock and the Chatham Islands, off the New Zealand coast. It mainly forages in coastal waters off eastern and southern New Zealand and Tasmania. It can travel vast distances and has been recorded off the west coast of South America. This species is a rare vagrant to southeast Australian waters and LHI and is unlikely to be significantly impacted by the proposed action as it forages over the open sea, breeds in New Zealand and is unlikely to consume rodent bait pellets or any organisms that had consumed Brodifacoum pellets.
Campbell Albatross, Campbell Black-browed Albatross *Thalassarche impavida* Vulnerable	The Campbell Albatross only breeds on Campbell Island south of New Zealand. They forage in open waters in the Antarctic, sub-Antarctic and subtropical South Pacific Ocean. Throughout the breeding season, breeding adults are generally found over the New Zealand continental shelf, whereas non-breeding birds often forage over the continental slopes around Australia. They also forage over the oceanic continental slopes off Tasmania, Victoria and NSW. The global population is estimated to be 19,000-26,000 breeding pairs. This species is unlikely to be significantly impacted by the proposed action as it is a vagrant in LHI waters over the winter months, forages over the open sea, breeds in New Zealand and is unlikely to consume rodent bait pellets or any organisms that had consumed Brodifacoum pellets.
Black-browed Albatross *Thalassarche melanophris* Vulnerable	There are approximately 530,000 breeding pairs of Black-browed Albatross, that breed on subantarctic islands. The species forages in Antarctic, subantarctic and temperate waters and occasionally enters the tropics. The species is a vagrant in the vicinity of LHI having been recorded over the open ocean on three occasions. The species is unlikely to be significantly impacted by the proposed action because it is a rare visitor to the waters around LHI. If any vagrants are in the area foraging over the open ocean during the baiting period it is highly unlikely

	that they would consume bait pellets or any organisms that had consumed Brodifacoum pellets.
Salvin's Albatross *Thalassarche salvini* Vulnerable	Salvin's Albatross breeds on Bounty, Snares and Chatham Islands, south of New Zealand, as well as on Crozet Island in the Indian Ocean. This species forages over most of the southern Pacific Ocean, where it is particularly common in the Humboldt Current, off South America. Small numbers have been recorded in the Indian Ocean and occasionally in the South Atlantic. The global population is between 350,000 and 380,000 individuals. Salvin's Albatross is a non-breeding visitor to Australian waters. During the non-breeding season, the species occurs over continental shelves around continents. This species is unlikely to be significantly impacted by the proposed action as it forages over the open sea, breeds in New Zealand, is a vagrant in LHI waters and is unlikely to consume rodent bait pellets or any organisms that had consumed Brodifacoum pellets.
Whimbrel *Numenius phaeopus* Listed marine/ migratory	The Whimbrel is a listed migratory and listed marine species that according to http://www.lordhoweislandbirds.com/index.php?option=com_content&view=article&id=151:whimbrel&catid=80&Itemid=553 can be found for most of the year at the LHI golf course and grasslands at the airstrip. According to SPRAT, the Whimbrel mainly forages on intertidal mudflats, along the muddy banks of estuaries and in coastal lagoons, either in open unvegetated areas or among mangroves. Being an occasional visitor to LHI (in small numbers) this species is unlikely to be significantly impacted by the proposed action.

Part 2 Other species

Masked Owl - *Tyto novaehollandiae castanops* (Tasmanian population) – Vulnerable
hybrids with Masked Owl (Southern Australia) *Tyto novaehollandiae novaehollandiae – not EPBC listed*

Species information

1. The Masked Owls on LHI were until recently believed to be the Tasmanian species *(Tyto novaehollandiae castanops),* however, genetic testing has found significant divergence of the LHI population from *Tyto novaehollandiae castanops* suggesting that hybridisation has occurred with the Southern Australian population *(Tyto novaehollandiae novaehollandiae).*

Potential impacts

2. LHIB stated that the proposed rodent eradication program provides an opportunity to eradicate the Masked Owl, which was introduced to LHI (along with five other Australian and North American owl species) to control rats in the 1920s and 1930s.

3. Rodents are the Masked Owl's main food source on LHI, supplemented by native birds including LH Woodhens. Most owls are likely to die due to secondary Brodifacoum poisoning through ingestion of poisoned rodents. To avoid remaining Masked Owls switching to a diet of solely native species in the absence of rodents, the referral proposes eradicating remaining Masked Owls via hunting or trapping before, during and after the baiting program.

Avoidance and mitigation measures

4. The Masked Owls on LHI are hybrids and their loss of genetic integrity means the LHI Masked Owls cannot be transferred to Tasmania or NSW. The referral does not propose any Masked Owl avoidance and mitigation measures because an objective of the rodent eradication program is the eradication of Masked Owls on LHI.

5. Rodent carcass collection activities will occur in the vicinity of the Settlement for human health and safety reasons and to reduce the likelihood of residents and tourists being exposed to significant quantities of decaying carcasses.

6. A major justification advanced by the proponent for not collecting carcasses outside the Settlement is to ensure that sufficient carcasses are available to maximise the number of Masked Owls poisoned by consuming dead rodents.

7. Proposed condition 4 requires the drafting of protocols to ensure systematic, targeted and effective rodent carcass search, collection and disposal occurs in the vicinity of the Settlement and other accessible areas (to avoid secondary poisoning of non-target species) at the same time recognising that Masked Owl eradication depends on sufficient carcasses remaining uncollected.

Conclusion

8. The Department notes that Masked Owls are not endemic to LHI rather they are introduced hybrids between the EPBC listed vulnerable Tasmanian *Tyto novaehollandiae castanops* and the non EPBC listed Southern Australian population *Tyto novaehollandiae novaehollandiae*.

9. The conservation advice relates to the population of the subspecies on Tasmania, and excludes the introduced population on LHI.

10. Therefore, the LHI population is not considered to be part of the EPBC listed vulnerable Tasmanian *Tyto novaehollandiae castanops* population.

11. The Department took this information into account and concluded that the proposed rat eradication program is unlikely to have significant impacts on any EPBC listed Masked Owl population.

Seabirds

Species information

12. The ERT lists 18 seabird species (albatross, petrels, tropicbirds and shearwaters) that are likely to be found within 2 km of LHI. Whereas the PER states that 35 EPBC listed seabird species occur on the LHIG or in the surrounding waters. These are divided into species that breed on the island, species that regularly occur at sea surrounding the LHIG and vagrant species recorded at sea.

13. According to the PER, the populations of breeding seabird species on the LHIG are significant at regional, state and national scales. The breeding populations of Masked Booby and Providence Petrel are also significant at an international scale, as the LHIG is one of a few island groups where these species breed.

14. This Appendix is an assessment of significance for seabird and wader species found on, or in the vicinity of, LHI.

15. Of the listed breeding seabirds, only the Masked Booby and Providence Petrel occur regularly on or around LHI in winter, when baiting operations will be undertaken.

Seabirds potential impacts

16. The breeding colonies of the Masked Booby and Providence Petrel will be baited using a helicopter (at this stage no ground baiting of seabird colonies is planned by LHIB). LHIB believes that the main potential impact of the proposed action on listed seabird species will be the risk of collision with helicopters. According to the PER, records of helicopter bird strikes or disturbance to seabird colonies during island aerial eradication operations are rare.

17. The Department conducted some internet searches (without success) to ascertain the frequency with which rodent baiting helicopters have struck birds.

18. Some stakeholders believed that Providence Petrels and Masked Boobies will abandon their nests due to helicopter over-flights.

19. The Department notes that the LHIB has proposed mitigation measures to minimise disturbance and the risk of collision. Helicopter flight times over Providence Petrel and Masked Booby colonies will be restricted to the periods when birds are least likely to be leaving or arriving at the colony (movements are greatest shortly after dawn and in the late afternoon) and helicopters will be restricted to flying at bait dispersal altitudes that minimise unusual behaviour by Providence Petrels and Masked Boobies (proposed condition 2(e)).

20. In drafting condition 2 the Department relied heavily on advice from the New Zealand Department of Conservation, the Tasmanian Parks and Wildlife Service and monitoring reports from the Macquarie Island rodent eradication program.

21. Providence Petrels mainly breed in the southern mountains, particularly on the slopes of Mounts Lidgbird and Gower. During the period from March to November they return from foraging trips mid-afternoon and display above the breeding sites, find mates and visit burrows. According to the PER, helicopter strike with Providence Petrels that are incubating or involved in courtship displays will be avoided by restricting helicopter flights around the southern mountains to before midday on each baiting day. The PER states that the majority of pelagic foraging trips and return trips to feed chicks occur after early July. LHIB is seeking approval to conduct aerial baiting activities between 1 June and 30 August each year.

22. The Department notes that significant deaths of non-target birds have occurred in the past, such as the death of Pelagic Seabirds on Rat Island in the Aleutians following helicopter and ground-based broadcasting of Brodifacoum pellets. One aerial baiting study on a tropical island detected Brodifacoum in the carcasses of Curlews, Golden Plovers, Ruddy Turnstones, the Wandering tattler and the Northern pintail months after the first aerial application of Brodifacoum.

23. The risk to threatened seabirds is a function of species behaviour, susceptibility to the toxin, composition and delivery method of the bait, and the probability of exposure to the toxin either directly or indirectly.

24. The Department notes that listed breeding seabird species likely to be present on LHI during and immediately after baiting is completed are carnivorous and obtain their prey at sea. They are not known to consume any food on land and as such they are unlikely to consume cereal bait pellets distributed on land or poisoned rodent carcasses (unlike scavenging bird species such as Skuas, Giant Petrels, Bald Eagles and Glaucous-winged Gulls that fell victim to secondary poisoning on Macquarie or Rat Islands).

25. Seabird species that occur on LHI could potentially suffer from secondary poisoning after eating marine vertebrates and invertebrates that have consumed bait pellets. However, because most or all individuals of each species forage in deep waters more than two kilometres from LHI, it is unlikely they will consume sufficient prey that have eaten bait pellets (within the shallow waters surrounding LHI) to receive a lethal dose of Brodifacoum. The risk of absorption of Brodifacoum via contact with the skin is extremely low for birds as almost all of their external body surface is covered by a thick layer of feathers (particularly seabirds) or cornified keratinocytic tissue, preventing contact with the skin.

26. Some seabird species are regularly (to infrequently) observed at sea surrounding LHI, but do not breed on the LHIG. These pelagic seabirds typically forage in deep water or are observed on migration, but rarely observed in the shallow waters within two kilometres of LHI. No individuals of these species have been recorded on land in the LHIG. These pelagic seabirds are unlikely to come into contact with Brodifacoum. The Department concludes that the likelihood of the proposed rodent eradication program impacting on these species is likely to be very low (Appendix 2).

27. Roosting and nesting seabirds could be disturbed by repeated helicopter passes at low altitudes whilst higher altitude passes will result in inaccurate bait distribution.

28. On Macquarie Island on-ground observers filmed the baiting over-flights and had radio contact with the pilot to advise if birds were exhibiting unacceptable adverse reactions. This information allows remedial action to be taken, including abandoning the flight line or increasing altitude (Macquarie Island Pest Eradication Project EPBC 2009/5079).

Avoidance and mitigation measures

29. The proponent intends taking advantage of the diurnal movements of seabirds to and from LHI when scheduling helicopter flights. Various sections of LHI will be baited when seabirds are foraging at sea and away from their roosting (nesting) grounds.

30. Proposed approval condition 2(e) requires helicopters to fly at bait dispersal altitudes that minimise unusual behaviour by Providence Petrels and Masked Boobies.

31. The Department concludes that removal of baits from seabird colonies will only be necessary if monitoring identifies significant seabird deaths due to primary consumption of Brodifacoum.

Conclusion

32. Conditions 2 to 5 of the proposed approval have been drafted to mitigate impacts of the proposed action on seabirds and other non-target species. These conditions specify helicopter flight times, both seasonally and at specific times during the day, flight path heights above seabird colonies, response actions should unacceptable disturbance occur, establishment of a TAG and protocols, drafting of a non-target species mitigation plan, collection of the carcasses of poisoned fauna and rodent detector dog accreditation requirements (including actions to prevent disturbance to seabird colonies).

33. The Department is satisfied that if the proponent complies with the proposed conditions, impacts of the proposed action on listed threatened seabirds should not be unacceptable.

Threatened Marine Species (Fish, Sharks, Whales and Turtles)

34. The following table lists EPBC Threatened Marine Animals recorded in the vicinity of LHI and the likelihood of the proposed action having significant impacts on each species.

Threatened Marine Animals	**EPBC Act Status**	**Likelihood of significant impact**
Black rock Cod *Epinephelus daemelii*	V	No. Unlikely to have sufficient exposure to bait.
Great White Shark *Carcharodon carcharias*	V	No. Species unlikely to be present or present in small numbers. Unlikely to have sufficient exposure to bait.

Blue Whale *Balaenoptera musculus*	E	No. Species unlikely to be present or present in small numbers. Unlikely to have sufficient exposure to bait.
Southern Right Whale *Eubalaena australis*	E	No. Species unlikely to be present or present in small numbers. Unlikely to have sufficient exposure to bait.
Humpback Whale *Megaptera novaeangliae*	V	No. Species unlikely to be present or present in small numbers. Unlikely to have sufficient exposure to bait.
Sperm Whale *Physeter macrocephalus*	V	No. Species unlikely to be present or present in small numbers. Unlikely to have sufficient exposure to bait.
Loggerhead Turtle *Caretta caretta*	E	No. Species unlikely to be present or present in small numbers. Unlikely to have sufficient exposure to bait.
Green Turtle *Chelonia mydas*	V	No. Unlikely to have sufficient exposure to bait.
Leatherback Turtle *Dermochelys coriacea*	E	No. Species unlikely to be present or present in small numbers. Unlikely to have sufficient exposure to bait.
Hawksbill Turtle *Eretmochelys imbricata*	V	No. Species unlikely to be present or present in small numbers. Unlikely to have sufficient exposure to bait.
Flatback Turtle *Natator depressus*	V	No. Species unlikely to be present or present in small numbers. Unlikely to have sufficient exposure to bait.

35. According to the LHIB, potential impacts to EPBC listed threatened marine species will be limited to accidental bait entry into the water (presumably due to a full load of rodent baits being jettisoned mid-air, a helicopter crashing or poorly targeted distribution) leading to primary or secondary poisoning of threatened marine species.

36. Stakeholders expressed concern about the potential for helicopters to crash or being forced to jettison up to bait 500kg of Brodifacoum in an emergency situation. The Department understands that the NSW Government will be issuing a NSW Marine Parks permit for the baiting operation that will include conditions related to clean up procedures if substantial quantities of bait are dumped in shore. Divers will be required to scoop up pellets from the sea floor. No clean-up is planned if a bucket load of pellets is dropped in deeper waters.

37. The Department has questioned both the feasibility of divers scooping up Brodifacoum pellets from the seabed and the necessity for such a response. The fate of pellets in sea water is unclear but is seems likely that the cereal based bulking material will quickly become water logged and break up into small fragments as it sinks through the water column to the seabed. Brodifacoum is unlikely to react with seawater, it is likely to bind to sediments with limited availability to marine invertebrates.

38. On 23 May 2001, 18 tonnes of Brodifacoum cereal pellet bait entered the tidal zone near Kaikoura on the south island of New Zealand following a road accident. Immediate

monitoring was undertaken because of the importance of the area for human food collection and the lack of information at the time regarding the toxicity and residual persistence of Brodifacoum in marine species including invertebrates.

39. Bait entering the water quickly began to soften and disintegrate. An area 100m wide by 300 to 700 m long turned a cloudy green due to the release of dye and particles from the pellets. The plume persisted for 24 hours. The seawater contained visible quantities of suspended or congealed cereal grain which accumulated on the adjacent beach and in rock crevices and sheltered areas of the seabed. After a week the congealed areas of pellet material were diluted and dissipated by wave action, kibbled grain material was no longer visible.

40. The case study is reported at http://link.springer.com/article/10.1007%2Fs00128-005-0668-1?LI=true

41. The report states that initial high environmental Brodifacoum concentrations in the immediate locality were probably sufficient to cause mortality of some invertebrates and fish, however, no dead fish were found and mortality would have been extremely difficult to measure in these mobile animals.

42. Brodifacoum residues in the sea water and sediment declined to below detectable concentrations within three and nine days respectively.

Fish and sharks

43. Black Cod (*Epinephelus daemelii)* and Great White Sharks (*Carcharodon carcharias)* are both listed Vulnerable under the EPBC Act but are unlikely to have sufficient exposure to the bait for the proposed action to have a significant impact at a population level due to Brodifacoum's low solubility in water and the high dilution factor. In the absence of major accidents only small quantities of Brodifacoum are likely to enter the sea.

Marine mammals

44. According to the referral, there is no realistic pathway by which threatened marine mammals can be exposed to Brodifacoum in sufficient quantities to result in significant impacts as a result of the proposed action. Marine mammal species are rare visitors to LHI waters, passing through on annual migrations and are therefore unlikely to encounter the bait.

45. The Department also noted that Brodifacoum is highly insoluble in water, only small quantities of Brodifacoum are likely to enter the sea and the dilution factor will be high. These factors mean that significant impacts on marine mammals are unlikely.

Turtles

46. Adult Green Turtles (*Chelonia mydas*) (Vulnerable) feed on seagrass and seaweed. It is unlikely that Green Turtles will be exposed to Brodifacoum by consuming baits directly or

prey items that have ingested the poison. Plants have not been recorded taking up or storing anticoagulants, therefore no significant impacts on adult Green Turtles are likely.

47. Juvenile Green Turtles and the other four species of turtle (Flatback Turtle (*Natator depressus)* (Vulnerable), Hawksbill Turtle (*Eretmochelys imbricata)* (Vulnerable), Leatherback Turtle (*Dermochelys coriacea)* (Endangered) and Loggerhead Turtle (*Caretta caretta*) (Endangered)) that occur in waters around LHI are carnivorous, and eat soft corals, shellfish, crabs, sea urchins and jellyfish. It is unlikely that these turtles will encounter marine invertebrates that may have been contaminated with Brodifacoum from the rat eradication program. The Department notes that no turtle nesting occurs on LHI or its islets nor do any of the turtle species crawl onto any beaches in the LHIG.

Conclusion

48. The Department undertook a number of scientific literature searches to ascertain if island pest control programs using Brodifacoum had resulted in significant impacts on individuals or populations of threatened Marine Species (Fish, Sharks, Whales and Turtles) (individuals or populations) similar to those populations recorded in the vicinity of LHI.

49. One study concluded that Brodifacoum residues detected in fish confirmed that Brodifacoum moved into the marine system, probably via bait drifting off the flight line due to windy conditions. Aerial baiting on LHI will not occur in strong winds, which should minimise the risk of bait drift.

50. The Department concluded the proposed action is unlikely to significantly impact EPBC listed threatened marine species (fish, sharks, turtles or whales) because:

- The use of specialised equipment on the bait hopper (a deflector arm can be attached to the spreader bucket to restrict the arc of the swathe to 180 degrees) will ensure little bait enters the water and the quantities of bait that may bounce off the cliffs into the sea will be minimal
- Baiting around the coast line will occur above the mean high water mark to minimise bait entry into the marine environment
- The breakdown of the baits (the cereal bulking material) that enter the sea will be rapid (the opportunity for fish and marine mammals to take baits will therefore be limited)
- Hawaiian studies show that fish display a lack of interest in baits
- Fish population levels are unlikely to be impacted by the death of a few fish that find and eat sufficient bait to be fatal
- Other islands have been baited using similar methods (sometimes using significantly more bait) with no significant adverse effects on the marine environment
- Any impacts are likely to be very localised and temporary in nature.

<u>Terrestrial Reptiles</u>

Lord Howe Island Skink *Oligosoma lichenigera* – Vulnerable
Lord Howe Island Gecko *Christinus guentheri* – Vulnerable

Species information

51. The ERT identified two EPBC listed terrestrial reptile species as occurring on LHI:

- the Lord Howe Island Skink *Oligosoma lichenigera* – Vulnerable
- the Lord Howe Island Gecko *Christinus guentheri* – Vulnerable

Potential impacts

52. The Department undertook a number of literature searches, however, scant information is available about Brodifacoum's impact on reptiles. One study investigated a population of Galápagos land iguanas (*Conolophus subcristatus*) during a rat eradication operation. Six iguanas were found dead afterwards, apparently due to consumption of bait and/or poisoned rats. The mortality rate was estimated to be 4.5% of the iguana population.

53. In New Zealand, Telfair's Skink (*Leiolopisma telfairi*) was recorded feeding on rain-softened pellet bait which apparently led to a number of deaths in this species. There was a 15 % mortality of the Caribbean gecko species (*Sphaerodactylus macrolepis)* when exposed to Talon-G (cereal pellets containing 0.02 g/kg Brodifacoum) during pen trials. In another study, lizards in a laboratory were offered cereal-based pellets as their sole source of food but only a relatively small amount of bait was consumed.

54. It is possible LHI terrestrial reptile species could be impacted by Brodifacoum via primary poisoning (direct consumption) and secondary poisoning (consumption of poisoned invertebrates). However, according to the assessment documentation, reptiles are considered to be more tolerant of rat poison than mammals and birds (based on field observations and survival during experimental dosing).

Avoidance and mitigation measures

55. The Lord Howe Island Skink and Lord Howe Island Gecko may ingest Brodifacoum if they feed on invertebrates that fed on Brodifacoum baits. However the risk of secondary poisoning for these species is low because baiting will take place in winter (an avoidance measure) when reptiles may be either dormant, or relatively inactive. Therefore few if any reptiles will be feeding at the time when invertebrates may be consuming Brodifacoum.

56. The Department also notes that the proportion of invertebrates that will have fed on Brodifacoum baits is likely to be small so even if they are foraging at this time most of the prey that they will encounter will not be poisoned.

Conclusion

57. The Department acknowledges that some Lord Howe Island Skinks and Lord Howe Island Geckos might die due to secondary consumption of Brodifacoum but considers that the proposed action is unlikely to have a significant impact on these species and has not

proposed specific conditions to ameliorate potential impacts of the proposal on terrestrial reptiles.

Terrestrial Plants

Species information

58. The ERT identified six flora species as likely or known to occur within the proposed action area. Three of these species are critically endangered, these are: *Calystegia affinis,* Phillip Island Wheat Grass (*Elymus multiflorus* subsp. *kingianus)* and Little Mountain Palm (*Lepidorrhachis mooreana).* The three endangered species are: *Geniostoma huttonii*, Rock Shield Fern *(Polystichum moorei)* and *Xylosma parvifolia.*

Potential impacts

59. Components of the proposed action that could potentially impact on EPBC listed plant species are potential uptake of Brodifacoum by plants and the direct and indirect impacts of the works associated with building the LH Woodhen and Currawong captive management facility.

60. No vegetation clearing will occur as part of the proposed action. Construction of the captive management facility involves modification of existing structures, and if required, construction on previously cleared land at the palm nursery. Construction of the captive management facility is therefore unlikely to have a significant impact on EPBC listed plant species.

61. The Department notes that Brodifacoum is not a herbicide, is highly insoluble and binds strongly to soil particles. Brodifacoum is therefore unlikely to be transported through soils and taken up by the roots of plants into plant tissues. There is no known chemical process that would allow Brodifacoum to impact on plants.

62. The referral cites a study that sampled grasses collected six months after application of Brodifacoum cereal baits at 15 kg/ha on Anacapa Island in California during 2001 and 2002 and found no detectable residues in the samples tested.

Avoidance and mitigation measures

63. Other than standard soil and water control measures associated with construction of the captive management facility the proponent has not proposed any flora specific avoidance and mitigation measures.

Conclusion

64. The Department has not proposed specific conditions to ameliorate potential impacts of the proposal on flora because the proposed action is unlikely to have significant impacts on any EPBC listed threatened flora species.

Part 3 Assessment of the potential impacts of the proposed action on additional listed threatened species identified in an ERT search on 20 June 2016

A search of the Department's Environmental Reporting Tool (ERT) on 13 July 2017 identified an additional six listed threatened species that were not identified in an ERT search on 20 June 2016 (the same co-ordinates were used in the two ERT searches), within a parallelogram that encompasses all the islands of the Lord Howe Island Group (except for Balls Pyramid) and within a buffer of 2 km from the parallelogram.

The following threatened species (although previously listed under the EPBC Act) were not identified by the ERT at the time the controlled action decision was made, and therefore were not considered during the assessment process:

- Red Knot (*Calidris canutus*) - endangered
- Curlew Sandpiper (*Calidris ferruginea*) – Critically endangered
- Herald Petrel (*Pterodrama heraldica*) - Critically endangered
- Pacific Albatross (*Thalassarche bulleri platei*) – Vulnerable
- Sei Whale (*Balaenoptera borealis*) – Vulnerable
- Fin Whale (*Balaenoptera physalus) - Vulnerable*

These species were identified in the SPRAT search of 13 July 2017 because their distributions were updated in SPRAT subsequent to the controlled action decision for this project. The Department recently assessed the potential impacts of the proposed action on the above species and concluded that it was highly unlikely that they would be significantly impacted by the proposal.

The following is a summary of this assessment

Red Knot (*Calidris canutus*) – endangered

This species is a rare, regular visitor to LHI (13 records between 1990 and 2004). According to *Australian Field Ornithology, Volume 21 Supplement 2004* LHIG is not on the regular migration path of the species from Siberia to New Zealand via Australia, nor does it need to stop on LHI on a regular basis.

According to SPRAT, the global population of the Red Knot is estimated at 1 090 000. The population in the East Asian Australasian Flyway is estimated at 110 000. Populations by country (in the non-breeding period) are: Australia, 135 000 and New Zealand, 68 000.

The Department concluded that the proposed action is unlikely to have a significant impacts on this species because only a few individuals are likely to visit the LHIG annually, it does not breed in Australia, nor do the few that reach LHI do so during the proposed baiting period.

Curlew Sandpiper (*Calidris ferruginea*) – Critically endangered

The Curlew Sandpiper is distributed around most of the Australian coastline (including Tasmania). It occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. The Curlew Sandpiper breeds in

Siberia and migrates to Australia for the non-breeding period, arriving in Australia between August and November, and departing between March and mid-April.

Individuals of this species recorded on LHI are from populations that occur throughout coastal Australia. The Department concluded that it is unlikely that the proposed action will have a significant impact on the Curlew Sandpiper because it is a rare/accidental visitor to LHI (recorded on 10 occasions since 1902).

Herald Petrel (*Pterodrama heraldica*) - Critically endangered

The Herald Petrel is a marine, pelagic species of tropical and subtropical waters. Published sightings of the Herald Petrel off eastern Australia occur from the edge of the continental shelf, 30-36 km offshore. LHI is over 500 km east of the mainland.

The species nests on tropical and subtropical islands, atolls, cays and rocky islets and was recorded near LHI on 28 April 2012. SPRAT indicates that there are less than 10 breeding pairs in Australia or fewer than 50 mature individuals. According to SPRAT, the global population size has not been quantified, but the population is believed to be greater than 10 000 mature individuals.

The Department is aware of a single record of this species from LHI and concluded that it is unlikely that the proposed action will have a significant impact on the Herald Petrel.

Pacific Albatross (*Thalassarche bulleri platei*) – Vulnerable

According to SPRAT, the Pacific Albatross is a non-breeding visitor to Australian waters. Foraging birds are mostly limited to the Pacific Ocean and the Tasman Sea, although birds sometimes reach the east coast of the Australian mainland.

The species breeds in New Zealand. Most birds seem to disperse outside Australasian seas during the non-breeding season. Away from the breeding grounds, they tend to range across the South Pacific Ocean north of the Antarctic Convergence, from south-east Australia to west South America. In Australia, the species occurs over inshore, offshore and pelagic waters and off the coast of south-east Tasmania.

This species is unlikely to be significantly impacted by the proposed action as it forages over the open sea, breeds in New Zealand and is unlikely to consume rodent bait pellets or any organisms that had consumed Brodifacoum pellets.

Sei Whale (*Balaenoptera borealis*) – Vulnerable

According to SPRAT, Sei whales have been infrequently recorded in Australian waters. This species is unlikely to be present, or present in small numbers, in the vicinity of the LHIG.

At sexual maturity, Sei whales can reach lengths of 17.7 m in males and 21 m in females. Sei whales feed on planktonic crustacea, in particular copepods and amphipods.

The Department concluded that there is no credible pathway by which this species could have sufficient exposure to sufficient bait to result in illness or death to any individuals. Sei whales are therefore unlikely to be significantly impacted by the proposed action.

Fin Whale (*Balaenoptera physalus*) - *Vulnerable*

The Fin whale is the second-largest whale species, after the blue whale (*Balaenoptera musculus*). Adult whales range between 20 and 27 m long and weigh more than 70 tonnes.

Fin whales feed intensively in high latitudes and may also feed to some extent, depending upon prey availability and locality, in lower latitudes. Fin whales feed on planktonic crustacea, some fish and cephalopods (crustaceans). This species is unlikely to be present or present in small numbers in the vicinity of the LHIG.

The Department concluded that there is no credible pathway by which this species could have sufficient exposure to sufficient bait to result in illness or death to any individuals. Fin whales are therefore unlikely to be significantly impacted by the proposed action.