Project Order
Proforma 2014

1. Short Project Title (less than 15 words)

Habitat selection by two focal species

Long Project Title	Habitat selection at different spatial scales by two focal species: the golden-tailed gecko and glossy black-cockatoo.
GISERA Project Number	B3
Proposed Start Date	1 October 2014
Proposed End Date	31 December 2015
Project Leader	Chris Pavey (CSIRO)

2. GISERA Research Program

×	Biodiversity Research	☐	Marine Research	☐	Land Research
☐	Water Research	☐	Social & Economic Research	☐	GHG Research

3. Research Leader, Title and Organisation

Dr Chris Pavey
CSIRO Land and Water Flagship
PO Box 2111
Alice Springs
Northern Territory 0801

4. Summary (less than 300 words)

Nearly 100 species of animals that are listed as of special conservation significance are known to occur or considered to possibly occur within the coal seam gas (CSG) development region. Two of these species have been selected for further detailed assessment of the impacts of CSG development. These two species are the golden-tailed gecko and the glossy black-cockatoo. The golden-tailed gecko occupies small home ranges within continuous

habitat and vegetation fragments. In contrast, the cockatoo has distinct feeding and nesting habitat and moves widely across the landscape. The habitat requirements and response to disturbance of these two species will be assessed in detail and these will act, in effect, as case studies of the range of impacts of CSG development on threatened species. Management prescriptions for habitat will be developed to ensure the long-term persistence of the two species within the CSG development region. The golden-tailed gecko work will focus on the impact of fragmentation and edge effects on the species. In contrast, the glossy black-cockatoo project will focus on understanding how landscape connectivity particularly the availability of feeding and nesting resources affects the species.

5. Budget Summary (From Excel Budget Pack worksheet "Project Plan Summary")

Expenditure	2011/12 Year 1	2012/13 Year 2	2013/14 Year 3	2014/15 Year 4	2015/16 Year 5	Total
Labour				100,084	37,348	137,432
Operating				20,000	10,000	30,000
Total Costs				**120,084**	**47,348**	**167,432**
CSIRO				120,084	47,348	167,432
Total Expenditure				**120,084**	**47,348**	**167,432**

Expenditure per Task	2011/12 Year 1	2012/13 Year 2	2013/14 Year 3	2014/15 Year 4	2015/16 Year 5	Total
Task 1				55,000		55,000
Task 2				55,000		55,000
Task 3				35,000		35,000
Task 4					22,432	22,432
Task 5						
Total Expenditure				**145,000**	**22,432**	**167,432**

Cash Funds to Project Partners	2011/12 Year 1	2012/13 Year 2	2013/14 Year 3	2014/15 Year 4	2015/16 Year 5	Total
CSIRO				72,050	28,409	100,459
Sub Total				72,050	28,409	100,459
Total Cash to Partners				**72,050**	**28,409**	**100,459**

Source of Cash Contributions	2011/12 Year 1	2012/13 Year 2	2013/14 Year 3	2014/15 Year 4	2015/16 Year 5	Total

GISERA				72,050	28,409	100,459
Total Cash Contributions				**72,050**	**28,409**	**100,459**

In-Kind Contribution from Partners	**2011/12 Year 1**	**2012/13 Year 2**	**2013/14 Year 3**	**2014/15 Year 4**	**2015/16 Year 5**	**Total**
CSIRO				48,034	18,939	66,973
Total In-Kind Contribution from Partners				**48,034**	**18,939**	**66,973**

	Total funding over all years	**Percentage of Total Budget**
GISERA Investment	100,459	60%
CSIRO Investment	66,973	40%
Total Other Investment	0	
TOTAL	**167,432**	

Task	Milestone Number	Milestone Description	Funded by	Participant Recipient	Start Date (mm-yy)	Delivery Date (mm-yy)	Fiscal Year	Fiscal Quarter	Payment $
Task 1	1	Field assessments – golden-tailed gecko	GISERA	CSIRO	1 Oct 2014	30 Jun 2015	14/15	2	33,000
Task 2	2	Field assessments – glossy black cockatoo	GISERA	CSIRO	1 Oct 2014	30 Sep 2015	14/15	1	33,000
Task 3	3	Data analysis and assessment	GISERA	CSIRO	1 Jan 2015	31 Oct 2015	14/15	3	21,000
Task 4	4	Preparation of management guidelines	GISERA	CSIRO	1 Oct 2015	31 Dec 2015	15/16	2	13,459

6. Other Researchers (include organisations)

(State time commitment to project by each Researcher listed)

Researcher	Time Commitment (project as a whole)	Principle area of expertise	Years of experience	Organisation
Chris Pavey	10%	Threatened species management	20	CSIRO
Raghu Sathyamurthy	10%	Quantitative ecology	12	CSIRO
Eric Vanderduys	20%	Field survey, Herpetology	15	CSIRO
Belinda Walters	20%	GIS, Field ecology	8	CSIRO

7. GISERA Objectives Addressed

Carrying out of research and improving and extending knowledge of social and environmental impacts and opportunities of CSG-LNG projects for the benefit of the CSG-LNG industry, the relevant community and the broader public.

Informing government, regulators and policy-makers on key issues regarding policy and legislative framework for the CSG-LNG industry.

8. Program Outcomes Achieved

Please refer to question 13.

9. Program Outputs Achieved

Please refer to question 13.

10. What is the knowledge gap that these research outputs will address?

Very limited information is currently available on the ecology of these two threatened species and on their responses, at a population-level, to various disturbance regimes. This makes it difficult to predict what impact a particular disturbance regime, such as that associated with CSG, will have on populations. The two species have been chosen because each is threatened and the CSG area is an important part of their range. However, the two species represent extremes in terms of the spatial scale at which impacts may be experienced. The golden-tailed gecko occupies small home ranges within large areas of continuous habitat and habitat fragments. The glossy black-cockatoo has discrete requirements for foraging habitat (Casuarina seeds) and nesting habitat (eucalypts) that are met at a landscape scale. The information collected in this project will ensure effective management options are developed to enable the species to persist within landscapes that are impacted by CSG.

11. How will these Research outputs and outcomes be used in State Government and other water managers to achieve Adaptive Management of Water Resources?

In a best case scenario this information will be used in planning and policy development by state government, local councils and other land managers to ensure that disturbance regimes within habitat of the two species will be of such an intensity to ensure their ongoing persistence within the study region.

12. Project Development (1 page max.)

The project was developed through a consultation and planning process that was organised in the period 2011-2012. This project development phase involved consultation between Australia Pacific LNG and CSIRO staff.

Further background: The Terrestrial Biodiversity Research Portfolio and budget was first reviewed and endorsed by the Research Advisory Committee in March 2012. At that time, nine of the Committee's ten members approved the program subject to minor change. One member suggested that the program could be significantly improved by the adoption of a more cohesive risk assessment and management framework approach. This detailed information was provided to the Management Committee for their consideration.

The Management Committee considered the detailed advice of the Research Advisory Committee in March 2012 and chose not to approve the proposed Biodiversity Research Portfolio and budget. The Management Committee instructed the GISERA Director to revise the Portfolio to 'ensure that there is a cohesive body of research that more clearly helps to understand and define risks, priority areas, methods for managing and reducing risk and methods for knowing that management has worked'.

The revised Portfolio was reviewed by relevant APLNG and CSIRO staff members, and received the unanimous endorsement of the Research Advisory Committee on 9 August 2012.

The revised Portfolio was then reviewed by the Management Committee on 12 December 2012 and received the unanimous approval. This included project 3 'Threatened Species Ecology'.

We originally required students to undertake PhD studies for this project. As we were unable to recruit suitable PhD students, the project has been rescheduled and re budgeted using established scientists.

13. Project Objectives and Outputs

The key project objectives are detailed below for each of the two species.

1. Golden-tailed gecko, *Strophurus taenicauda*. The objectives are to understand how fragmentation and edge effects influence this species and to use this information to predict how it may be impacted by the development of CSG infrastructure. Searches will be undertaken in remnant vegetation of three patch sizes (≤10 ha, 10 – 100 ha,

and ≥100 ha, that is: small, medium and large) in three broad vegetation types (Brigalow, Callitris, and Ironbark woodlands). Regional Ecosystem (RE) and bioclimatic modelling has already been undertaken to identify Regional Ecosystems in which S. taenicauda is known to occur, and the likely extent of S. taenicauda's range based on bioclimatic factors. Searches will also be undertaken in non-remnant patches in close proximity to known remnant habitat to determine the extent of use of non-remnants. We plan to stratify sites by patch size across two of the three subspecies; S. t. taenicauda and S. t. albiocularis. The third subspecies S. t. triaureus, although more restricted, is likely to be less impacted by gas exploration activities. Surveys are planned near areas where gas drilling activities are occurring and overlap with known or modelled S. taenicauda habitat.

2. Glossy black-cockatoo, *Calyptorhynchus lathami*. The objectives for this species are to understand what level of landscape connectivity it requires and to use this information to develop management prescriptions that will retain suitable feeding and nesting trees at a landscape-scale. From Regional Ecosystem maps, we derived all REs where the primary RE (RE1 in REDD) contained the term "Allocasuarina" within the Brigalow Belt, Mulga Lands, Southeast Queensland and Central Coast Bioregions. Allocasuarina trees are the key food species for the cockatoos. Seventy-eight REs were identified by this process. We buffered these mapped "Allocasuarina REs" by 2.5 km and selected any RE that contacted this 2.5 km buffer zone. In this way we derived a set of RE polygons that included all Allocasuarina, plus remnants that would be accessible to GBC if they can travel a minimum of 2.5 km. We will use these sites and carry out field assessments at a subset of these sites where gas drilling activities are occurring. We have chosen three broad zones within the range of GBC in which to focus our attention; southern (west of Dalby), central (north of Roma), and northern (northeast of Blackwater). These three zones have extensive operational and/or exploratory gas drilling. By carrying out surveys for GBCs at these sites we will address the following questions; i) how far will GBC travel across unsuitable habitat?, ii) how close to feeding resources do nesting resources need to be?, iii) are there preferred nesting and feeding habitats within the broadly suitable habitat landscape?, iv) at what regeneration stage does non-remnant vegetation become useful to GBC and does this vary across the landscape?

Key outcomes from the project will be improved management and ongoing persistence of both species within the study region.

The key outputs are detailed below.

1. **Golden-tailed gecko**

a. Management prescriptions developed for the golden-tailed gecko within the CSG region. The aim of these prescriptions will be to mitigate against the effects of CSG development on the golden-tailed gecko. The prescriptions will focus on the desired level of habitat availability including patch size and number that will enable the species to persist within a landscape.

b. Journal paper written and submitted to a conservation-focussed journal. The paper will cover the habitat requirements and response to fragmentation of the species.

2. **Glossy black-cockatoo**

a. Management prescriptions developed for the glossy black cockatoo within the CSG region. The aim of these prescriptions will be to mitigate against the effects of CSG development on the glossy black cockatoo. The prescriptions will focus on identifying the mix and most appropriate juxtaposition of feeding and nesting habitat required within a landscape for the species to continue to persist.

b. Journal paper written and submitted to a conservation-focussed journal. The paper will cover the habitat requirements of the glossy black-cockatoo in central Queensland and will compare and contrast these with its habitat requirements elsewhere particularly on Kangaroo Island.

14. Project Plan

14.1 Project Schedule

ID	Task Title	Task Leader	Scheduled Start	Scheduled Finish	Predecessor
Task 1	Field assessments – golden-tailed gecko	Eric Vanderduys	1 October 2014	30 June 2015	None
Task 2	Field assessments – glossy black cockatoo	Chris Pavey	1 October 2014	30 September 2015	None
Task 3	Data analysis and assessment	Raghu Sathyamurthy	1 January 2015	31 October 2015	1 & 2
Task 4	Preparation of management guidelines	Chris Pavey	1 October 2015	31 December 2015	1, 2 & 3

TASK 1.

TASK NAME: Field assessments – golden-tailed gecko

TASK LEADER: Eric Vanderduys

OVERALL TIMEFRAME: October 2014-June 2015

BACKGROUND: This task will involve field assessments to understand the impacts of patch size and edge effects on the golden-tailed gecko to CSG development. Three or four nine day field trips will be undertaken to complete this task.

TASK OBJECTIVE: Detailed understanding of the response to fragmentation of the golden-tailed gecko.

TASK OUTPUTS: Dataset from stratified sampling across three broad habitats and three patch sizes. Sites will be across three broad geographic zones within the GISERA area.

SPECIFIC DELIVERABLES: Dataset from stratified sampling across three broad habitats and three patch sizes.

TASK 2.

TASK NAME: Field assessments – glossy black cockatoo

TASK LEADER: Chris Pavey

OVERALL TIMEFRAME: October 2014 to September 2015

BACKGROUND: This task will involve field assessments of the foraging and nesting ecology of the glossy black-cockatoo across the study area.

TASK OBJECTIVE: Detailed understanding of the use of landscapes within the study area by the glossy black-cockatoo.

TASK OUTPUTS: Dataset on the use of foraging and nesting habitat of the glossy black-cockatoo.

SPECIFIC DELIVERABLES: Dataset on the use of foraging and nesting habitat of the glossy black-cockatoo.

TASK 3.

TASK NAME: Data analysis and assessment

TASK LEADER: Raghu Sathyamurthy

OVERALL TIMEFRAME: January to October 2015

BACKGROUND: Analysis of and modeling (if required) of data collected during the field assessments.

TASK OBJECTIVE: Summary and rigorous scientific interpretation of the field data in a format suitable for the development of managed prescriptions.

TASK OUTPUTS: Detailed interpretation of the field data.

SPECIFIC DELIVERABLES: Detailed interpretation of the field data.

TASK 4.

TASK NAME: Preparation of management guidelines

TASK LEADER: Chris Pavey

OVERALL TIMEFRAME: October to December 2015

BACKGROUND: Following the field assessments and the data analysis it will be essential to develop management prescriptions for the two species of threatened fauna.

TASK OBJECTIVE: Management prescriptions for both the golden-tailed gecko and the glossy black-cockatoo.

TASK OUTPUTS: Two sets of management prescriptions; one for each species.

SPECIFIC DELIVERABLES: A specific report detailing the project aims, methodology, results and management prescriptions.

15. Budget Justification

CSIRO will provide 40% of the funding for this project. This project will be undertaken on a minimal budget and on a very short timeframe. The four researchers on this project have a solid mix of appropriate skills and experience in the GISERA area. Three of these (Pavey, Vanderduys, Sathymurthy) have established national and international science profiles).

16. Project Governance

The project team will meet fortnightly. The project manager (Pavey) will communicate with relevant GISERA contacts (Graeme Bartrim, Damian Barrett) on a monthly basis and will maintain a close interaction with appropriate individuals from Origin and QGC. The project manager will conduct two meetings with appropriate individuals from Origin and QGC. Milestones and budget will be tracked monthly within CSIRO's project management systems.

17. Communications Plan

General communication will be managed by GISERA.

18. Risks

There are a number of potential risks including inaction, insufficient time to carry out the work, insufficient budget, unexpectedly poor weather, difficulties in gaining access to field sites, unexpected departure (= redundancy) of key staff.

An unusually significant amount of time has already gone in to planning the project details including scoping out sites and site access. The project team feels that it is ideally focussed to complete this work if given the go ahead.

Capacity to deliver: The project team is experienced in this type of project and has been involved in work in the study area already. The knowledge of threatened species management is strong.

Project Management: Pavey will be the project manager. He has 20 years of experience in carrying out similar projects to successful completion. CSIRO has strong project management systems.

19. Intellectual Property and Confidentiality

Background IP (clause 10.1, 10.2)	**Party**	**Description of Background IP**	**Restrictions on use (if any)**	**Value**
				$
				$
Ownership of Non-Derivative IP (clause 11.3)	CSIRO			
Confidentiality of Project Results (clause 15.6)	Project results are not confidential.			
Additional Commercialisation requirements (clause 12.1)	Not Applicable			
Distribution of Commercialisation Income (clause 1.1)	Not Applicable			
Commercialisation Interest (clause 1.1)	**Party**		**Commercialisation Interest**	
	APLNG		[Specify each party's interest in Commercialisation Income. Eg 50%]	
	CSIRO			
	QGC			