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NB: Since this was prepared in April 2003, new information suggests that some of the stygofauna may not be endemic to the island. Also, recent research has shown that the *Pseudantechinus* on Barrow Island is genetically different from *Pseudantechinus roryi* and other *Pseudantechinus* spp. from the Pilbara mainland. Its taxonomy is yet to be resolved. 23/01/04

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

POSITION PAPER

TRANSLOCATIONS OF BARROW ISLAND FAUNA

The translocation of Barrow Island endemic fauna to other islands has been suggested as a management strategy in order to minimise potential impacts of the proposed Gorgon gas development on one of the major biodiversity values of the island. A summary of the distribution, taxonomy and translocation potential for some of the endemic taxa and 'evolutionary significant units' (ESU) on Barrow Island is shown in Table 1. While this strategy may appear attractive, it is unlikely that many of the endemics could, or should be translocated. Reasons for this are shown below:

- Availability of suitable island sites: The fauna of Barrow Island is related to North West Cape peninsula, the Pilbara and desert regions, so translocation sites would need to be along the Pilbara coast. Islands large enough and potentially suitable for vertebrate translocations in this area include the Montebellos and Dampier Archipelago. While the Montebellos have a similar geology to Barrow Island and the larger islands (Hermite, Trimouille, Alpha etc) may appear suitable for translocations, two threatened mammals species have already been introduced to two of the islands (Trimouille and North West) and reintroductions of Spectacled Hare-wallaby and Golden Bandicoot are proposed for Hermite Island. Any further translocations would be introductions (see below). Most of the islands in the Dampier Archipelago are a different geology and vegetation from Barrow Island and any translocations would be introductions. The largest limestone island in this group, Legendre Island, is a temporary Ministerial Reserve for industrial purposes and long-term conservation security would need to be guaranteed before any translocations were contemplated. Dirk Hartog Island has been suggested as a potential translocation site, however its fauna is related to the south-west region and there are plans to reintroduce other fauna once the island is part of the conservation estate, and feral cats and goats have been eradicated.
- As most taxa being considered are endemic, they are not known from other islands and so most translocations would be introductions. Most islands off the Pilbara coast are nature reserves and approval would not normally be given for introductions (as opposed to reintroductions) to island nature reserves, unless there were exceptional conservation benefits. Introductions can lead to local environmental change and local extinctions of naturally occurring biota. An exception is the Montebellos, where the past and existing environmental degradation make them more appropriate for introductions of highly threatened animals, a procedure sometime referred to as 'marooning'. However, apart from Hermite, where restoration of the original fauna is proposed, other islands in this group are small and do not have similar vegetation to Barrow Island.

- Technically it may not be possible to successfully translocate many of the endemic taxa. Few, if any invertebrates and subterranean fauna have been translocated successfully in Australia. Similarly, there have only been a few successful reptile translocations. Even for mammals, where there is now considerable knowledge about translocation and monitoring techniques, it is possible that the proposed reintroductions of Golden Bandicoots and Spectacled Hare-wallabies to Hermite Island may not be successful in the long term as the vegetation has changed considerably over the last 100 years because of weed invasion. It is possible that substantial funding for ecosystem reconstruction would be needed to improve the chance of success.

If translocations were to proceed, capture, release and short-term (6-8 days) monitoring costs per mammal species range from $ 160 000 (Barrow to Montebellos) to $ 180 000 (Barrow to Dampier Archipelago). These include salary, allowances and overheads, travel, and operational costs (helicopter etc). Longer term monitoring (up to 5 –7 years) is required to determine translocation success and this would require additional funding.

Barrow Island is a unique ecosystem, a remnant of what the mainland was once like. Translocations of a small proportion of the taxa that comprise that ecosystem will not downgrade the value of the island to biodiversity conservation. Translocations of fauna from Barrow Island may be possible subject to the constraints above, however these will potentially only improve the conservation status of a few taxa and/or ESU. They should not be regarded as a mechanism for allowing additional industrial development, with its inherent threats to biodiversity, to occur on Barrow Island.

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TABLE 1. Summary of information on distribution, taxonomy and translocation potential for some of the endemic taxa or taxa of evolutionary significance on Barrow Island

Taxon/Evolutionary Significant Unit	Distribution	Taxonomy and genetics	Translocation Potential
Mammals			
Unnamed planigale, *Planigale* 'species 1'	Occurs on Pilbara mainland, isolated population on Barrow Island, no other island populations.	Limited genetics research, isolated population	Occurs in low numbers on BWI, no obvious island site for translocation.
Tan antechinus, *Pseudantechinus roryi*	Occurs on Pilbara mainland and North West Cape peninsula, isolated population on Barrow Island, no other island populations.	Limited genetics research, isolated population	Occurs in low numbers on BWI, no obvious island site for translocation.
Barrow Island golden bandicoot, *Isoodon auratus barrowensis*	Subspecies endemic to Barrow and Middle Islands (no genetics research comparing two populations)	Genetics research suggests that *Isoodon obesulus* group once widely distributed in southern Australia; Barrow Island animals probably the same taxon as mainland animals (note highly threatened on mainland)	Proposed reintroduction to Hermite Is once rat eradication confirmed (2005).
Northern brushtail possum, *Trichosurus vulpecula arnhemensis*	Subspecies occurs across northern Australia, isolated population on Barrow Island	No subspecies described, no genetics research, isolated population	No obvious island site for translocation.

Taxon/Evolutionary Significant Unit	Distribution	Taxonomy and genetics	Translocation Potential
Barrow Island boodie, *Bettongia lesueur* Barrow Island subspecies	Endemic to Barrow Island, reintroduced to Boodie Island – may be a full species	Unpublished research by Dr Ken Aplin (formerly WA Museum) suggests that this taxon is an undescribed full species. PhD underway to include taxonomic study.	Has been reintroduced to Boodie Is. Legendre Is may be a potential introduction site, but not conservation estate.
Barrow Island spectacled hare-wallaby, *Lagorchestes conspicillatus conspicillatus*	Subspecies endemic to Barrow Island, ? same subspecies extinct on two Montebello Islands	No genetics research	Proposed reintroduction to Hermite Is once rat eradication confirmed (2005).
Black-flanked rock-wallaby, *Petrogale lateralis lateralis*	Scattered, remnant populations on mainland, also on Salisbury Island, extinct on Depuch Island, isolated population on Barrow Island	Barrow Island population highly inbred and genetically unique	Only ca. 150 animals on BWI. Potential for reintroduction to Depuch Is or introduction to Angel/Gidley Islands, but these are different habitats to BWI. Also genetic considerations.
Barrow Island euro, *Macropus robustus isabellinus*	Subspecies endemic to Barrow Island	Limited genetics research—unique Barrow population	No obvious island site for translocation. Any site would need to be sufficiently large with adequate refuge sites.
Barrow Island mouse, *Pseudomys nanus ferculinus*	Subspecies endemic to Barrow Island	No genetics research	Sandy coastal islands may be suitable, *P. n. nanus*? occurs on Sholl and Regnard Islands.

Birds

Barrow Island black-and-white fairy-wren, *Malurus leucopterus leucopterus*	Endemic to Barrow Island, possibly occurred in the Montebellos; if it did it is	Detailed genetics research shows 0.60% difference in mtDNA between Barrow Island	Proposed reintroduction to Hermite Is once rat eradication confirmed (2005).

Taxon/Evolutionary Significant Unit	Distribution	Taxonomy and genetics	Translocation Potential
	extinct there	and mainland WA populations.	
Spinifexbird, *Eremiornis carteri*	Common on Barrow Island, widespread in arid, northern mainland Australia	No genetics research, isolated population. Also occurs on Thevenard Island.	Translocations not considered.

Reptiles

Ctenotus pantherinus acripes	Endemic to Barrow Island	No genetics research, but tissue with WAM.	Translocations not considered.
Ramphotyphlops longissimus	Endemic to Barrow Island, only known from a single specimen.	No genetics research	Translocations not considered possible.

Fish

Blind gudgeon, *Milyeringa veritas*	Barrow Island and North West Cape peninsula	No genetics research, isolated population	Translocations not considered possible.

Invertebrates

Barrow Island millipede, *Speleostrophus nesiotes*	Endemic to Barrow Island	No genetics research, species very distinct	Translocations not considered possible.
Scorpion: new genus: family placing uncertain	Endemic to Barrow Island	No genetics research, distinct at genus level, possibly at family level	Translocations not considered possible.
Barrow Island draculoides, *Draculoides bramstokeri*	Barrow Island and North West Cape peninsula	No genetics research, isolated population	Translocations not considered possible.
Nocticola sp.	Endemic to Barrow Island		Translocations not considered possible.
Barrow Island bogidomma amphipod, *Bogidomma australis*	Endemic to Barrow Island		Translocations not considered possible.

Taxon/Evolutionary Significant Unit	Distribution	Taxonomy and genetics	Translocation Potential
Barrow Island liagoceradocus amphipod, *Liagoceradocus subthalassicus*	Endemic to Barrow Island	Genetics research of amphipods underway (ESE Technical Appendix I)	Translocations not considered possible.
Nedsia fragilis	Endemic to Barrow Island	Genetics research of amphipods underway (ESE Technical Appendix I)	Translocations not considered possible.
Nedsia humphreysi	Endemic to Barrow Island	Genetics research of amphipods underway (ESE Technical Appendix I)	Translocations not considered possible.
Nedsia hurlberti	Endemic to Barrow Island	Genetics research of amphipods underway (ESE Technical Appendix I)	Translocations not considered possible.
Nedsia macrosculptilis	Endemic to Barrow Island	Genetics research of amphipods underway (ESE Technical Appendix I)	Translocations not considered possible.
Nedsia sculptilis	Endemic to Barrow Island	Genetics research of amphipods underway (ESE Technical Appendix I)	Translocations not considered possible.
Nedsia straskraba	Endemic to Barrow Island	Genetics research of amphipods underway (ESE Technical Appendix I)	Translocations not considered possible.
Nedsia urifimbriata	Endemic to Barrow Island	Genetics research of amphipods underway (ESE Technical Appendix I)	Translocations not considered possible.
Nedsia chevronia	Endemic to Barrow Island	Genetics research of amphipods underway (ESE Technical Appendix I)	Translocations not considered possible.
Oniscidea (Isopoda) sp. nov.	Endemic to Barrow Island	No genetics research	Translocations not considered possible.

Taxon/Evolutionary Significant Unit	Distribution	Taxonomy and genetics	Translocation Potential
Oniscidea (Isopoda) sp. indet.	Endemic to Barrow Island	No genetics research	Translocations not considered possible.
Haptolana pholeta	Endemic to Barrow Island	No genetics research	Translocations not considered possible.
Stygiocaris stylifera	Barrow Island and North West Cape peninsula	No genetics research, isolated population	Translocations not considered possible.
Qistrachia barrowensis	Also on nearby islands	No genetics research	Translocations not considered possible.

Notes:

1. ESE Technical Appendix I reports that additional endemic stygofauna, including oligochaetes, ostracods and copepods, exist on Barrow Island.
2. Recent preliminary DCLM data suggests some of the stygofaunal taxa may occur on the mainland.