Board Meeting: September 2017	**Agenda Number:** 8 (i)	**Record Number:** ED17/4297

LORD HOWE ISLAND BOARD
Business Paper

OPEN SESSION

ITEM

Lord Howe Island Rodent Eradication Program (REP) Final Go / No Go Decision.

RECOMMENDATION

That the Board proceed to Stage Three of the LHI Rodent Eradication Program (REP) with implementation scheduled for winter 2018.

BACKGROUND

On 18 May 2015, the LHI Board decided to proceed with the planning and approvals stage of the REP in accordance with the process for resolution outlined in Figure 1.

Figure 1: Process for Resolution

Process for Resolution

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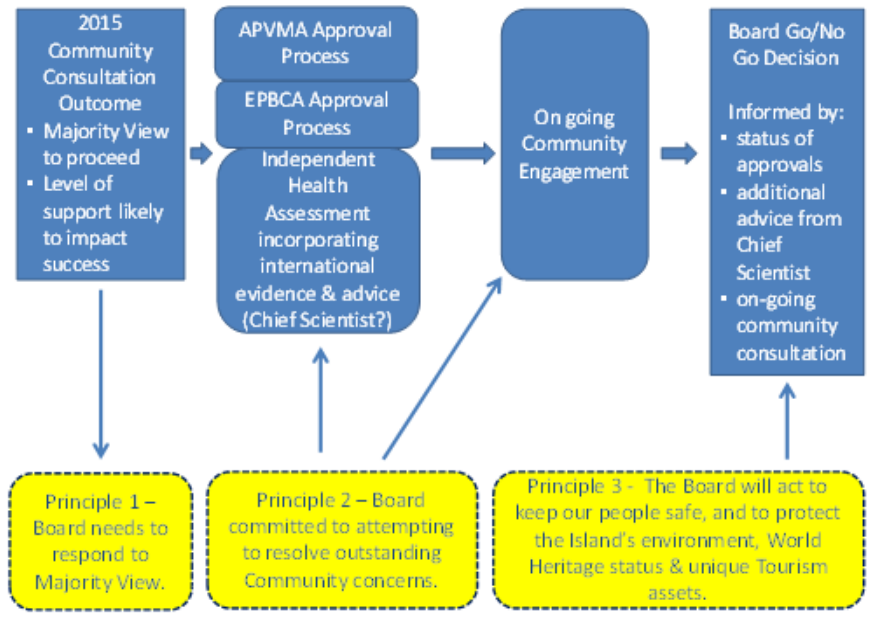

The rodent eradication program has now been divided into three stages:

Stage One: Preliminary planning and community consultation

This stage has previously been completed. It involved undertaking required initial trials including captive management and toxin resistance trials as well as initial operational planning. It included the biosecurity review and progression of biodiversity outcome monitoring. Finally it included the community consultation and engagement process and the community survey.

Stage Two: Planning and Approvals

This stage is now complete. The key tasks during this stage were:

- Assembling key personnel to undertake the work on the next stages
- Reviewing the Rodent Eradication Plan to ensure that it takes into consideration all new information since it was drafted in 2009
- Developing individual property and livestock management plans, which inform the eradication plan and the approval process. This involved a detailed property by property consultation with individual leaseholders and residents.
- Continue working with community to fully understand the programs objectives
- Undertake any necessary studies required for the approval process, including independent human health risk assessment
- Continue the relevant baseline outcome monitoring
- Further develop detailed planning and all necessary risk assessments;
- Obtain required permits and approvals,
- Update operational details;
- Prepare key tender documentation

Final Go / No Go Decision

The Board must now make the final go / no go decision on whether to proceed with the REP considering:

1. The status of key approvals
2. Safety of the environment
3. The advice of the NSW Chief Scientist and Engineer regarding a further independent Human Health Risk Assessment
4. Social Acceptability
5. Budget considerations
6. Technical Feasibility
7. Steering Committee recommendation

Stage Three: Implementation and evaluation of the eradication plan

This Stage will not happen unless the decision to proceed is made.

Stage Three will involve the eradication plan being implemented in winter 2018 over an approximate three month period. Key elements are:

- Finalise detailed logistics and operational planning

- Assemble and train remaining resources
- Construction of captive management facilities for the woodhen and currawong
- Capture of woodhens and currawongs
- Operational readiness check
- Implementation of ground and aerial baiting
- Follow up monitoring and release of woodhens and currawongs
- Maintaining an ongoing biosecurity and rodent detection monitoring network

CURRENT POSITION

1. Status of Required Approvals

A range of approvals is required for the project, the status of which is detailed in Table 1 below.

All key approvals that formed part of the 2015 Process for Resolution above have been received.

A decision on the Development Application for the captive management facilities associated with the REP is required in this Board meeting (see separate report). Minor approvals remaining will be sought once the final decision to proceed is made.

Table 1: Approvals requirements and status

Agency / Legislation	Requirement and considerations	Received	Key Approval Conditions
Australian Pesticides and Veterinary Medicines Authority (APVMA) *Agriculture and Veterinary Chemicals Code Act 1994*	Minor Use Permit for use of the pesticide in Australia specifically for the LHI REP. Considers: Safety • Human health • Environment Efficacy • Effectiveness of the product	Y	• Development of Risk Mitigation Plan • Education programme and information sheets for community and visitors
Department of the Environment and Energy *Environmental Protection and Biodiversity Conservation Act* 1999	Approval for an "action" that will have or is likely to have a significant impact on any of the matters of national environmental significance. Considers: Matters of National Environmental Significance • Threatened and migratory species • World Heritage values • Commonwealth Marine Area	Y	• Establishment of Technical Advisory Group • Development of Monitoring and Mitigation Plan • Development of Biosecurity Management Plan • Reporting of non-target impacts • Reporting of post operational monitoring results
Department of Agriculture and Water Resources *Biosecurity Act 2015*	Permit to import the bait into Australia. Considers: • Biosecurity of the bait	Y	• Manufacturer's Declaration
Civil Aviation Safety Authority *Civil Aviation Safety Regulation 1998*	Pilot Licensing and Aerial Operator's Certificate (held by helicopter contractor)	Y	
	General permit for flight lines	To be submitted once decision is made to proceed	
Department of Primary Industry – Fisheries *Fisheries Management Act 1994*	Section 220ZW Licence authorising an action that is likely to result in harm to a threatened species, population or ecological community.	Y	• Marine spill containment and clean-up plan

	Considers: • NSW listed threatened marine species		• Marine research and monitoring plan • Reporting of marine non target impacts • Operational report
Department of Primary Industry – Marine Park Authority *Marine Estate Management (Management Rules) Regulation 1999*	Consent to harm animals and plants in all zones of the Lord Howe Island Marine Park (NSW) Considers: • The Lord Howe Island Marine Park (NSW)	Y	
Office of Environment and Heritage *Threatened Species Conservation Act 1995*	A Species Impact Statement and Section 91 Threatened Species License to harm or pick a threatened species, population or ecological community* or damage habitat. Considers: • NSW listed threatened species, populations and ecological communities	Y	• Reporting of non-target deaths • Operational report
	License to capture listed threatened species (Covered under existing LHIB licenses)	Y	
	Captive holding permits (held by Taronga Zoo as captive management contractor)	Y	
Lord Howe Island Board *Environmental Planning and Assessment Act 1979 (Part 4)*	Development consent for construction of the captive management facilities. Considers: Local Environmental Plan 2010	Decision required as part of this Board Meeting	
Environmental Protection Agency *Pesticides Act 1999*	Pesticide use license for prescribed pesticide works to cover ground application.	To be issued once ground staff in place. EPA will train and license staff on LHI May 2018	
	Chemical distribution license (Business and pilot). Held by helicopter contractor.	Y	

2. Safety of the Environment

Potential environmental impacts of not undertaking the REP are compared to the potential impacts and benefits from proceeding with the REP below.

Potential Environmental Impacts of Not Proceeding with the REP

The devastating impacts of introduced rodents on offshore islands around the world are well documented. The presence of exotic rodents on islands is one of the greatest causes of species extinction in the world. Ship rats alone are responsible for the severe decline or extinction of at least 60 vertebrate species and currently endanger more than 70 species of seabird worldwide (Jones et *al. 2008*)[1]. They suppress plants and are associated with the declines or extinctions of flightless invertebrates, ground-dwelling reptiles, land birds and burrowing seabirds. Mice have also been shown to impact on plants, invertebrates and birds (Angel *et al.* 2009)[2].

On LHI, rats are implicated in the extinction of five endemic bird species, at least 13 species of endemic invertebrates, and two plant species. Rodents are also a recognised threat to at least 13 other bird species, 2 reptiles, 51 plant species, 12 vegetation communities, and seven species of threatened invertebrates on LHI (DECC, 2007)[3]. Rodents have therefore not reached equilibrium with native species on LHI.

Failure to proceed with the REP will result in continuing adverse consequences to biodiversity, and World Heritage values on LHI through:

- Ongoing impacts to biodiversity as a result of rodent predation and competition.
- An increased extinction probability for several species including seven species listed as Critically Endangered (probability of extinction in the wild is at least 50% within 10 years)
- An increased risk that several species could experience population declines and become eligible for higher or new threatened species status listing representing a higher degree of endangerment
- Continuation of the current rodent control program (and the continuous presence of poison baits in the environment) essentially in perpetuity. This presents an ongoing risk of poisoning for non-target species and potential for development of rodent resistance to poison.
- Potential further degradation of World Heritage values (including endemic and threatened species) and the potential for the LHIG to be inscribed on the "World Heritage in Danger List".

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[1] Jones, H. P., Tershy, B. R., Zavaleta, E. S., Croll, D. A., Keitt, B. S., Finkelstein, M. E. and Howald, G. R. (2008). Severity of the effects of invasive rats on seabirds: a global review. *Conservation Biology* **22**, 16-26.

[2] Angel, A., Wanless, R. and Cooper, J. (2009). Review of impacts of the introduced house mouse on islands in the Southern Ocean: are mice equivalent to rats? *Biological Invasions* **11***,* 1743-1754.

[3] DECC. (2007) Lord Howe Island Biodiversity Management Plan. Department of Environment and Climate Change, Hurstville.

Potential Environmental Impacts of Proceeding with the REP

The potential environmental impacts arising from the proposed REP were extensively assessed through the various environmental approval documents and processes. These included:

- Pollution of soil, air or water
- Bioaccumulation
- Mortality of non-target species due to primary poisoning from consumption of bait pellets
- Mortality of non-target species due to secondary poisoning from consumption of poisoned rodents, fish or invertebrates
- Bird strikes and collisions from helicopter activity
- Disturbance from helicopter activity
- Potential impacts as a result of handling and captive management during the captive management program
- Long term changes to ecological relationships affecting threatened species following the eradication of rats, mice and owls.

Based on evidence from similar eradications around the world, studies done on LHI, the physical and chemical properties of the bait and toxin and the relatively small quantity used in a one-off eradication, the risk to the environment and most species from the REP was shown to be very low.

The only species considered to be at significant risk from the REP were the LHI Woodhen and LHI Currawong. Mitigation is in place to manage risks to these two species through a detailed plan to manage large proportions of the populations of these two species in captivity during the REP. The captive management component of the REP will be managed by animal husbandry experts from Taronga Zoo including vets, vet nurses and experts in bird management. Both species have previously been held in captivity before with no observable ill effects. With the captive management in place, it is considered unlikely that the REP will have a significant impact on woodhens or currawongs.

An extensive monitoring program will be conducted before, during and after the REP. This includes

- Monitoring of weather in the lead up to and during the REP. This will ensure bait can be distributed safely and effectively and not during adverse weather conditions.
- Monitoring for non-target species deaths after bait distribution to ensure there are no unexpected impacts to endemic species.
- Monitoring breakdown of baits after distribution. This will provide confidence in bait breakdown prior to release of captive managed species.
- Soil monitoring before and after bait distribution. This will provide evidence that pollution has not occurred.
- Random sampling will be conducted on water bodies on the island to monitor Brodifacoum levels before and after the bait drop. This will provide evidence that pollution has not occurred and water is safe to drink.

- Monitoring of fish, milk and eggs to monitor Brodifacoum levels before and after the bait drop. This will provide evidence food is safe to eat.
- Monitoring of Woodhen post release. This will provide evidence of recovery.
- Monitoring of free-ranging currawong and captive Currawong LHPC post-release. This will provide evidence of impacts and recovery.

Potential Environmental Benefits from proceeding with the REP

The many successful rodent eradication programs undertaken on islands around the world have shown that the benefits to native plants and animals are both significant and immediate (Jones *et al,* 2016)[4]. Benefits include:

- significant increases of seeds and seedlings of numerous plant species on islands after the eradication of various rodent species
- rapid increases in the number of ground lizards (e.g. geckos, skinks) following removal of rats – including a 30-fold increase in one case
- dramatic increases in the numbers of breeding seabirds and fledging success
- rapid increases in forest birds and invertebrates.

The anticipated benefits specifically relating to the REP on the LHIG include:

- recovery of a range of species an ecological communities directly at risk of extinction due to rodents such as the cloud forest snail species, LHI Placostylus, Little Mountain Palm, Phillip Island Wheat Grass and Gnarled Mossy Cloud Forest
- a marked increase in birds, reptiles and insect density, diversity and distribution – this boost in diversity will increase food resources for predatory terrestrial vertebrates and potentially lead to population increases which will enrich the experience of both island residents and tourists
- increases in the abundance of plants, seeds and seedlings, thereby enhancing the process of forest regeneration
- removal of the economic and environmental burden of the ongoing control currently in place, eliminating the need for the ongoing use of rodent poisons in the environment and their associated long-term risks to native species, pets, livestock and people
- the ability to return species (or closely related surrogates/ecological equivalents) that have long been absent due to the predation of rats and mice, such as the Island gerygone, grey fantail, Boobook Owl, LHI Wood-feeding Cockroach and LHI phasmid
- Long term positive impacts for tourism through protection and enhancement of World Heritage values and improved visitor experience of a rodent free World Heritage Area.

[4] Jones H. P., Holmes N. D., Butchart S. H., Tershy B. R., Kappes P. J., Corkery I., Aguirre-Monoz A., Armstrong D. P., Bonnaud E., Burbidge A. A., Campbell K., Courchamp F., Cowan P. E., Cuthbert R. J., Ebbert S., Genovesi P., Howald G. R., Keitt B. S., Kress S. W., Miskelly C. M., Oppel S., Poncet S., Rauzon M. J., Rocamora G., Russell J. C., Samaniego-Herrera A., Seddon P. J., Spatz D. R., Towns D. R. and Croll D. A. (2016) Invasive mammal eradication on islands results in substantial conservation gains. *PNAS* **113**, 4033-8

The eradication of rodents is consistent with numerous local, state, commonwealth and international plans and obligations. Eradication of exotic rodents from high priority islands (including LHI) is the first objective in the Commonwealth *Threat Abatement Plan to Reduce the Impacts of Exotic Rodents on Biodiversity on Australian Offshore islands of Less than 100 000 Hectares*[5].

Environmental Summary
There is a clear and demonstrated need for the REP based on documented evidence of significant impacts of rodents both globally and on LHI at the species and ecosystem level, even in the presence of ongoing rodent control. There are unacceptable consequences of failing to proceed with the REP.

The REP is essential and beneficial. Risks have been addressed through proposed mitigation to the point where they are considered to be very low. Any potential impacts are localised and short term and far exceeded by the benefits that will be provided by implementation of the REP. Potential impacts of the REP are also considerably less than the ongoing impact of failing to proceed.

3. Advice of the NSW Chief Scientist and Engineer regarding an additional Human Health Risk Assessment (HHRA)

In line with the agreed Process for Resolution above, in June 2016 the NSW Minister for the Environment (on behalf of the LHIB) requested that the NSW Office of the Chief Scientist and Engineer (OCSE) oversee an additional independent Human Health Risk Assessment for the project.

The OCSE was requested to convene an Expert Panel to:

1. Provide advice to the Board on processes for commissioning the HHRA including identification of suitable experts and scope of the request for proposal
2. Convene an Expert Panel to review proposals to undertake the HHRA and select a preferred candidate; review project plans and methodologies; and review draft and final reports of the HHRA as required
3. Provide advice to the Minister for the Environment on the HHRA
4. Respond to media enquires as they relate to the Terms of Reference for the Expert Panel

The Expert Panel consisted of:

- **Professor Mary O'Kane, Chair**
  Mary O'Kane is the NSW Chief Scientist & Engineer.
- **Dr Chris Armstrong, Deputy Chair**
  Chris Armstrong is the Director of the Office of Chief Scientist & Engineer, NSW.
- **Professor Brian Priestly**
  Brian Priestly is Director of the Australian Centre for Human Health Risk Assessment

[5] DEWHA, (2009). THREAT ABATEMENT PLAN to reduce the impacts of exotic rodents on biodiversity on Australian offshore islands of less than 100 000 hectares. Department of Environment Water, Heritage and the Arts, Canberra

(ACHHRA) associated with the Monash University School of Public Health & Preventive Medicine and an Independent Environmental Services Professional.

- **Emeritus Professor Stephen Leeder**
  Stephen Leeder is an emeritus professor of public health and community medicine at the University of Sydney. He is also currently chair of the Western Sydney Local Health District Board.

The Expert Panel (with the assistance of two members of the Community Working Group; Dr Frank Reed and Mr Robert Rathgeber) selected Ramboll Environ Pty Ltd to undertake the HHRA.

The HHRA overseen by the OCSE and undertaken by the Ramboll Environ concluded that a comprehensive evaluation of the environmental releases from the REP **did not** identify exposures expected to lead to adverse health effects. The overall conclusion was that **estimates of exposure from all potential sources associated with the REP are below those likely to result in adverse health effects in any individuals** (Ramboll Environ, 2017).

The NSW Office of the Chief Scientist and Engineer (OCSE) has now presented its report[6] on the HHRA prepared by the consultants Ramboll Environ in 2017 to the NSW Minister for the Environment, Local Government and Heritage.

The OCSE and Expert Panel supported Ramboll Environ's conclusions and recommended:

- a communication strategy for the period before and during the REP;
- a monitoring strategy to measure outcomes; and
- reports to the Minister on community and environmental outcomes at designated periods post REP.

The executive summary from the OCSE report is attached (Attachment 1). The Minister has now accepted the OCSE report.

A representative of the OCSE and two representatives from Ramboll Environ visited the island on the 2nd and 3rd of Aug 2017 to present the findings to community. Approximately 40 people attended the two public sessions.

The outcomes from this additional HHRA and expert panel review concur with the results of previous HHRA's undertaken by Toxikos Pty Ltd in 2010 and by Pacific Environment Ltd in 2015 that show that with the proposed mitigation in place, the **REP is safe for the community and visitors**. The executive Summary form the OCSE report is attached (Attachment 1)

4. Social Acceptability

Continued engagement with the community from 2015 -2017 via a variety of methods has resulted in steadily increasing acceptance of the REP. Whilst a small minority of the community may still be opposed to the REP, individual property management discussions have shown that even those opposed are willing to allow access to their properties for some baiting treatment method by some nominated islanders. Only one landholder has declared they will not be allowing access to their property for baiting, citing concerns about potential impacts to human

[6] NSW Chief Scientist and Engineer (2017). Report on the Human Health Risk Assessment for the Lord Howe Island's proposed Rodent Eradication Program.

health and the environment. The project team will continue to work with this individual (and all residents) in the lead up to implementation to ensure we have 100% property access.

Social acceptability is supported by public submissions on key approvals documents:

- The Public Environment Report for the Department of Environment and Energy
    - 128 submissions were received with 118 (92%) of those in support of the project
- The Species Impact Statement or the Office of Environment and Heritage
    - 55 submissions were received with 52 (95%) of those in support of the project.

Support for the REP has been received from major organizations including:

- World Wildlife Fund Australia (WWF)
- BirdLife Australia and the Australasian Seabird Specialist Group
- Island Conservation
- International Union for the Conservation of Nature (IUCN) Invasive Species Specialist Group
- The Invasive Species Council
- CSIRO
- Taronga Conservation Society Australia
- Zoos Victoria
- Australia's Threatened Species Commissioner

A detailed economic evaluation of the project was undertaken in November 2016 (Gillespie, 2016)[7]. The study showed that the REP has a Benefit to Cost ratio of 17:1, resulting in an estimated net social benefits of $142M with $58M of that returning directly to LHI residents. Hence the REP is justified on economic efficiency grounds.

It is anticipated that acceptance and tolerance in the community will increase further still once a final decision to proceed has been made and outcomes of the approvals process and HHRA can be communicated to residents.

If the decision to proceed is made, the REP staff will continue to engage with the community via a variety of methods including one on one property discussions in the lead up to, during and after the implementation. PR consultants (also used by the LHI Tourism Association) will continue to provide assistance for on and off island stakeholder engagement.

A contingency has been put in place to cover the loss of project team member Anthony Wilson through use of Islanders in ongoing consultation. Anthony has also committed to returning to the island for implementation of the REP.

It should be noted that the REP does not need 100% acceptance to proceed or to be successful, rather it needs 100% property access (or with appropriate risk mitigation for any residual properties).

[7] Gillespie Economics Pty Ltd. (2016). Economic Evaluation of LHI Rodent Eradication Project. Final Report Unpublished report for the Lord Howe Island Board

Property Access Options

Access to leases and residents properties will at all times be in accordance with "*LHIB Procedure for Access to Leasehold Land"* and the individual Property Management Plan negotiated with owners/occupiers for the Project. No access to residential dwellings will occur without approval from owners / occupiers. Options to ensure we have adequate bait coverage and property access are outlined below and in Figure 2.

Preferred Option

The LHIB's preferred option for accessing properties (including access to residential dwellings) is to continue to negotiate with leaseholders and residents to gain consent for access to distribute bait during the REP. During the negotiations we will continue to discuss issues such as:

- Individual property areas of concern such as children, pets and vegetable gardens.
- The outcome of approvals applications, the Human Health Risk Assessment and the LHIB's final Go/ No Go decisions. Some people are awaiting the outcomes of all of these before granting access to properties.
- Individual preferences for nominated persons to undertake the baiting on individual properties. Some people have expressed concern with certain individual staff from the LHIB conducting baiting on their properties or inside dwellings. The REP will employ approximately 30-40 staff during implementation, many of these will be locals. It is highly likely that local staff will be employed on the REP with whom individual residents are comfortable to grant property and dwelling access to for baiting.

Potential Alternative Access Options

The options below are *not preferred* but could be pursued if necessary.

Powers of Entry to Access to Properties

Under various pieces of legislation (outlined in the "*LHIB Procedure for Access to Leasehold Land")*, the LHIB has Powers of Entry to access all lease types on LHI (perpetual leases, special leases and permissive occupancies) in order to exercise functions of the LHIB. Where access is denied the LHIB can access leases after providing written notification of intent to enter. The REP, once approvals have been received and the decision to proceed is made, would be a valid function of the Board. Therefore access to properties can be obtained for the REP if necessary by providing written notice of intent in accordance with the access procedure.

Access to Residential Premises (Dwellings)

The LHIB's Powers of Entry cannot be used in relation to residential dwellings except:

a) with the permission of the occupier

b) if entry is necessary for the purpose of inspecting work being carried out under an approval,

c) under the authority conferred by a search warrant

Where permission to enter residential premises is not granted, the LHIB does not have the ability to obtain warrants under the LHI Act and would not be seeking warrants under other legislation for this purpose.

If there continues to be a small number of residents who refuse access to dwellings, there is potential to negotiate the use of alternate methods of rodent destruction on those premises. This could include the use of commercially available rodenticides such as Talon (which most islanders are familiar with and many currently use in their homes) on those properties. It could include the use of other methods such as rodent traps or clearance of the property with detector dogs. There may also be an option of extended baiting and surveillance monitoring (traps, cameras and detector dogs) at the perimeter of the residential dwellings where consent is not granted.

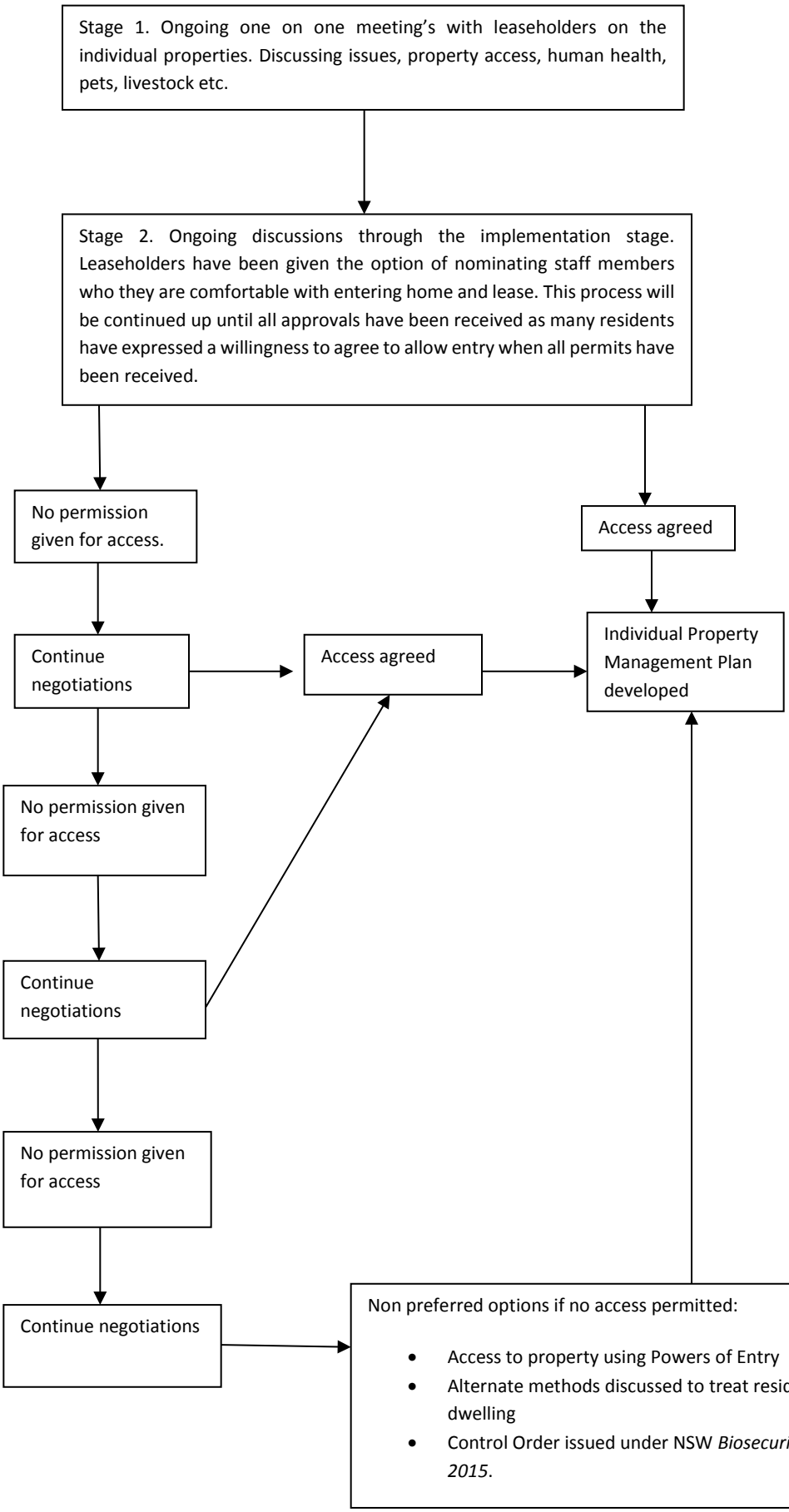
Biosecurity Act Control Order

With enactment of the new NSW *Biosecurity Act 2015* and development of the *Biosecurity Regulations 2016,* which came into force on 1 July 2017, new legislative options are available to deal with biosecurity risk matter.

The LHIB has been in discussion with NSW Department of Primary Industries about how best to manage all biosecurity risks for Lord Howe Island. Consideration is currently being given to having Lord Howe Island declared as a “Biosecurity Zone” or the ability to declare particular species that are considered biosecurity risks to Lord Howe Island and not mainland NSW (i.e. rats and mice) as Biosecurity Risk Species for Lord Howe Island only.

If the eradication proceeds, a Control Order establishing control zones or specific control measures can be issued to individuals or groups with particular control measures to be specified (i.e. baiting) for treatment or destruction of rodents. This would place the responsibility of complying with the control order on residents (i.e. residents would be responsible for baiting within their homes, not LHIB staff), therefore allowing effective bait coverage within properties and inside dwellings. Penalties are available under the act for non - compliance with a control order.

Figure 2 Property Access Flowchart



5. Budget Considerations

Both funding partners, the Australian Government National Landcare Program and the NSW Environmental Trust have recently extended the funding agreements for the project through to end of June 2019, ensuring continued availability to the previously allocated grant funds for the duration of the REP. Both funding partners have strict accountability and audit processes in place to ensure transparent and efficient management of government funds.

The Project budget has regularly been updated as the REP has progressed. Current estimates at completion of the REP show a final overrun of approximately 4% of total project budget. This is below the standard (and expected) 10% variance for a project of this size. At present there is still uncertainty in many individual line items until final costs are known (for example: sufficient budget has been allowed for helicopter time that includes extended weather delay, however this may not be required). It is highly likely that the budget will reduce over time as line item costs are confirmed.

In the event that minor additional funding is required, a funding strategy has been developed outlining various potential sources that can be pursued. This will be implemented if the REP proceeds. The strategy includes seeking additional funding (or alternate support such as resource sharing) through:

- Other relevant Commonwealth and State government grants programs including submitted and pending applications
- Conservation organizations including WWF, Birdlife Australia, Royal Society for the Protection of Birds, Island Conservation, Friends of Lord Howe and the Foundation for Australia's Most Endangered Species,
- High Net Wealth philanthropic donors with an interest in conservation or LHI.
- Crowd funding models such as "Go Fund Me" and "Pozzible"
- Corporate conservation investment/finance
- Volunteer positions on REP during implementation and follow up monitoring

It is expected that any minor budget shortfall can be addressed through a combination of the above sources if required.

It should be noted that if the decision not to proceed is made, all remaining grant funds will need to be returned to the funders. The funding cannot be used to fund other projects on Lord Howe Island.

LHI Rodent Eradication Project

Balance											
			Balance on Hand 1 Jul 15	Balance on Hand 1 Jul 16	Balance On Hand 1 Jul 17	Balance Estimate 1 Jul 17- 30 Jun 18	Balance Estimate 1 Jul 18 - 30 Jun 19	Balance Estimate 1 Jul 19 - 30 Jun 20	Balance Estimate at Completion		
			$ 8,172,756	$ 8,041,314	$ 6,939,653	$ 2,736,015	$ 39,316	-$ 437,132	-$ 437,132		

Revenue											
Project Revenue	Total Approved Revenue		Revenue Earned 30 June 2015	Revenue Earned FY15-16	Revenue Earned FY16-17	Revenue Estimate 1 Jul 17- 30 Jun 18	Revenue Estimate 1 Jul 18 - 30 Jun 19	Revenue Estimate 1 Jul 19 - 30 Jun 20	Total Revenue Estimate at Completion	Cross Check	
NSW Env Trust	$ 4,542,442		$ 4,542,442	$ -	$ -	0			$ 4,542,442		
Caring for Our Country	$ 4,500,000		$ 4,500,000	$ -	$ -	0			$ 4,500,000		
Interest	$ -		$ 610,390	$ 177,020	$ 176,603	$ 58,897	$ 846		$ 1,023,756		
Total Revenue	**$ 9,042,442**	**$ -**	**$ 9,652,832**	**$ 177,020**	**$ 176,603**	**$ 58,897**	**$ 846**	**$ -**	**$ 10,066,198**	**$ 10,066,198**	

Expenses											
Item	Budget Estimate	Expenses Incurred 2012/2013	Expenses Incurred 2014 to 30 June 2015	Expenses Incurred 1 Jul 15 to 30 Jun 16	Expenses Incurred 1 Jul 16 - 3o Jun 17	Expenses Estimate	Expense Estimate 1 Jul 18 - 30 Jun 19	Expense Estimate 1 Jul 19 - 30 Jun 20	Total Expense Estimate at		
Captive Management Sub Total	**$ 2,183,839**	**$ -**	**$ -**	**$ -**	**$ 485,517**	**$ 817,969**	**$ 630,353**	**$ 250,000**	**$ 2,183,839**		
Community Liaison Sub Total	**$ 709,381**	**$ -**	**$ 327,106**	**$ -**	**$ 82,275**	**$ 210,000**	**$ 90,000**	**$ -**	**$ 709,381**		
Baiting Sub Total	**$ 2,233,681**	**$ -**	**$ -**	**$ 3,000**	**$ 34,438**	**$ 1,597,743**	**$ 596,250**	**$ 2,250**	**$ 2,233,681**		
Livestock/Animal Management Sub Total	**$ 691,189**	**$ -**	**$ -**	**$ -**	**$ 23,677**	**$ 378,863**	**$ 288,649**	**$ -**	**$ 691,189**		
Operational Monitoring Sub Total	**$ 577,275**	**$ -**	**$ -**	**$ -**	**$ 84,305**	**$ 54,100**	**$ 402,380**	**$ 36,490**	**$ 577,275**		
Eradicating Owls Sub Total	**$ 137,000**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 12,000**	**$ 78,000**	**$ 47,000**	**$ 137,000**		
Project Management Sub Total	**$ 2,328,952**	**$ -**	**$ 336,000**	**$ 305,462**	**$ 470,515**	**$ 706,290**	**$ 382,685**	**$ 128,000**	**$ 2,328,952**		
Biosecurity Sub Total	**$ 470,244**	**$ -**	**$ 60,000**	**$ -**	**$ 42,000**	**$ 294,307**	**$ 61,229**	**$ 12,708**	**$ 470,244**		
Outcome monitoring Sub Total	**$ 414,800**	**$ -**	**$ -**	**$ -**	**$ 55,537**	**$ 191,263**	**$ 168,000**	**$ -**	**$ 414,800**		
Misc Sub Total	**$ 756,970**	**$ 756,970**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 756,970**		
Total	**$ 10,503,330**	**$ 756,970**	**$ 723,106**	**$ 308,462**	**$ 1,278,264**	**$ 4,262,535**	**$ 2,697,546**	**$ 476,448**	**$ 10,503,330**	**$ 10,503,330**	

6. Technical Feasibility

After completing a Feasibility Study in 2001[8], the LHIB has carefully considered and evaluated the eradication of rats and mice on the LHIG. Due to developments in eradication techniques during the past 20 years, particularly the refinement of aerial baiting methods, the eradication of both rats and mice on the LHI Group in a single operation is now considered technically feasible and achievable. A range of possible methods and mortality agents were considered for use in eradicating both rats and mice on LHI. The only method capable of removing every rat and mouse on LHI is aerial distribution, in conjunction with minimal hand broadcast and bait stations where required (i.e. the settlement area), of highly palatable bait containing an effective toxicant. Assessment of other options considered and why they were unsuitable on LHI are shown in Table 2 below.

Table 2 Assessment of Eradication Options

Eradication Technique	Suitable for eradication	Feasible for Eradication on LHI	Justification
Disease	No	No	No suitable pathogen yet developed that could eliminate all individuals.
Trapping	Yes	No	May be feasible for eradication on small islands, however may cause individuals to become trap shy. Size and inaccessible terrain of LHI makes this option unfeasible
Biological	No	No	Likely to fail to completely eradicate the target species. High likelihood of unacceptable non-target species impacts.
Fertility Control	No	No	No suitable fertility control yet developed that could eliminate all individuals.
Toxicant - Bait station / hand broadcast only	Yes	No	May be feasible for eradication on small islands. Size and inaccessible terrain of LHI makes this option unfeasible.
Toxicant – Aerial Broadcast only	Yes	No	Highly successful on uninhabited islands. Socially unacceptable on LHI.
Toxicant – Combination of Aerial and Hand Broadcast / Bait Stations	Yes	Yes	Brodifacoum in the form of Pest off 20R has been selected as the preferred toxicant on LHI considering proven success, efficacy and non-target impacts

[8] Saunders, A. and Brown, D. (2001). An Assessment of the Feasibility of Eradicating Rodents from the Lord Howe Island Group. Unpublished report to the Lord Howe Island Board.

The eradication techniques proposed for LHI are neither novel nor experimental. They are the culmination of more than 30 years of development and implementation involving more than 380 successful eradications worldwide (Howald et al. 2007[9] and DIISE, 2016[10]). Systematic techniques for eradicating rodents from islands were first developed in New Zealand in the 1980s. Since then techniques have improved significantly, and eradications are now being attempted and achieved on increasingly larger and more complex islands, including those with human populations.

Aerial broadcasting of bait using helicopters has become the standard method used in eradications, particularly those on large islands (Towns and Broome 2003)[11]. This method has proven to be a more reliable and more cost-effective option than the previous ground based techniques. Depending on the nature of the area to be treated, aerial baiting has been combined with hand broadcasting of bait and the use of bait stations, particularly around areas of human habitation. The use of new tracking and mapping technologies such as global positioning systems and geographic information (computer mapping) systems has increased the efficacy of aerial-based eradication programmes.

The toxicant selected for the eradication of rats and mice from the LHIG is Brodifacoum, a second-generation anticoagulant. Brodifacoum has proven to be successful in over 226 eradications, in a variety of climatic conditions including those similar to LHI, and on all 14 eradications on islands greater than 500 ha in size. An evaluation of potential rodenticides for aerial control of rodents (Eason and Ogilvie 2009[12]) concluded that Brodifacoum was the best rodenticide for island eradications. The use of any other mortality agent would be largely experimental and pose unacceptable risks of failure. The Island Eradication Advisory Group for the Department of Conservation in New Zealand who are recognised as leaders in this field, is of the opinion that "*there is no other alternative rodenticide on the market anywhere in the world with which we would have the same level of confidence in using to eradicate Ship Rats and mice from an island such as Lord Howe*".

There are three key principles of eradication that must be met in every case for all target species. The LHI REP has been designed with these principles in mind and they are discussed in further detail below.

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[9] Howald, G., Donlan, C.J., Galvan, J.P., Russell, J.C., Parkes, J., Samaniego, A., Wang, Y., Veitch, D., Genovesi, P., Pascal, M., Saunders, A. and Tershy, B. (2007). Invasive rodent eradication on islands. *Conservation Biology* **21**, 1258-1268.

[10] DIISE (2016): Database for Island Invasive Species Eradications accessed January 2016: http://diise.islandconservation.org

[11] Towns, D. R. and Broome, K. G. (2003). From small Maria to massive Campbell: forty years of rat eradications from New Zealand islands. *New Zealand Journal of Zoology* **30**, 377-398.

[12] Eason, C. T. and Ogilvie, S. (2009). A re-evaluation of potential rodenticides for aerial control of rodents. DOC Research and Development Series 312. Department of Conservation, Wellington, New Zealand.

1. *All individuals can be put at risk by the eradication technique(s).*

Constraints and solutions to this principle are detailed below.

Constraint	**Solution**
Efficacy of the bait	Brodifacoum is highly toxic to both rats and mice in minute quantities, allowing a lethal dose to be consumed in a single feed. It is also a chronic toxicant (i.e. its action is delayed) meaning the rodent does not associate any illness with the bait it has consumed. These two factors are important for avoiding the consumption of sub-lethal doses and the associated risk of bait shyness/avoidance. Trials on LHI have confirmed that doses available during the REP are sufficient to kill all rats and mice.
Palatability of the bait and alternate food sources	The Pestoff 20R bait proposed to be used is specially designed to be highly palatable to rodents and this has been shown on LHI even with alternate food available in the laboratory and in field conditions. The Pestoff 20R bait is much more palatable than commercial rodenticides containing Brodifacoum as these contain waxes to preserve life and taste deterrents to prevent human ingestion. Whilst LHI has alternate foods sources available, unlike tropical islands, the sub-tropical LHI has reduced alternate food availability over winter when the REP is planned.
Access to baits, inter species competition and home ranges of rats and mice	The LHI REP has been specifically designed to target both rats and mice considering the smaller home range of mice. Bait will be applied at a density that will allow all rats and mice access to a lethal dose. The second bait drop also acts as a contingency to ensure there are no gaps in the bait coverage and to target individuals that may have been denied access to bait distributed in the first application (by more dominant individuals that will now be dead).
Island size and topography (including cliffs, crevices, caves	The aerial distribution of baits is the only realistic method of baiting a large topographically challenging island such LHI. Aerial application using a specifically designed spreader bucket has been shown to be effective in delivering a toxic dose of bait to every rodent on similar large and rugged islands (i.e. Macquarie and Campbell Islands). GPS technology will be used to ensure total bait coverage through the development of flight lines and ensuring 100% of island is bait treated. The second bait drop also acts as a contingency to ensure there are no gaps in the bait coverage.
Permanent human population	To minimise potential risks to human health, a combination of hand broadcasting and bait stations will be used in the settlement area. This will allow coverage to be maintained including in roofs and under buildings. A clean up of island hard waste successfully removed over 400 tonnes of hard waste that was providing potential rodent habitat.

	Access to individual properties has been agreed with all but one leaseholder and will continue prior to implementation. Contingency options for property access are available as discussed above.
Potential survivors	A comprehensive rodent monitoring programme has been developed for the REP. It includes intensive monitoring particularly in the settlement area immediately after the eradication and then extending to all accessible areas across the island for two years after. This approach facilitates the early detection and removal of localised survivors but will also give a high level of confidence to allow declaration of eradication success which will be declared after two years of monitoring with no rodent activity. The detection network will include a combination of detection tools including detector dogs, chew cards, chew blocks, cameras, trakka tunnels, traps and bait stations. Response to a detection will be guided by a Technical Advisory Group (TAG) who will be on immediate standby to provide consensus advice on how to respond to any specific situation. The TAG will consist of selected experts in eradication techniques, rodent detection and rodent behaviour.

2. Rodents can be killed at a rate exceeding their rate of increase at all densities

The use of aerial baiting is the only method that can be used on an island the size and topography of LHI to ensure that rodents can be killed faster than they can breed. The time between the two bait applications is deliberately shorter than the breeding cycle of rats and mice. The second bait drop also acts as a contingency to target any young recently emerging from nests after the first application.

3. The probability of the pest re-establishing is manageable to near zero

To protect the eradication investment and manage the risk of rodents reinvading and establishing, the LHIB is:

- upgrading the Island's biosecurity system (regardless of whether or not the REP proceeds)
- establishing a rodent detection network.

<u>Biosecurity system upgrade</u>

In 2015 a consultant was engaged to review and update the LHI Biosecurity Strategy. Recommendations from the updated Strategy (AECOM, 2015[13]) include:

- reducing risk at the Port Macquarie wharf
- increasing education and awareness for residents and visitors pre arrival to LHI

[13] AECOM Australia Pty Ltd (2016). Lord Howe Island Biosecurity Strategy 2016. Unpublished Report for the Lord Howe Island Board

- Increasing inspection regimes for all pathways
- pursuing legislative declaration of LHI as a Special Biosecurity Zone under the Biosecurity Act 2015
- increasing residents' awareness of biosecurity risks of plants, animals and diseases both before and after import
- being prepared to react quickly to new incursions through early detection and rapid response
- continuing with on ongoing management and eradication programs
- ensuring biosecurity is adequately resourced with realistic cost and resource estimates

Specifically in relation to rodents the following measures will be applied:

- Employment of dedicated on island biosecurity officer(s) who will have primary responsibility for biosecurity detector dogs.
- Upgrades to the shipping contract to increase emphasis on rodent prevention including requirements to:
    - have in place a Biosecurity Management Plan
    - maintain rodent baiting at the point of mainland departure
    - maintain rodent baiting and De-ratting certificates on the cargo vessel
    - report biosecurity risk cargo and incidents prior to arrival

<u>Rodent Detection Network</u>

A permanent rodent detection and prevention monitoring network will be established on the island to detect any possible reintroductions. The monitoring network developed for the initial follow-up monitoring and declaration of success will be modified to allow targeted monitoring of high risk reinvasion points. It will include:

- A grid network of detection tools at high risk reinvasion points such as the wharf and airport and potential areas for initial recolonisation. This will be checked at a frequency commensurate with arrivals (i.e. daily at the airport and fortnightly at the wharf coinciding with cargo vessel arrivals)
- The permanent rodent detector / biosecurity dogs based on the island will routinely screen all incoming cargo and luggage
- The permanent rodent detector / biosecurity dogs based on the island will sporadically undertake targeted searches of high risk and random areas

This methodology will allow a high level of confidence that any reinvasion would be detected. Genetic testing on LHI rodents has been undertaken. In the event that rodents are detected post REP, the genetic samples will allow determination of whether the eradication failed or the detection was a reinvasion.

Summary of Technical Feasibility

Whilst it is difficult to predict a likelihood of success, the selected eradication techniques, toxin and bait give the LHI REP the best chance of being successful given the constraints on LHI and based on global experience developed over 30 years and more than 380 successful rodent eradications worldwide. The success rate for mouse eradications from 1997-2014 on NZ islands using the same bait and technique is 100% or 11 from 11 attempts (Broome and Fairweather, 2016,) whilst rat eradications on islands over the same period have been 98% successful (37 of 39 attempts) (DIISE 2016).

The LHIB receives technical advice on the project from the New Zealand Island Eradication Advisory Group (IEAG) to ensure best practice and lessons learnt from other eradications are

considered. The IEAG have reviewed several versions of the operational plan as the project has progressed to provide advice to the Project steering committee and LHIB as part of the final decision to proceed. The IEAG advice to the LHIB is presented below and in full in Attachment 2.

"The eradication of rodents is in our view, the only viable option for long-term ecological benefit on Lord Howe Island. It remains technically feasible assuming the operational plan can be delivered to a high standard and the basic principles of eradication success are adhered to; i.e.,

- *all individual target animals are exposed to the methods;*
- *they are killed at a rate higher than their ability to reproduce at all densities; and*
- *the risk of reinvasion is managed.*

The likelihood of success will largely depend on the ability of the team to implement the plan to the required standard of excellence. Continued attention to detail in the planning and preparation, including building a strong and motivated project team and strong support from the LHIB and community will be critical to success. There is much still to be done before next winter but the fundamental design and the preparation to implement that design we have seen so far gives every indication that eradication is achievable. A more thorough evaluation closer to the time of fieldwork beginning is advisable."

In addition the IEAG will review a final operational plan after the decision to proceed is made and an IEAG member will undertake a final operational readiness check prior to on the ground implementation in May of 2018.

7. Steering Committee Recommendation

The Steering Committee for the LHI Rodent Eradication Project was established to:

a) Support the Board in achieving the Project Objective of eradicating all ship rats and house mice from LHI.
b) Advise on the best use of the funding to that end.
c) Provide direction, guidance and support to the Project team in implementing the Project to achieve the Project Objective
d) Provide support and advice to the Board at key milestone points where decisions have to made about the direction of the project

Current membership is:

- Federal funding partner – National Landcare Program. Joanne Nathan (Director, Natural Heritage, Department of the Environment and Energy
- State funding partner – NSW Environmental Trust. Peter Dixon (Director Grants, OEH)
- LHIB. Penny Holloway (Chief Executive Officer, LHIB)
- LHIB. Barney Nichols (locally elected member LHIB)
- Rodent Eradication Expert. Keith Broome (Chair, Island Eradication Advisory Group, NZ Department of Conservation)

The Steering Committee has met quarterly since 2012 and is very familiar with the Project, its development over time and current status. The Steering Committee recommendation to the LHIB is presented below.

“The Steering Committee is of the opinion that the project team has now satisfied all criteria that were established in May of 2015 to allow the decision to proceed to Stage 3 implementation to be made; namely:

1. *Key approvals required have been received with conditions that are achievable and do not impact implementation of the project. This includes:*
    - *Approval (EPBC 2016/7703) from the Department of Environment and Energy under the Environment Protection and Biodiversity Conservation Act considering Matters of National Environmental Significance This includes consideration of impacts to Commonwealth listed threatened and migratory species and species endemic to Lord Howe Island as part of assessment of impact to the World Heritage values*
    - *License to Harm Threatened Species (C0002763) issued under the NSW Threatened Species Conservation Act which considers impacts to NSW listed threatened species.*
    - *A Minor Use permit from the Australian Pesticides and Veterinary Medicines Authority allowing use the bait*
    - *A permit from NSW Fisheries and Marine Parks*
2. *Risks to human health have been extensively considered and are mitigated to the point where risks are considered to be very low. The Steering Committee endorse the outcomes of the Human Health Risk Assessment process overseen by the Office of the Chief Scientist and Engineer and support the recommendations made.*
3. *Community support now appears to be sufficient to allow the project to proceed*
4. *There is committed funding, sufficient budget remaining to implement the project and a contingency funding strategy in place if required.*
5. *The Project is considered to be technically feasible by eradication experts*

On the basis of the above the Steering Committee unanimously recommends to the Board that the decision to proceed to Stage 3 implementation be made with implementation in winter 2018”

8. Summary

A summary of essential criteria for the decision to proceed is shown below

Criteria	Additional Information	Result
Is the REP safe for residents and visitors	Three separate human health risk assessments of the project have shown it be safe for resident and visitors.	Yes
Is the REP safe for the environment	Receipt of the various Commonwealth and State environmental approvals required for the project is evidence that the REP is considered safe for the environment. Environmental benefits of proceeding significantly outweigh any potential impacts. Comprehensive mitigation is in place to manage the two species considered at risk.	Yes
Have all of the key approvals been received	All key approvals required have been received	Yes
Is the REP socially acceptable	The project is now well understood and accepted by the majority of the community. Property access is available for the majority of the Island	Yes
Are there sufficient funds to implement to REP	The REP currently has sufficient funds for successful implementation. Variance is currently within standard acceptable limits with some line items still to be confirmed. A plan can be enacted to seek additional funds if required.	Yes
Is the REP technically feasible	Eradication on LHI is technically feasible and achievable.	Yes
Are all risks mitigated or reduced to an acceptable level	Risks of proceeding have been identified, mitigated or reduced to an acceptable level. Several very high risks are associated not with proceeding. A more detailed risk assessment is included as Attachment 3.	Yes
Is the REP endorsed by rodent eradication experts	The eradication is endorsed by the Island Eradication Advisory Group	Yes
Is proceeding with the REP endorsed by the project Steering Committee	The steering Committee recommends proceeding to Stage Three implementation	Yes

RECOMMENDATION

That the Board make the decision to proceed to Stage Three of the LHI Rodent Eradication Program (REP) with implementation in winter of 2018.

Prepared: Andrew Walsh, Rodent Eradication Project Manager

Endorsed: Penny Holloway, Chief Executive Officer

Attachments:
Attachment A: Report on Human Health Risk Assessment
Attachment B: IEAG Recommendation
Attachment C: Risk Assessment

NSW GOVERNMENT | Chief Scientist & Engineer

Report on the Human Health Risk Assessment for the Lord Howe Island's proposed Rodent Eradication Program

NSW Chief Scientist & Engineer

July 2017

www.chiefscientist.nsw.gov.au/reports/independent-review-of-the-lord-howe-island-rodent-eradication-project

NSW GOVERNMENT | Chief Scientist & Engineer

The Hon. Gabrielle Upton MP
Minister for the Environment
Minister for Local Government
Minister for Heritage
52 Martin Place
SYDNEY NSW 2000

Dear Minister,

Report – Independent Human Health Risk Assessment for the Lord Howe Island's proposed Rodent Eradication Program

In June 2016, your predecessor wrote requesting that I assist the Lord Howe Island Board in undertaking an independent Human Health Risk Assessment for the Lord Howe Island's proposed Rodent Eradication Program in line with the Terms of Reference (see Appendix 1). As planned, an Expert Panel was convened and a suitable firm procured (Ramboll Environ Pty. Ltd.) to undertake the Human Health Risk Assessment, with input and review of the Expert Panel.

The purpose of this report is to provide you with an overview of the process, the finding of the Human Health Risk Assessment and some observations and recommendations. The report of Ramboll's is included as Appendix 2 of this report.

I understand that the Human Health Risk Assessment is important for the Lord Howe Island community. During discussion between the Lord Howe Island Board (the Board) and my office, the Board has expressed an interest in representatives from the Expert Panel and the Office of the Chief Scientist & Engineer attending the island to participate in a community engagement event, discussing the outcomes of the Human health Risk Assessment. I would support this suggestion and my office would be willing to assist should this occur.

I would like to acknowledge the Expert Panel members, Dr Chris Armstrong, Professor Brian Priestly and Emeritus Professor Stephen Leeder, and thank the Lord Howe Island community for their assistance and input into this project.

Yours sincerely,

Mary O'Kane
Chief Scientist & Engineer
19 July 2017

EXECUTIVE SUMMARY

At the request of the Minister for the Environment, the NSW Chief Scientist & Engineer commissioned an independent Human Health Risk Assessment for the Lord Howe Island's proposed Rodent Eradication Program. The Rodent Eradication Program proposes to use the rodenticide brodifacoum, across the island to eradicate both rats and mice. The rodenticide, in the form of Pestoff 20R, would be distributed by aerial baiting, hand distributed, and in bait stations and trays.

Ramboll Environ Pty. Ltd. was engaged to undertake the Human Health Risk Assessment. An Expert Panel was convened to oversee its development and to review the Human Health Risk Assessment.

The Human Health Risk Assessment looked at a number of potential exposure pathways of the rodenticide to humans, including exposure through soil, air (dust), sediment, surface water, tank water as well as 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.

A quantitative risk assessment of these exposure pathways and population groups concluded that exposure to brodifacoum from all potential sources are below those likely to result in adverse health effects.

The Human Health Risk Assessment also assessed potential exposure due to ingestion of pellets and found that ingestion of one or a few pellets by a child is unlikely to result in observable anticoagulant effects.

While exposure to the rodenticide via the Rodent Eradication Program was not likely to result in adverse health effects, the pathways contributing most to projected exposure included:

- ingestion of soil
- ingestion of tank water
- dermal contact with soil
- inhalation of airborne dust during aerial operations.

The Human Health Risk Assessment report (the Report) was reviewed by the Expert Panel. The Expert Panel supported the conclusions of the Report noting that while adverse health effects are not expected, identification of the major pathways can allow those concerned with exposure to implementation mitigation strategies.

The Expert Panel noted that community concerns are greater than the scope of the Human Health Risk Assessment. These concerns include issues around health and wellbeing (e.g. anxiety and stress) and the implementation of the Rodent Eradication Program, such as the likelihood of success and possible need to undertake further eradications at a later date. It is clear that the Rodent Eradication Program is a divisive issue for the island, which has potential to affect social cohesion. Enhancement of community consultation and engagement may assist with alleviating some of these concerns, although expert advice or assistance from professionals should be considered to assist with health and wellbeing related concerns.

Planning for the case of the rats re-emerging will be considered through the Lord Howe Island Board's rodent detection monitoring program. In such a case, measurement and monitoring should enable early intervention, and consideration of other possible approaches. Further, resistance to brodifacoum has been considered and if necessary additional strategies will be implemented to address this issue. Finally, should the Rodent Eradication Program need to be repeated at a later date, new technologies that are currently being

researched (including reproductive technologies) may be considered noting that further research and commercialisation is required before being available commercially.

It is understood that other relevant approvals processes will look at environmental outcomes (effect of brodifacoum on non-rodent species), likelihood of success of the eradication, and approval of helicopter operations during the Rodent Eradication Program (Civil Aviation Safety Authority). The results of these approvals and the recommendations of this report will be considered by the Lord Howe Island Board.

1 RECOMMENDATIONS

Recommendation 1
That the Lord Howe Island Board note the Human Health Risk Assessment report and its advice that the proposed Rodent Eradication Program is not expected to result in adverse health effects for any individual due to exposure to brodifacoum.

Recommendation 2
Noting the considerable remaining community concern on Lord Howe Island, that the Minister request the Lord Howe Island Board to deliver:

1. a communication strategy for the period before and during the Rodent Eradication Program that clearly articulates the following:
   - the reason for the eradication and approach chosen
   - guidance to residents and visitors on actions that they should and could take during the Rodent Eradication Program to minimise exposure to brodifacoum
   - plans for follow-up measures that will be taken after the eradication program
2. a monitoring strategy to measure the outcomes and impacts of the Rodent Eradication Program, including for re-emergence of rodents, as well as triggers that would lead to further action
3. reports to the Minister following the Rodent Eradication Program on community and environmental outcomes, at designated timeframes, such as one month after the second bait distribution, one month after re-introduction of birds and cattle, and two years post the Rodent Eradication Program.

Department of Conservation
Te Papa Atawhai

General Manager
Lord Howe Island Board
PO Box 5
Lord Howe Island 2898
NSW

15th August 2017 Our ref: DOC-3141548

Dear Penny,

You have asked the Island Eradication Advisory Group to comment on the technical feasibility of eradicating rodents from Lord Howe Island. The group has supported the project with peer review of the operational planning for several years and members are familiar with the current state of the planning through discussions with Project Manager Andrew Walsh and my involvement on the project steering committee. Below is our current assessment of the feasibility from what we know today. Technical feasibility is assessed dispassionately with a focus on what needs to be done to give the best chance of success.

The eradication of rodents is in our view, the only viable option for long-term ecological benefit on Lord Howe Island. It remains technically feasible assuming the operational plan can be delivered to a high standard and the basic principles of eradication success are adhered to; i.e.,

- all individual target animals are exposed to the methods;
- they are killed at a rate higher than their ability to reproduce at all densities; and
- the risk of reinvasion is managed.

The likelihood of success will largely depend on the ability of the team to implement the plan to the required standard of excellence. Continued attention to detail in the planning and preparation, including building a strong and motivated project team and strong support from the LHIB and community will be critical to success. There is much still to be done before next winter but the fundamental design and the preparation to implement that design we have seen so far gives every indication that eradication is achievable. A more thorough evaluation closer to the time of fieldwork beginning is advisable.

Yours Sincerely

Keith Broome
Chair,
Island Eradication Advisory Group

Hamilton Office
Private Bag 3072, Hamilton 3240, New Zealand

Ref	Activity / Potential Impact	Impact Description	Category	Unmitigated Case						Mitigated Case			
				Consequence	Consequence Rating	Likelihood	Likelihood Rating	Unmitigated Risk Rating	Unmitigated Risk Level	Mitigation	Mitigated Likelihood	Mitigated Likelihood Rating	Residual Risk Level
1	**Not proceeding with the eradication**												
1.01	Ongoing rodent predation to threatened species	Continued impacts to threatened species including species extinctions	Environment	Severe	21	Likely	7	28	Very High	Ongoing control even at increased densities will not mitagte the risk sufficiently	Likely	7	Very High
1.02	Ongoing rodent predation to threatened species	Impact to World Heritage values	Reputation	Major	16	Possible	5	21	High	Ongoing control even at increased densities will not mitagte the risk sufficiently	Likely	7	High
1.03	Risk of rodents developing resistance to currently available poisons	Increased impacts to threatened species including species extinctions	Environment	Severe	21	Likely	7	28	Very High	No alternate tecnhologies currently avialable	Likely	7	Very High
1.04	Ongoing accidental poisoning of non target threatened species	Continued deaths to species such as the woodhen	Environment	Moderate	11	Almost certain	9	20	High	Mitigation as per current. Doses of vitamin K if possible	Possible	5	Medium
1.05	Ongoing use of Poison	Economic costs of rodent control in perputity	Financial	Minor	6	Almost certain	9	15	Medium	Cost likely to increas not decrease	Almost certain	9	Medium
1.06	Accidental exposure to significant amount of poison	Potential risks to human health	Human Health / pets	Moderate	11	Unlikely	3	14	Medium	Mitigation as per current parental vigilance and treatment	Rare	1	Low
1.07	Accidental exposure to significant amount of poison	Domestic Animals	Human Health / pets	Minor	6	Possible	5	11	Medium	Mitigation as per current owner vigilance and treatment	Unlikely	3	Low
1.08	Non compliance with legal obligations	Monetary or reputational damage to the LHIB	Legal	Moderate	11	Possible	5	16	Medium	No mitigation	Possible	5	Medium
1.09	Visitor experience	interaction with rodents spolis visitor experience and incurs reputational damage to the island	Reputation	Minor	6	Likely	7	13	Medium	No mitigation	Likely	7	Medium
2	**Proceeding with the eradication**												
2.01	Accidental poisoning of non target threatened species	Potential risks to threatened species including woodhen and currawong	Environment	Major	16	Likely	7	23	High	Mitigation in place including captive management and monitoring	Rare	1	Medium
2.02	Accidental poisoning of other non target species	Potential risks to other non-target species	Environment	Minor	6	Possible	5	11	Medium	Mitigation in place including captive management and monitoring	Unlikely	3	Low
2.03	Accidental posioning of the environment	Pollution of soil or water	Environment	Minor	6	Unlikely	5	11	Medium	Extensive mitigation and monitoring in place	Rare	1	Low
2.04	Accidental exposure to significant amount of Brodifacoum	Potential risks to human health	Human Health / Pets	Moderate	11	Possible	5	16	Medium	Extensive mitigation and monitoring in place	Rare	1	Low
2.05	Accidental exposure to significant amount of poison	Domestic Animals	Human Health / Pets	Minor	6	Likely	5	11	Medium	Extensive mitigation and monitoring in place	Rare	1	Low
2.06	Captive Management	Harm to species in captivity	Environment	Minor	6	Possible	5	11	Medium	Expert care in place	Rare	1	Low
2.07	Project failure -rats	Project fails for various reasons	Operational	Major	16	Rare	1	17	Medium	technical advice and operation review by eradication experts	Rare	1	Medium
2.08	Project failure - mice	Project fails for various reasons	Operational	Moderate	11	Possible	5	16	Medium	technical advice and operation review by eradication experts	Rare	1	Low
2.09	Reinvasion	Rodents reinvade the island	Operational	Moderate	11	Unlikely	3	14	Medium	Upgraded biosecuirty and detection network	Rare	1	Low
2.1	Legal Challenge	Delays or upholds the project	Financial	Minor	6	Possible	5	11	Medium	legal advice that if challenge was overturned, costs could be re	Unlikely	3	Low
2.11	Rodent predation to threatened species	Impacts from rodents to threatened species removed	Environment					0		Positive impact			
2.12	Visitor experience	Visitor experience enhanced by improved world Heritage values	Reputation					0		Positive impact			
2.13	Compliance with legal obligations	No non compliance and enhanced reputation of the LHIB	Legal					0		Positive impact			
2.14	Economic impacts	17:1 Benefit to Cost ratio. Delivers wide economic benefits	Reputation					0		Positive impact			