



NATIONAL PARKS AND NATURE CONSERVATION · AUTHORITY

Report on visit to Barrow and Thevenard Islands

23 October - 27 October 1995

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Report on NPNCA visit to Barrow Island 1993 (update)

REFERENCES

1. GENERAL

1.1 Introduction and acknowledgments

Barrow Island is an "A" Class Reserve vested in the National Parks and Nature Conservation Authority (NPNCA) for the purpose of the conservation of flora and fauna. Because of its responsibility to the public for the land vested in it, the NPNCA is obliged to take a concerned interest in all happenings which may affect its functions and duties as defined in the CALM Act. This report summarises the results of the visit to Barrow and Thevenard Islands by four members of the NPNCA, Mr Tom Day (Chairman), Mrs Marion Blackwell (Deputy Chair), member Mrs Pat Barblett and deputy *ex-officio* member Mr Frank Batini. WAPET have held a lease over Barrow Island for the production of oil since 1967 and Thevenard Island since 1988

The NPNCA visits Barrow Island biennially to review the conservation estate. The visit took place from the 23rd to 27th of October 1995. The NPNCA considers that these visits are of great importance in order to carry out its mandate because they provide the opportunity for direct contact between the Authority and the staff of West Australian Petroleum Pty Ltd (WAPET), in order to discuss issues and carry out on site visits.

The NPNCA wish to thank WAPET staff for their wonderful hospitality and the interest and support of our presence on the island shown by all personnel. In particular we would like to thank Russell Lagdon, Stefan Fritz, Peter Ford, Peter Doig and Gordon Innes, who organised our visit. They gave the NPNCA members the opportunity to discuss issues openly and frankly, and provided the means for site visits. We would like to thank Russell and Stefan for organising the spotlight survey of animal numbers. This has become a traditional feature of NPNCA biennial visits.

The thorough induction process given to new staff and visitors to the Island is commended by members. We were very aware of the general staff concern for the environment, and we were impressed by the new Harry Butler Museum and associated facilities for the use of staff and visitor education on environmental issues.

1.2 Gorgon proposal

In addition to viewing operations of the existing oil bases, we were briefed on the Gorgon development which is proposed, and on the alternative sites being considered (Exmouth, Barrow Island and Karratha). Authority members inspected the two sites where a plant may be built on the island - at Surf Point or in the general area of the tank farm.

2. MANAGEMENT ISSUES

2.1 Data

Members appreciated access to a number of environmental, technical, and management reports which were readily made available, for use during our visit.

2.2 Rehabilitation

It is pleasing to note visual evidence of the rehabilitation of previously disturbed sites, and the returning of them close to their original landform. WAPET have commissioned an experienced bulldozer operator to identify and rehabilitate areas of ground disturbance, some of which had not been properly carried out in earlier days.

The strategies used for seismic line rehabilitation have obviously worked. Members were shown the comparisons between more recent examples, and those which had revegetated over a number of years. Although the areas have stabilised, they exhibit differences in vegetational composition from that of the surrounding communities.

2.3 Construction of New Leases

Considerable progress has been made by the company regarding the construction of new leases. It is to be commended that the area required has been reduced and that a mud pit is now incorporated within the pad area, rather than being situated outside the "lease". It is felt, never-the-less, that greater attention to siting, namely positioning of the pad within the landscape eg. not right on the crest, (or right in a valley), could help to visually integrate the intrusion into the topography, as well as facilitating rehabilitation. It could also reduce the cost of both processes. In addition, it should be noted that at the cessation of usage, the reconstitution of this landform does not necessarily require the covering of the whole cut face, merely the creation of a final land form which fits comfortably into its surrounds. In this context it is recognised that there are limits to the positioning of the lease imposed by the need for vertical drilling by the operation of the Lufkin pump.

2.4 Waste Management

Authority members were impressed with the excellent management of waste products. The incineration of wet refuse and waste paper, and the burning of dry rubbish has eliminated bird and animal scavenging from the main tip. Aluminium cans and polystyrene cups are being buried at the tip. It is suggested they be separated and that the aluminium become part of scrap removal.

The scrap collection has now been concentrated on the old air strip. Previously there had been no centralised collection of scrap. We commend WAPET for their initiative in contracting the Talarji Group of Aboriginal people from Onslow to remove scrap metal and used piping from the Island. It is encouraging to see Aboriginal people involved in the oil industry. Very good rehabilitation of the old scrap pipe dump has been achieved.

The creation of a separate disposal stock pile for used, low radio-active, 'frac' sand is commended; rather than its incorporation in the general waste disposal area. This will facilitate easy recovery at a future date, should this become necessary.

In discussions with WAPET staff we note that the area of the old air strip cannot be reduced as the whole area is required for current uses and for its potential use as an emergency air strip.

2.5 Re-use of Gravel

The company has adopted a gravel re-use programme throughout the island, in particular gravel previously used on the construction of earlier lease sites. Also the re-use of gravel material from unsuccessful water harvesting trials and road re-alignments where possible is commended.

We also note the building of 20 new lease sites in the current drilling programme without the need to commission any new gravel extraction pits. Rehabilitation is being carried out on these areas as gravel is removed. It is recognised gravel is a very scarce and valuable resource and is probably the greatest source of soil disturbance on the island.

Never-the-less the gravel inventory as requested in 1993 is still an outstanding item, and gravel is still being used from a number of sites including the large gravel pit near Biggada Creek.

2.6 Quarantine

Members were shown quarantine procedures, and it is evident from the vermin free island that these are working. This is an area where vigilance of all staff at all times is needed. Even so there are instances when circumstances beyond the company's control can arise eg. a rat infested boat being blown ashore during a cyclone. We were very impressed with the high priority by which staff regarded this issue. Strict quarantine procedures must be required for all research and CALM staff.

2.7 Mice and Rat Eradication

Good examples of collaborative work between WAPET and CALM were the prompt actions to control and then eradicate rats from the southern end of Barrow Island and Boodie Island and mice from a drill site on Barrow Island. Apparently the two mice caught were introduced from Thevenard Island on a drilling rig. Prompt action resulted in their eradication from the area which was fenced off and then thoroughly baited and trapped. The rats had been present on Boodie Island for some years and may have swum over to Barrow. It appears that rats have now been eradicated from both areas. An Action Plan has been prepared based on these experiences which will be very useful if further introductions occur.

2.8 Terminal Tank Farm

The tank farm was established many years ago. The bund is unlined as are the sludge pits and tanker ballast pits. Improvements have occurred over the years (eg. the bund

integrity was improved, ballast water is no longer accepted) and are continuing (eg the sludge pits will be replaced by a concrete sump, bioremediation will be trialed).

Continued effort in this area is to be encouraged as the sludge is highly visible and the area is also close to the sea. Control systems have been reviewed and improved subsequent to a recent oil spill. The proposed clean up, the concreted sump and work on bioremediation (both in situ and in a sump) are to be encouraged.

2.9 Ballast Water

Concern was raised by members as to the procedure for ballast water replacement or removal at the loading terminal. The company pointed out their inability to completely control procedures carried out by shipping lines, because of the lack of an enforceable international regulation governing the disposal of ballast water. However members were impressed by the efforts of the company in achieving approximately 34% of their fleet voluntarily controlling their ballast water. WAPET provides its own pilots and has a policy in the inspection of ships for seaworthiness before allowing them access to their loading points. This action will minimise the risk of a spill or shipping accidents.

2.10 Fuel Tanks

Whilst it is recognised that appropriate technology for installation of petrol storage tanks above ground was very unreliable some years ago, diesel storage tanks can be installed above ground readily. WAPET are now replacing vehicle refuelling installation into above ground equipment. Leaks in underground tanks are common and are not only potentially detrimental to the water table but can prove costly if not detected for some time. We commend the company for their initiative in instigating this procedure.

2.11 GIS and Monitoring

The Authority is pleased to hear progress from the recommendation of a previous visit, regarding the incorporation of environmental data sets onto a Geographic Information System (GIS) compatible with that used by CALM and other government agencies.

Monitoring is carried out extensively throughout the island. It is interesting to note the use of satellite imagery and the use of computer programming to log and monitor the rehabilitation of disused gravel pits, seismic lines and closed roads. Vegetation growth after significant rainfall was clearly evident on satellite photographs. This process is relatively new and is encouraged by members.

2.12 Report of the Marine Parks and Reserves Selection Working Group

Action should be taken co-operatively by NPNCA, CALM and WAPET to achieve resolution of the recommendations made in the Report of the Marine Parks and Reserves Selection Working Group 'A Representative Marine Reserve System for Western Australia' regarding Bandicoot Bay and other proposals relating to the marine environs of Barrow Island.

2.13 Fire Fighting and Post Burn Monitoring

The Authority members recognise that in a fire emergency situation the best decisions will be made by on-site personnel. Also that the priorities must be the protection of life and of assets. However, firefighters have the opportunity for alternate suppression strategies - either direct attack or burning off from predetermined boundaries.

We are pleased to note that, depending upon the location, the degree of threat and the prevailing weather conditions, WAPET fire policy may use either direct attack, or indirect attack by allowing the fire to burn out to a predetermined boundary.

Monitoring of post-pyral succession by CALM could present opportunities to obtain information which would be applicable to the judicious use of fire as a management tool.

2.14 Produced Water Disposal Systems

The 1994 WAPET Environmental Management Review identified this as an area of high importance and high difficulty (Report July 1995 refers). Authority members were briefed on the progress to date and viewed copies of a report by AGC and a summary report by WAPET.

Disposal systems have included unlined pits using surface evaporation and subsurface draining, disposal into limestone caverns, the use of corrugated plate interceptors and hydrocyclones, injection into the Cardabia zone (ca 200m) and the proposed injection into deep strata (ca 1100m). Deep well injection bores were observed on Thevenard Island.

This work has progressed at considerable cost to WAPET, and the progress is acknowledged by Authority members.

Unlined pits have been reduced by half and during 1996 no further hazardous liquids will be sent to unlined pits and the remaining pits will be removed. Investigations are proceeding into the causes and solutions to the occurrence of flowline leaks.

The deep disposal system is planned for installation by the end of 1997 at a cost of several million dollars.

A ground water monitoring programme based on 45 anode wells will continue quarterly for at least 12 months. Some wells showed the presence of oil. The Authority would like to obtain reports and believes that it should be consulted before this monitoring programme is discontinued.

3. OTHER INTERACTIONS (BARROW ISLAND)

3.1 Interim Management Guidelines

The report prepared by Authority members after the 1993 visit referred extensively to this topic and made two recommendations, Numbers 17 and 18, which are repeated below:

No. 17 Interim management guidelines should be developed in collaboration between WAPET and CALM.

No 18 Developments proposed for areas in which there has been relatively little previous impact should be routinely referred to the NPNCA. A document setting out what needs to be referred to CALM and what does not should be studied and if appropriate be formally accepted by the Authority.

There has been little activity by CALM on the collaborative production of these guidelines. A very rough first draft was prepared in June 1995 but this draft needs major revision.

The interim guidelines need to address the NPNCA and CALM needs relating to management of Barrow Island. WAPET's management is already adequately covered by the Company's existing and extensive management systems.

In particular, the guidelines need to address matters such as recreation, tourism, cooperative research, threatening processes (fire, quarantine measures, responses to disease, weed and feral animals) declared flora and fauna and communications between NPNCA, CALM and WAPET.

These guidelines need to be developed jointly by the NPNCA, CALM and WAPET, possibly with a group chaired by the NPNCA. Some urgency is recommended as the guidelines would be a statement of the guiding management principles for CALM for a nature reserve which ranks amongst the most important in Western Australia.

3.2 Protection of Subterranean Fauna

Subterranean fauna may be obligatory inhabitants of underground waters (stygo fauna) and of caves (troglobites). Both are known to occur on Barrow Island. Some elements of these fauna have also been recorded from the Cape Range area, SE Australia, New Zealand, Chile, the West Indies, Columbia, Canary Islands, Cuba, Somalia, Madagascar and Galapagos.

In recognition of the importance of these fauna, WAPET has already changed a number of practices which may have locally threatened some of these populations (see Produced Water Disposal Systems).

The NPNCA considers it desirable that the occurrence and distribution of these fauna be better quantified on a State-wide basis. This would provide a baseline against which

proposals for developments could be assessed. The State has a number of areas of eroded limestone (Karst) such as Nullarbor, Leeuwin Naturaliste, Yanchep, Rottnest, Abrolhos, Cape Range, Barrow Island and Kimberley.

The survey should be broadly based and funded by Government (NPNCA, EPA, CALM, Museum, DRD and DOME) and industry groups.

This survey should be carried out in stages as follows:

- a desk top study of likely geological formations in Western Australia (WA Geological Survey and Museum)
- design and costing of a preliminary broadscale survey
 - sampling of existing wells (eg water wells)
 - sampling of known caves
- analysis of data, report and review
- design and costing of more detailed surveys, as required

4. VISIT TO THEVENARD ISLAND

4.1 General

Authority members visited Thevenard Island on 24 October 1995, which included a visit to the western end of the nature reserve, the WAPET lease and the Crest development.

4.2 Environmental Management Programme

A draft Environmental Management Programme (EMP) prepared by WAPET has been received by CALM from the Department of Environmental Protection, for comment by 13 November 1995. Comment will be provided by CALM and NPNCA.

Authority members noted that:

- Section 8 Item 7 page 3 dealing with activities on the WAPET lease offers an acceptable solution. Only those proposals for activities outside the lease area or for those activities on the lease which may affect the Nature Reserve should be referred to CALM/NPNCA.
- The existing WAPET lease with CALM should be included as an additional Appendix to the EMP.
- The EMP may benefit from a discussion of procedures for Cooperative Research Programmes such as Leggadina Recovery Plan, again as an Appendix.

4.3 Navigation Beacon

The power supply to the Navigation beacon was discussed and inspected. The proposal is acceptable and will be taken to the NPNCA's November meeting for endorsement.

4.4 Crest Wells

The Crest well site and road are to be rehabilitated as the wells were unsuccessful. WAPET is to investigate the soil profile (pH, EC, TSS) and develop a rehabilitation proposal in consultation with CALM. This proposal will be implemented once suitable machinery is on the island. *Acacia coriacea* should be incorporated - either as seedlings or pre-treated seed.

4.5 Ward Reef

The Ward reef well site is rehabilitating slowly but is progressing.

4.6 Spectral Quality of Light Sources

It is pleasing to note that work is proceeding in relation to the spectral qualities of the various sources of light and of their potential effects on turtles. The NPNCA would like to be kept informed of changes to design and work practices that ensue as a result of this work.

4.7 Gas Flaring

It is of concern that a considerable amount of gas is still being flared and that two flares are required by WAPET on the lease area.

4.8 Weed Control

Weed control is proceeding and we were informed of the removal of 30-40 kapok plants in the previous week. However, several sow thistles (*Sonchus oleraceus*) near the office were seen. As this is a focal point for visitors, control is recommended.

4.9 Mus/Leggadina

We were informed that house mice (*Mus musculus*) are again a problem in the camp area. This situation poses an ongoing threat to Barrow Island's quarantine programme. The implementation of the species recovery plan for Leggadina should be continued with renewed emphasis. This plan should address the differing quarantine standards between WAPET and Mackerel Islands, the feasibility of eradication of Mus and the likelihood of their reintroduction. An approach should be made to the Department of Land Administration to review and strengthen the lease conditions for Mackerel Islands if eradication of Mus is likely to be successful. Control of Mus using toxicants within the camp buildings should continue.

4.10 Mackerel Islands Lease Conditions

CALM Regional Office at Karratha should advise the NPNCA if a management plan acceptable to CALM and DOLA has been prepared by the lessee. The plan must address lighting, weed control (eg kapok), quarantine (especially for mice and rats), the keeping of non native animals (cats and dogs) and other matters of importance for nature conservation.

5. RECOMMENDATIONS

This report contains a number of comments relevant to management. There are three main recommendations arising from the report, these being:

Barrow Island:

- (i) The urgent requirement for the writing of Interim Guidelines for Management for Barrow Island. These guidelines need to address matters such as recreation, tourism, co-operative research, threatening processes (fire, quarantine measures, responses to disease, weed and feral animal control), declared flora and fauna and communications between NPNCA, CALM and WAPET. These guidelines need to be developed by CALM in collaboration with WAPET and the NPNCA.
- (ii) The need to assess the presence and location of subterranean fauna on the island and place this into a regional context.

Thevenard Island:

- (iii) The requirement for an acceptable management plan, prepared by the lessee, for the Mackerel Island lease. the plan needs to address lighting, weed control, quarantine, the keeping of non-native animals and other matters of importance for nature conservation. The NPNCA will make enquiries with CALM on the status of such a document.

REPORT ON NPNCA VISIT TO BARROW AND THEVENARD ISLANDS
28 APRIL 1993 TO 3 MAY 1993 - UPDATE

BARROW ISLAND

No.	RECOMMENDATION	RESPONSIBLE AGENCY	WAPET COMMENTS (mostly in letter 20.12.1993)	NPNCA COMMENTS 27.10.1995
1	Production of detailed technical reports re environment issues	WAPET	Reports on environmental matters will continue to be produced (letter 20.12.93).	A number of reports and discussion papers were made available.
2	Botanist to walk all seismic lines	WAPET	Vegetation map prepared and lines are walked (20.12.93).	The vegetation map is available to CALM and NPNCA.
3	GIS for vegetation, plant communities, flora, landform, soil types	WAPET	Information Technology Group has been set up.	NPNCA was advised that the GIS system had commenced but was not yet complete
4	Rehabilitation experiments on new seismic lines	WAPET	This will be incorporated as part of the 3D seismic program.	Some lines were viewed. Quantitative data should be included in Triennial Reports.
5	Early informal referral of exploration proposals to NPNCA	WAPET/CALM	WAPET to make annual presentation to NPNCA and CALM.	NPNCA and CALM attend these and find them useful.
6	Recycle gravel/ survey potential gravel supply areas for rare flora.	WAPET	A gravel resource inventory will be available by 12/94.	NPNCA noted extensive reuse of gravel from roads, leases and bunds. Inventory not done to date.
7	Correct unsuccessful rehabilitation of gravel pits	WAPET	\$200,000 pa budgeted for 1993 and 1994.	NPNCA noted many examples where this work had been completed.
8	Aluminium cans included in scrap removal programme	WAPET	Area with potential, will work on it 1994.	There are still problems with the recycling of aluminium cans.
9	Reduce size of old airport scrap collection area.	WAPET		Whole area appears to be required by WAPET. There is some erosion in the gully, but not serious.

No.	RECOMMENDATION	RESPONSIBLE AGENCY	WAPET COMMENTS	NPNCA COMMENTS
10	Consult NPNCA once appropriate alternative selected for emergency disposal of oil in water to limestone cave.	WAPET		WAPET provided details of produced water disposal and comment is made in the 1995 report.
11	Tests to confirm disease status of sand imported from Jandakot.	WAPET		Dr Hart's report was made available to NPNCA and CALM.
12	Minimise spillage/inappropriate use of imported sand	WAPET		System of transport has been changed.
13	Use past (and future) natural fires to obtain data (with CALM) on use of fire as management tool to protect flora and fauna.	WAPET/CALM		NPNCA notes minimal action by CALM and comments are made in 1995 report.
14	Include data from herbaria in revised flora list/ lodge specimens at State Herbarium.	WAPET		Dr Matiske would be lodging voucher specimens
15	Avoid introduction of animal pathogens - research staff care, no return to island of removed animals.	CALM	WAPET requests visitors to undertake precautions.	CALM to make this a condition for any licence issued.
16	Encourage publication of results of company supported research.	WAPET	Can encourage but cannot enforce.	Noted.
17	Develop interim management guidelines.	WAPET/CALM	Are prepared to develop guidelines. CALM should convene.	NPNCA notes little action by CALM and makes reference in 1995 report to WAPET.
18	Refer proposed developments in relatively undisturbed areas to NPNCA. Document what proposals need to be referred to CALM.	WAPET/CALM	Part of 17 above.	Noted.

THEVENARD ISLAND

No.	RECOMMENDATION	RESPONSIBLE AGENCY	WAPET COMMENTS	NPNCA COMMENTS
19	Adjust timing of use of flare to avoid impact (if any) on turtle hatchlings.	WAPET	Research on effects on hatchlings and on spectral quality was done.	Noted. NPNCA comments on 1995 visit refer.
20	Study germination and establishment of <i>Acacia coriacea</i> .	WAPET	Latter trials were more successful.	Some plantings of <i>Acacia coriacea</i> were seen by NPNCA.
21	Continue to liaise with CALM re removal of mice.	WAPET	Ongoing	Mice are an ongoing problem and comment is made in the 1995 report.

REFERENCES

Marine Parks and Reserves Selection Working Group "A Representative Marine Reserve System for western Australia" CALM June 1994.

National Parks and Nature Conservation Authority "Report on visit to Barrow and Thevenard Islands, 28 April 1993 to 3 May 1993".