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## Socioeconomic Systems and Reef Resilience

Project 10.2

## Social and economic values in the Wet Tropics World Heritage Area

Project 12.3

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# Socioeconomic Systems and Reef Resilience

Project 10.2



## SOCIOECONOMIC SYSTEMS AND REEF RESILIENCE: WHAT DO WE SEEK TO KNOW AND WHY?

- The influence of socioeconomic variables (e.g. price, cattle numbers) on water quality/sediment

**Tells us about what the economy does to the GBRWHA**

**(also provides an indication of whether market based policies are likely to achieve environmental goals)**

- The relative 'value' (benefit) of the goods and services provided by the Great Barrier Reef World Heritage Area (GBRWHA) to residents of and visitors to the GBR Catchment area

**Tells us about what the GBRWHA does to/for the economy**

**(also provides indication of likely environment/economy trade-offs)**

- Plus some 'geeky' science exploring new ways of estimating the 'value' of non market goods and services
- A continuation of the long-term monitoring of tourists as they leave Cairns airport (which Bruce Prideaux has been undertaking since 2007)

**Gives an indication of trends over time**

**(program also provides opportunity for investigation of 'pressing' issues for industry)**

# OUTPUTS

## Report from Cairns Airport (visitor) exit surveys:

Prideaux, B., Sakata, H. and Thompson, M. (2013) *Tourist Exit Survey Report: February – September 2012. Annual Patterns of Reef and Rainforest Tourism in North Queensland from Exit Surveys Conducted at Cairns Domestic Airport*. Report to the National Environmental Research Program. Reef and Rainforest Research Centre Limited, Cairns.

## Interim report from cross-sectional (regional) data:

Stoeckl, N., Farr, M., and Sakata, H., (2013), *What do residents and tourists 'value' most in the GBRWHA? Project 10-2 Interim report on residential and tourist data collection activities including descriptive data summaries*. Report to the National Environmental Research Program. Reef and Rainforest Research Centre Limited, Cairns, pp. 112, available at: <http://www.nerptropical.edu.au/publication/project-102-technical-report-what-do-residents-and-tourists-'value'-most-gbrwha>

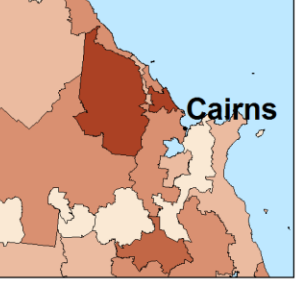
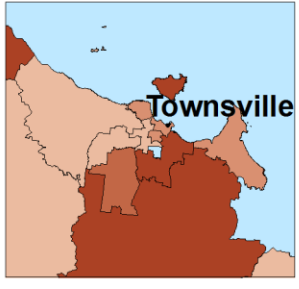
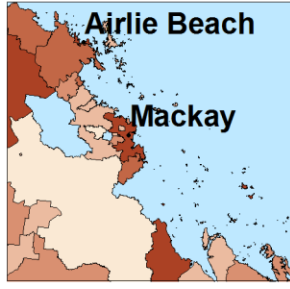
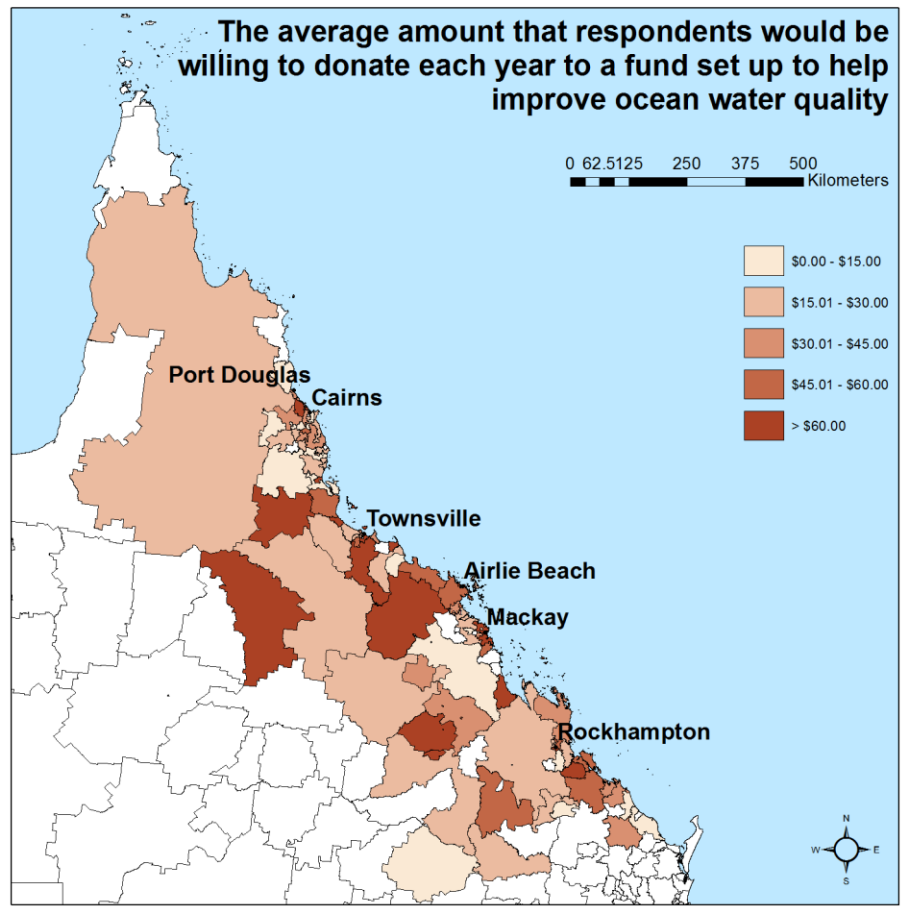
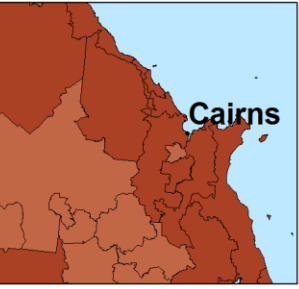
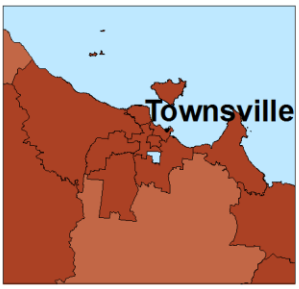
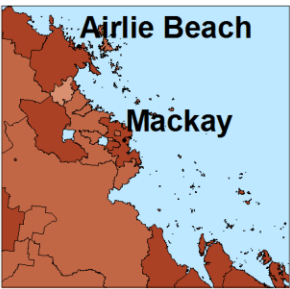
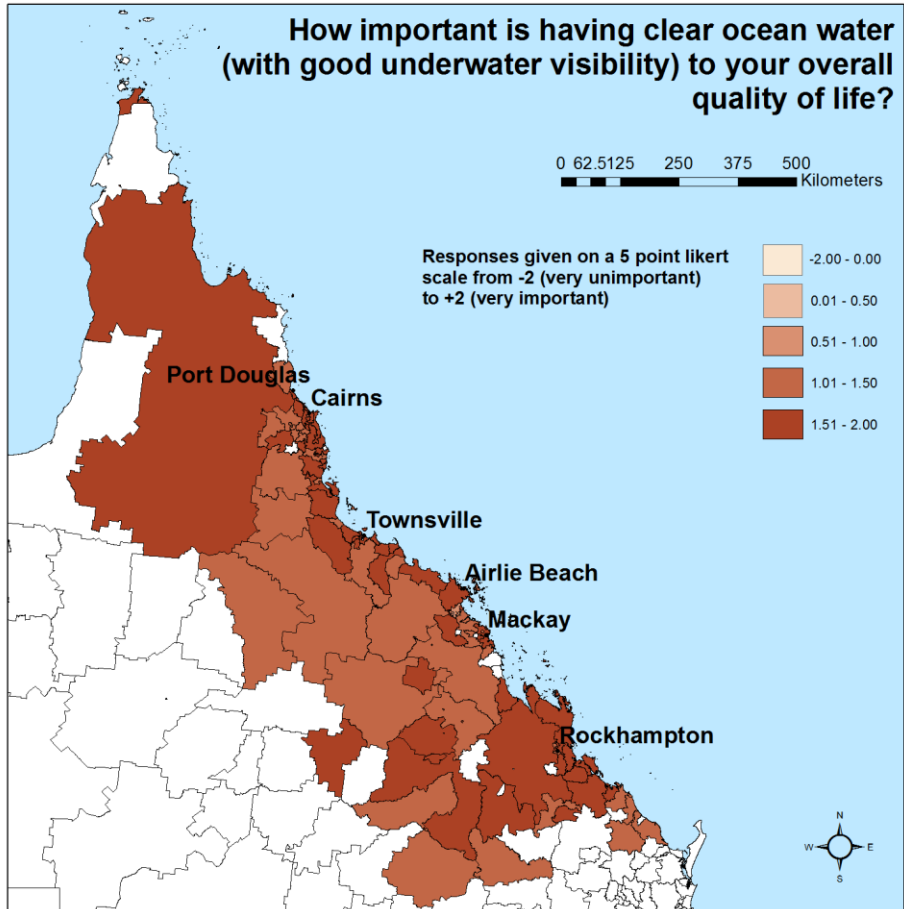
- Overview of methods, data collection processes, and summary of data (descriptive statistics)

## Factsheets

- An overview with interim results (largely for DOE) – April 2014
- Tourism factsheets, developed for the industry
  - One of each region (Cairns/Port Douglas; Townsville/Whitsundays; Mackay/Rockhampton); One for Chinese visitors, one for Japanese visitors
  - Series focusing on Domestic visitors (at request of TTNQ);
  - Series on specialist issues – drive tourists, food tourists etc.

## Residential and Tourist data summaries + LT visitor exit survey data submitted to e-atlas

## Maps summarising distribution of responses at regional scale (residential data)





# SOCIOECONOMIC SYSTEMS AND REEF RESILIENCE:

## OUTPUTS (CONT)

### Contributions to chapters and working papers

- ADC Northern Australia Development Summit; Working paper on the northern Economy
- Stoeckl, N., Farr, M., Reside, A., Curnock, M. Larson, M., Crowley, G., Turton, S., Prideaux, B., Marshall, N., Gillett, S. (2014), Potential impacts of Climate Change on Industries, in Hilbert D. W., Hill R., Moran C., Turton, S. M., Bohnet I., Marshall N. A., Pert P. L., Stoeckl N., Murphy H. T., Reside A. E., Laurance S. G. W., Alamgir M., Coles R., Crowley G., Curnock M., Dale A., Duke N. C., Esparon M., Farr M., Gillet S., Gooch M., Fuentes M., Hamman M., James C. S., Kroon F. J., Larson S., Lyons P., Marsh H., Meyer Steiger D., Sheaves M. & Westcott D. A. 2014. *Climate Change Issues and Impacts in the Wet Tropics NRM Cluster Region*. James Cook University, Cairns, available at: <https://publications.csiro.au/rpr/pub?list=ASE&pid=csiro:EP14913>.
- Pert, P., Alamgir, M., Crowley, G., Dale, A., Esparon, M., Farr, M., Reside, A., Stoeckl, N. (2014), The impacts of climate change on key regional ecosystems, in Hilbert D. W., Hill R., Moran C., Turton, S. M., Bohnet I., Marshall N. A., Pert P. L., Stoeckl N., Murphy H. T., Reside A. E., Laurance S. G. W., Alamgir M., Coles R., Crowley G., Curnock M., Dale A., Duke N. C., Esparon M., Farr M., Gillet S., Gooch M., Fuentes M., Hamman M., James C. S., Kroon F. J., Larson S., Lyons P., Marsh H., Meyer Steiger D., Sheaves M. & Westcott D. A. 2014. *Climate Change Issues and Impacts in the Wet Tropics NRM Cluster Region*. James Cook University, Cairns. available at: <https://publications.csiro.au/rpr/pub?list=ASE&pid=csiro:EP14913>.



# SOCIOECONOMIC SYSTEMS AND REEF RESILIENCE:

## OUTPUTS (CONT)

### Journal articles – published or accepted

1. Jarvis, D., Stoeckl, N., Chaiechi, T. (2013) “Applying econometric techniques to hydrological problems in a large basin: quantifying the rainfall-discharge relationship in the Burdekin, Queensland, Australia”, *Journal of Hydrology*.  
<http://dx.doi.org/10.1016/j.jhydrol.2013.04.043>
2. Bos, M., Pressey, B., Stoeckl, N. (Forthcoming),” Effective Marine Offsets for the Great Barrier Reef World Heritage Area”, *Environmental Science and Policy*.
3. Farr, M., Stoeckl, N., and Sutton, S. (2014) “Recreational Fishing and Boating: are the determinants the same?” *Marine Policy*, 47: 126-137
4. Larson, S., Farr, M., Stoeckl, N., Cacon, A., Esparon, M., (Forthcoming), Does participation in outdoor activities determine residents’ appreciation of nature: explorations of resident activities and perceptions in the Great Barrier Reef region, Australia. *Environmental and Natural Resources Research*



# SOCIOECONOMIC SYSTEMS AND REEF RESILIENCE: OUTPUTS (CONT)

## Book chapter

9. Jamal, T., Prideaux, B., Thompson, M., & Sakata, H. (forthcoming). A micro-macro assessment of climate change and visitors to the Great Barrier Reef, Australia. In V.J. Reddy & K. Wilkes (Eds.), *Tourism in the Green Economy*. Routledge.

## Conference Papers

10. Jamal, T., Prideaux, B., Thompson, M., & Sakata, H. (2014). A preliminary exploration of tourists as a key stakeholder in climate change impact management. Referred paper presented at the meeting of the CAUTHE national conference *Tourism and hospitality in the contemporary world: trends, change and complexity*, Brisbane, 10-13<sup>TH</sup> February, 2014.
11. Prideaux, B., Lee, L., & Thompson, M. (2014). Tourists' perspectives on protecting Australia's Great Barrier Reef: Concerns, challenges and possible policy responses. Paper presented at the meeting of the Global Tourism and Hospitality Conference and Asia Tourism Forum *Charting the new path: innovations in tourism and hospitality*, Hong Kong, 18-20<sup>th</sup> May, 2014.



# SOCIOECONOMIC SYSTEMS AND REEF RESILIENCE:

## OUTPUTS (CONT)

### Journal articles – in review

5. Assessing the impact of price changes and extreme climatic events on sediment loads in a large river catchment near the Great Barrier Reef (Chaiechi et al)
6. Overcoming problems of overlapping values when assessing entire ecosystems: a case-study of Australia's Great Barrier Reef. (Stoeckl et al)
7. The role Great Barrier Reef plays in resident wellbeing and implications for management (Larson et al)
8. The significance of environmental values to the Great Barrier Reef World Heritage Area 's tourism competitiveness (Esparon et al)
12. The impact of economic, social and environmental factors on satisfaction and repeat visitation in the GBR (Jarvis et al)
13. The importance of Water Clarity to Tourists in the Great Barrier Reef and their willingness to pay to improve it (Farr et al)



# SOCIOECONOMIC SYSTEMS AND REEF RESILIENCE: ADDITIONAL OUTPUTS ANTICIPATED BEFORE END DEC 2014

## Final Project Report

## Journal articles – in prep or under revision

- Estimating the existence value of natural assets using the life satisfaction approach: a case study of the Great Barrier Reef (Jarvis et al)
- The potential implications of environmental deterioration on business and non-business visitor expenditures at a natural setting: the case of Great Barrier Reef World Heritage Area, Australia (Mustika et al)

## Workshop/presentations

- November NERP conference



## LONG-TERM MONITORING AT CAIRNS AIRPORT

### WHERE TO ACCESS RESULTS

- Publications – Technical reports, factsheets
- MTSRF (2007-2010 results)
  - Project 4.9.2 Sustainable nature-based tourism: planning and management
  - [http://www.rrrc.org.au/mtsrf/theme\\_4/project\\_4\\_9\\_2.html](http://www.rrrc.org.au/mtsrf/theme_4/project_4_9_2.html)
- NERP (2012-2014 results)
  - NERP Tropical Eco-systems Hub, Project 10.2
  - <http://www.nerptropical.edu.au/>



## SOCIOECONOMIC SYSTEMS AND REEF RESILIENCE: WHAT DO WE SEEK TO KNOW AND WHY?

- The influence of socioeconomic variables (e.g. price, cattle numbers) on water quality/sediment

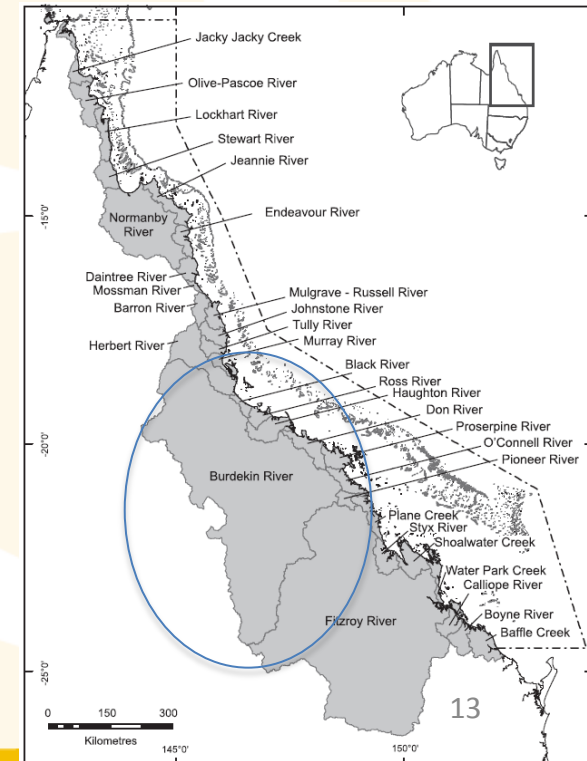
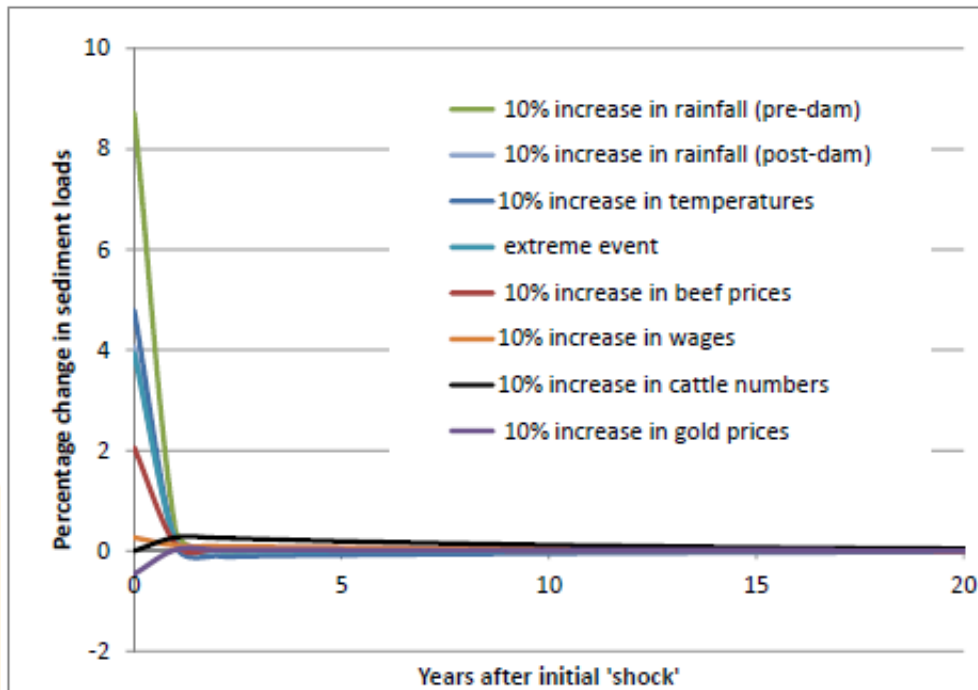
**Tells us about what the economy does to the GBRWHA**

**(also provides an indication of whether market based policies are likely to achieve environmental goals)**

# KEY FINDINGS

## Journal articles – published and in review

1. Jarvis, D., Stoeckl, N., Chaiechi, T. (2013) “Applying econometric techniques to hydrological problems in a large basin: quantifying the rainfall-discharge relationship in the Burdekin, Queensland, Australia”, *Journal of Hydrology*.  
<http://dx.doi.org/10.1016/j.jhydrol.2013.04.043>
2. Assessing the impact of price changes and extreme climatic events on sediment loads in a large river catchment near the Great Barrier Reef (Chaiechi et al, in review)



Full model: predicted change in sediment loads associated with various 'changes'



## SOCIOECONOMIC SYSTEMS AND REEF RESILIENCE: WHAT DO WE SEEK TO KNOW AND WHY?

- The relative 'value' (benefit) of the goods and services provided by the Great Barrier Reef World Heritage Area (GBRWHA) to residents of and visitors to the GBR Catchment area

**Tells us about what the GBRWHA does to/for the economy**  
**(also provides indication of likely environment/economy trade-offs)**

- Plus some 'geeky' (fundamental) science exploring new ways of estimating the 'value' of non market goods and services



# GBRWHA RESIDENT AND TOURIST STUDIES

- Conducted major literature review
- Ran several workshops in Cairns, Townsville and Brisbane, to identify
  - A variety of different ecosystem services (use/non-use 'values') for assessment and other goods/services to be compared with
  - Key management issues/problems for assessment
  - Appropriate sampling strategies
- Used insights to develop draft questionnaires, conducted pre-tests in workshops, amended accordingly
- Conducted pre-tests in airport (mainly tourist surveys) and in residential mail-out, only minor adjustments necessary.
- Collected data, analysed, in write-up phase (interim report already available)

# KEY SECTIONS OF THE RESIDENT SURVEY

- *Background demographics, activities in the GBRWHA*
- *Satisfaction with life overall*
  - To compare with satisfaction with GBRWHA goods and services
  - To look at the way in which life-satisfaction varies with social, economic, demographic AND biophysical factors
- *Importance of and satisfaction with 18 different goods and services* (randomised order)
  - To rank goods and services in terms of (a) importance & (b) satisfaction
  - To compare importance and satisfaction, looking for significant 'gaps'
  - To look at differences in 'values' for different 'types' of people &/or people in different regions.
- *Impact of 8 different hypothetical "changes" to different goods and services on overall quality of life:*
  - To compare with other prioritisation data
  - Look for similarities/differences in responses for different 'types' of people and/or regions
- *WTP (a) for improvements in water quality; (b) to protect top predators; (c) to reduce risk of shipping accidents* , plus questions to help contextualise:
  - To compare with other prioritisation data
  - To look for similarities/differences in responses for different 'types' of people and/or regions



# KEY SECTIONS OF THE GBR TOURIST SURVEY

- Wherever possible have kept questions identical to those in the resident survey
  - Allows comparisons tourists and residents
- Have included *extra questions often asked and monitored in tourism studies*, so can:
  - continue long-term monitoring started during MTSRF (Prideaux);
  - compare with other tourism studies.
- The *importance questions focus on reason for coming to the region* (rather than importance to overall quality of life)
- Slightly different set of 'market' goods (to compare with non-market goods) for satisfaction/importance questions.
- The *Impact of "changes"* question asks about *how much shorter trip the may have been* (rather than on the impact on overall quality of life)
- Also collected *expenditure data* from 50% of sample (the other 50% had WTP instead) so can look at:
  - regional economic impact of tourism;
  - potential regional economic impact of "changes".



# THE GBR RESIDENTIAL SAMPLE

- Mailed questionnaires to random selection of households across 106 postcodes that lie partially (or entirely) in GBR catchment area;
  - 47 responses from pre-test (from 199; response rate of 23.6%)
  - 902 responses from the main survey (from 3977; response rate of 22.7%)
- Also collected data from residents when intercepted during tourism sampling (e.g. fly-in/fly-out miners and or business people at airports; residents at the beach) – additional 663
- In total, 1592 usable responses
  - Reasonably representative of population in terms of location/geography, gender, income, industry of employment (slightly more miners, fishers, and agriculturalists).
  - Those aged over 45 and those with higher education were over-represented.

# THE GBR TOURIST SAMPLE

## Collected data from 2743 visitors to the GBR catchment

- Over 12 month period to control for seasonality (2012/13)
- At airports, lagoons, caravan parks, ferry terminals and through tourism operators (36) who gave questionnaires to customers
- In three GBRMPA 'management areas'
  - Mackay/Capricorn ( $\approx 10\%$  of visitors; 8% of sample)
  - Townsville/Whitsunday ( $\approx 40\%$  of visitors; 41% of sample)
  - Cairns/Cooktown ( $\approx 50\%$  of visitors ; 51% of sample)
    - Also translated questionnaires into Chinese and Japanese, and used Mandarin and Japanese speaking research assistants to distribute at Cairns domestic and international airports. In 2012
      - $\approx 15\%$  of visitors to this region were Chinese; 16% of regional sample
      - $\approx 15\%$  of visitors to this region were Japanese; 18% of regional sample



# OUR LONG-TERM CAIRNS AIRPORT VISITOR EXIT SURVEY

Prof. Bruce Prideaux and Michelle Thompson

- A continuation of the long-term monitoring of tourists as they leave Cairns airport (which Bruce Prideaux has been undertaking since 2007)

**Gives an indication of trends over time**

(program also provides opportunity for investigation of 'pressing' issues for industry)



# LONG-TERM MONITORING AT CAIRNS AIRPORT

## HOW DID WE COLLECT THE DATA?

- Exit survey of tourists
- Administered at domestic terminal, Cairns International Airport
- 2-3 days/month since 2007
- 3-4pg self-administered survey form
- Closed and open-ended questions
- Research assistant approach participants, ask if they were visiting the region on holidays, and then invite them to participate
- Limitations
  - Representative of English speaking tourists
  - Representative of those departing Cairns/region via Cairns Airport
  - Views of self-drive market and Eastern markets are under-represented
  - 2014 data comprises only 5 months



# LONG-TERM MONITORING AT CAIRNS AIRPORT

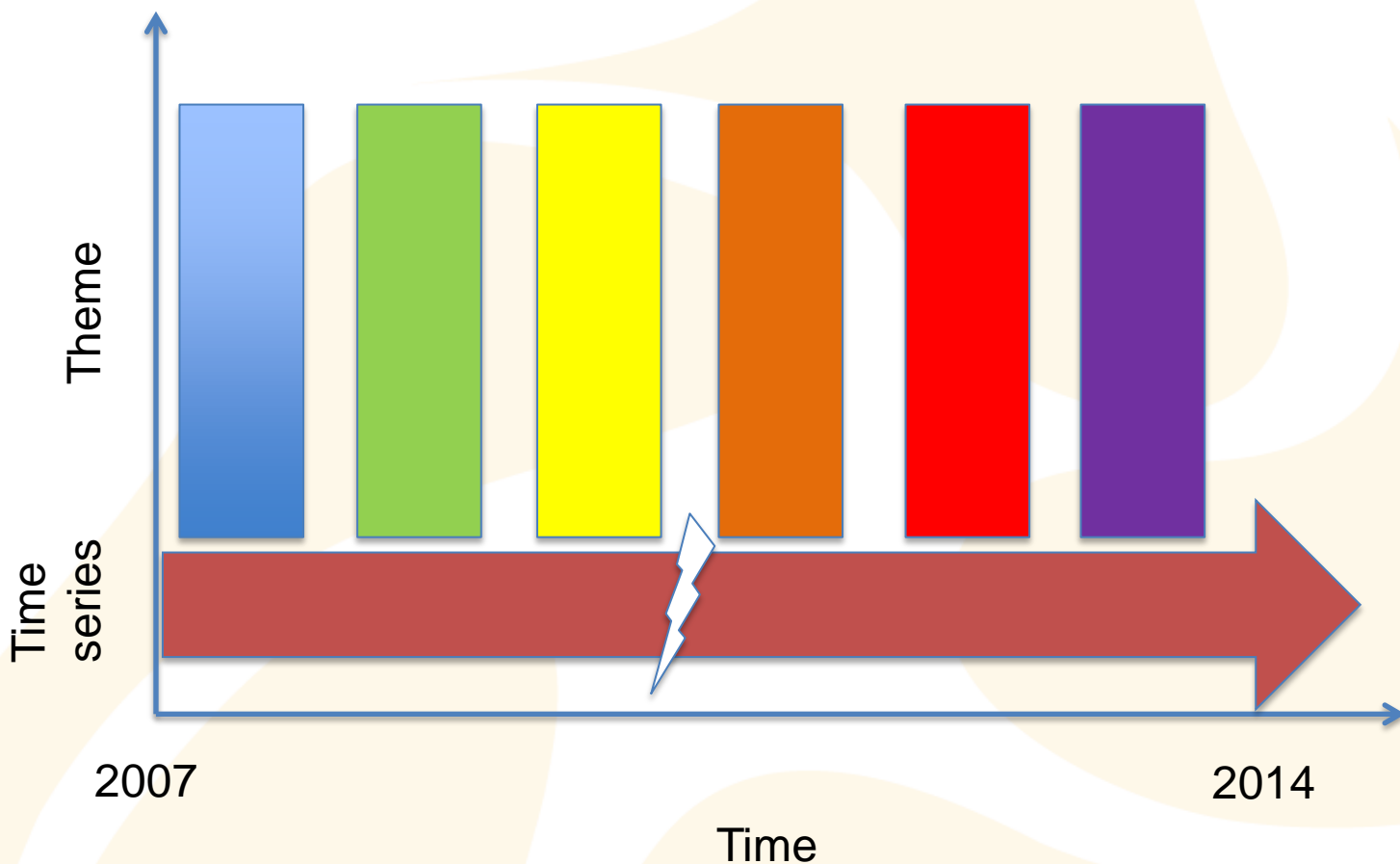
## WHAT DATA DO WE HAVE?

- Long-term monitoring database across 2 programs:
  1. MTRSF Project
    - January 2007 to June 2010
    - Sample size: 5177
    - Core: socio-demographic variables, travel motivations, travel patterns – regional dispersal, participation & satisfaction, GBR/WTR visitation
    - Themes: WHA listing, interpretation, environmental awareness
  2. NERP Project
    - January 2012 to May 2014
    - Sample size: 2873
    - Core: socio-demographic variables, travel motivations, travel patterns – regional dispersal, participation & satisfaction, GBR/WTR visitation
    - Themes: airlines, climate change, eco-tourism, food tourism, indigenous tourism



# LONG-TERM MONITORING AT CAIRNS AIRPORT

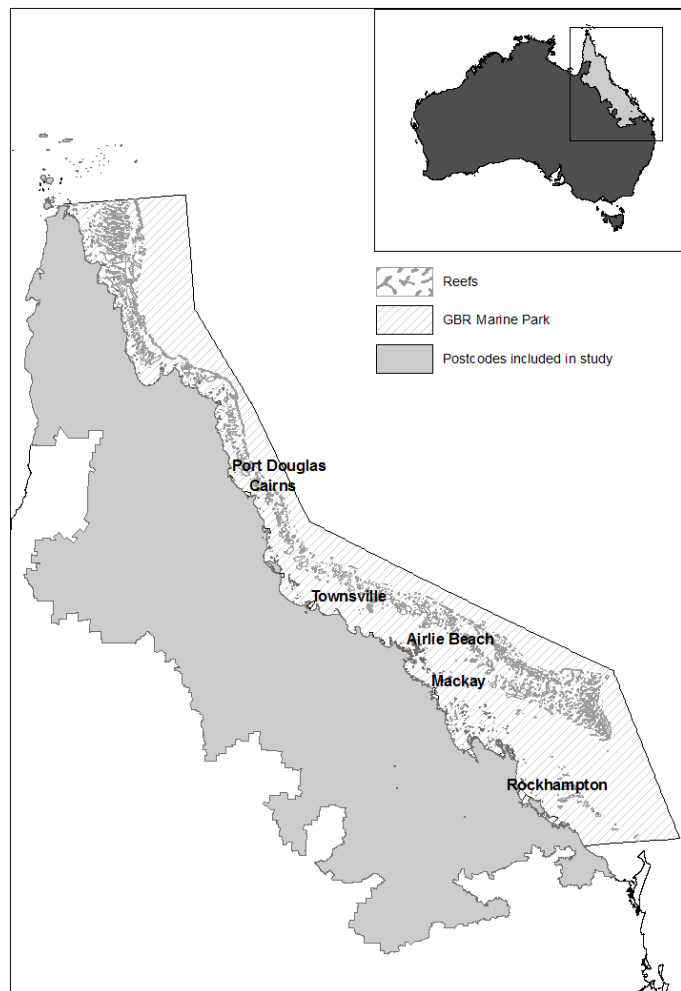
## WHAT THE DATA TELLS US



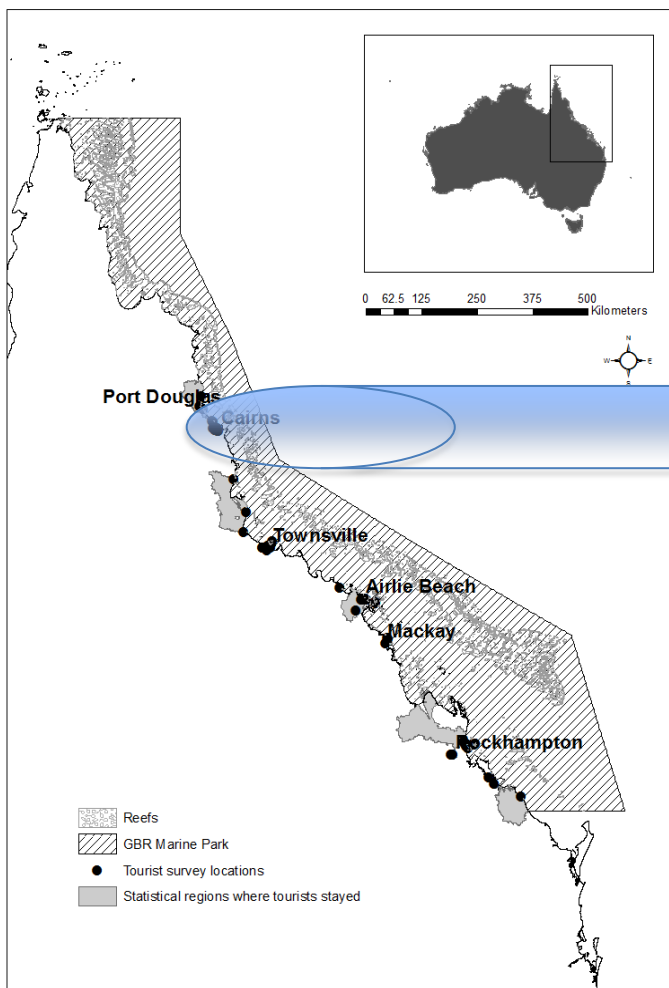


# OVERVIEW OF PROJECT 10.2's DATA

2013 Survey of 1592  
residents living adjacent to  
the GBR



2012/13 Survey of 2743  
visitors to the GBR  
catchment area

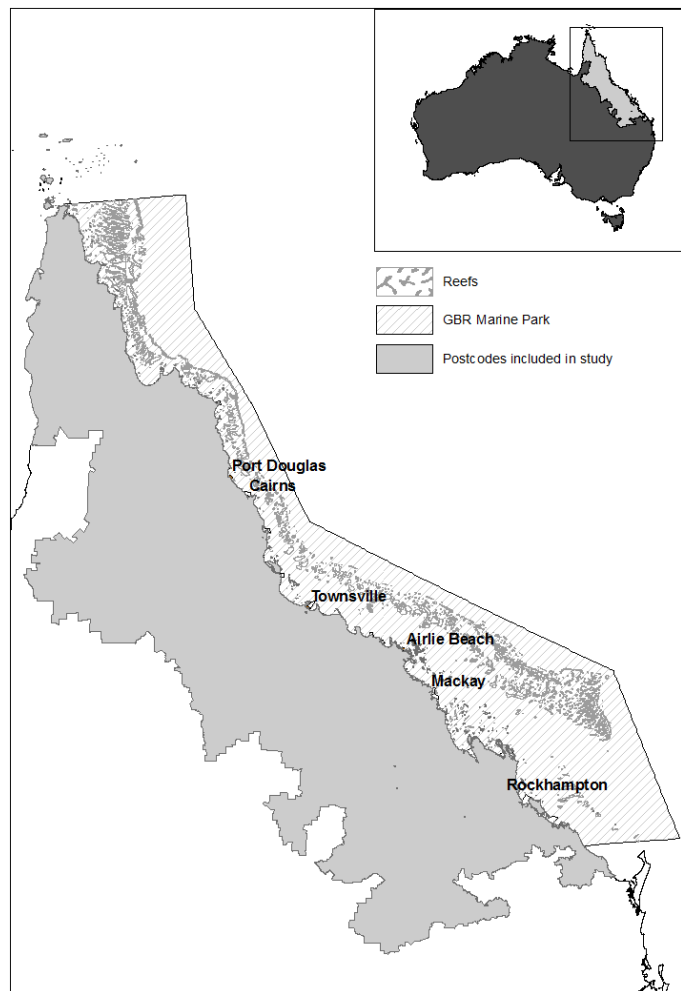


2007 – 2014  
8050 visitor exit  
surveys from Cairns  
airport

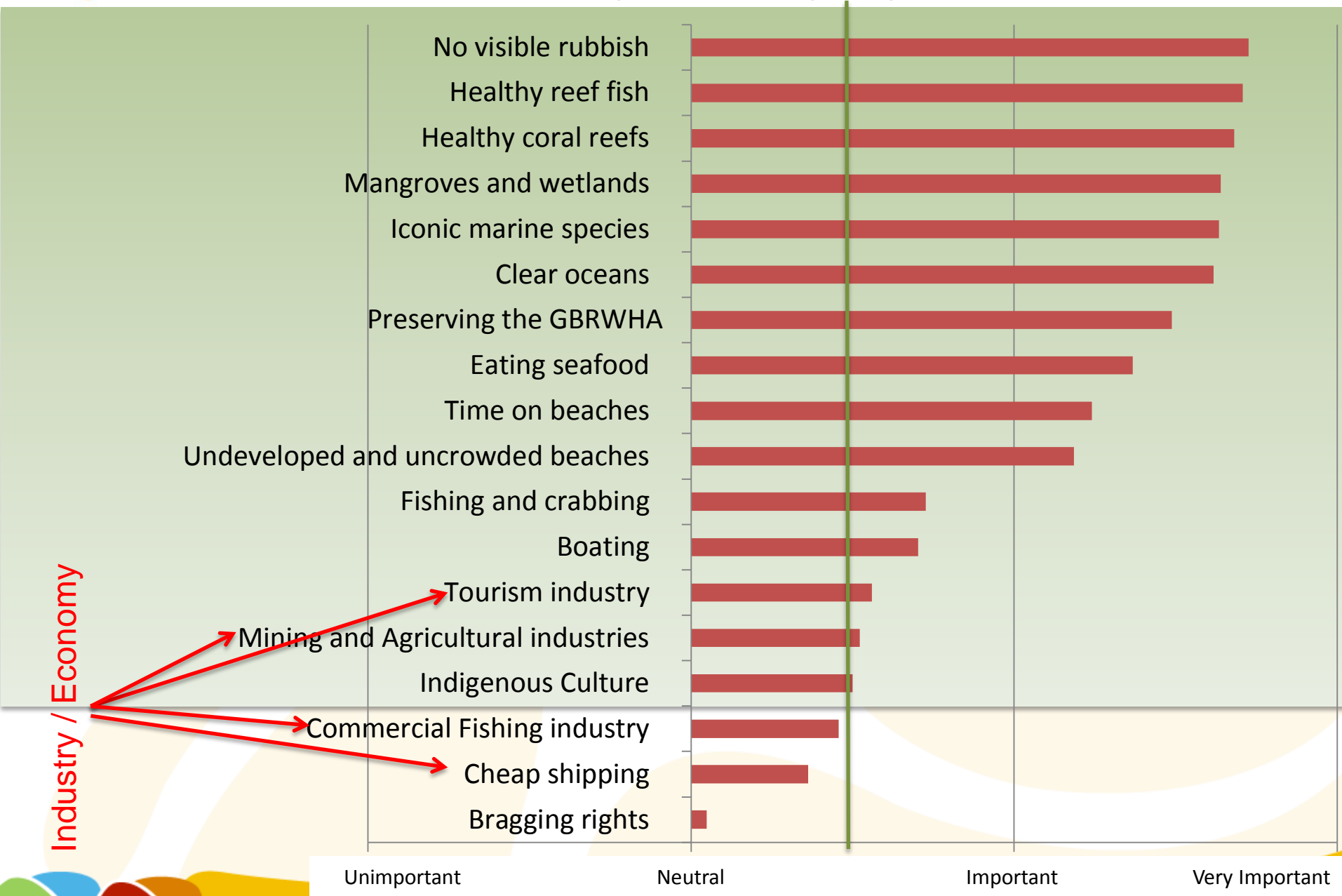


# INSIGHTS FROM OUR RESIDENT SURVEY

2013 Survey of 1592  
residents living adjacent to  
the GBR



# GBR Residents – How important are each of the following to your overall quality of life ? (N=1001)

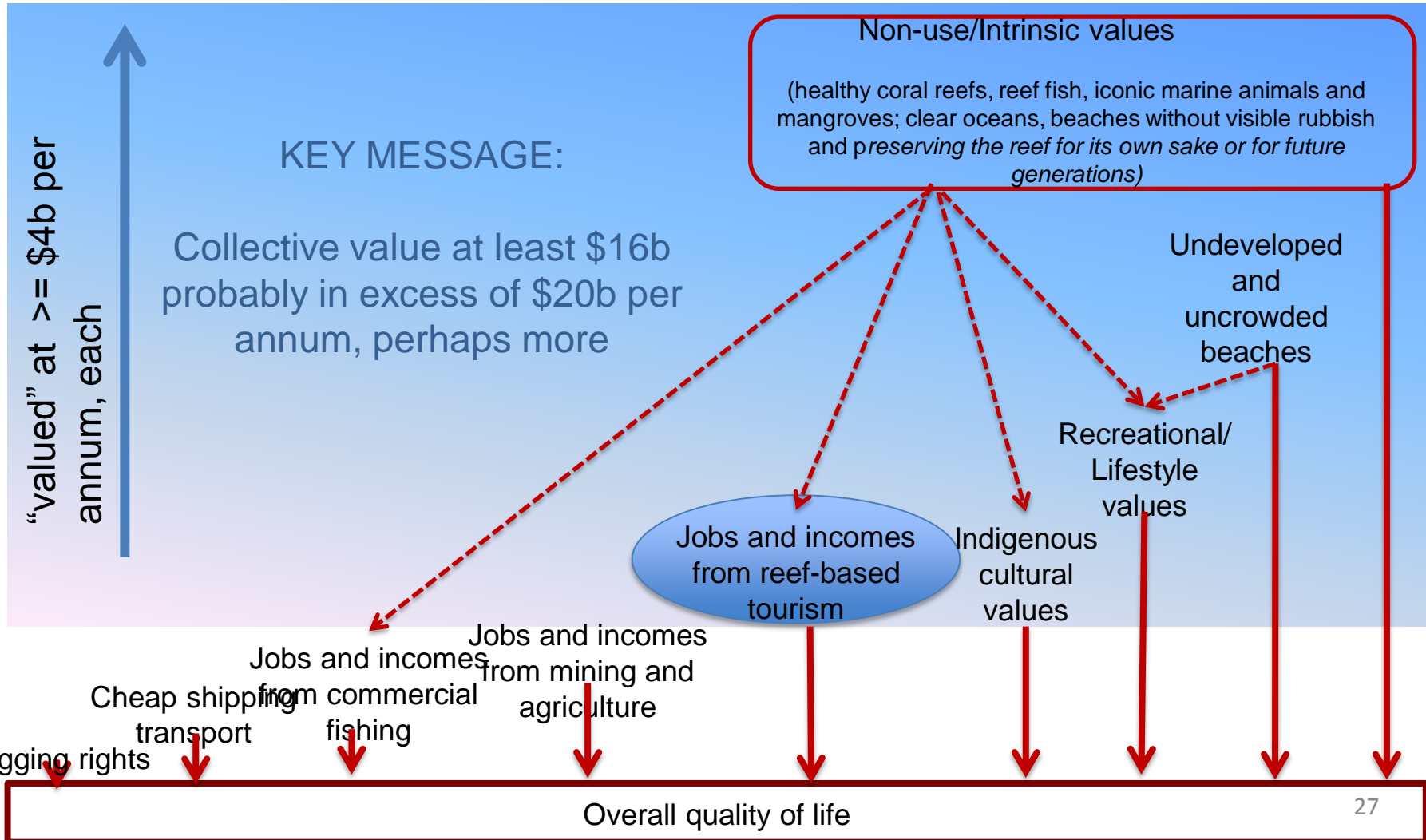




# KEY FINDINGS (CONT)

## Journal articles – in review

6. Overcoming problems of overlapping values when assessing entire ecosystems: a case-study of Australia's Great Barrier Reef. (Stoeckl et al)

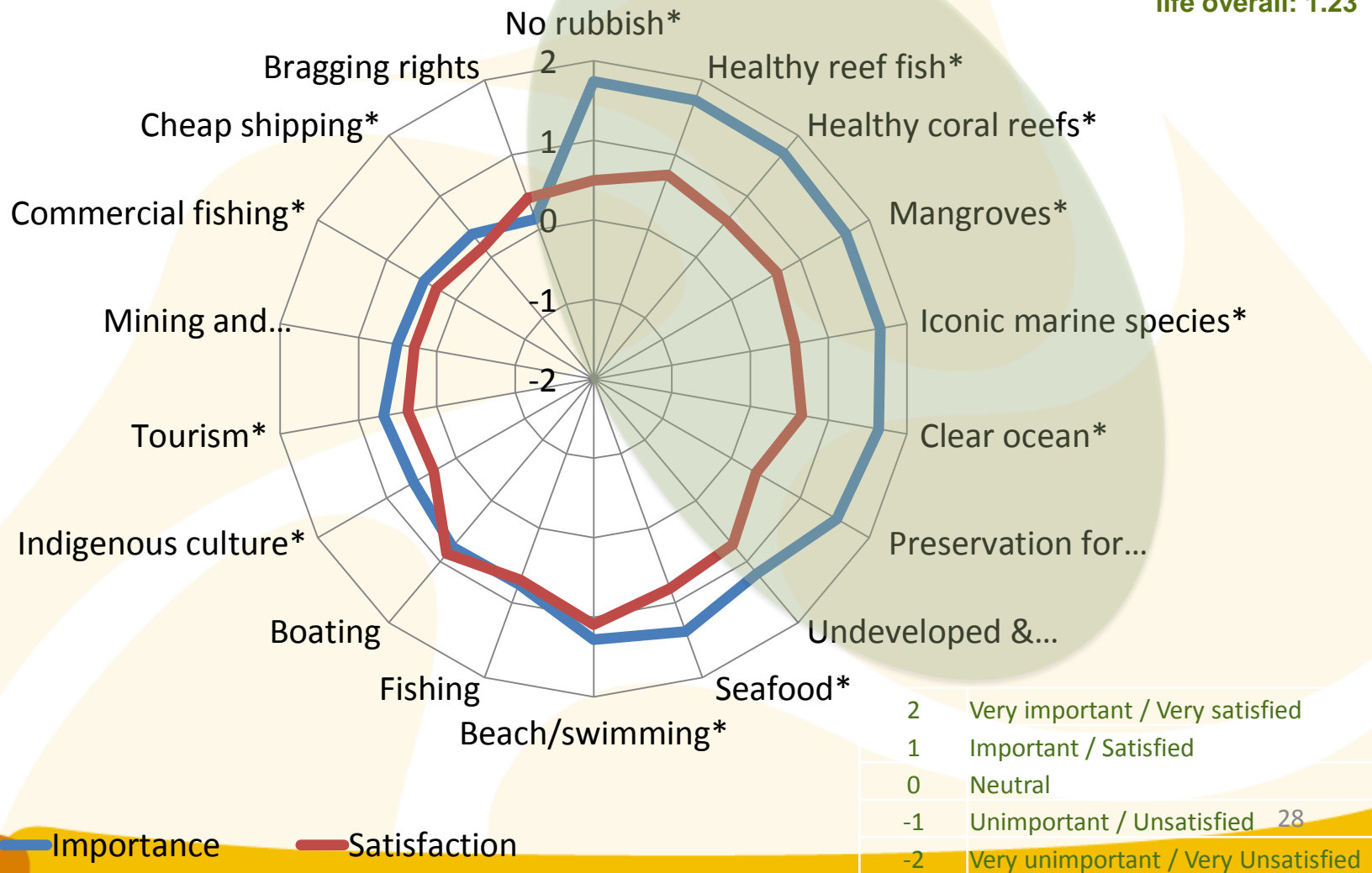


# KEY FINDINGS (CONT)

## Journal articles – in review

### 7. The role the GBR plays in resident wellbeing and implications for management (Larson et al)

**Satisfaction with  
life overall: 1.23**



# KEY FINDINGS (CONT)

## Journal articles – in review

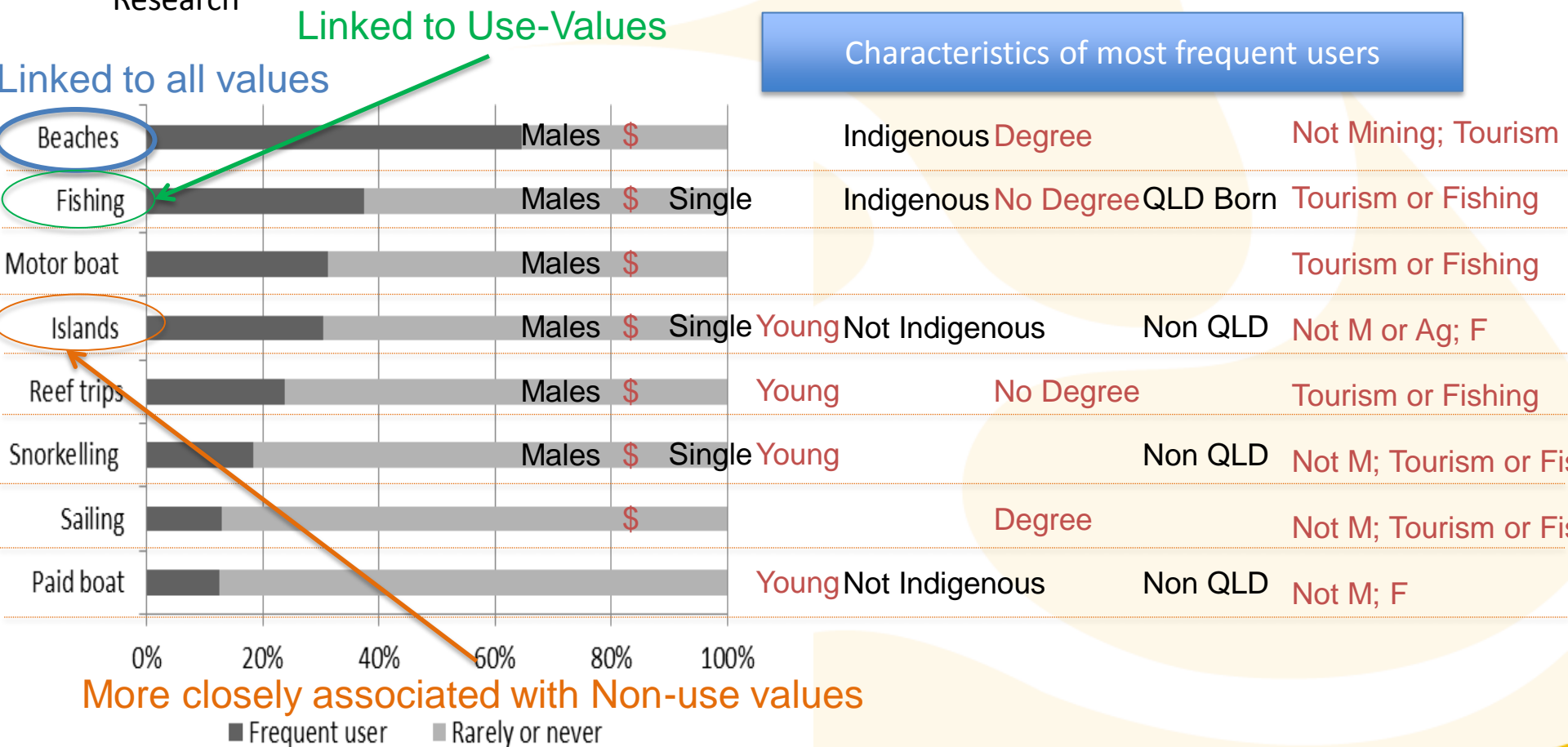
### 7. The role the GBR plays in resident wellbeing and implications for management (Larson et al)

	Non-Use (I, IDS)
Male	-, -
Education	+, +
Single	
Age	
Household income	
Indigenous	
Born in QLD	
Main household income from:	
Mining	
Fishing	
Government	°, +
Tourism	
Agriculture	

## Journal articles – accepted

# KEY FINDINGS (CONT)

4. Larson, S., Farr, M., Stoeckl, N., Chacon, A., Esparon, M., (Forthcoming), Does participation in outdoor activities determine residents' appreciation of nature: explorations of resident activities and perceptions in the Great Barrier Reef region, Australia. Environmental and Natural Resources Research



# KEY FINDINGS (CONT)

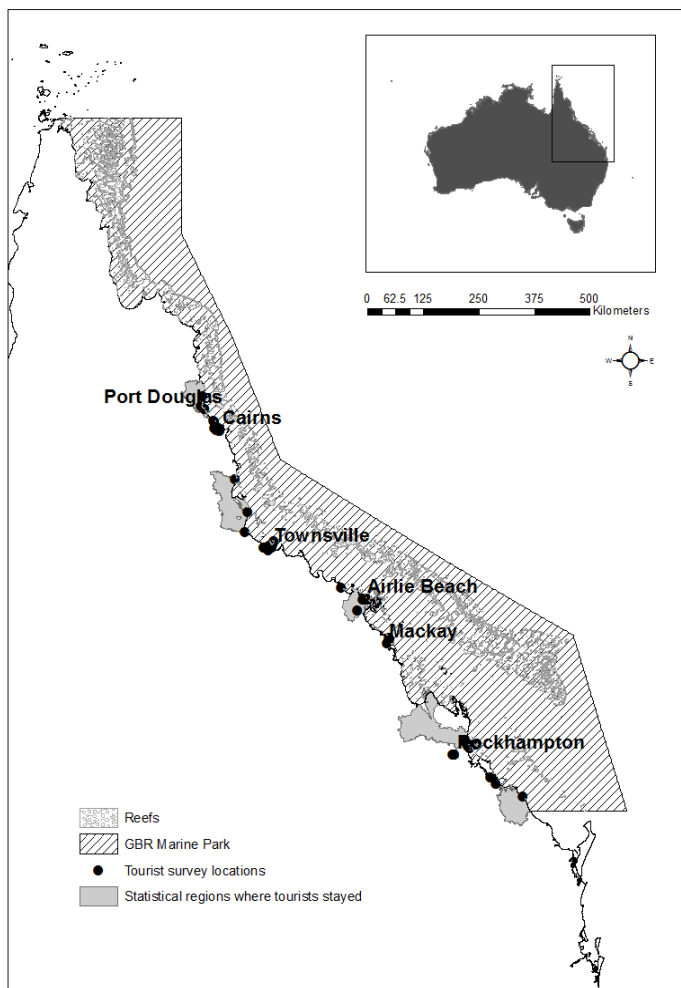
## Journal articles – in prep

13. Estimating the existence value of natural assets using the life satisfaction approach: a case study of the Great Barrier Reef (Jarvis et al)

Determinants of Life Satisfaction	Cairns	Townsville	Mackay	Fitzroy
Age (older => happier)	Age effect stronger in the south			
Male (males less happy)	Gender effect stronger in the north			
Married (married happier)	Marital effect stronger in the north			
University Degree (degree happier)	Education effect stronger in the north			
Income (income happier)	Income effect stronger in the south			
The level of satisfaction that the GBRWHA will be preserved for future generations (positive impact on LS)	Preservation effect stronger in the north			



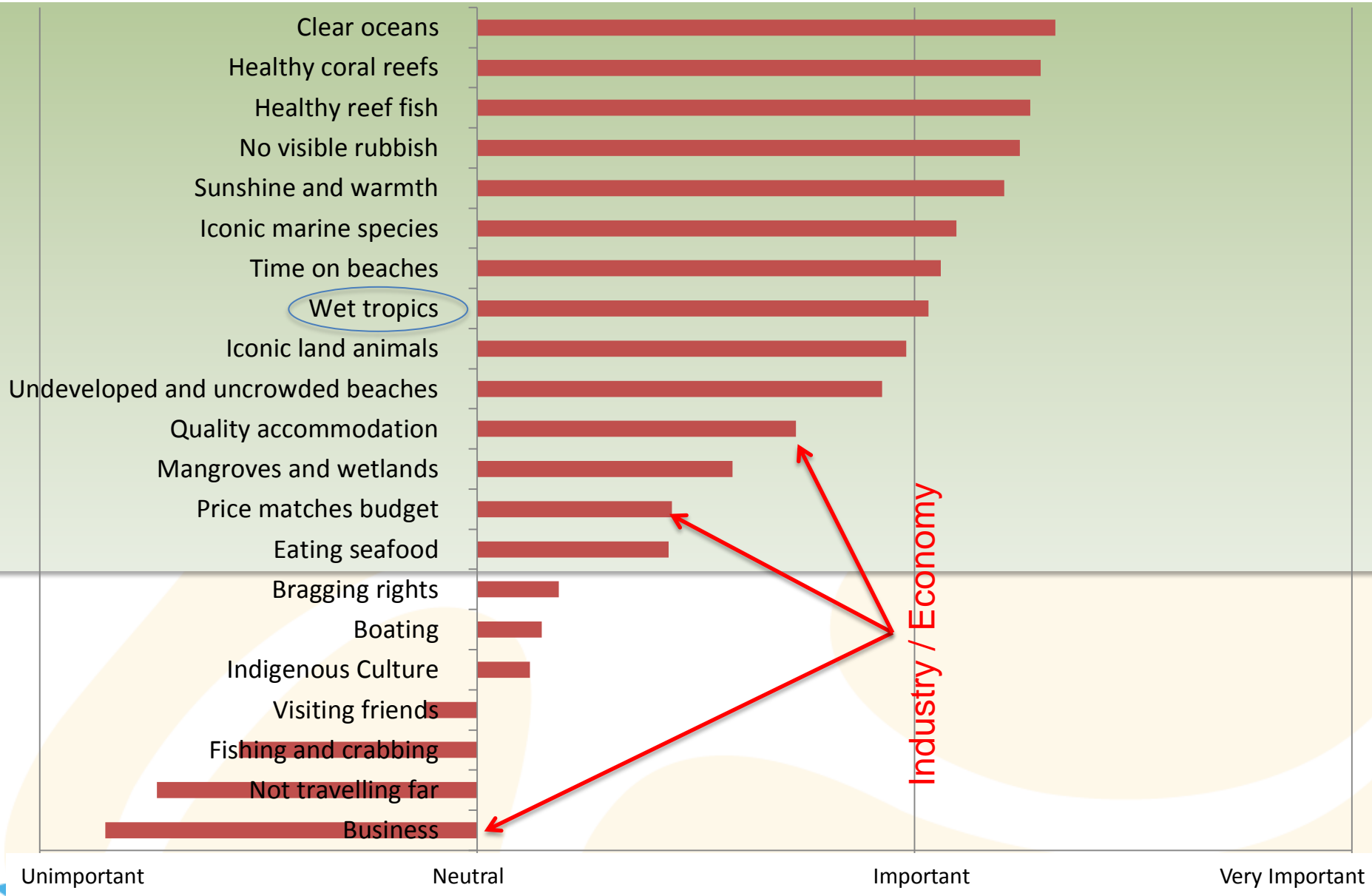
2012/13 Survey of 2743  
visitors to the GBR  
catchment area



# INSIGHTS FROM OUR CROSS- SECTIONAL / REGIONAL TOURIST SURVEY

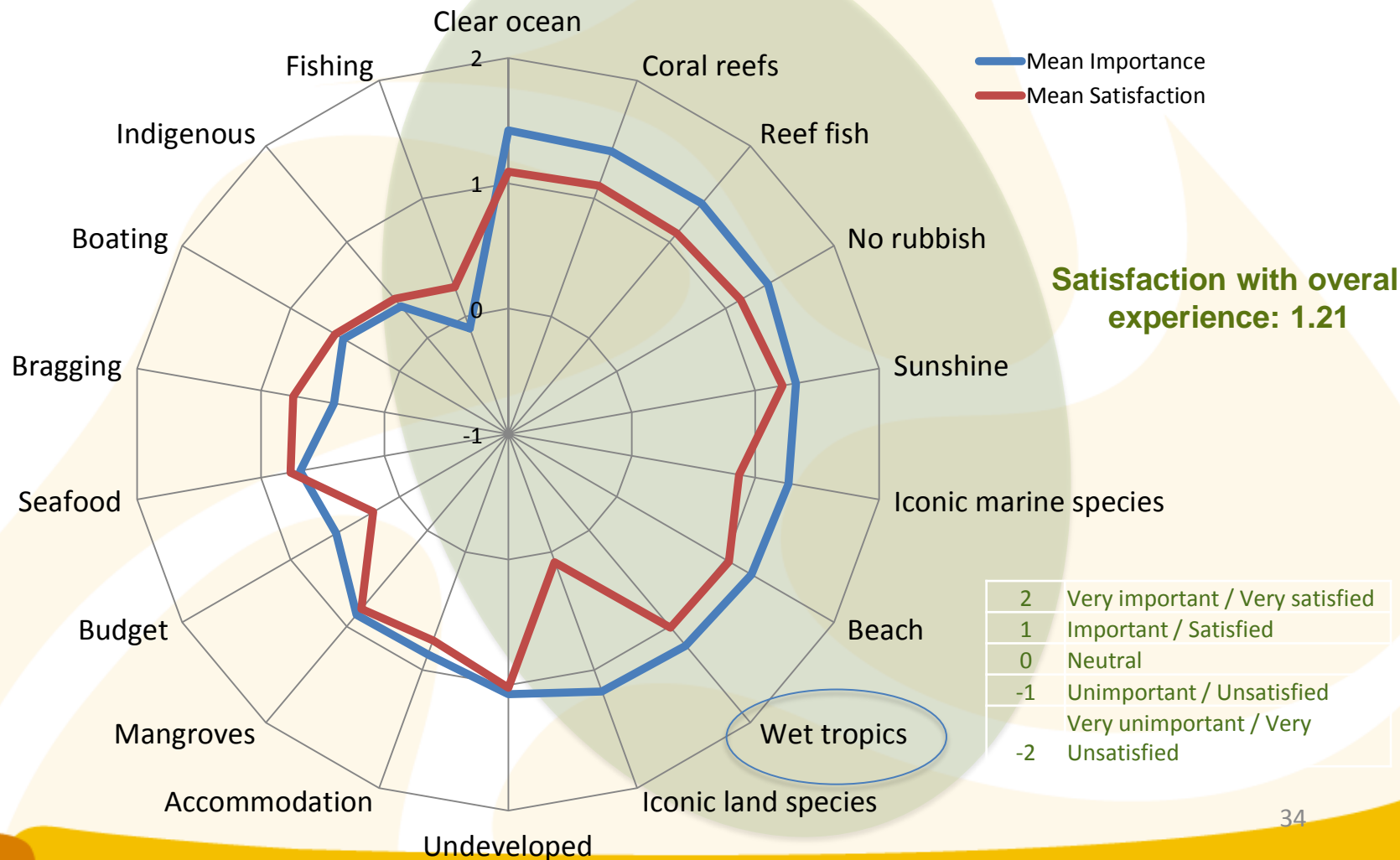


# Tourists – How Important were each of the following as a reason for coming to this part of Australia ? (N = 2455)



# KEY FINDINGS (CONT)

8. The significance of environmental values to the Great Barrier Reef World Heritage Area 's  
 tourism competitiveness (Esparon et al)

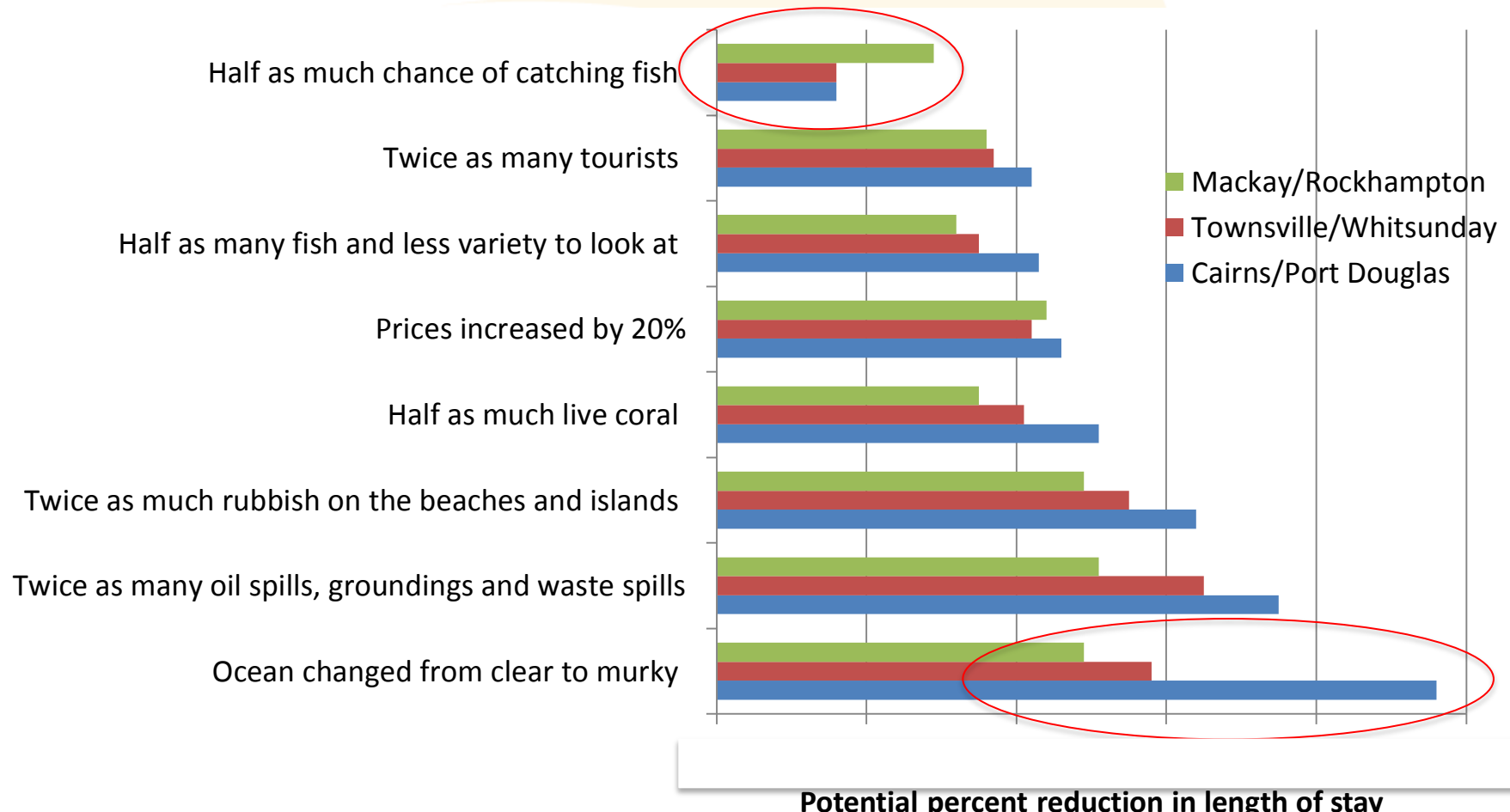


# KEY FINDINGS (CONT)

## Journal articles – in review

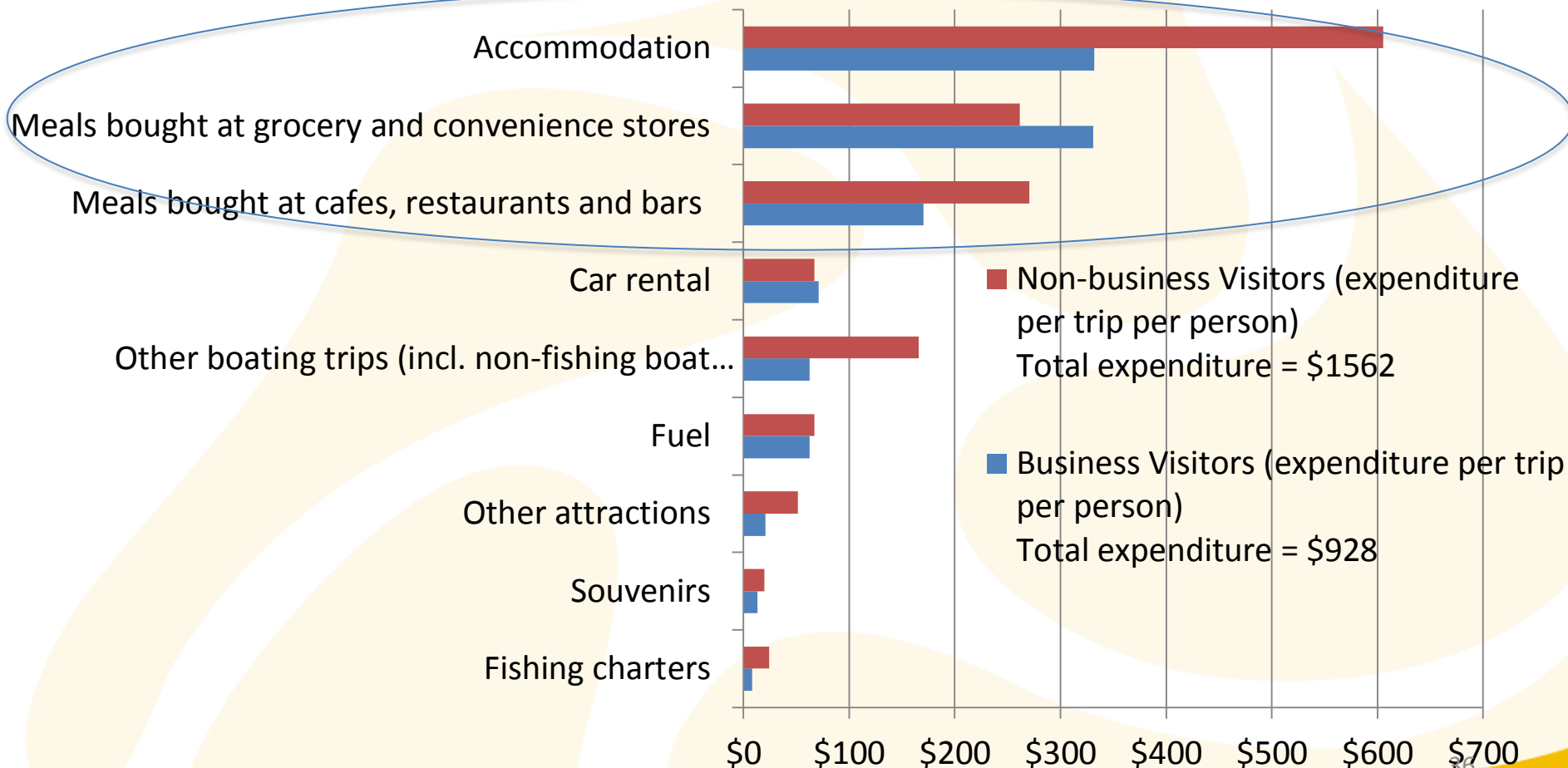
8. The significance of environmental values to the Great Barrier Reef World Heritage Area 's tourism competitiveness (Esparon et al)

How would each of the following changes have affected your decision to come to the region, and your length of stay ?



# KEY FINDINGS (CONT)

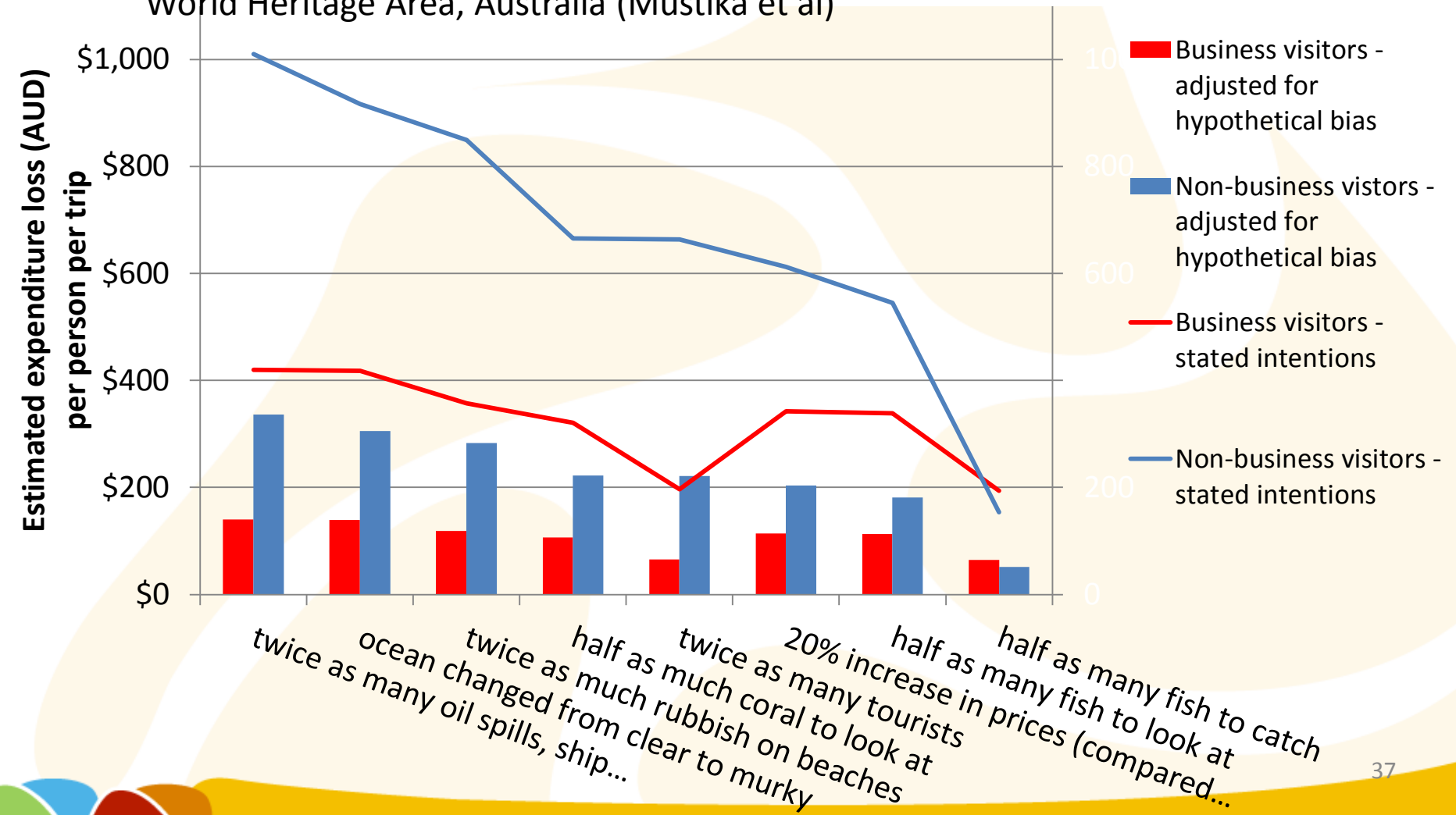
## 14. The potential implications of environmental deterioration on business and non-business visitor expenditures at a natural setting: the case of Great Barrier Reef World Heritage Area, Australia (Mustika et al)



# KEY FINDINGS (CONT)

## Journal articles – in prep

14. The potential implications of environmental deterioration on business and non-business visitor expenditures at a natural setting: the case of Great Barrier Reef World Heritage Area, Australia (Mustika et al)





# KEY FINDINGS (CONT)

## Journal articles – in prep

### 12. The impact of economic, social and environmental factors on satisfaction and repeat visitation in the GBR (Jarvis et al)

#### **Probability that a tourist will RETURN, depends on**

- Their origin(North America, Asia or Europe: negative)
- The number of previous visits to GBR: positive
- Trip satisfaction: positive

#### **Trip satisfaction depends on:**

- Tourist income: positive
- Spent 1 or less nights: negative
- Tourist visited reef at least once: positive
- Belief that lost wallet would be returned: positive
- Intensity of construction works: negative
- Rainfall: negative
- Water Turbidity (predicted value\*): negative

Could potentially 'lose' up to \$400k per annum in tourist revenues (across entire GBR catchment) if a 10% increase in turbidity



\* To control for endogeneity, we used predicted values from the regression of water turbidity (at specific time and location) against rainfall + TSS from closest river + wind speed

# KEY FINDINGS (CONT)

## Journal articles – in prep

12. The impact of economic, social and environmental factors on satisfaction and repeat visitation in the GBR (Jarvis et al)

Scenarios	Potential increase in tourism revenues
<b>(from 9.1: Eve MacDonald &amp; Ken Anthony's project)</b>	
25% reduction in TSS in each of the rivers flowing in to the GBR lagoon	\$89,000
50% reduction in TSS in each of the rivers flowing in to the GBR lagoon	\$178,000
Daintree and Russell-Mulgrave catchments reduce the TSS within those rivers back to the levels experienced before the arrival of European settlers, TSS loads in the other rivers maintained at current levels	\$12,000

# KEY FINDINGS (CONT)

## Journal articles – under review

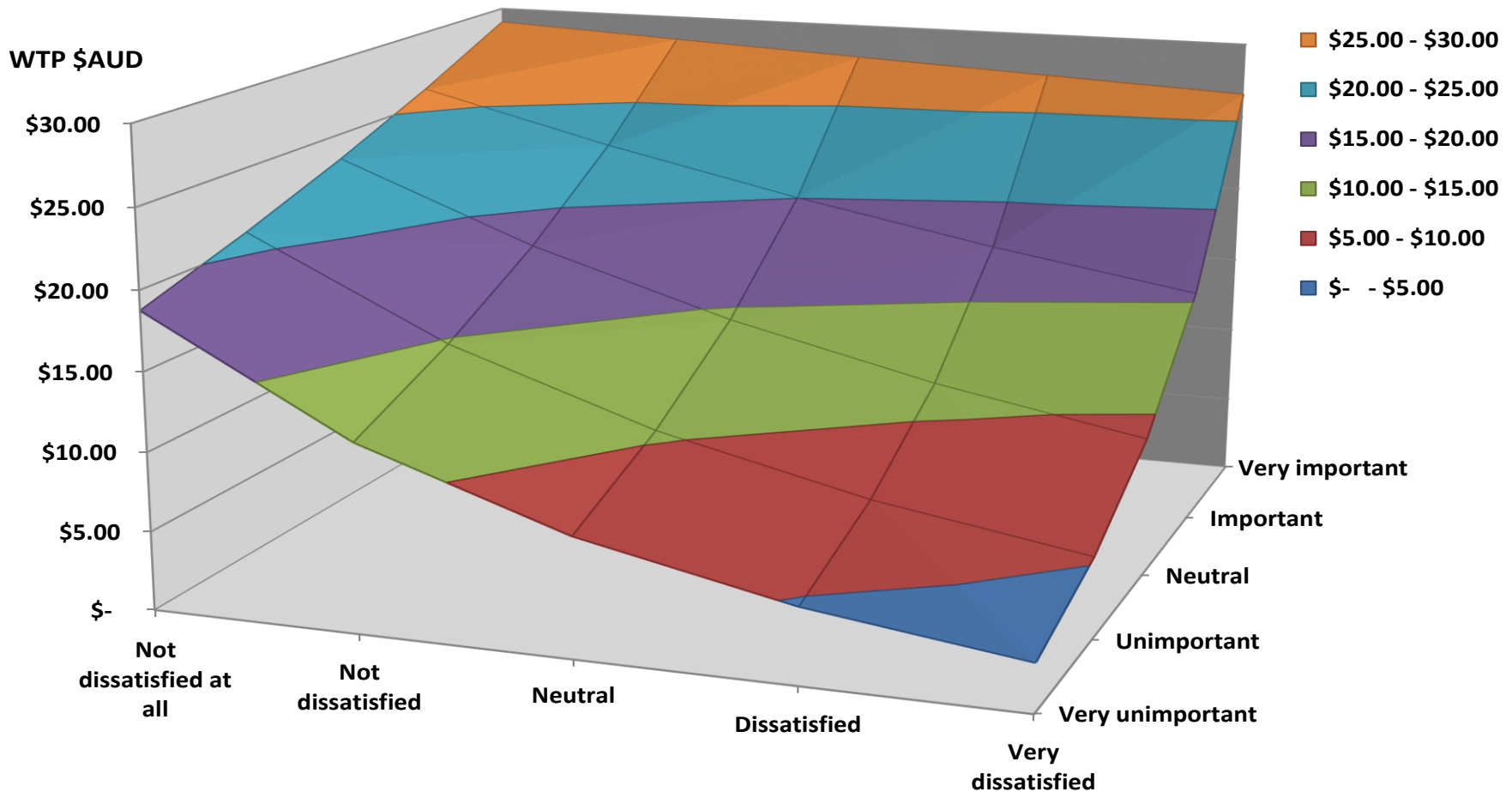
### 15. The importance of Water Clarity to Tourists in the Great Barrier Reef and their willingness to pay to improve it (Farr et al)

- Tourists who are most likely to be willing to pay SOMETHING to improve WQ include :
  - Young; University degree
  - DO NOT rely on tourism
  - Happy to pay to help protect the GBRWHA, providing that other users pay too; and do not believe that only those who live near the GBR should care for it
  - Questionnaire with low dollar values on the 'bid card' (WQ)
  - Not from China; From Japan ;
  - Planning to return to the GBRWHA
  - Felt that WQ was important when choosing destination
- Of those willing to pay SOMETHING, those offering to pay most included people
  - High incomes (WQ); Not from China
  - Planning to return to the GBRWHA
  - Questionnaire with high dollar values on the 'bid card'
  - Satisfied with water quality & thought it was important

# KEY FINDINGS (CONT)

## Journal articles – under review

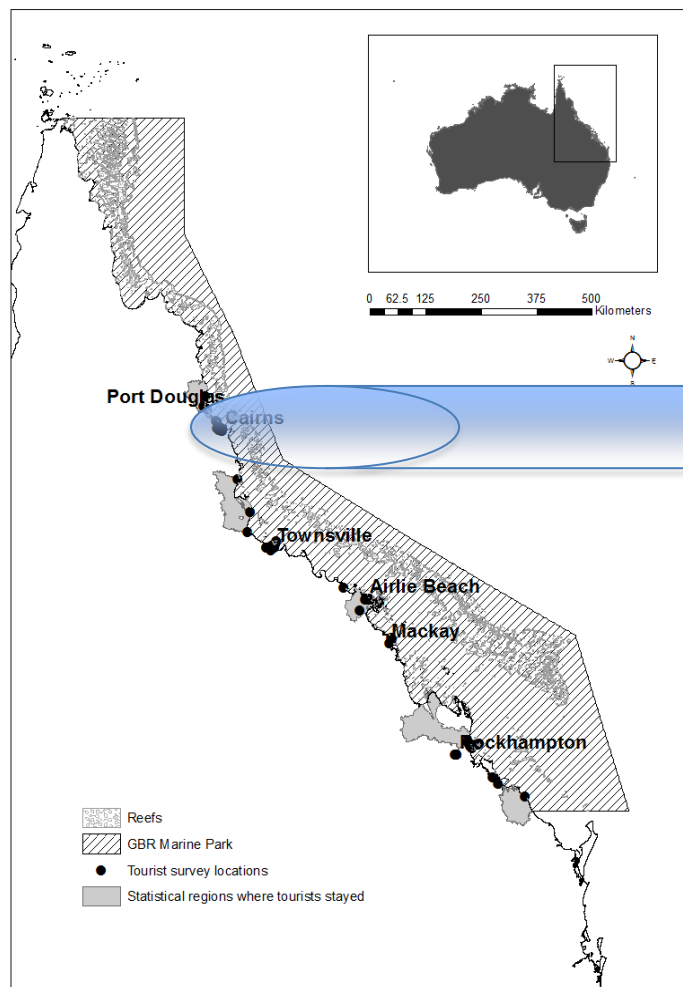
15. The importance of Water Clarity to Tourists in the Great Barrier Reef and their willingness to pay to improve it (Farr et al)





# INSIGHTS FROM OUR LONG-TERM CAIRNS AIRPORT VISITOR EXIT SURVEY

Prof. Bruce Prideaux  
and Michelle Thompson



2007 – 2014  
8050 visitor exit  
surveys from Cairns  
airport



# LONG-TERM MONITORING AT CAIRNS AIRPORT

## WHAT THE DATA TELLS US

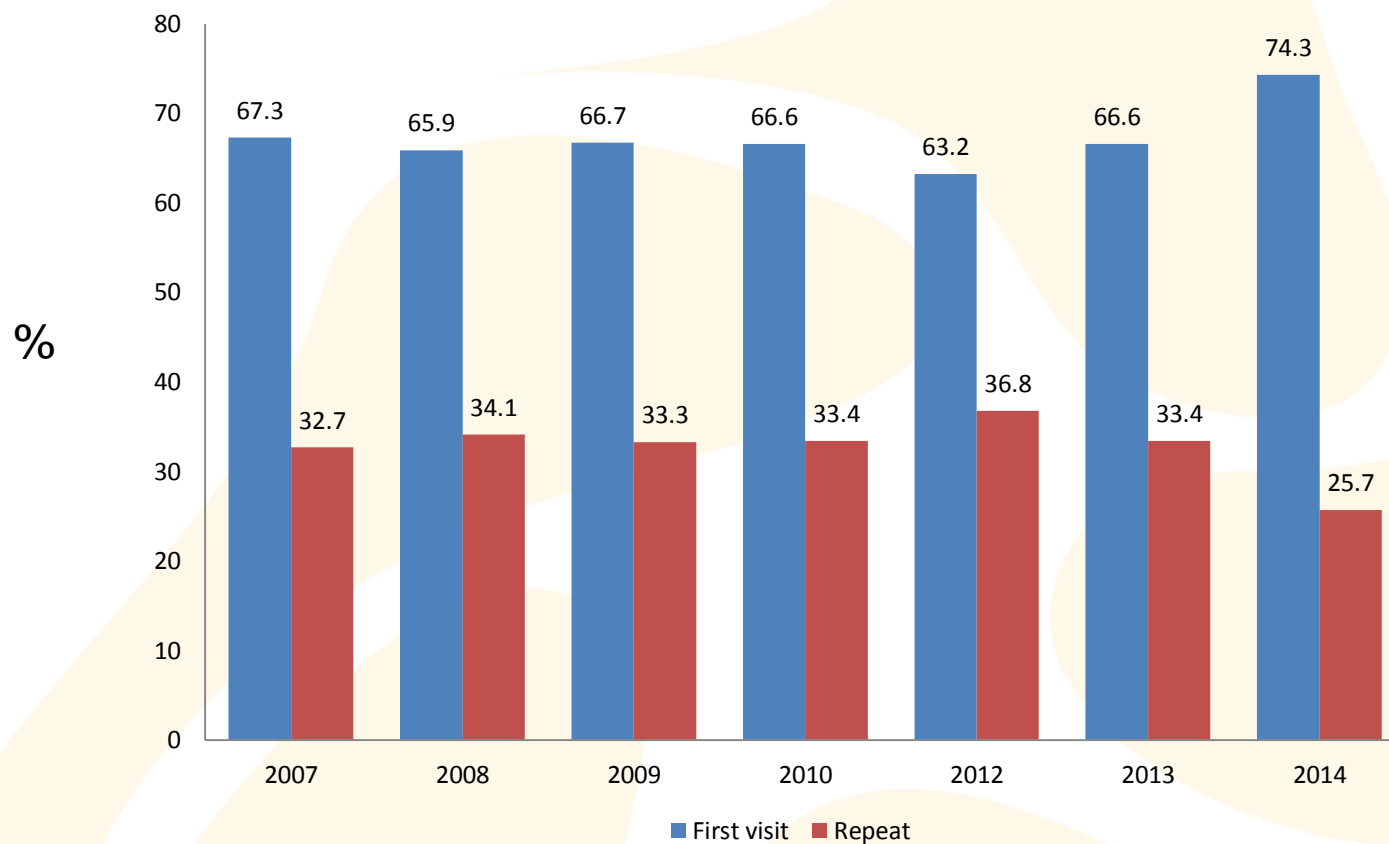
- Track long-term tourist trends over the survey period (from 2007)
- Compare results by:
  - Year (2007 to 2014), Seasonality (peak vs trough)
  - ***First and repeat*** visitors, ***domestic and international*** visitors
- Profile tourists by ***motivations, participation*** and ***perceptions***
  - Eco-tourists who are they, how are they different from other visitors, how can I target them in my marketing?
- In-depth snapshot of themes
  - ***Indigenous tourism***, social media, airline use, ***threats to nature***
- Include issues relevant to industry through consultation
  - Visitation to GBR, motivations, visitor profile
  - Reef dredging, climate change, looking for eco-certification, What if...?



# LONG-TERM MONITORING AT CAIRNS AIRPORT

## RESULTS - TIME SERIES

- Socio-demographics – First by Repeat Visitors (%)

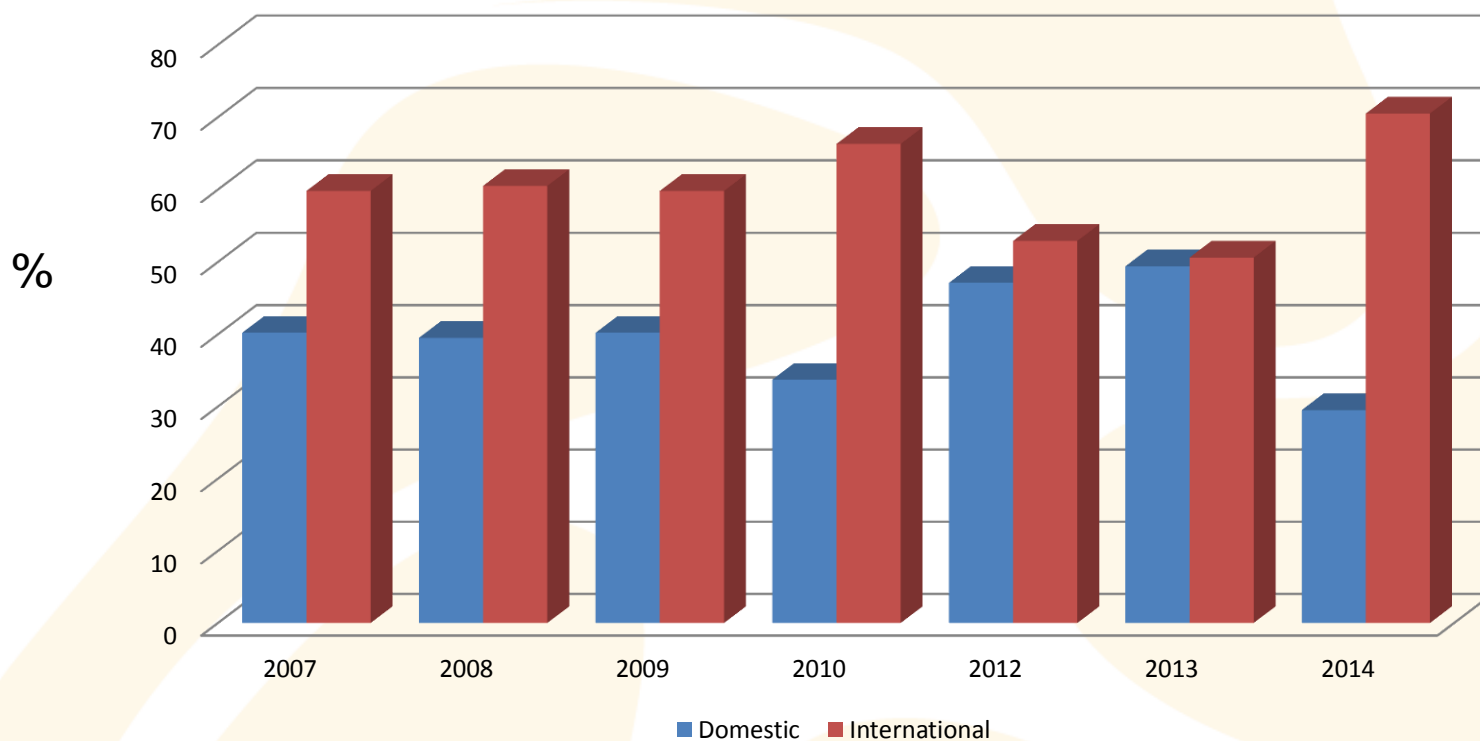




# LONG-TERM MONITORING AT CAIRNS AIRPORT RESULTS - TIME SERIES

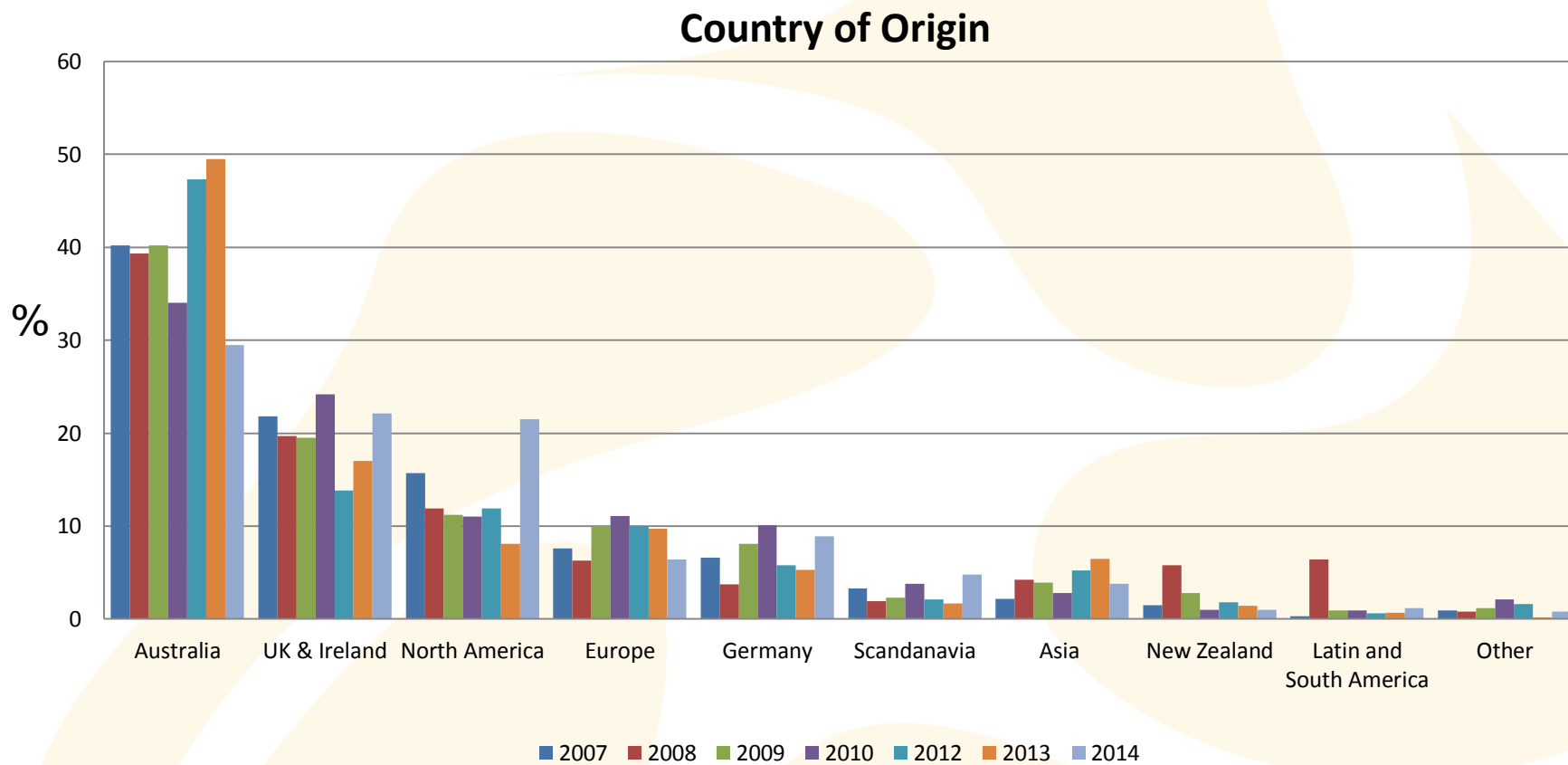
- Socio-demographics (%)

Visitor Origin - Domestic & International





## LONG-TERM MONITORING AT CAIRNS AIRPORT RESULTS - TIME SERIES

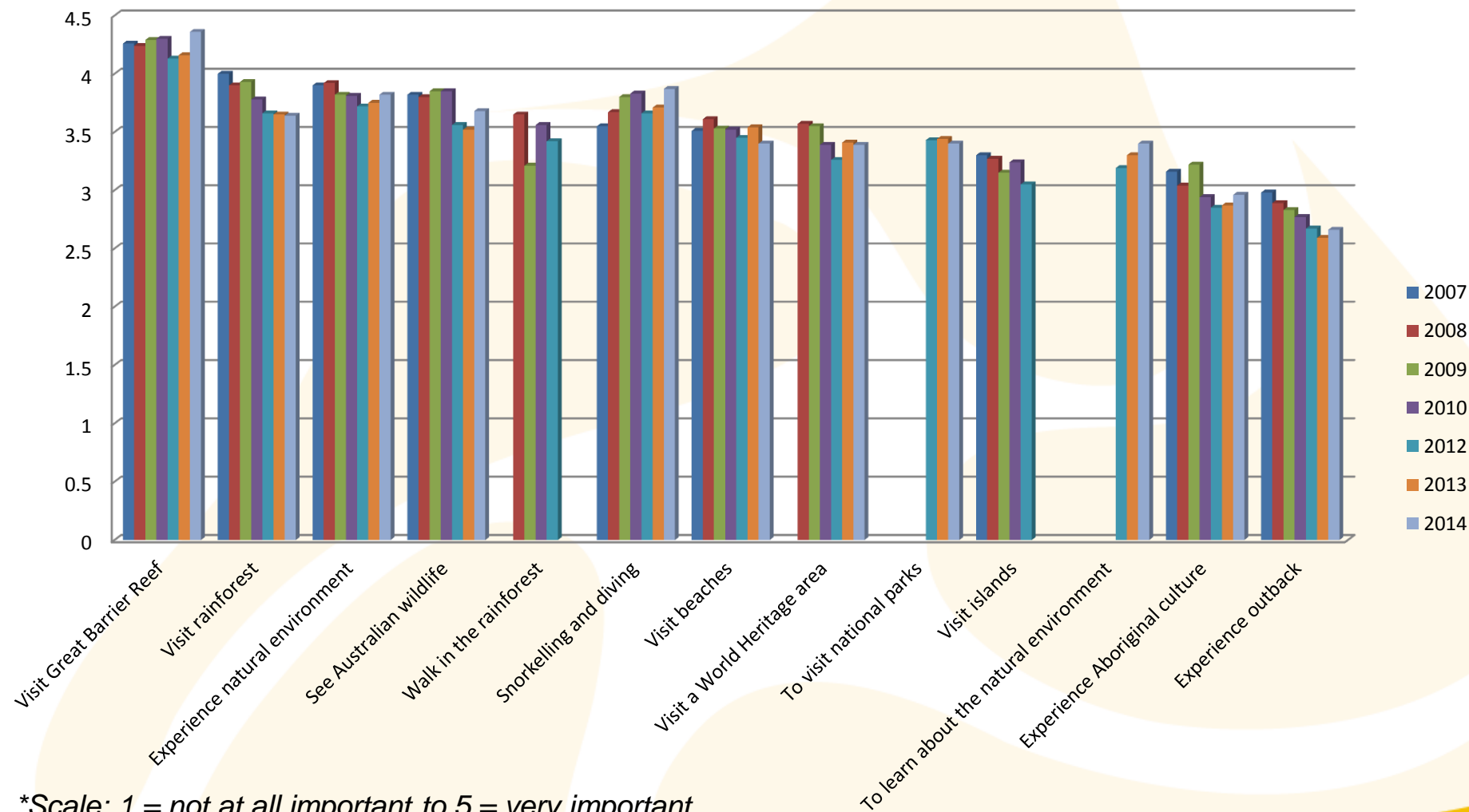




## LONG-TERM MONITORING AT CAIRNS AIRPORT

### RESULTS - TIME SERIES

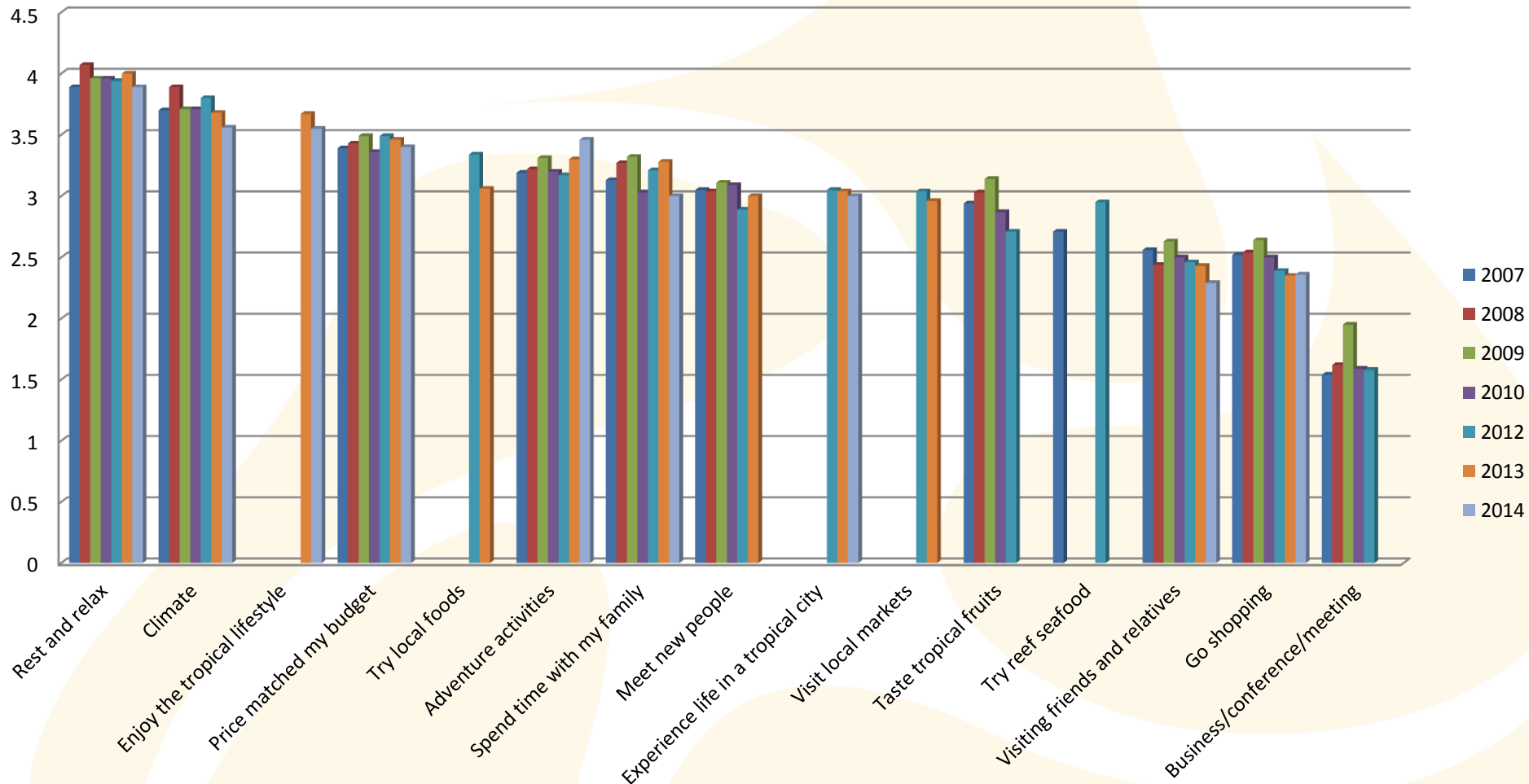
#### Nature-based Travel Motivations



\*Scale: 1 = not at all important to 5 = very important

## LONG-TERM MONITORING AT CAIRNS AIRPORT RESULTS - TIME SERIES

### Other Travel Motivations



# LONG-TERM MONITORING AT CAIRNS AIRPORT RESULTS - TIME SERIES

- Reef Visitation

GBR	2007 (n=1441)	2008 (n=1392)	2009 (n=1146)	2010 (n=630)	2012 (n=1188)	2013 (n=900)	Part 2014 (n=565)
Visit	71%	73.5%	79%	74.5%	66%	69%	76%
Not Visit	29%	26.5%	21%	25.5%	34%	31%	24%
Mean Rank*	4.26	4.24	4.29	4.30	4.13	4.16	4.36
<i>First-time visitors</i>	80.5%	77%	78%	81%	77%	78.5%	87.5%

- Between 2012-2014, 80-85% rated their visit “good”\*\*

\*Scale: 1 = not at all important to 5 = very important

\*\*Scale: good – fair – poor – awful



# LONG-TERM MONITORING AT CAIRNS AIRPORT RESULTS - TIME SERIES

- Rainforest Visitation

WTR	2007 (n=1441)	2008 (n=1360)	2009 (n=1134)	2010 (n=648)	2012 (n=519)	2013 (n=900)	Part 2014 (n=565)
Visit	77.5%	74%	76.5%	72.5%	62%	59%	60%
Not Visit	22.5%	26%	23.5%	27.5%	38%	41%	40%
Mean Rank*	4.00	3.90	3.93	3.78	3.66	3.65	3.64
First-time visitors	73%	70.5%	73%	71.5%	69%	73%	82%

- Between 2012-2014, 80% consistently rated their visit “good”\*\*

\*Scale: 1 = not at all important to 5 = very important

\*\*Scale: good – fair – poor – awful



## LONG-TERM MONITORING AT CAIRNS AIRPORT RESULTS –THEME

- Indigenous tourism
  - Sample of 326 visitors
  - 58% females, 42% males
  - 67% international and 33% domestic visitors
- Indigenous experiences as a travel motivation
  - Consistently ranked 15 out of 20 motivations

Overall Sample	First-time	Repeat	Dom	Intl	Male	Female
2.90	3.02	2.59	2.78	2.96	2.70	3.04

*\*Scale: 1 = not at all important to 5 = very important*



## LONG-TERM MONITORING AT CAIRNS AIRPORT RESULTS –THEME

- Actively look for opportunities to participate in indigenous tourism experiences
  - 16% “Yes”, 35% “Sometimes”, 49% “No”
- Prefer: cultural history (71%); food (51%); art (50%); festivals (43.5%); dance (23.5%)
- 13% had an indigenous experience this trip
  - 81% rated the experience “good”, 14% “fair”
- Experiences located in regional TNQ
  - Kuranda, Mossman Gorge, + specific attractions



## LONG-TERM MONITORING AT CAIRNS AIRPORT RESULTS –THEME

- 12% purchased indigenous artifacts this trip
  - 77.5% made by those who did not participate in an indigenous activity
  - 67.5% purchased boomerangs - most popular
- 85% of purchasers stated the importance of the artefacts being locally made
- 38.5% stated they would pay more for locally made artefacts, another 42.5% “maybe”



# Relative social and economic values of residents and tourists in the WTWHA

## Project 12.3

### 12.3 TEAM:

Natalie Stoeckl<sup>1, 2</sup> Michelle Esparon<sup>1</sup> Silva Larson<sup>1</sup>

<sup>1</sup>*School of Business, JCU*

<sup>2</sup>*TROPWater, JCU*



## WHAT DO WE SEEK TO KNOW AND WHY?

- The relative 'value' of the goods and services provided by the Wet Tropics World Heritage Area (WTWHA) to residents of and visitors to the region

**Tells us about what the WTWHA does to/for the economy**  
**(also provides indication of likely environment/social/economy trade-offs)**

- Also – testing and comparing different methods for attempting to 'value' non-market good and services



# METHODS ...



# WTWHA RESIDENT AND TOURIST STUDIES

- Conducted major literature review
- Ran workshops in Cairns to identify
  - A variety of different ecosystem services (use/non-use 'values') for assessment and other goods/services to be compared with
  - Key management issues/problems for assessment
  - Appropriate sampling strategies
- Used insights to develop draft questionnaires and amended accordingly
- Collected data, analysed, in write-up phase

# KEY SECTIONS OF THE RESIDENT SURVEY

- *Background demographics, activities in the WTWHA*
- *Satisfaction with life overall*
  - To compare with satisfaction with WTWHA goods and services
  - To look at the way in which life-satisfaction varies with social, economic, demographic AND biophysical factors
- *Importance of and satisfaction with 27 different goods and services* (randomised order)
  - To rank goods and services in terms of (a) importance & (b) satisfaction
  - To compare importance and satisfaction, looking for significant 'gaps'
  - To look at differences in 'values' for different 'types' of people &/or people in different regions.
- *Impact of 12 different hypothetical "changes" to different goods and services on overall quality of life:*
  - To compare with other prioritisation data
  - Look for similarities/differences in responses for different 'types' of people and/or regions
- *WTP (a) for improvements in water quality; (b) to protect native plants & animals; (c) to maintain undeveloped scenery; (d) to protect the Aboriginal cultural values*, plus questions to help contextualise:
  - To compare with other prioritisation data
  - To look for similarities/differences in responses for different 'types' of people and/or regions



# KEY SECTIONS OF THE WT TOURIST SURVEY

- Wherever possible have kept questions identical to those in the resident survey
  - Allows comparisons tourists and residents
- Have included *extra questions often asked and monitored in tourism studies*, so can:
  - continue long-term monitoring started during MTSRF (Prideaux);
  - compare with other tourism studies.
- The *importance questions focus on reason for coming to the region* (rather than importance to overall quality of life)
- Slightly different set of 'market' goods (to compare with non-market goods) for satisfaction/importance questions.
- The *Impact of "changes"* question asks about *how much shorter trip there may have been* (rather than on the impact on overall quality of life)
- Also collected *expenditure data* so can look at:
  - regional economic impact of tourism;
  - potential regional economic impact of "changes".



# THE WET TROPICS STUDY COMPARED TO THE GBR STUDY

Parts deliberately similar to facilitate comparisons

But ...WT focused on:

- Aesthetic values
- Indigenous cultural values
- Importance of environment, aesthetics and Indigenous cultural values relative to 'social' values (e.g. safety of family) as well as to market values (e.g. employment).

# OVERVIEW OF THE WET TROPICS SAMPLES

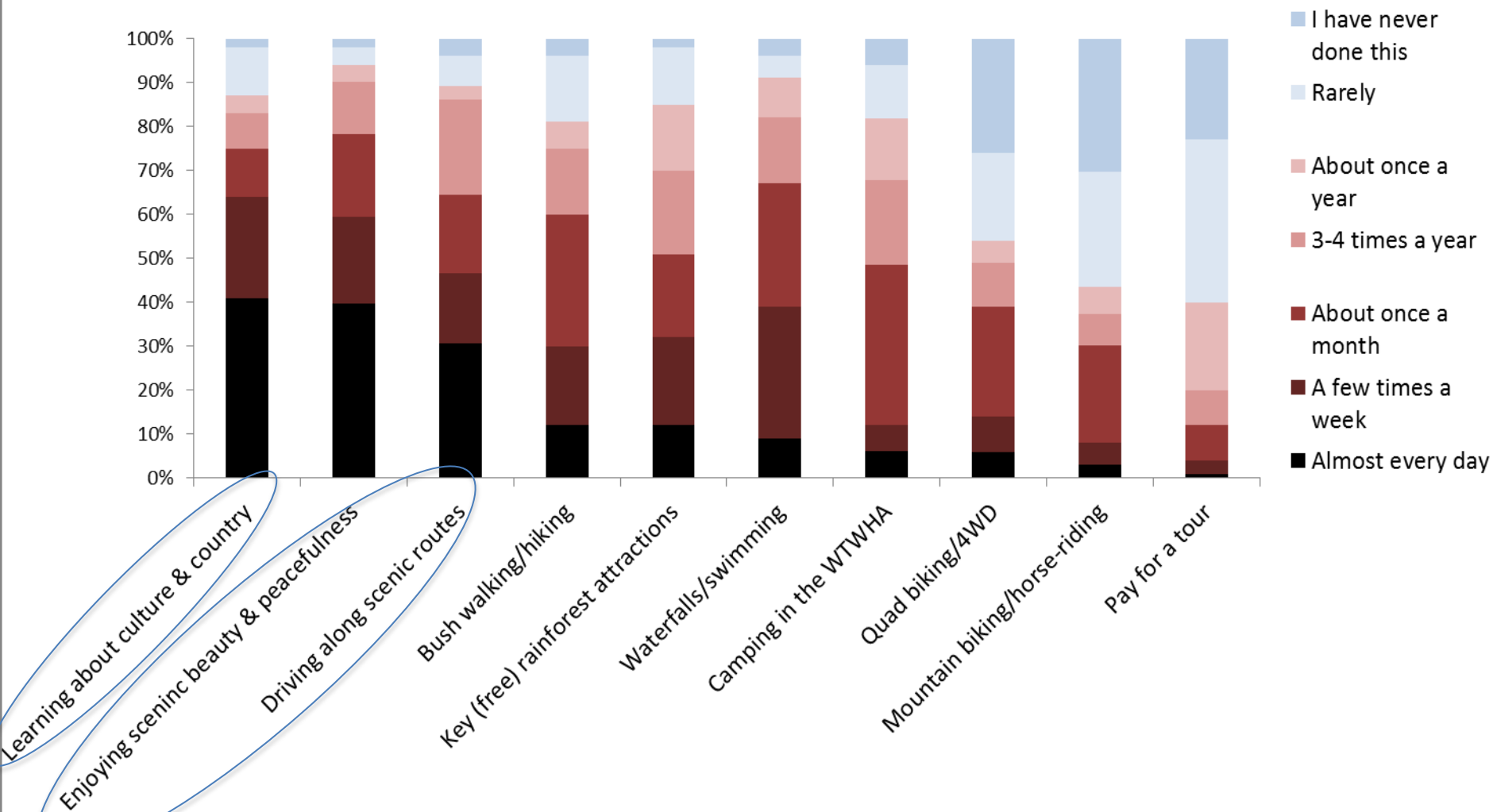
- Mailed questionnaires to random selection of households across 33 postcodes that lie partially (or entirely) in WTWHA;
  - 386 responses from 2000 households; response rate of 25%
- The Rainforest Aboriginal People's Alliance (RAPA) distributed questionnaires for us in four regions of the Wet-Tropics
  - 160 responses
- In total, 546 responses from residents.
- In total, 621 responses from tourists (July 2013-Jun 2014)
  - 309 from domestic terminal
  - 104 from international terminal
  - 208 from lagoon



## SOME INSIGHTS...

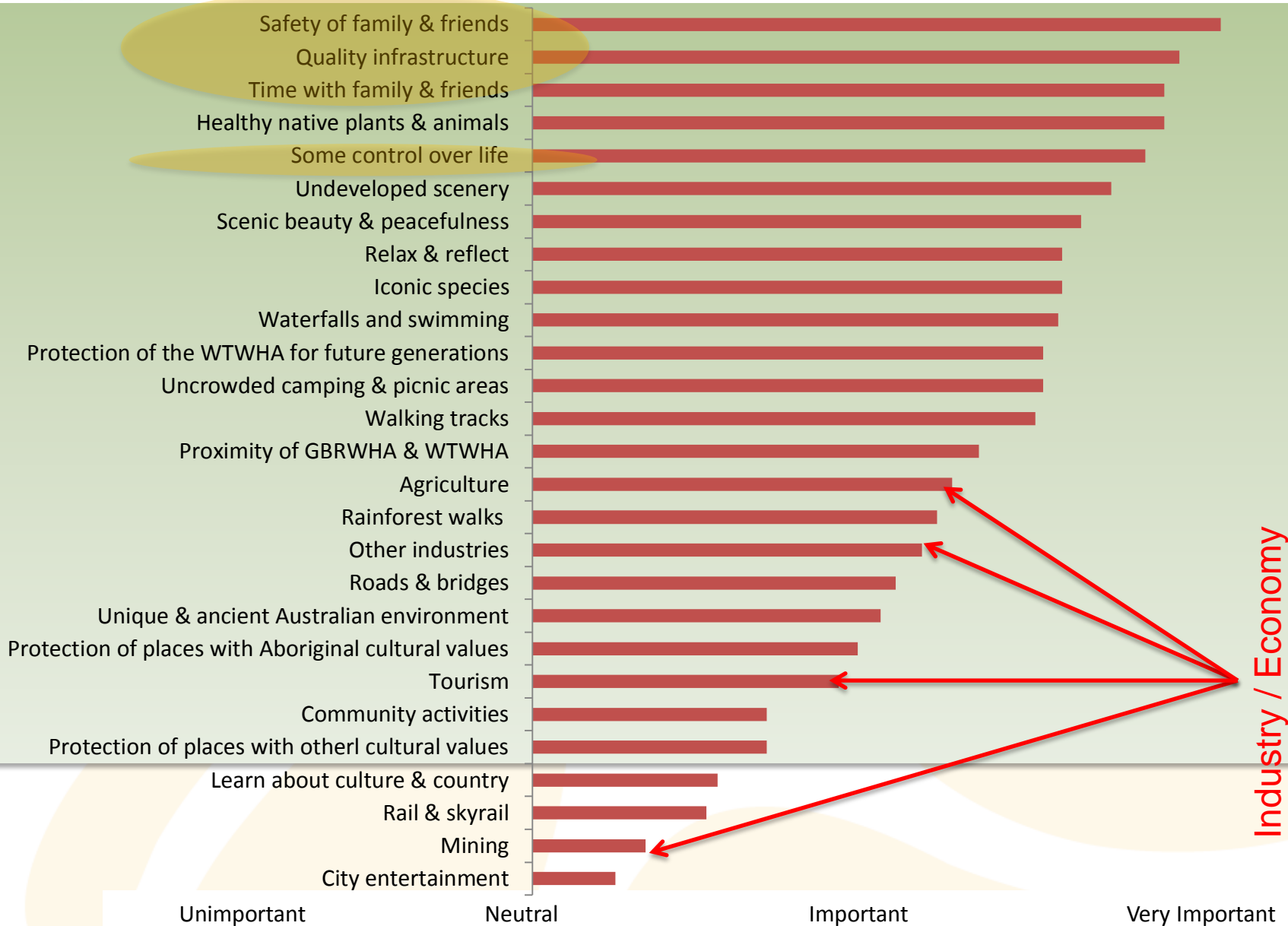


## Frequency of activities in the WTWHA – Indigenous residents





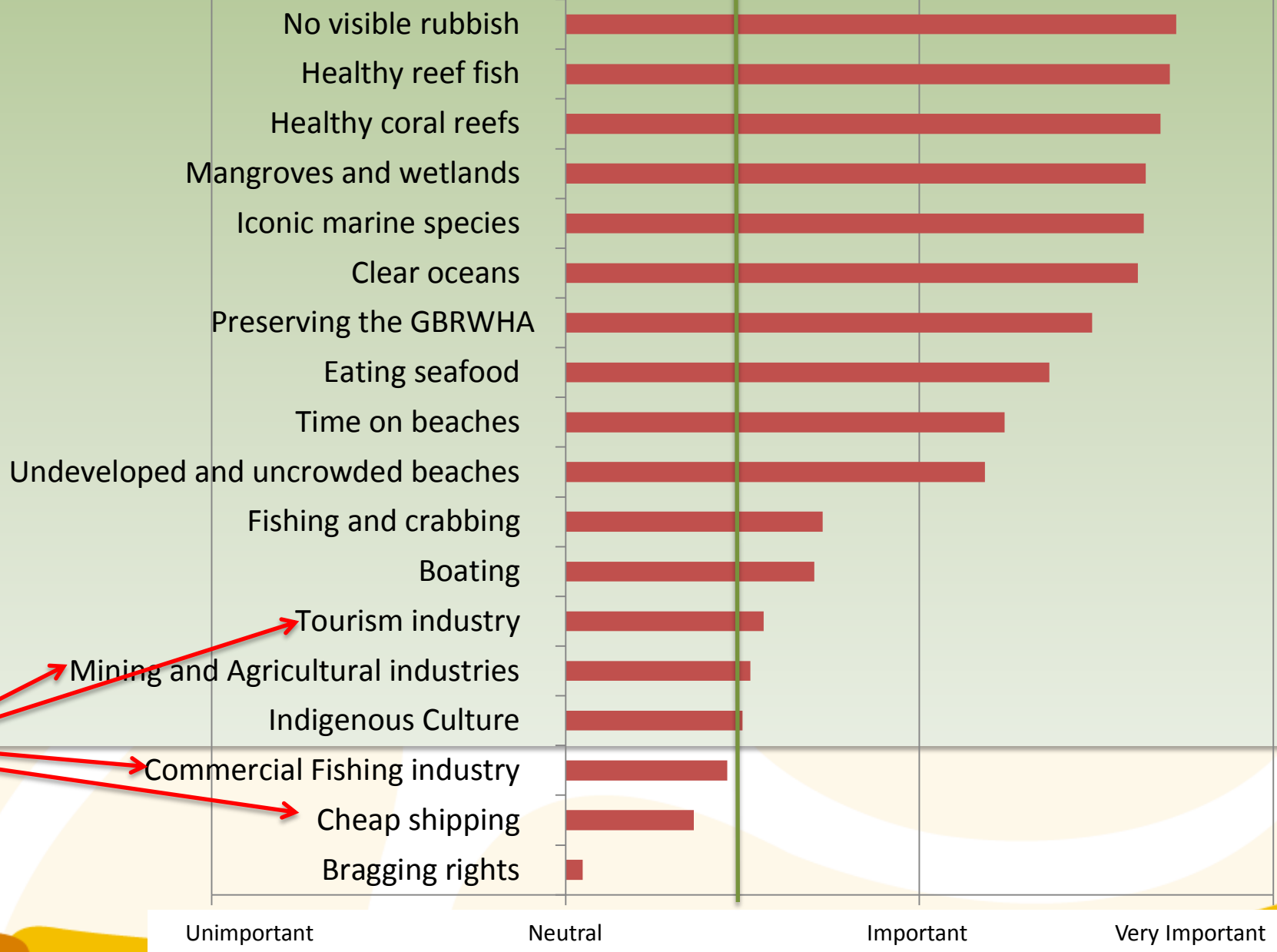
# Non-Indigenous WT Residents - Importance to overall quality of life (N=370)



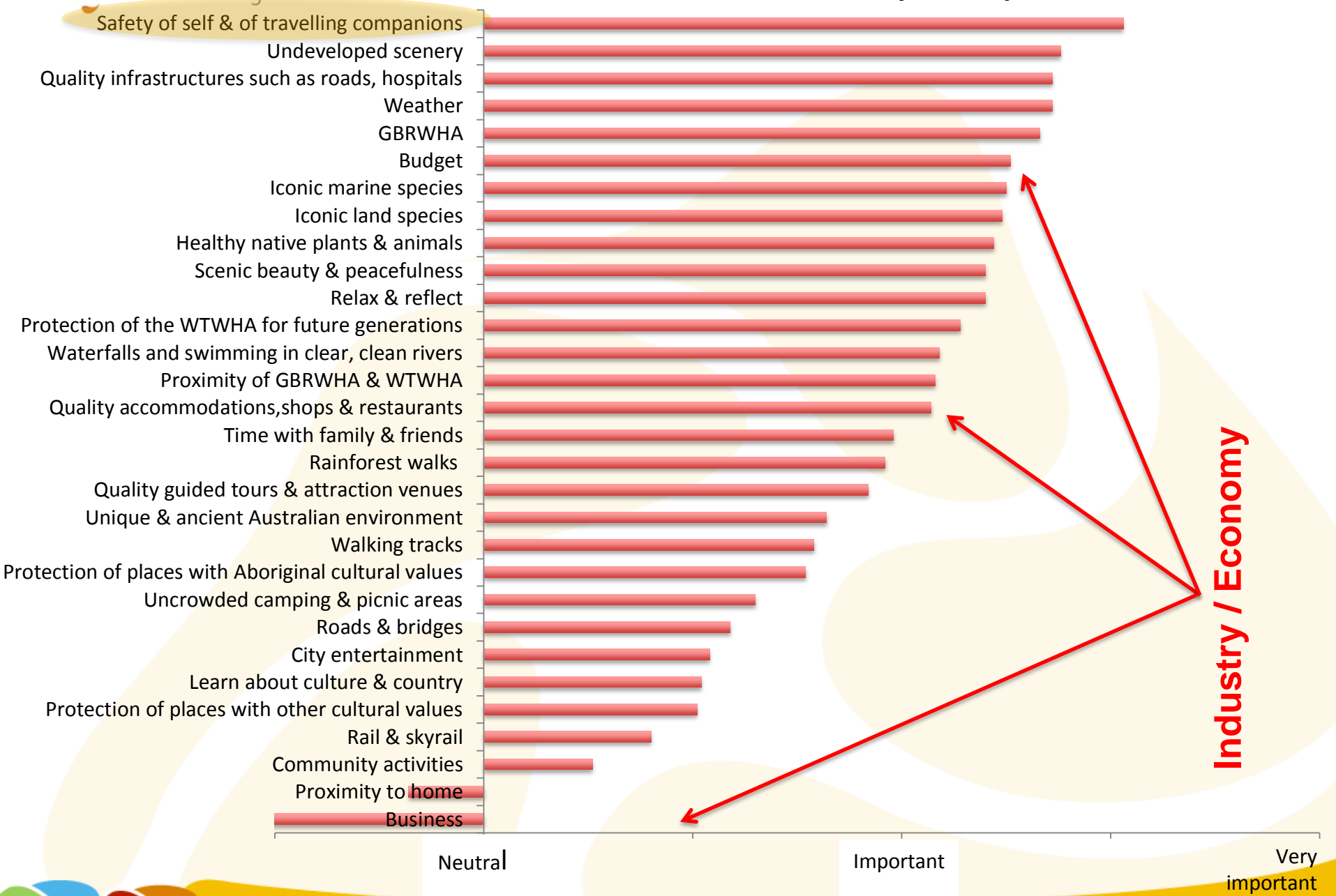


# GBR Residents - Importance to overall quality of life (N=1001)

Industry / Economy

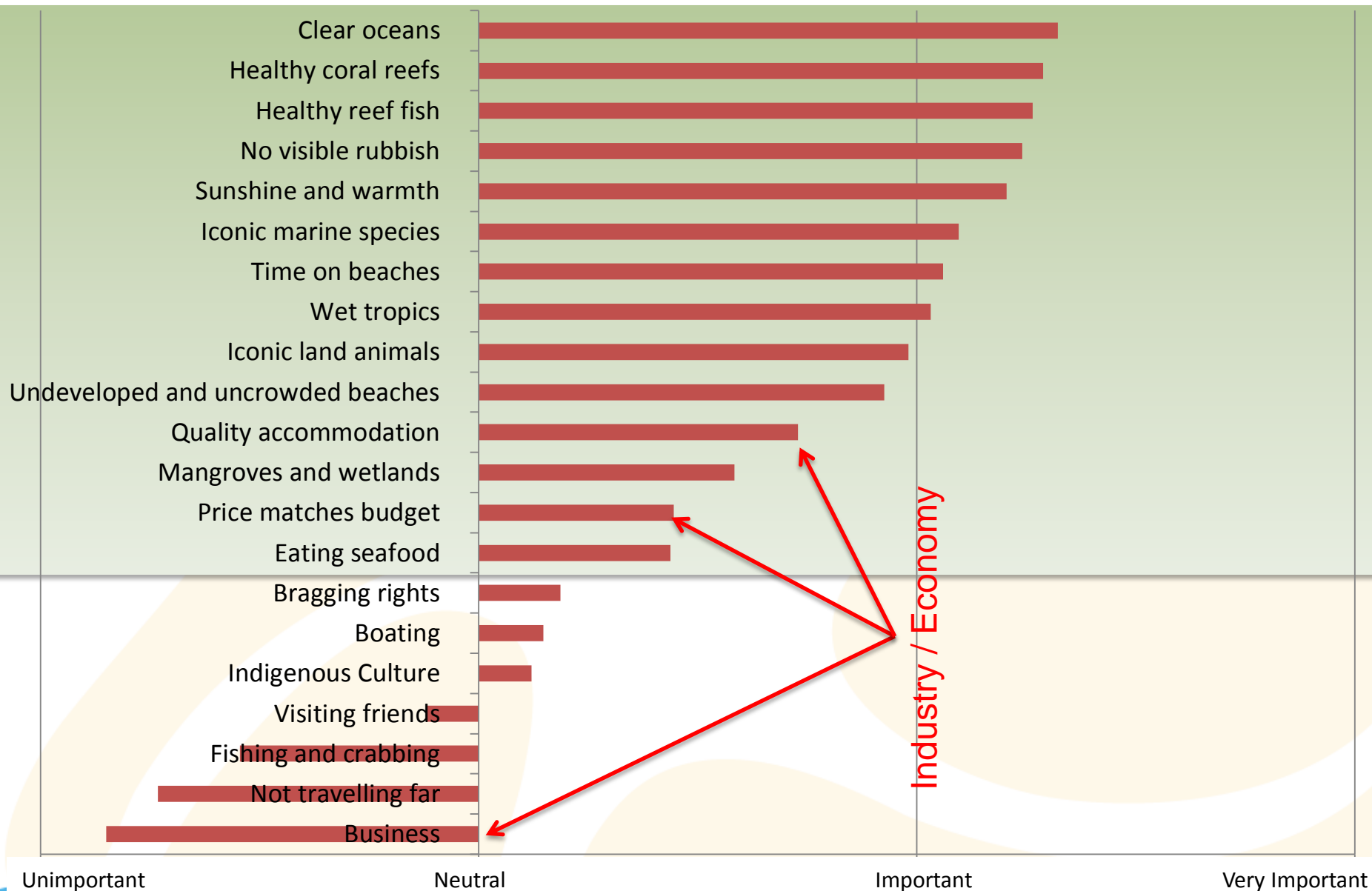


# Tourists - Importance as a reason for coming to this part of Australia (N=585)





# Tourists - Importance as reason for coming to this part of Australia (N = 2455)





## KEY MESSAGES...

Widespread agreement that the safety of family and friends and that of self and travelling companions may top all

- Intrinsic (environmental) values more important than other values.

Responses indicate recognition (even if only implicit) of important inter-relationships between values, evidenced in

- analysis of correlation coefficients
- principal component analysis



## Project 12.3

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BUT ITS ABOUT MORE THAN JUST  
'IMPORTANCE' ....



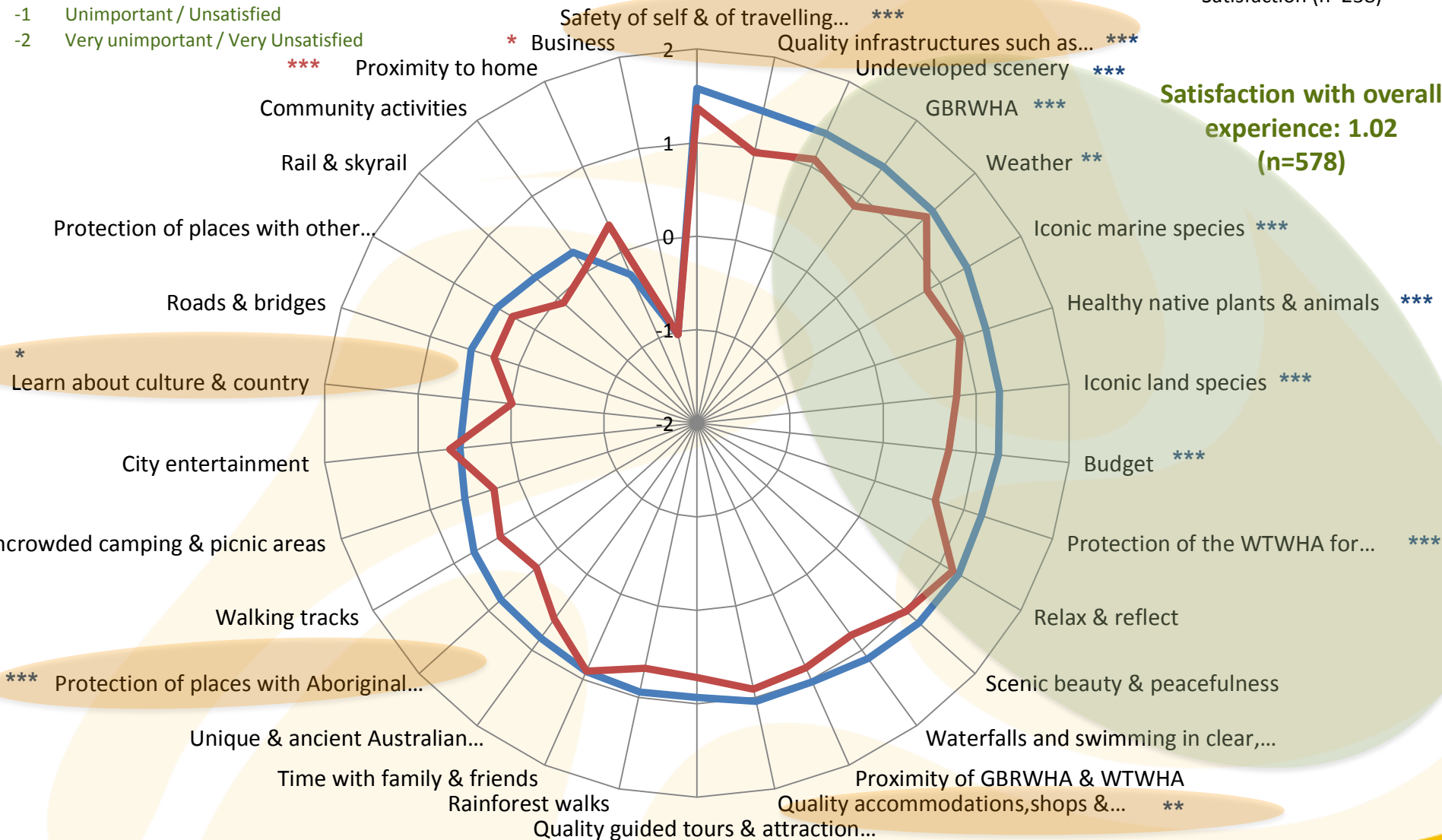
# IMPORTANCE & SATISFACTION

## WT TOURISTS

- 2 Very important / Very satisfied
- 1 Important / Satisfied
- 0 Neutral
- 1 Unimportant / Unsatisfied
- 2 Very unimportant / Very Unsatisfied

— Importance (n=238)  
— Satisfaction (n=238)

**Satisfaction with overall  
experience: 1.02  
(n=578)**



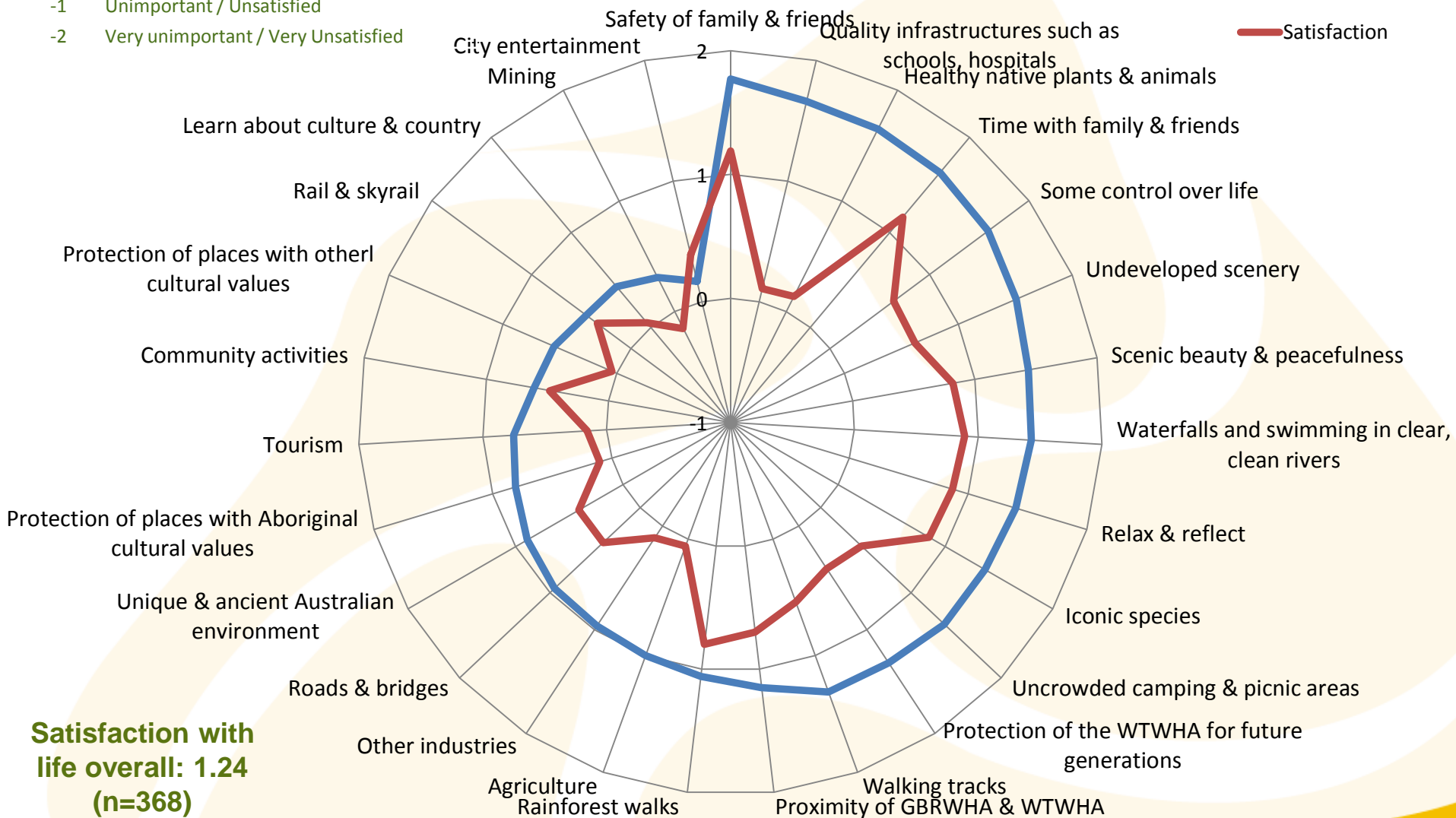


# RAINFOREST

## NON-INDIGENOUS RESIDENTS

- 2 Very important / Very satisfied
- 1 Important / Satisfied
- 0 Neutral
- 1 Unimportant / Unsatisfied
- 2 Very unimportant / Very Unsatisfied

— Importance  
— Satisfaction

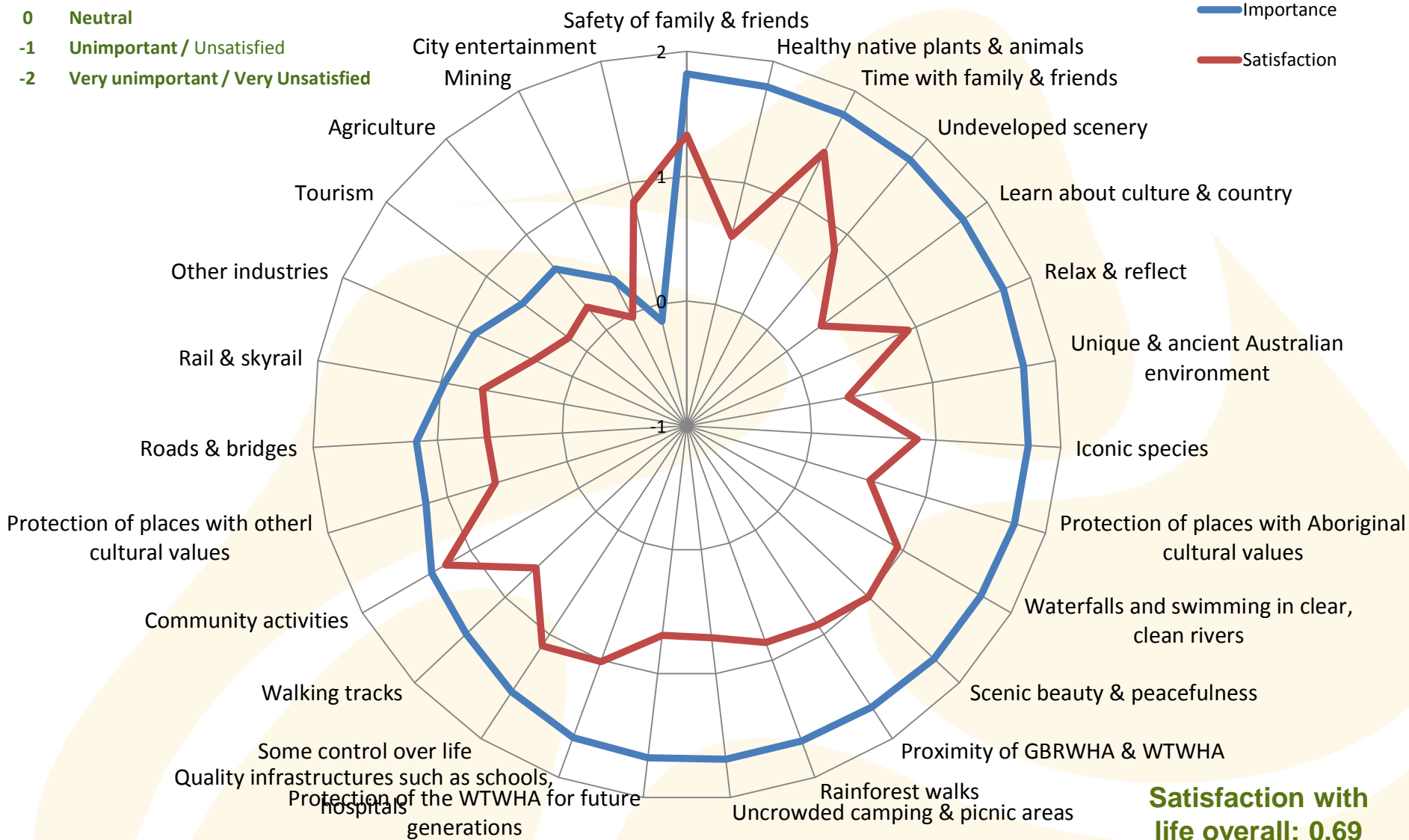


**Satisfaction with  
life overall: 1.24  
(n=368)**

# IMPORTANCE & SATISFACTION – INDIGENOUS RESIDENTS WTWHA

- 2 Very important / Very satisfied
- 1 Important / Satisfied
- 0 Neutral
- 1 Unimportant / Unsatisfied
- 2 Very unimportant / Very Unsatisfied

— Importance  
— Satisfaction



**Satisfaction with  
life overall: 0.69  
(n=140)**



## KEY MESSAGES...

Importance almost always greater than satisfaction, not generally a problem unless big differences

- Most significant problem likely to be associated with Intrinsic values/environmental values
- Gap between importance and satisfaction not particularly large for tourists, larger for non-Indigenous residents; largest for Indigenous residents



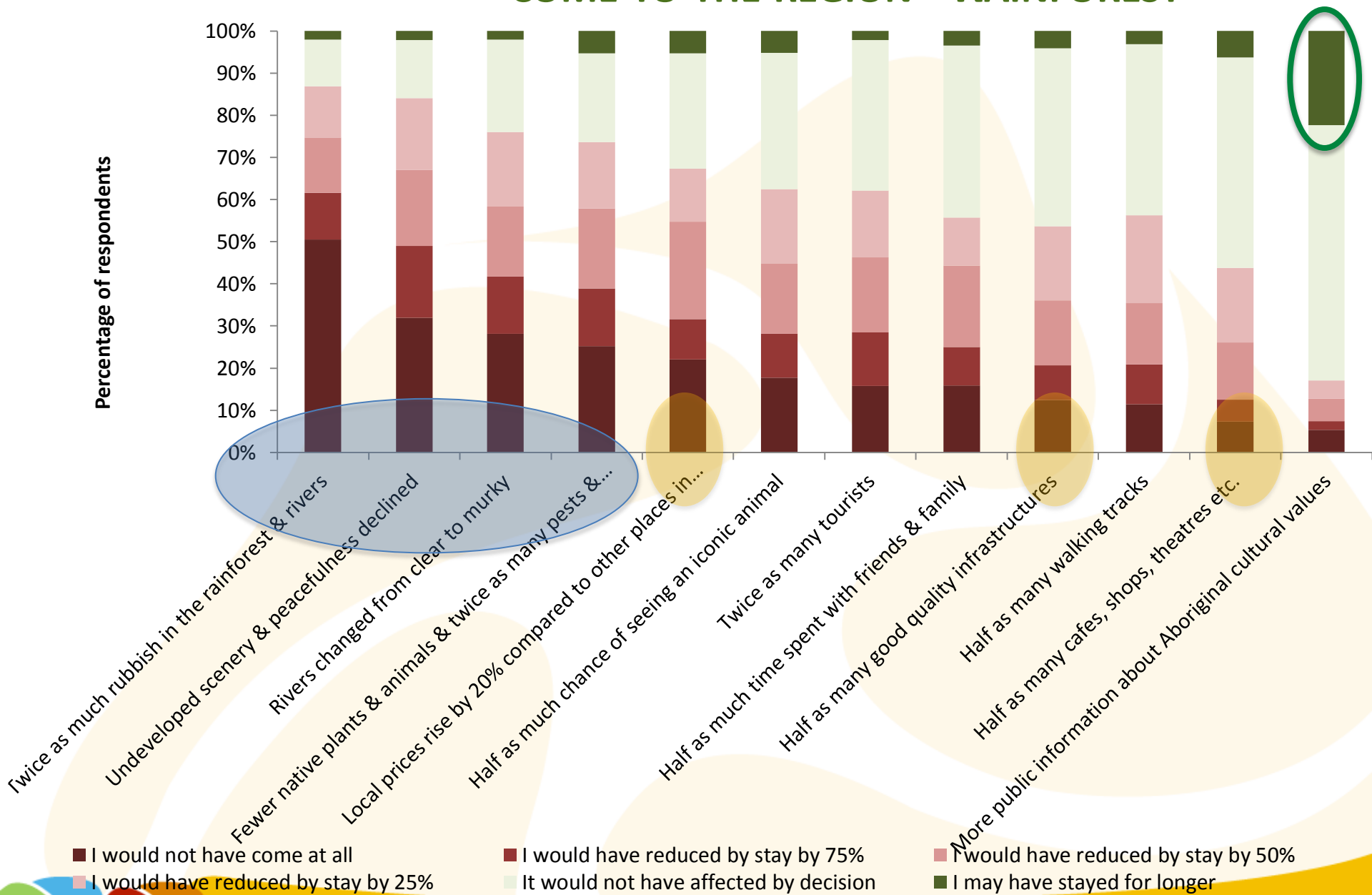
## Project 12.3

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SO HOW WOULD PEOPLE REACT IF  
THE THINGS THEY VALUE  
DETERIORATED?

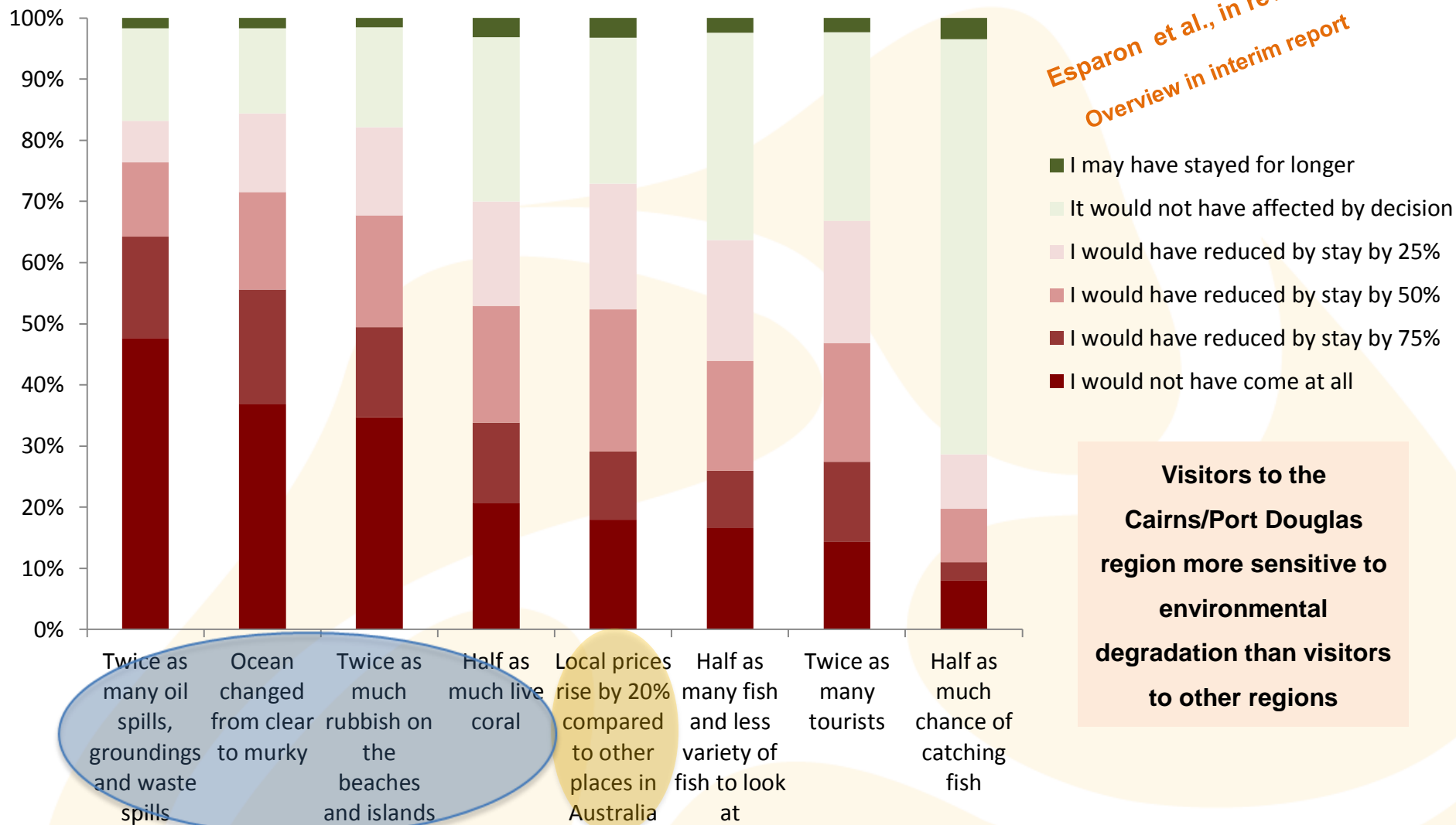


# IMPACT OF HYPOTHETICAL CHANGES ON DECISION TO COME TO THE REGION - RAINFOREST



# IMPACT OF HYPOTHETICAL CHANGES ON DECISION TO COME TO THE REGION

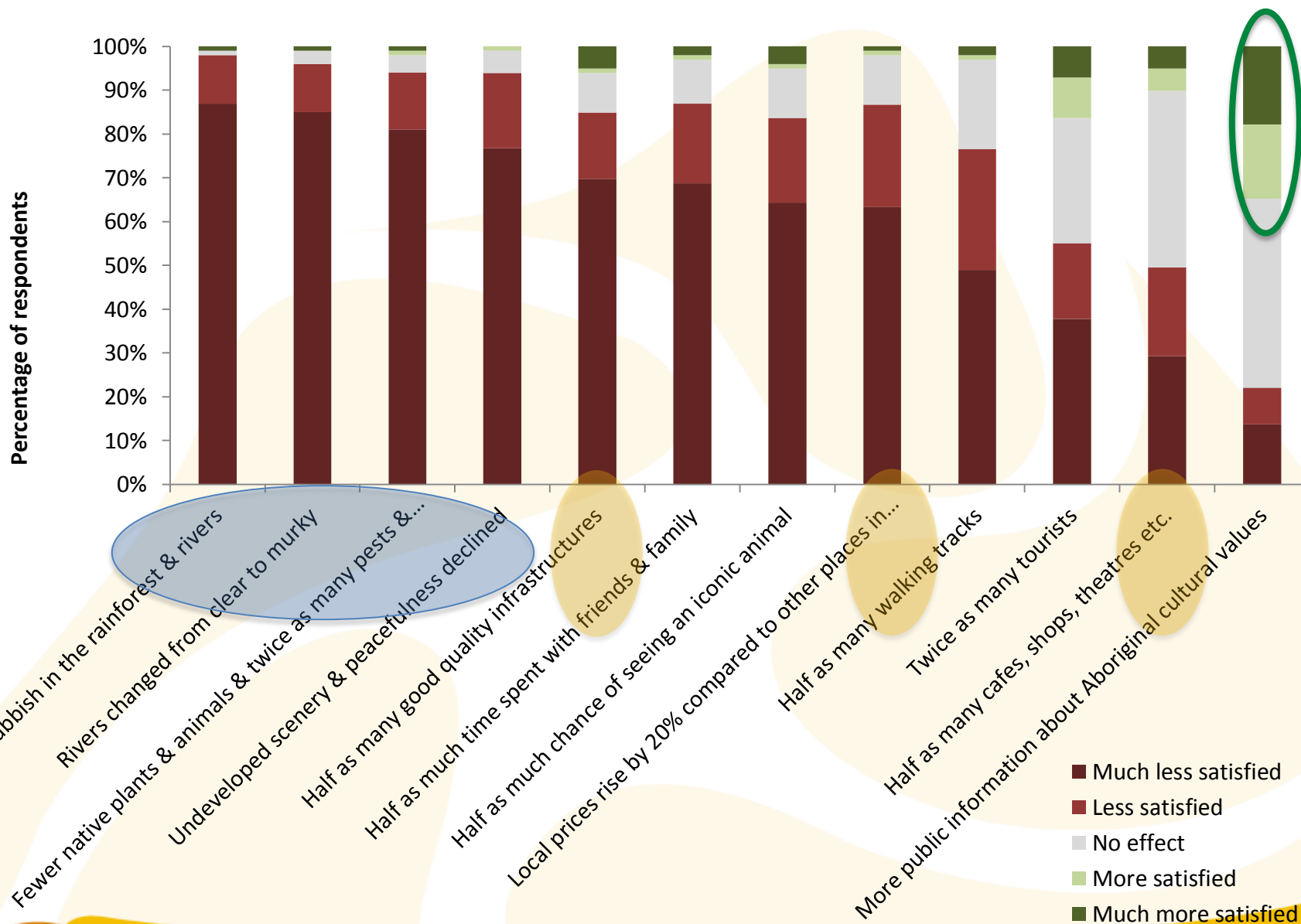
*Esparon et al., in review*  
*Overview in interim report*



*NB: Non-parametric tests confirm that differences between 'price' distribution and all other distributions are statistically significant*



# IMPACT OF HYPOTHETICAL CHANGES ON OVERALL QUALITY OF LIFE – NON-INDIGENOUS RESIDENTS (WT)

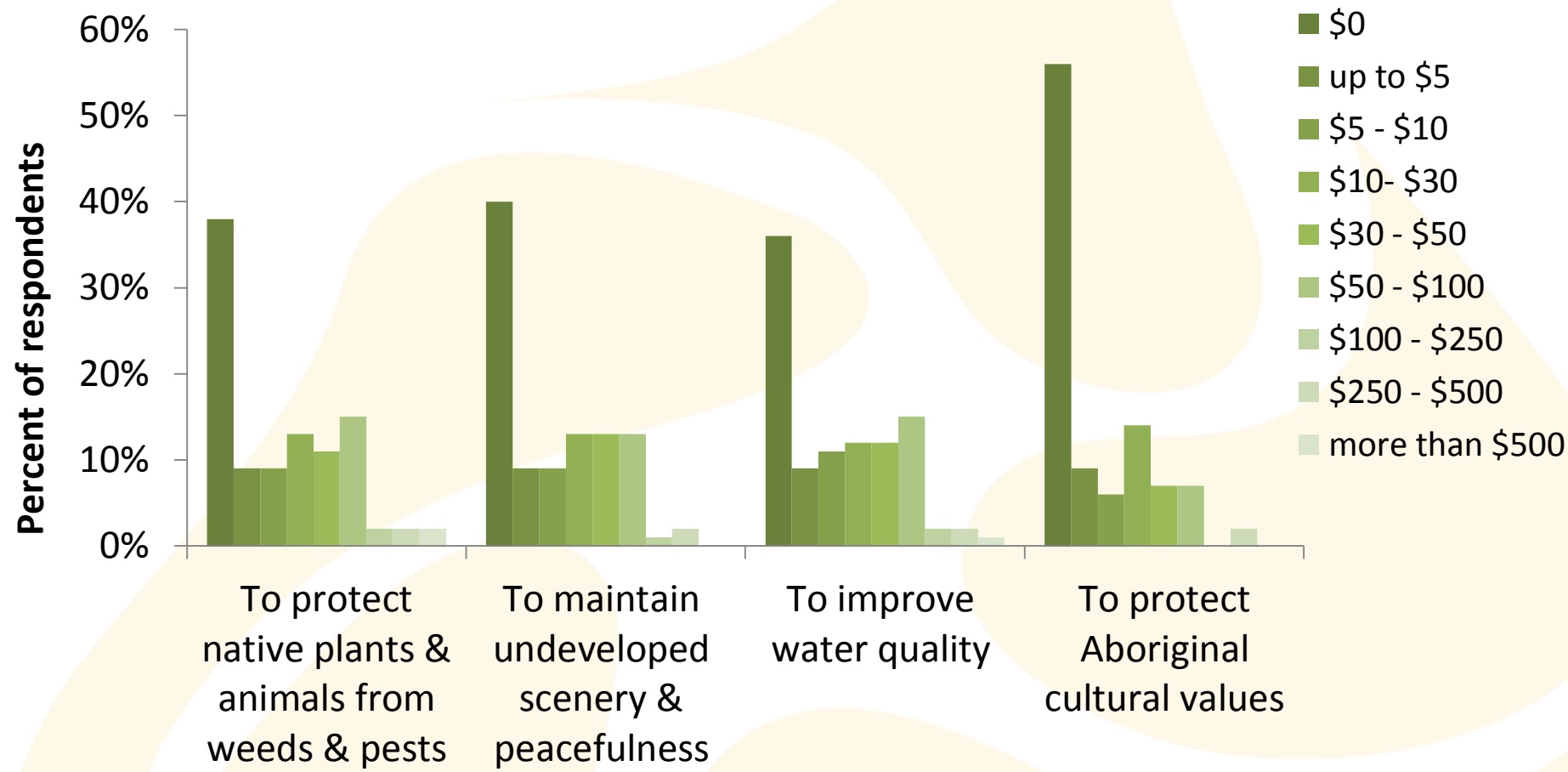




## KEY MESSAGES...

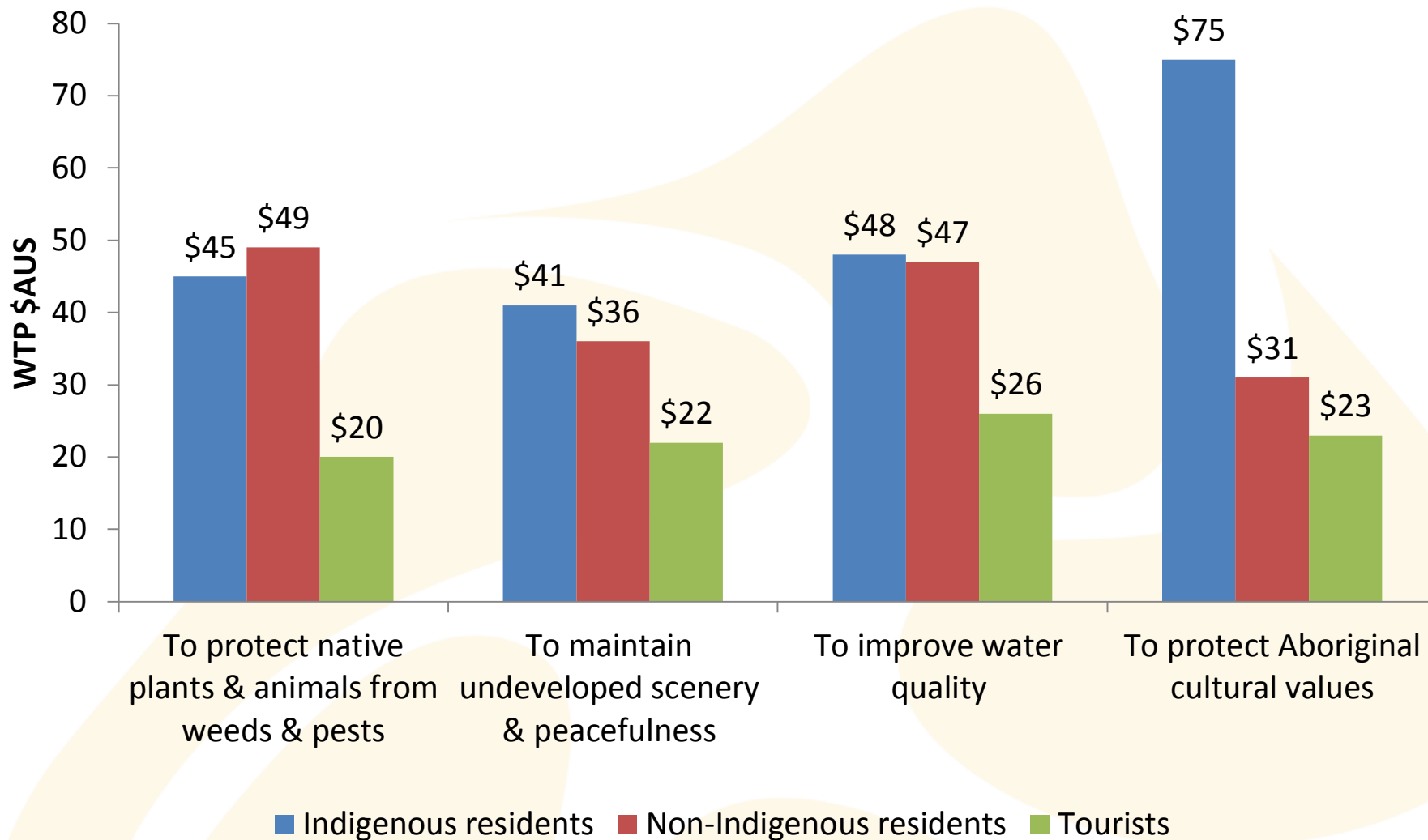
- Environmental degradation generally perceived as ‘worse’ than 20% price increase
- Northern visitors seem more sensitive to prospect of environmental degradation than southern visitors
  - (matches observation about residential ‘values’ in GBR and *very* preliminary analysis of WTMA residential data)
- More information about Aboriginal culture and activities would encourage longer length of stay

# WT NON-INDIGENOUS RESIDENT WILLINGNESS TO PAY, PER ANNUM, FOR IMPROVEMENTS...



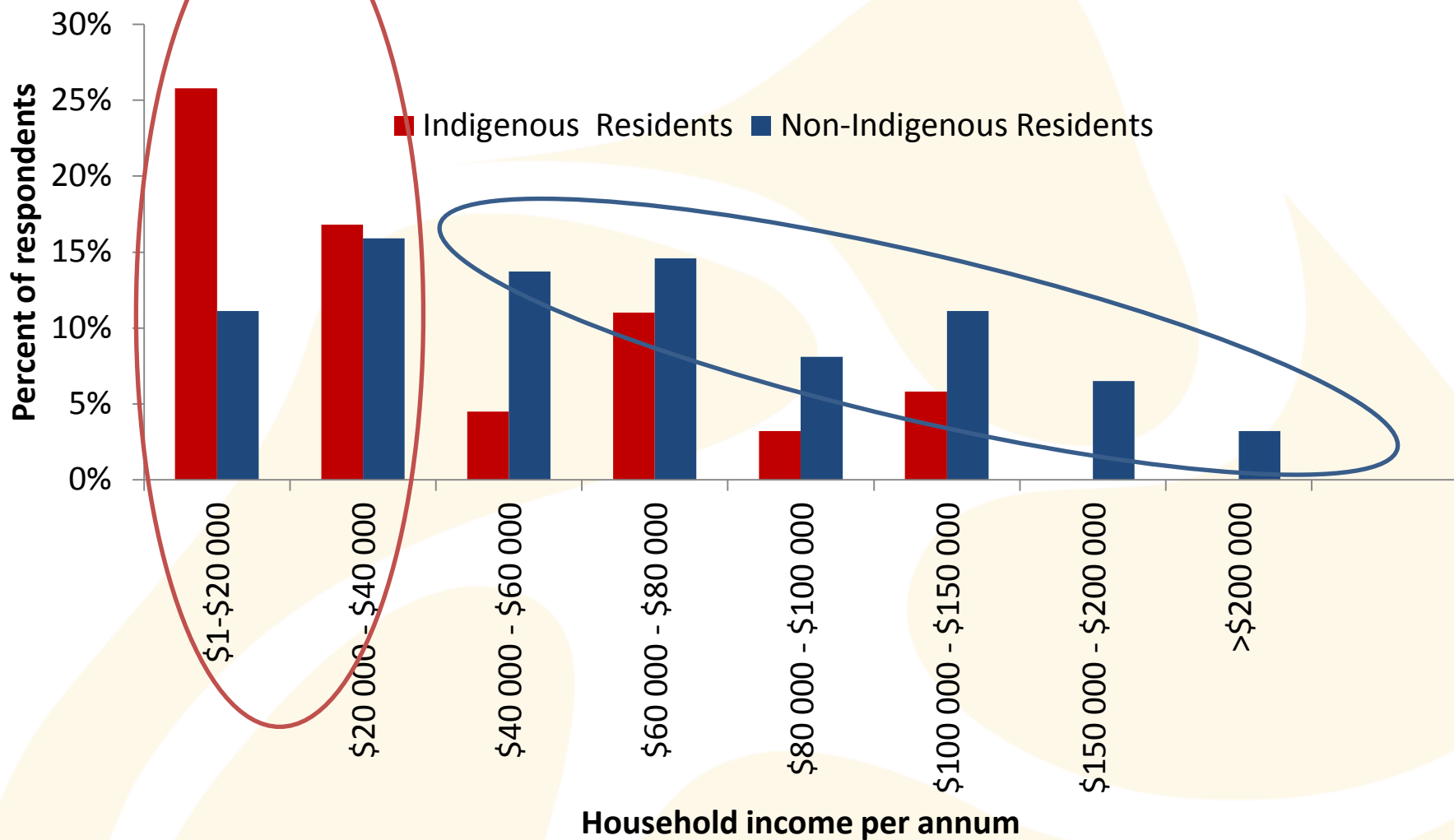


## WT MEAN WTP RESIDENTS & TOURISTS



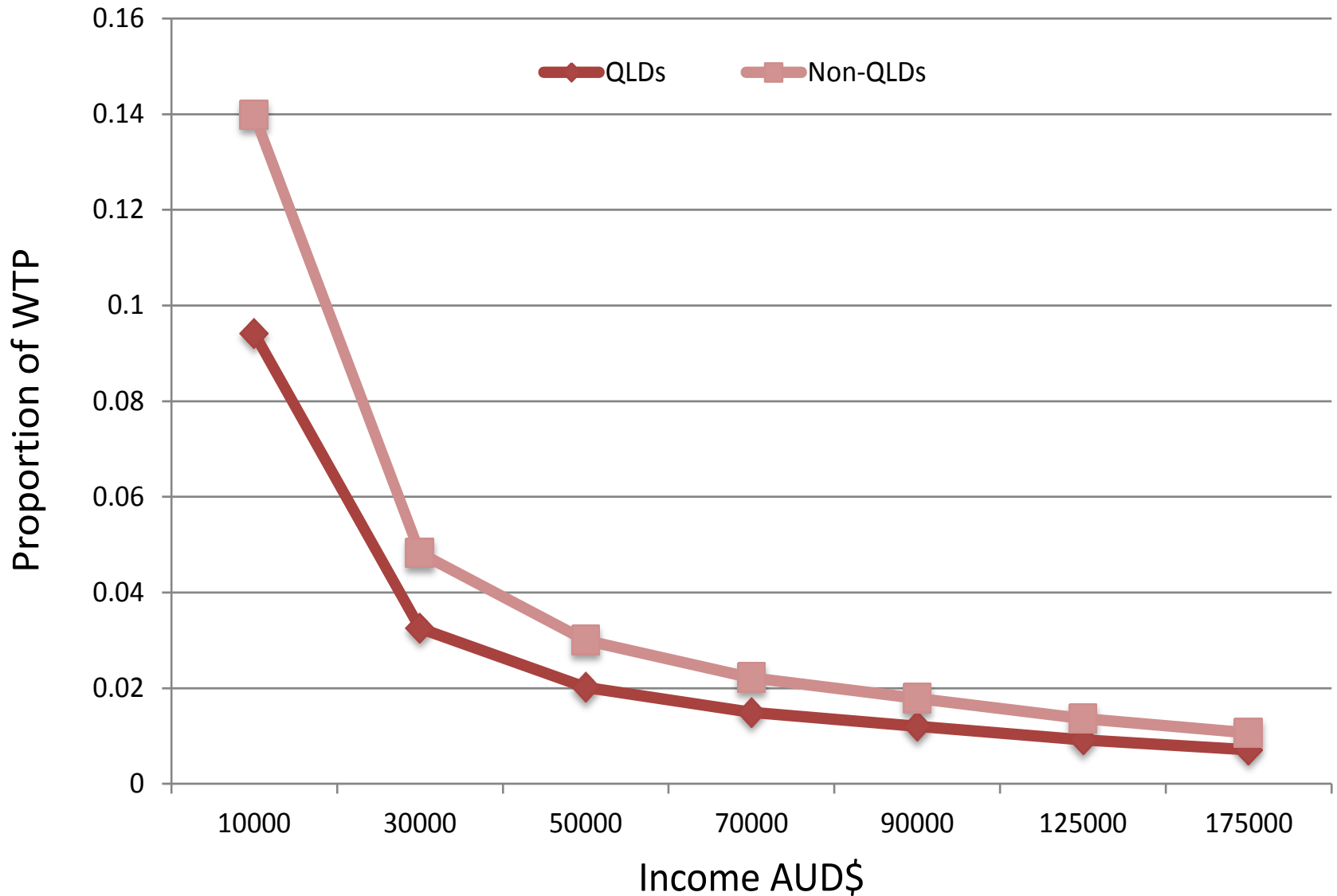


# INDIGENOUS AND NON- INDIGENOUS INCOMES COMPARED



# GBR TOURISTS: WTP TO HELP IMPROVE WATER QUALITY AS A % OF INCOME

Farr et al., in review





## KEY MESSAGES...

Despite indicating the environment as the most important factor, many people are not WTP anything to protect it:

Many *'not wanting to pay unless others pay too'*

WTP linked to income (and other things)

Those on high income are WTP smaller proportion of income for the environment than those on low income



## Project 12.3

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# COMPARISON OF DIFFERENT WAYS OF THINKING ABOUT 'VALUE'



## Aboriginal culture

	Indigenous residents	Non-Indigenous residents	Tourists
Importance	High Mean 1.76  Highest =1.82 Lowest = -0.14	Low Mean 0.43  Highest =1.77 Lowest = 0.17	Moderate Mean 0.49  Highest =1.58 Lowest = -1.03
Satisfaction	Moderate Mean 0.34  Highest =1.45 Lowest = -0.03	Low Mean 0.05  Highest =1.19 Lowest = -0.15	Low Mean -0.01  Highest =1.37 Lowest = -1.03
Response to hypothetical 'changes' to more information	58% ↑ Satisfaction (Biggest increase in satisfaction)	33% ↑ Satisfaction (Biggest increase in satisfaction)	23% ↑ in length of stay (Biggest increase in satisfaction)
WTP for more information	Highest (\$75)	Lowest (\$31)	Third Lowest (\$23)



## River water clarity

	Indigenous residents	Non-Indigenous residents	Tourists
Importance	High Mean 1.72  Highest = 1.82 Lowest = -0.14	High Mean 1.43  Highest = 1.77 Lowest = 0.17	Moderate Mean 1.11  Highest = 1.58 Lowest = -1.03
Satisfaction	Moderate Mean 0.95  Highest = 1.45 Lowest = -0.03	Moderate Mean 0.89  Highest = 1.19 Lowest = -0.15	Low Mean 0.08  Highest = 1.37 Lowest = -1.03
Response to hypothetical 'changes' – from clear to murky	Second biggest decrease in satisfaction	Second biggest decrease in satisfaction	Third biggest decrease in satisfaction
WTP to maintain/improve quality & clarity of rivers	Second highest (\$48)	Second highest (\$47)	Highest (\$26)



## Pests & Weeds

	Indigenous residents	Non-Indigenous residents	Tourists
Importance	High Mean 1.79  Highest = 1.82 Lowest = -0.14	High Mean 1.65  Highest = 1.77 Lowest = 0.17	Moderate Mean 1.25  Highest = 1.58 Lowest = -1.03
Satisfaction	Moderate Mean 0.56  Highest = 1.45 Lowest = -0.03	Low Mean 0.14  Highest = 1.19 Lowest = -0.15	Moderate Mean 0.96  Highest = 1.37 Lowest = -1.03
Response to hypothetical 'changes' – twice as many pests & weeds	Third biggest decrease in satisfaction	Third biggest decrease in satisfaction	Fourth biggest decrease in satisfaction
WTP to protect native plants & animals from pests and weeds	Third highest (\$45)	Highest (\$49)	Lowest (\$20)



# IN SUM

- Quality of life/decision to visit depends on multiple things, including, but not limited to:
  - Safety of family & friend/self & travelling companions; culture; environment; economy
- May need to watch the 'gap' between importance and satisfaction relating to
  - environment and Indigenous culture;
  - roads, hospitals, schools and safety
- Potentially vulnerable to some types of change, since people in this region are so reliant upon environment for livelihoods and wellbeing.
- If we damage the environment, it may 'bite back'.
  - Likely to also be the case if we degrade or damage culture

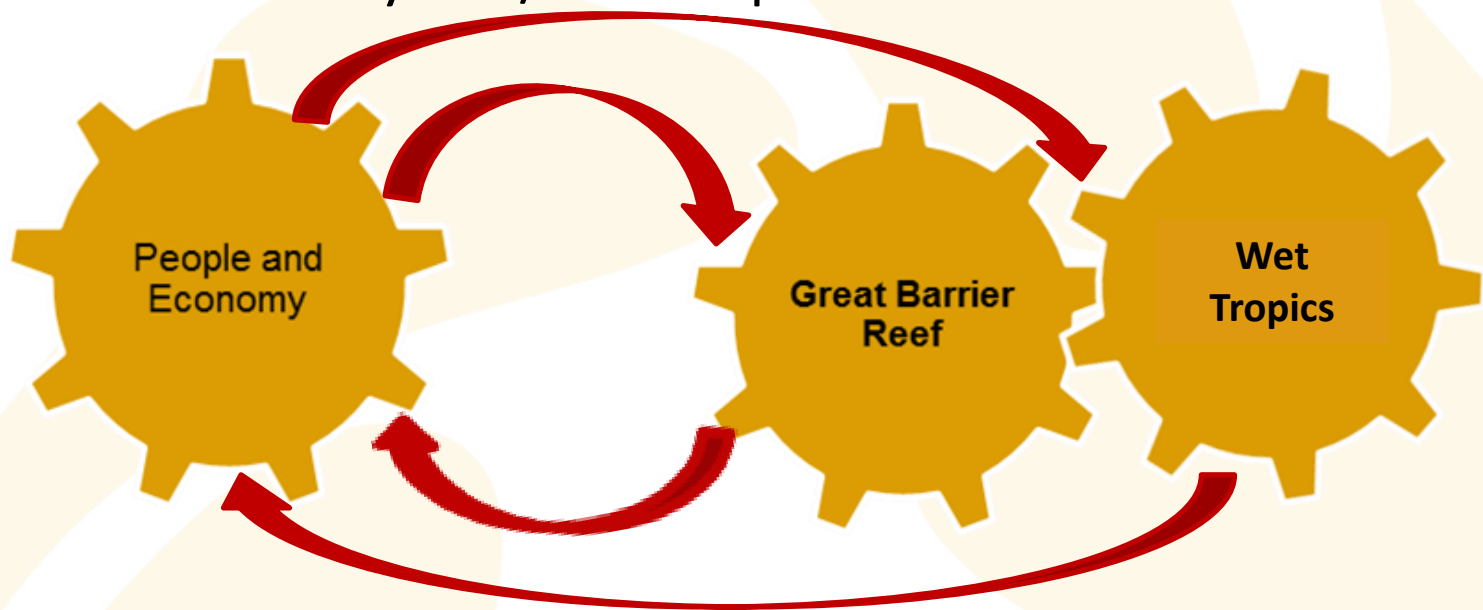
# NATURAL AND ECONOMIC SYSTEMS

## TRULY DYNAMIC AND INTERLINKED

**Changes in the economy affect the environment.**

**These changes feed back and affect people and economy**

Changes in one part of the economy can impact other parts of the economy and/or multiple environments



Social and environmental values are important to people: deterioration thus has a real impact on the economy and on well-being.



# SCIENTIFIC PUNCHLINES

- Emerging body of literature on life satisfaction offers promising new way of ‘valuing’ non-market goods, assessing
  - Total values (how important is x compared to, say, y?)
  - Marginal values (how would a change in x affect you?)
- These ‘values’ can be expressed in non-monetary terms (e.g. just using comparisons/relativities); some can also be converted to monetary equivalents
- Irrespective of whether or not these values have \$ attached, these quantitative measures likely to be useable in integrated modelling exercises
- Need long term data sets so can do ‘proper’ dynamic integrated modelling



# THANK YOU

## COMMENTS, IDEAS AND SUGGESTIONS

### WELCOME 😊

#### Project 10.2 (GBR) contacts

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##### CONTACT for long-term visitor exit surveys from Cairns airport

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Organisation: James Cook University

Phone: (07) 4232 1039

Email: [bruce.prideaux@jcu.edu.au](mailto:bruce.prideaux@jcu.edu.au)

#### Project 12.3 (Wet Tropics) contacts

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