

I would like to begin by acknowledging the Traditional Owners of the land we meet on today, the Larrakia, I pay my respects to the their elders past, present and emerging. I also acknowledge other Aboriginal and Torres Straight Islanders who are present or listening to this presentation.

Good afternoon Justice Pepper, all the panel and everyone here and listening online.

I thank you all for the work you have done on the Draft final report under tight timeframes and public scrutiny. I have managed to read through most of it and appreciate the opportunity to make comment on it.

I would like to begin by adding further words of wisdom from Rachel Carson in setting the tone of this presentation.

“We stand now where two roads diverge. But unlike the roads in Robert Frost’s familiar poem, they are not equally fair. The road we have long been travelling is deceptively easy, a smooth superhighway on which we progress with great speed, but at the end lies disaster.

The other fork of the road – the one less travelled by – offers our last, our only chance to reach a destination that assures the preservation of the earth¹.”

As I comment on the this draft final report, I stand on the path less travelled, that is urging assurance of the preservation of the NT’s rich biodiversity, unique and beautiful landscape, clean water and flowing waters and strong culture.

Again, as for the interim report, I am torn between responding to specific issues that need to be addressed if this industry goes ahead versus simply making the case for why it needs to be banned. We clearly stand with many others you have heard over these last two days that are calling for a ban on fracking. We simply do not support the creation of a new fossil fuel industry at a time when all carbon pollution needs to be reduced. We frame this also in the context of the NT not having a climate policy (although we are told it is on its way). From all accounts, the NT Government are not intending to include a GHG reduction target, because they intend for GHG emissions to increase in the NT. Others have addressed the issue of GHG and I am grateful for them making an effort to get their head around the numbers.

¹ Silent Spring, Carson 1962 p.277

We are choosing to respond to your request for feedback on the Draft final report. We will mostly address the chapter on regulatory reform, plus some further issues at the end.

We assert that if all the recommendations made in this draft Report are adopted and implemented in full, as they are currently written, the risks relating to water, land, air and public health, will not be mitigated or reduced to acceptable levels. (I acknowledge my acceptable levels are probably different from yours, but I won't go there).

I firstly want to remind us all that we have current situation in the NT where we have exploration permits already approved – they have been approved without any public EIA process, without any of these recommendations you are suggesting here to minimise the risks. We also have a significant amount of explorations permits under application, which if the moratorium is lifted, could be subject to recommendations in this draft final report.

So our biggest concern with the Draft Final Report (DFR) is the timing of key recommendations being 'before any production licence is granted'. We believe all the recommendations that refer to the term 'before any production licence is granted' should be replaced with 'before an exploration permit is granted or perhaps clearer, before any ground disturbing activity'. In the case of where previous exploration permits have been granted, the recommendations should stipulate before 'any further regulated activities, including hydraulic fracturing operations, land clearing, road building, earthworks etc. can occur', after considering new information.

There are five reasons for this recommendation:

1. It is imperative that baseline studies occur before any further activity so that if there is any future impacts to the 'environment', it is clear if the impact has been from hydraulic fracturing or associated operational activities. There can be no comeback from the gas companies to say the impact wasn't from their activities if the baseline studies are undertaken before any further activities. (Ignoring any damage already done at this point). Baseline studies may previously have been a condition on past exploration permit approvals, although these studies often don't make it into the public domain.
2. The activities related to exploratory activities are not dissimilar ones undertaken during production (albeit at a different scale) – wells are drilled and fracked through aquifers, water is extracted and needs to be managed, weeds are spread, native vegetation is felled.

3. Estimations of the amount of wells that can be drilled and fracked whilst under an exploration permit can be over 60 including appraisal and delineation phases, per exploration permit. If you multiply the amount of existing exploration permits by that number, that is an extraordinary amount, with potentially vast impacts. This will possibly be without baseline studies or assessments and analysis of the Territories unique environmental values, including water interactions, GHG emission, terrestrial ecosystems, public health and social impacts.
4. The majority of the NT community has no faith or trust in the regulatory environment, as it stands to monitor or respond to this industry. So it is unthinkable (to us) that the panel would recommend exploratory fracking operations to continue under the same legislative and regulatory conditions that exist before this inquiry. That is not 'robust' and 'rigorous'. This doesn't make logical sense, and it doesn't help to build any social licence or trust in the ability of regulatory framework to address the risks. We look forward to the community inquiry on Saturday where, as you stated yesterday, we have an opportunity to ask the panel questions and to hear your response. In the interests of openness and transparency we request there by question time made available to occur within the whole group.
5. Lastly Origin admitted themselves in their presentation yesterday that it is difficult to change regulatory requirements overnight and transition to a different regulatory requirement during operations.

We request the following 'inquiry recommendations' be amended in the Final report to change the timing of their implementation from 'before any production licence is granted' to 'before an exploration permit is granted'. In the case of where previous exploration permits have been granted, the recommendations should stipulate before 'any further regulated activities, including hydraulic fracturing operations, land clearing, road building, earthworks etc. can occur' taking into account the analysis and assessment received from the SREBA.

Recommendation 7.1, 7.4, 9.2, 10.1, 14.16, 14.32 and 15.1 and any others with this wording I may have missed. *no go zone's*

In further clarifying your recommendations we refer to your risk assessment relating to land on page 172. We agree with your assessment that "the likelihood of onshore shale gas development occurring in currently undocumented areas of high conservation value in the NT is 'high', given the lack of comprehensive and systematic information on the biodiversity assets of prospective regions, including

virtually no information on invertebrate fauna. This poses a significant threat to species that might occupy highly restricted ranges within a development area, and therefore, the consequence is also rated as 'high'. Combining the likelihood ('high') and consequence ('high') gives an overall risk rating of 'high'.

This high risk can only be mitigated by implementing the findings from a strategic regional assessment of biodiversity values conducted prior to any shale gas development being approved"

Recommendation 8.1 states:

That strategic regional terrestrial biodiversity assessments are conducted as part of a SREBA for all bioregions prior to any onshore shale gas production, with all onshore shale gas development excluded from areas considered to be of high conservation value. The results of the SREBA must inform any decision to release land for exploration as specified in Recommendation 14.2 and be considered by the decision-maker in respect of any activity-based EMP.

We believe that significant risks also apply at the exploration, appraisal and delineation phase, not just development and production phase. Therefore recommendation 8.1 should state that all onshore shale gas regulated activities be excluded from areas identified as high conservation value from the SREBA assessments.

So in delving even deeper into to these regulatory reform recommendations. As far as we can read there are no recommendations of how to implement the findings of the SREBA assessment and analysis, especially for areas where exploration permits have already been granted given the current laws around obtaining a licence under the Petroleum Act.

I quote on page 372

Where the Minister is satisfied that the proponent has:

- complied with the Petroleum Act, conditions of its EP and any directions given by the Minister;***
- discovered a commercially exploitable accumulation of petroleum within the EP area; and***
- complied with the requirements for an application,***
the Minister must grant the PL – production licence.

Your report then goes on to say ‘many of the reforms proposed above with respect to exploration have direct application to the production phase of any onshore shale gas industry. For example, it may be the case that between the granting of the exploration permit and the consideration of an application for a production licence, an event happens or information is obtained that calls into question at this point you go onto talk about ‘fit and proper person’.

I had high hopes that as I was reading, that it would be here that you would make recommendations about how to amend the Petroleum Act to take into account new information from the SREBA. That you would shed some light on how to give meaningful purpose to information obtained from the SREBA. That if identification of high conservation land or other risks was ascertained to already be in areas that had been granted an exploration permit, that they could be revoked through legislation.

In staying on the topic of the SREBA, we believe the following considerations should also be included in the scope and content of the assessment:

1. Inclusion of traditional Aboriginal ecological and cultural knowledge to understanding the environment and to risk assessment.

We refer to NLC’s submission on the ‘Public Review of the draft Environmental Impact Statement Guidelines released by the Northern Territory’s Environmental Protection Agency’ dated 15 July 2013

‘The guidelines do not address the value of traditional Aboriginal ecological and cultural knowledge to understanding the environment and to risk assessment. Aboriginal people hold a different worldview to that promoted in the environmental impact assessment process and have developed an understanding of the natural environment and land management practices that complement non-indigenous impact assessments. Once integrated into the process, traditional knowledge will help provide a more complete evaluation and a more holistic approach to environmental impact assessment. Where possible, information relating to traditional knowledge and management systems should be collected and incorporated into EIS documents, potentially the Historic and Cultural Impact Assessment. In addition, specific reference should be made in the ESIA to the contributory value of traditional Aboriginal knowledge and its inclusion in the risk assessment process; and information that is of value for describing specific biophysical impacts should be included as part of the required surveys and analyses (e.g. flora and fauna surveys).

2. Our second recommendation is for SREBA to consider to consider impacts to biodiversity in an altered climate and refer the Panel the article 'How Australian legislation can consider climate change in ecological impact assessment' by Lukas L. Clews²
3. Thirdly, any previous baseline data collected from exploration permits to be included and added to this assessment process.

Still staying on regulatory reform we would like to address your question regarding the options for reform of the regulator.

We support option 1. Which proposes to align closely with the NT Governments 'existing environmental reform process'. This option 'proposes that all petroleum activities must have a separate environmental approval under uniform environmental legislation that is administered by an entity other than DPIR. Under this option "an overarching Environmental Protection Act is introduced in accordance with the Government's current environmental reform agenda whereby the Minister for the Environment provides a separate and independent approval for all petroleum activities that have an environmental impact. The Act will require that Minister to decide whether or not petroleum activities (including any onshore shale gas activities) can occur or not, on environmental grounds only. The Minister must apply the principles of ESD, including the precautionary principle, when the Minister makes a decision, and the Minister must be satisfied that the environmental risks and impacts associated with the petroleum activity have been reduced to levels that are acceptable. Consistent with the current regulatory framework for petroleum activities, all environmental plans, approvals and reasons for all approvals must be published". Option continues to be expanded on page 389 very clearly.

We believe taking the recommendations from this inquiry through to the current regulatory reform process will go some ways to strengthening vital regulation needed for other projects and industries including mining, land clearing, etc. We also believe that the triggers for assessment to be developed under the regulatory reform process may capture some public environmental assessment at the exploration permit stage, where previously there has been none.

We would like to strongly recommend that the following recommendations make it through to the Final report and note that they have broader application to the environmental regulatory reform:

² Accessed from <http://publications.rzsnsr.org.au/doi/pdf/10.7882/FS.2012.021>

In Recommendation 8.8 regarding 'offsets', we have significant concerns regarding their integrity³. We refer to 24 million dollars to be granted over 22 years still not received from the Inpex project for the Western Top End Marine Megafauna Program. Question 29 form budget estimates dated 9th June 2017, raises the issue. These offsets were meant to start flowing from the third quarter of 2016. The answer returned was that the program is intended to be implemented in 2018/19. We will continue to explore the issues of an offsets program through the environmental regulatory reform process.

There are many more issues we could address regarding well integrity, water security, economic assessment and social impact assessment. We trust these issues will be addressed in other submissions particularly from Lock the Gate and Arid Lands Environment Centre.

In closing we concur with the similar sentiments raised by Braedon Earley yesterday. Many of us feel a connection to the Territory that is physical, psychological and also can't be seen. Everything in our bodies, heart and being is saying 'onshore hydraulic fracturing in the NT is a bad idea' - that message needs to be respected and listened to.

³ See <http://www.abc.net.au/news/2016-03-31/inpex-joint-venture-seeks-to-dump-federal-environmental-projects/7289310?pfmredir=sm>

Senate Standing Committee on Environment and Communications
Legislation Committee
Answers to questions on notice
Environment and Energy portfolio

Question No: 129
Hearing: Budget Estimates
Outcome: Outcome 1
Program: Environment Standards Division (ESD)
Topic: Inpex – Western Top End Megafauna
Hansard Page:
Question Date: 9 June 2017
Question Type: Written

Senator Waters asked:

We have seen a copy of the agreement between the NT government and Inpex signed in October 2014. In Annexure D, the budget is laid out, and funds were supposed to start flowing in the third quarter of 2016. Why didn't that occur?

What is the holdup with that project? Does Inpex accept that they need to fund it, or are they still trying to dodge that obligation?

Answer:

Condition 11 of the approval for the INPEX Ichthys project requires the person taking the action to submit a Coastal Offset Strategy for the protection of listed threatened and migratory species impacted by the Ichthys project in Darwin Harbour. That Strategy was approved by the Minister's delegate in April 2012.

The approved Coastal Offset Strategy outlines programs to be funded by INPEX as offsets for impacts to matters of national environmental significance associated with the Ichthys project. One of those programs, the Western Top End Marine Megafauna Program is to be designed and implemented by the Northern Territory Government, with funding to be provided by INPEX.

The approved Coastal Offset Strategy requires INPEX to provide \$24 million over 22 years to the Northern Territory Government to implement the Western Top End Marine Megafauna Program. The Department has been advised by INPEX that the Northern Territory Government intends to commence the Western Top End Marine Megafauna Program in 2018/19, following completion of the Conservation Status of Coastal Dolphins Program (a program part of the approved Coastal Offset Strategy). The outcomes of the Conservation Status of Coastal Dolphins Program will inform the design of the Western Top End Marine Megafauna Program.

How Australian legislation can consider climate change in ecological impact assessment

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ABSTRACT

Climate change will exacerbate the suite of existing threats to biodiversity posed by human activity. While climate change considerations are currently incorporated into aspects of coastal land use planning in New South Wales, little effort has been made to include climate change considerations into the assessment of biodiversity impacts for development activities elsewhere. The legislation from which current ecological assessment procedures originate (e.g. the *NSW Environmental Planning and Assessment Act 1979* and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)) predates the recognition of climate change as a major threat to biodiversity and they need to be adapted to respond to climate change pressures on biodiversity. Here it is recommended that species sensitive to effects of climate change should be included on threatened species lists under the *NSW Threatened Species Conservation Act 1995* and the EPBC Act. An assessment procedure for incorporating these species into ecological impact assessment is suggested. The ability to provide for climate change adaptation for such species through mitigation and compensatory measures is also explored.

Key words: climate change; biodiversity; ecological impact assessment; legislation; mitigation

Introduction

Climate change is considered to be the world's most urgent environmental, economic and social issue (McAlpine *et al.* 2010) and is studied intensively at the regional and global policy-setting levels (Byer *et al.* 2009). The Third Assessment Report of the Intergovernmental Panel on Climate Change (Intergovernmental Panel on Climate Change 2007) concluded that Australia would be vulnerable to the changes in climate that are projected to occur over the next 100 years due to the natural climate variability, inherent dryness of the continent, and the pattern of human settlement in low lying coastal areas. These climate changes are considered to represent a new threat to biodiversity that will exacerbate the suite of existing threats posed by humans such as habitat loss and fragmentation, pollution, invasive species, and over harvesting (Sala *et al.* 2000, Thomas *et al.* 2004, Dunlop and Brown 2008). In Australia, increased temperature, altered rainfall patterns, changes in the frequency, timing and severity of extreme weather events, rising sea levels, increased sea-surface temperatures and ocean acidification are likely (Intergovernmental Panel on Climate Change 2007). As the distribution of most species, populations and communities is influenced by climate, many species could be adversely affected by climate change unless they are able to move widely across the landscape (Hughes and Westoby 1994, Hughes 2003, Pearson and Dawson 2003, Chambers 2006). While climate change is recognised as a threat to biodiversity in the scientific literature, this is not adequately reflected in current framework of the New South Wales (NSW) and Commonwealth legislation requiring Ecological Impact Assessment (EcIA) for development proposals.

Previous strategies (e.g. Department of Environment and Climate Change NSW 2007, NSW Inter-agency Biodiversity and Climate Change Impacts and Adaptation Working Group 2007) have included some adaptation strategies dealing with climate change impacts on biodiversity on private land. However, their priority focus areas were building and managing the reserve system. Despite the continuing focus on public land, it is recognised that the national reserve system must be enhanced by more effective off-reserve conservation and that public land alone is not able to provide protection to all ecosystems under the impacts of climate change (Steffen *et al.* 2009).

Climate change should be a mandatory consideration in EcIA. However, our current legislative system does not require assessment of impacts under future climate change scenarios: incorporating climate change considerations into decision-making would mean adjustment of the current state and federal legislation that governs the conservation of biodiversity. One way of doing this might be to change legislation via the consideration of 'climate sensitive' aspects of biodiversity. This paper provides a method of interpreting the impacts of a development on climate sensitive biodiversity. Changes to our current thinking on impact mitigation are also suggested. Through the improvement of existing land-use planning and development controls to account for climate change, EcIA has the potential to play an important role in the conservation of biodiversity outside of conservation reserves in the face of a changing climate.

Ecological Impact Assessment – Its current status in the NSW system

Preservation of resilient ecosystems is an important goal of planning and development, being essential to support ecological functions essential for ecologically sustainable development (ESD) (Rookwood 1995, Beatley 2000, Lofvenhaft *et al.* 2002, Kim and Pauleit 2007, Mortberg *et al.* 2007). Article 14 of the Convention on Biological Diversity calls for each contracting party to introduce appropriate Environmental Impact Assessment (EIA) procedures to avoid and minimise human impacts to the environment (United Nations 1992). Environmental Impact Assessment (EIA) is recognised globally as an important decision tool and is embedded in the decision-making processes for projects that are likely to involve substantial environmental impacts in Australia (Glasson *et al.* 1999, Janssen 2001, Elliot and Thomas 2009).

Ecological Impact Assessment is a sub-discipline of EIA that is used to identify, predict and evaluate the impacts of proposed actions on ecosystems or their individual components (Treweek 1996, 1999, Wale and Yalaw 2010). Means to mitigate impacts and/or compensate for residual impacts are also an integral part of EcIA. Designed as a scientifically defensible approach to ecosystem management, EcIA is based on ecological science; however, it is the prediction and assessment of potential ecological impacts that is the crucial component of EcIA and the aspect that distinguishes EcIA as separate from the science of ecology (Treweek 1996). A detailed account of the EcIA process and the typical steps involved can be found in Treweek (1999) and Atkinson *et al.* (2000). Increasingly, EIA is including the assessment of impacts on biodiversity and its conservation and sustainable use, as required under the Convention on Biological Diversity.

In New South Wales (NSW), the principal piece of legislation that governs land use and provides for environmental assessment is the *Environmental Planning and Assessment Act 1979* (EP&A Act) (Elliot and Thomas 2009) which has three assessment pathways:

1. Part 4 – for development that requires consent from local council;
2. Part 5 – for activities that require approval from a determining authority and various forms of development being carried out by the NSW Government; and
3. Part 3A – for a major infrastructure development that must obtain approval from the Minister¹.

Depending on the requirements of the consent or determining authority, each assessment pathway may require EcIA to be performed to determine if there is likely to be an impact on biodiversity resulting from the proposed development or activity. If, through the discretion of the practitioner, there is considered to be a risk of significant impact to threat-listed species, further assessment may be required.

Currently, seven procedures are used in EcIA to assess the significance of human developments and activities on biodiversity in NSW:

1. The assessment of significance (7-part test) (EP&A Act, s5A);
2. Species Impact Statement (SIS) (EP&A Act, Part 6, Division 2);
3. Heads of consideration (EP&A Act, Part 3A);
4. The BioBankingscheme (*Threatened Species Conservation Act 1995* (TSC Act), Part 7A);
5. Property Vegetation Plans (*Native Vegetation Act 2003*, Part 4);
6. Biocertification of Environmental Planning Instruments (TSC Act, Part 7AA); and
7. The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) significant impact guidelines for impacts to matters of national environmental significance.

Each of the procedures listed above form an integral part of any EcIA report for which they are required and require similar levels of investigation. However, the legislation from which these assessment procedures originate predates the recognition of climate change as a key risk to biodiversity (Steffen *et al.* 2009). Consequently, there is a general failure to assess the impacts of human development on biodiversity in the context of climate change. Central to the practice of EcIA is the assessment of significance of impacts on species and communities listed under the TSC Act and the EPBC Act. While *Anthropogenic climate change and Loss of climatic habitat caused by anthropogenic emissions of greenhouse gases* have been listed as Key Threatening Processes under the TSC Act and the EPBC Act respectively, it is the listing of threatened biodiversity under these pieces of legislation that is the critical driver for EcIA. In Australia, every EcIA must explicitly consider impacts on threat-listed species. This is therefore a possible entry point for considering climate change impacts in EcIA.

Although the perverse outcomes for biodiversity that may result from threatened species-centric EcIA have been well documented (see Rohlf 1991, Possingham *et al.* 2002, Lunney *et al.* 2004, Bubna-Litic 2008), the way that the current biodiversity assessment and decision making process has evolved is based on the publication of threatened species lists (Lunney *et al.* 2004). Hence, the ability of EcIA to address climate change relies on the listing of species that will be detrimentally impacted by climate change as threatened under legislation. The 2008 review of the EPBC Act suggested that significant changes in policy and management for biodiversity conservation are needed to meet the challenge of climate change (Hawke 2009). Indeed, Hawke (2009) proposed that climate change adaptation issues should be addressed in the EPBC Act by listing species or communities threatened by climate change as threatened species or ecological communities.

¹ This has changed since the change of the NSW State government in March 2011.

While some progress towards including climate change adaptation into biodiversity conservation strategies and action statements has been made in NSW (e.g. Department of Environment and Climate Change NSW 2007, NSW Inter-agency Biodiversity and Climate Change Impacts and Adaptation Working Group 2007, Department of Environment Climate Change and Water NSW 2010b), in other Australian states (e.g. QLD Office of Climate Change 2007) and nationally (National Resource Management Ministerial Council 2004), these action plans lack the legislative clout that is required to drive action by proponents of development. These strategies and position statements rely solely on persuasive and political force.

It is well recognised that climate change will have significant impacts on coastal developments and associated infrastructure (McGranahan *et al.* 2007). Consequently, a policy shift towards incorporating climate change considerations in development planning is occurring within the coastal zone (Myers v. South Gippsland Shire Council 2008, Department of Environment Climate Change and Water NSW 2010a, Moore 2010). While the impacts of climate change on human development are a priority for action, however, the impacts of climate change on biodiversity are not currently addressed by development controls or government policy. There is no specific mandate within the legislation to consider climate change adaptation for biodiversity (Argrawala *et al.* 2010). However, climate change risk assessments are increasingly being incorporated into the Australian EcIA process. Argrawala *et al.* (2010) provides an example of one EcIA in the Namadgi National Park in the ACT that considered climate change impacts on the threat-listed Alpine Sphagnum Bogs and Associated Fens ecological community and the Northern Corroboree Frog (*Pseudophryne pengilleyi*), a community and species particularly threatened by climate change. It would appear, however, that consideration of climate change impacts is restricted to species that are currently listed as threatened under legislation.

What changes are needed if climate change is to be addressed in EcIA?

If ESD is to be achieved in an altered climate, the following are suggested as necessary changes to the current biodiversity protection legislation:

- Listing of climate sensitive species and species of restricted range, diet and dispersal ability (Intergovernmental Panel on Climate Change 2007, Environmental Defenders Office 2009a, b, Hawke 2009) e.g. shorebirds and waders that will suffer from the loss of breeding and feeding habitat due to sea level rise;
- Insertion of climate refuges as a matter of National Environmental Significance under the EPBC Act (Hawke 2009) e.g. areas resistant to drought;
- Listing of populations at the limit of their geographic range to protect advancing populations as they migrate (Environmental Defenders Office 2009a, b) e.g. Black Flying-fox establishing in Melbourne;
- Critical habitat declared that includes possible future distributions of species (Environmental Defenders Office 2009a, b) e.g. suitable habitat southward of current distributions;
- A significant impact trigger for development in important wildlife corridors (Environmental Defenders Office 2009a, b) e.g. the Great Dividing Range;
- Adjustment of endangered ecological communities to include changes that may occur due to climate change (Environmental Defenders Office 2009a, b) e.g. new species associations; and
- Listing of non-native 'climate refugee' species that may migrate to northern Australia from Papua New Guinea or Indonesia and become resident (Chapron and Samelius 2008, Adam 2009, Environmental Defenders Office 2009a, b) e.g. species of bat and birds.

Future biodiversity assessment for developments should include a combination of site-scale assessment and strategic landscape-scale approaches. This will be necessary to take into account planning for ecological processes including pollination, predation, daily movements, and migration that will be imperative to maintain under an altered climate, rather than static patterns of current distributions (Pressey *et al.* 2007). It is unlikely that a single site scale assessment will capture future distributions of species. A good example of how a landscape-scale spatial planning approach can be used to implement adaptation measures to climate change for conservation planning is provided in Vos *et al.* (2010).

Assessment questions to determine impacts on climate sensitive species

While uncertainty surrounds the future impacts of climate change (Intergovernmental Panel on Climate Change 2007, Vos *et al.* 2010), we know that there will be detrimental consequences for biodiversity. Adaptation to climate change is about making decisions for possible future outcomes that involve a considerable amount of uncertainty (Beaumont *et al.* 2007, Vos *et al.* 2010), so the degree to which the climate will warm under different climate change scenarios should not matter for EcIA. Assessment should be focused on species that are the most sensitive to climate change and therefore likely to be affected at the lower end of climate change scenarios (Howden *et al.* 2003).

The Standing Committee on Natural Resource Management (Climate Change) (2009) suggests that the risk of a species declining or disappearing under climate change may be increased if the species has:

- Immobile or sedentary habits – species unable to move to more suitable habitats are at risk of extinction due to climate change;
- A limited geographic distribution – species with restricted distribution due to edaphic or landscape limitations are likely to decline due to climate change if these features are not replicated or available in the projected southward or upward distributional ranges of the species; and

- Poor dispersal capacity – the likely ability of species to track changing climate by southward and upward migration is constrained.

Additionally, species experiencing decline caused by other non-climatic threatening processes are less likely to be resilient to climate change impacts (Sala *et al.* 2000, Dunlop and Brown 2008). Consequently, assessment of immobile or sedentary species, species with limited geographic distribution, and species with poor dispersal capacity should occur in EcIA.

The Secretariat of the Convention on Biological Diversity (2009) states that current available impact assessment guidelines can be used to assess risks to biodiversity from climate change; however, further development and validation of tools is necessary. Like what currently occurs with the '7-part test' of significance under the TSC Act or the significant impact guidelines under the EPBC Act, a set of questions needs to be developed to assess impacts to biodiversity in an altered climate. The questions posed below are not new; they are based on well-established ecological principles that form the basis of current thinking in conservation science. The suggested assessment questions are as follows:

- Will the proposed action prevent adaptation and/or resilience of the species, population or ecological community (e.g. by contributing to existing threats or by degrading ecosystem health)?
- Will the proposed action impact on connectivity either at the local, landscape and/or ecosystem scale?
- Will the proposed action impact on migration corridors?
- Will the proposed action impact on past or future climate refugia (e.g. mountain tops, permanent wetlands, areas with a variety of landforms)?
- Will the proposed action impact on those species or groups of species responsible for maintaining ecological function and ecosystem processes (e.g. apex predators)?

Mitigation and compensatory measures can offer an opportunity to aid in climate adaptation

Climate change can only be mitigated effectively through reducing greenhouse gas emissions and by removing greenhouse gases already in the atmosphere via establishment of sinks (Intergovernmental Panel on Climate Change 2007). However, measures to allow species to adapt to climate change must be set in place. Ecological impact assessment, like the broader environmental assessment process, should consider the means to adapt to climate change and the means to mitigate climate change through the life cycle of a project (Byer *et al.* 2009). Wilson and Piper (2008) state that there should be a focus on implementing adaptation measures that reduce species vulnerability *in situ* by increasing ecosystem resilience and also by accommodating change. Restoring degraded ecosystems to improve ecosystem services delivery and safeguarding links across climatic gradients to enable species range shifts are important components of adaptation (Vos

et al. 2010). It is also recognised that climate change is likely to result in novel ecosystems without past analogues, which will create new challenges with using current accepted best practice approaches to restoration ecology (Hobbs and Cramer 2008). Planning and maximising opportunities for adaptation to climate change means addressing the anticipated effects at policy and landscape planning levels, as well as at project level through site-scale assessment. While the ideas presented below would require a considerable amount of money, political will, shifts in current thinking and conventions on ecosystem restoration, and in some cases a certain amount of risk, these mitigation and compensatory measures may provide opportunities to enhance the adaptation of species to climate change and can readily be incorporated into consent conditions for development. Suggested measures to aid in climate change adaptation are as follows:

- Reconsider the use of local provenance plant species in revegetation (Maciver and Wheaton 2005, Harris *et al.* 2006, Millar *et al.* 2007, Environmental Defenders Office 2009a, b). Plant genotypes (e.g. *Eucalyptus crebra* Narrow-leaved Ironbark, *E. moluccana* Grey Box, *E. tereticornis* Forest Red Gum, and *E. saligna* Sydney Blue Gum) from Queensland may be better suited to plant in New South Wales and Victoria;
- Considering future climate change when incorporating mitigation measures into developments (e.g. designing fauna underpasses in coastal areas to allow for dry passage under a variety of climate change scenarios);
- Translocation of species that will not survive *in situ* may become a more viable option as their bioclimatic envelope shifts (Pearson and Dawson 2005, Harris *et al.* 2006, Hoegh-Guldberg *et al.* 2008, Environmental Defenders Office 2009a, b); and
- Creating corridors across climatic gradients to enable range shifts (Halpin 1997, Noss 2001, Vos *et al.* 2008, Environmental Defenders Office 2009a, b) instead of focusing on like for like vegetation offsets in the same catchment.

Conclusions for future EcIA in a changing climate

For the current threat-centric discipline of EcIA to contribute to off reserve conservation of species in the face of climate change, a fundamental change in legislation and consent conditions placed on developments needs to occur. Despite the problems that arise with the publishing of threatened species lists, the ability of EcIA to address climate change could be enhanced immediately by listing 'climate sensitive species' as threatened under the existing legislation. The changes to legislation suggested here are necessary if progress is to be made towards lessening the impacts of human developments and activities on species that will be or are likely to be detrimentally affected by climate change. Achieving ESD in the future will depend on considering impacts to climate sensitive species during the assessment of human activities. The government strategies and adaptation

frameworks that have been developed for addressing climate change impacts to biodiversity must be legislated so that proponents of development can comply with requirements. Otherwise, business as usual will proceed. The assessment questions posed here provide one way of addressing the impacts of human development on species

that are susceptible to climate change. Finally, while the mitigation and compensatory measures suggested here might be uncomfortable in terms of current thinking on biodiversity conservation, they may be necessary to allow for climate change adaptation in an environment that has been altered by the activities of humans.

Acknowledgements

I would like to thank C. Threlfall and M. Predavec for encouraging the writing of this paper and for the contribution of insightful comments and ideas on

earlier manuscripts. The comments of P. Byer and an anonymous reviewer on the draft manuscript are greatly acknowledged.

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INPEX joint venture seeks to dump \$30 million of federal environmental projects

Exclusive by the National Reporting Team's Kate Wild

Updated Thu 31 Mar 2016, 4:02pm



PHOTO: The Ichthys INPEX project will pipe natural gas from WA to Darwin. (Supplied)

The company behind a \$34 billion liquefied natural gas (LNG) project in the Northern Territory is trying to renege on its agreement to complete \$30 million worth of environmental projects.

The Ichthys INPEX joint venture will take natural gas off the coast of Western Australia and pipe it 900 kilometres underwater to a processing plant in Darwin Harbour.

Seventy per cent of the gas will go to Japan once production begins.

RELATED STORY: Hundreds march to protest work practices at INPEX's Darwin LNG project

RELATED STORY: INPEX completes deep water gas pipe lay spanning 890 kilometres

MAP: NT



Key points:

Government approval was conditional on the company delivering \$91 million of environmental offset projects over the 40-year life of the project.

But the Federal Environment Department has confirmed INPEX has sought approval to revise its offset program "in light of lower-than-expected environmental impacts for the project".

The ABC understands the company wants to save around \$30 million by dumping marine and land reserves it agreed to establish.

That includes 2,000 hectares of mangroves and land, plus "marine habitat for inshore dolphins, marine turtles and dugong".

Sources have told the ABC a \$24 million partnership with Aboriginal rangers "to provide for co-management of dugong, coastal dolphins and Marine turtles" along approximately 300 kilometres of coast is in danger if the Federal Government approves INPEX's request.

Environmental risks no longer relevant: INPEX

In a statement to the ABC, the general manager of INPEX, Sean Kildare, said the assessed environmental risks were no longer relevant.

"[The request for changes] was made on the basis that independently verified environmental studies have demonstrated many of the environmental risks assessed at the time of approval are no longer relevant and are extremely unlikely to be realised in future".

The company's environmental pledges were a condition of the Federal Government approving the Ichthys LNG project under the Environmental Protection and Biodiversity Conservation Act (EPBC), in 2011.

INPEX described its offset projects on the company website as "designed to compensate for residual environmental impacts associated with the project".

- Approval of Ichthys INPEX project conditional on venture providing \$91m of environmental offset projects
- INPEX asks Federal Government to release it from \$30m of promised projects
- Projects marked to be dumped include reserves set aside permanent protection of animals, habitat

Independently verified environmental studies have demonstrated many of the environmental risks assessed at the time of approval are no longer relevant.

Sean Kildare, INPEX general manager

Elsewhere it said: "We are committed to establishing, building and maintaining community trust. We work closely with stakeholders to ensure information is readily available to the community, as well as providing mechanisms for feedback and response."

Mr Kildare said in his statement that more than \$100 million had been spent "on baseline environmental studies and investigations" off the Kimberly coast and the broader Darwin region, which had "substantially increased the scientific knowledge of these minimally studied areas".

The footprint of the Ichthys project stretches from Western Australia to the Northern Territory.

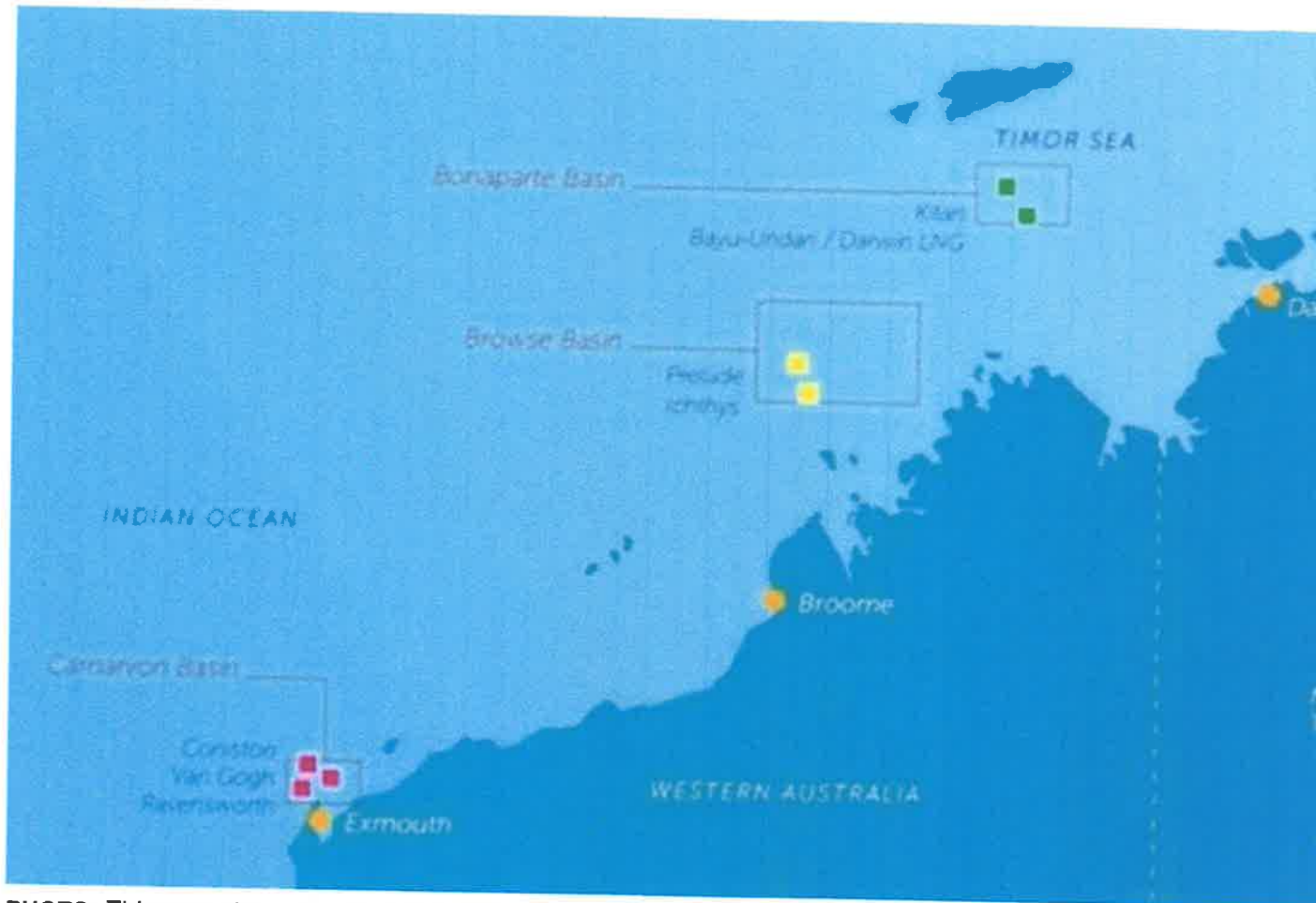


PHOTO: This map shows the footprint of the LNG operation. (Supplied: Ichthys INPEX)

INPEX said offset projects, including aerial surveys of dugong, dolphin and turtles along the entire NT coastline and a 40-year program of monitoring and research in Darwin Harbour, were already underway.

Others, such as ecological surveys in the Kimberley and two national research grants have already been completed.

Mr Kildare said "a significant investment of time, money and people" had shown predicted environmental impacts of the Ichthys project had been "either completely removed ... or were not applicable based on expert advice".

The Federal Environment Department has asked INPEX for more documentation to support the company's request for "a variation of its approval conditions".

Northern Territory Minister for the Environment, Mr Gary Higgins, said it was a matter for the Federal Government who the NT trusted to "assess the proposal based on the facts and the science".

Environment Minister Greg Hunt declined to answer questions put by the ABC.

Topics: oil-and-gas, business-economics-and-finance, government-and-politics, federal-government, environmental-impact, nt, australia, wa

First posted Thu 31 Mar 2016, 3:40pm