BE WHAT YOU WANT TO BE

Protection values for the Great Barrier Reef

John Rolfe

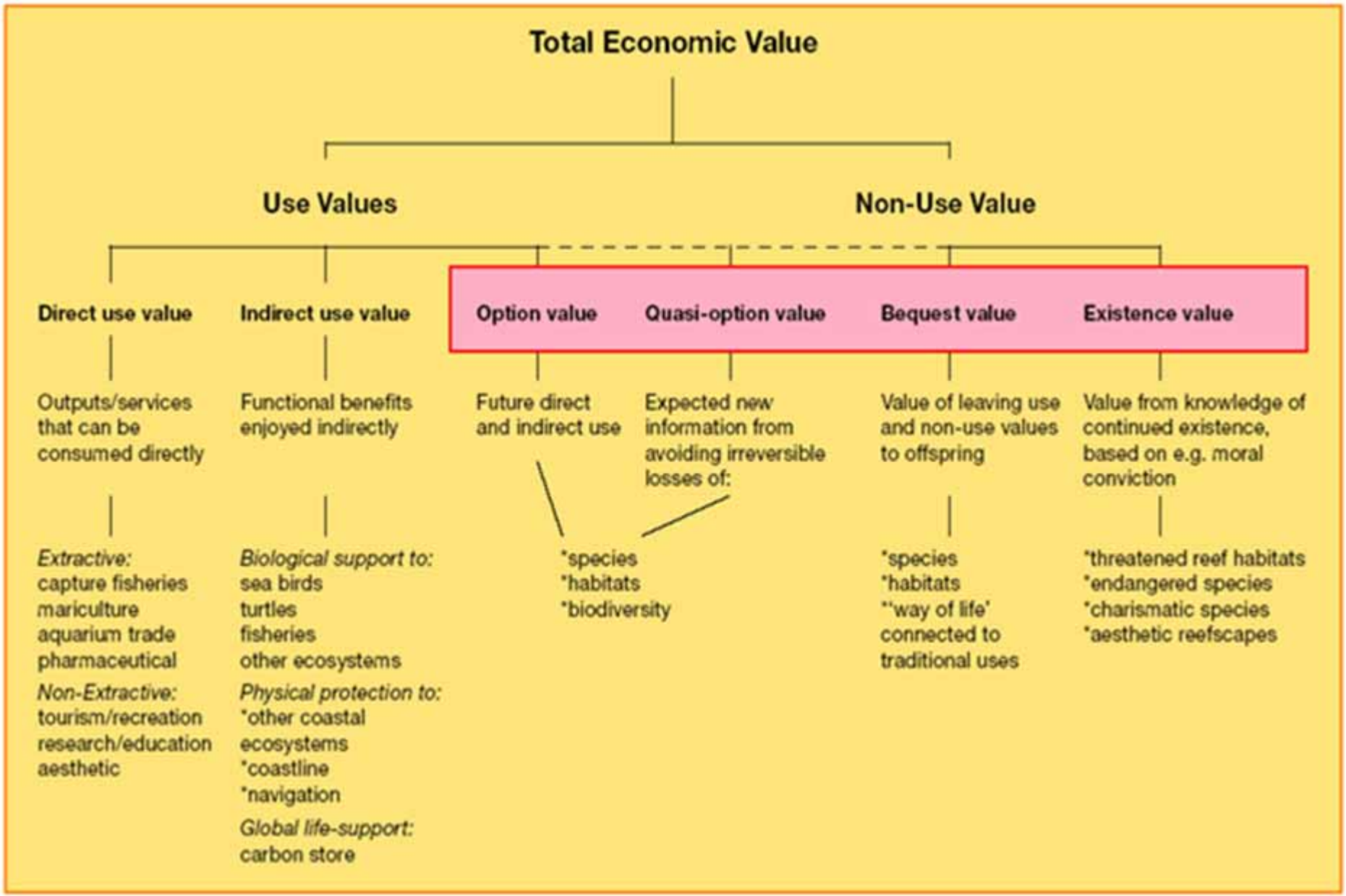
Background

- Support from GBRMPA and Jeff Bennett in the design phases
- CQU project team has been John Rolfe and Jill Windle, with additional support from Xuehong Wang and Daniel Gregg

The problem being addressed

- Protection of the GBR involves significant effort and resources, e.g.
  - Establishment of marine park
  - World Heritage status (1981)
  - 33% protected in green zones (2004)
  - Reef Rescue program addressing water quality
  - Calls to reduce greenhouse gas emissions
- Each proposal can involve significant public and private costs
- Do the benefits of extra protection outweigh the costs?

Benefits derived from the GBR



Very few valuation studies of the GBR

- Almost all economic studies have focused on value of commercial activities
- These are impact assessments
  - Results do not translate to estimates of value
- Most valuation studies have focused on recreation
    - Hunloe et al. 1987, Blamey and Hundloe 1993, Carr and Mendelsohn 2003,Kragt et al. 2009, Prayaga et al. 2010
- Very few studies estimating non-use values
    - Hunloe et al. 1993, Windle and Rolfe 2005
    - Results extrapolated by Oxford Economics 2009

The Oxford Economics 2009 report

- Assessed Total Economic Value for the GBR = $51.4B
  - Tourism consumer surplus = $16.6B
  - Tourism producer surplus (profit) = $3.6B
  - Recreational fishing consumer surplus = $2.5B
  - Recreational fishing producer surplus = $0.3B
  - Commercial fishing producer surplus = $1.4B
  - Indirect use values = $10.4B
  - National non-use values = $15.5
    - $57.40 per annum for each Australian household for 100 years
  - International non-use values = $1.9B

The focus of this study

- Key aim: estimate values for improved or maintained protection of the GBR
  - Focused on estimating marginal values (small changes in protection)
  - Testing whether the types of management options used are important – or just the end protection
  - Testing whether the level of certainty that protection will occur is important
  - Testing if values vary across different population groups

Conducting the case study

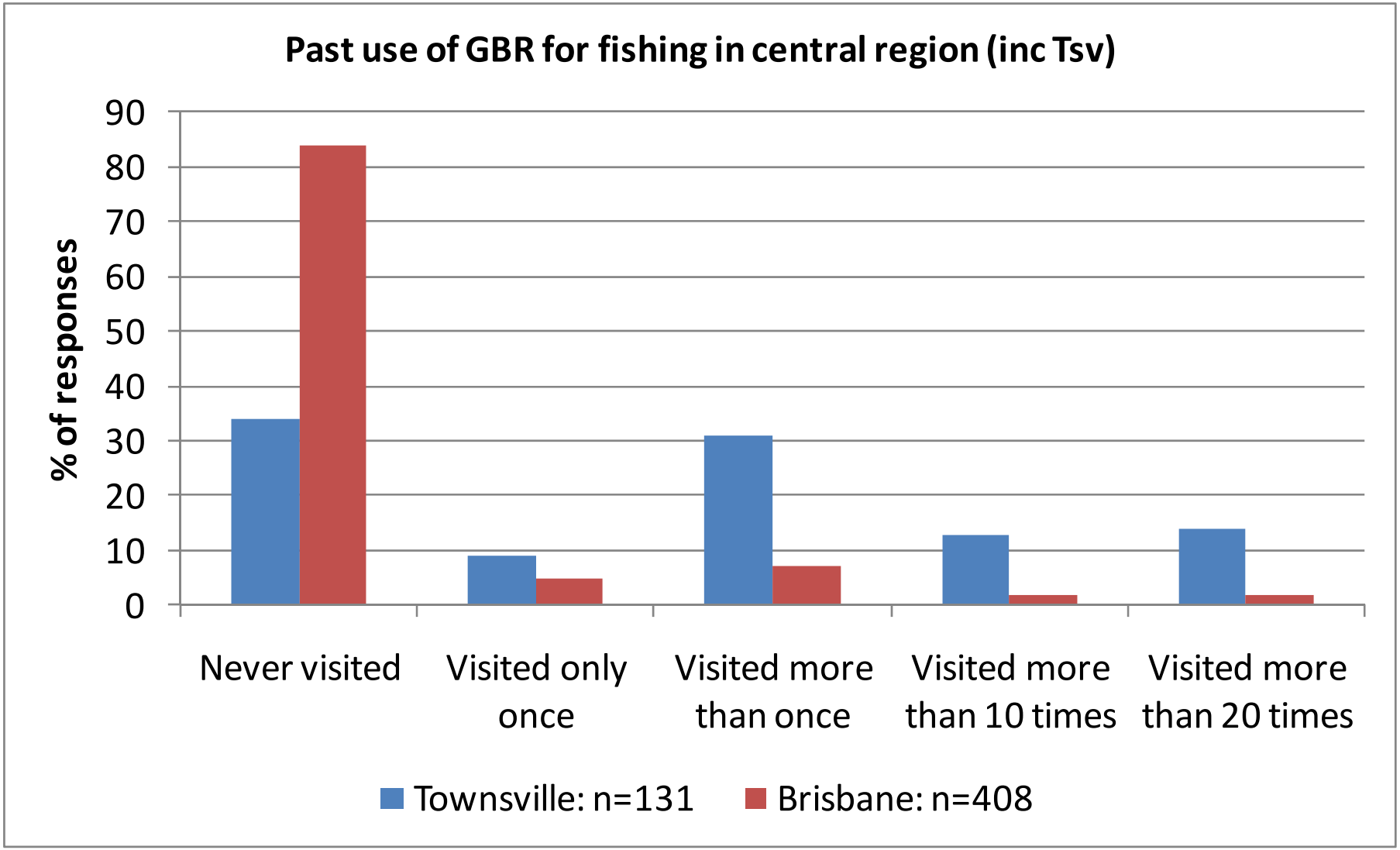
- Used the choice modelling technique
  - Initial consultation phase with stakeholders
  - Multiple focus groups in Brisbane, Rockhampton and Townsville
  - Conducted three main rounds of surveys
    - More than 30 different split samples to test different case study and methodological issues
    - Used both drop-off/collect and web-based formats
    - Updated experimental designs between rounds
    - More than 3,000 households surveyed in Queensland

Example choice set

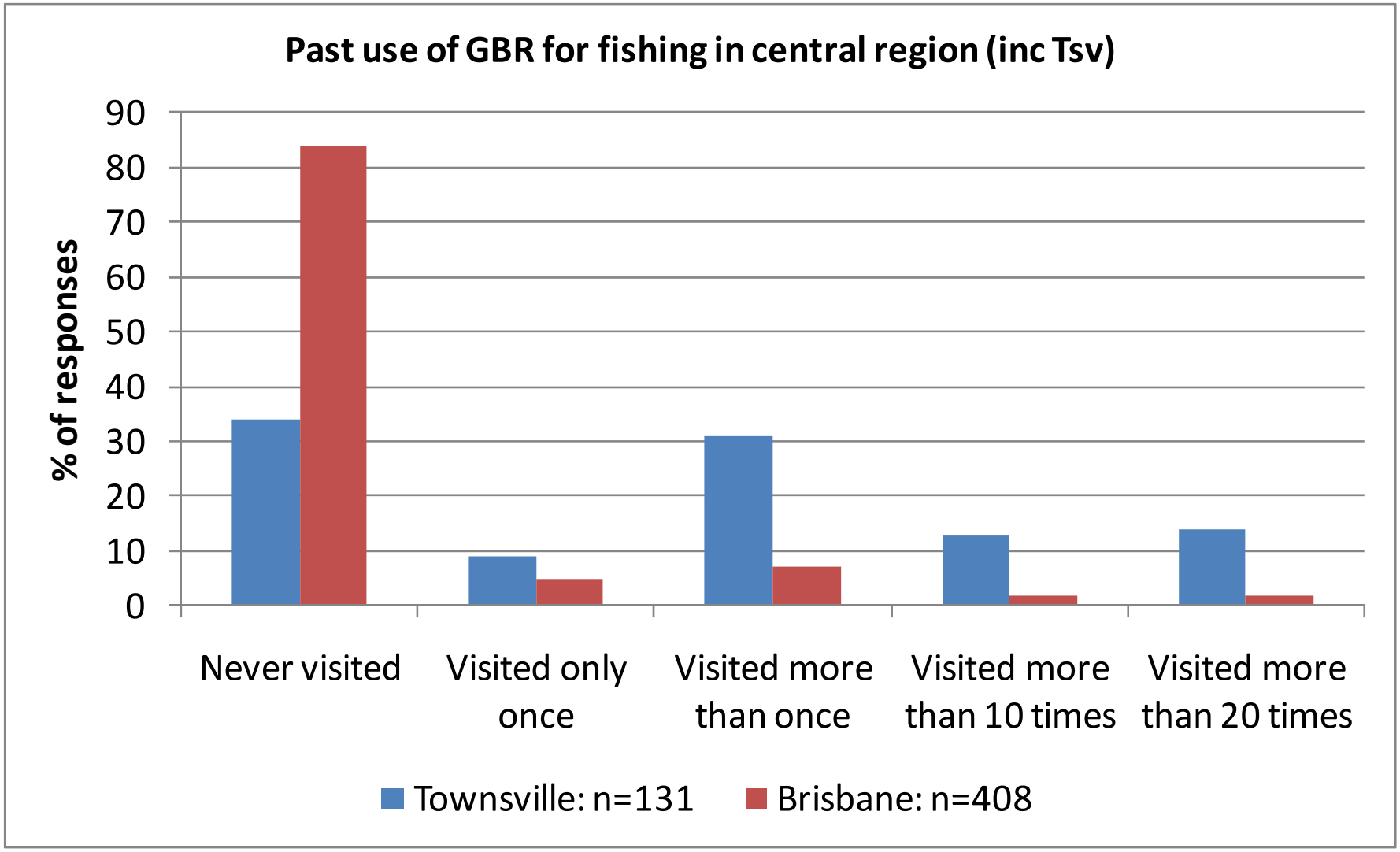
Whole GBR

	Management	Amount of GBR in good condition	Will it happen?	Cost	Your choice
		 Current condition: 90% in good condition (311,000 sq km)			
	Option for particular focus	Condition in 25 years time	Level of certainty	How much you pay each year (5 years)	Select one option only
Option A	**Current trends**	**65% in good condition** (225,000 sq km)	**80%**	**$0**	☐
Option B	**Improve water quality**	**68%** (235,000 sq km) = **3%** improvement	**60%**	**$100**	☐
Option C	**Increase conservation zones**	**66%** (228,000 sq km) = **1%** improvement	**75%**	**$50**	☐
Option D	**Reduce greenhouse gases***	**85%** (294,000 sq km) = **20%** improvement	**40%**	**$100**	☐

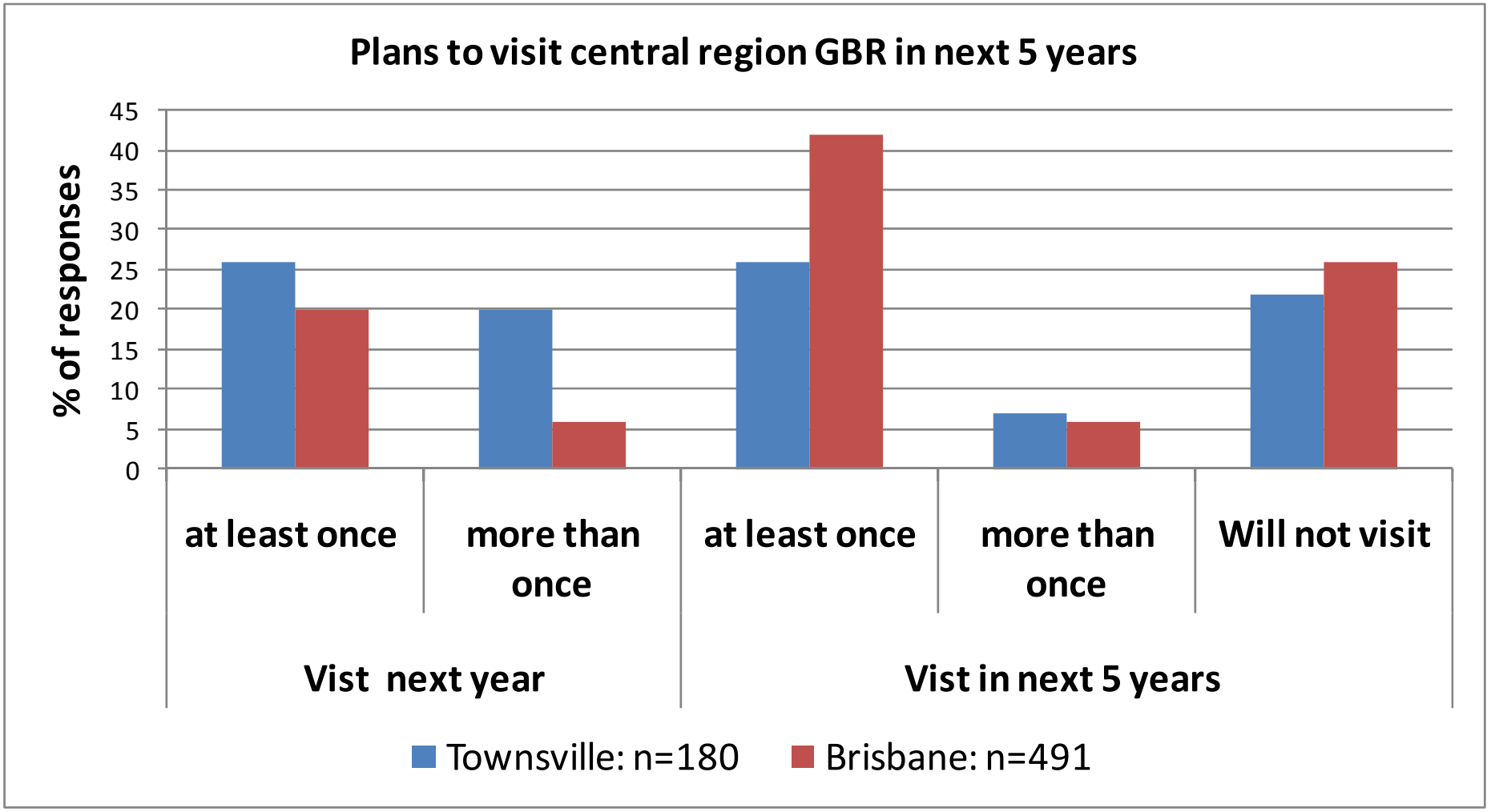
Use for recreational fishing



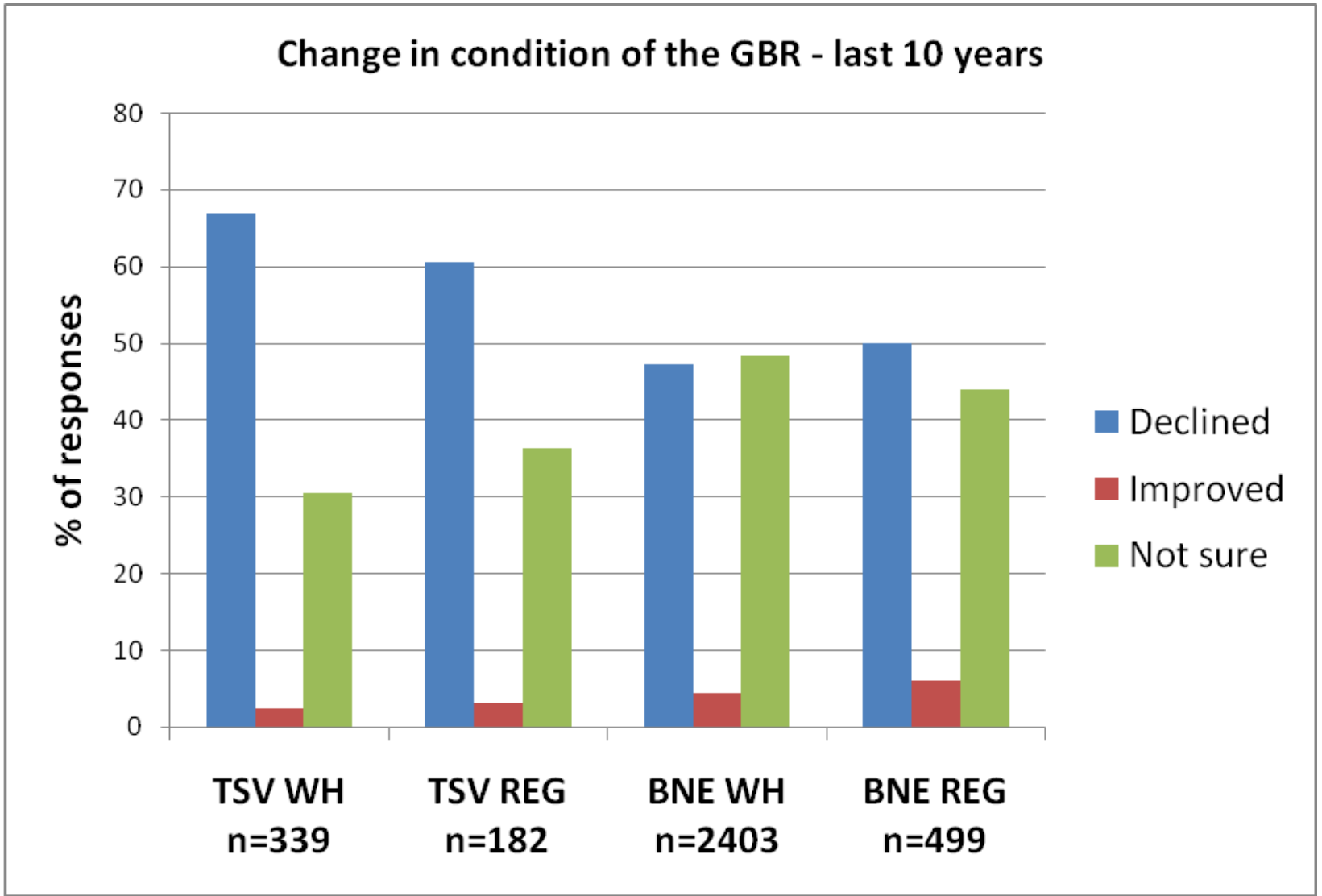
Other recreational uses



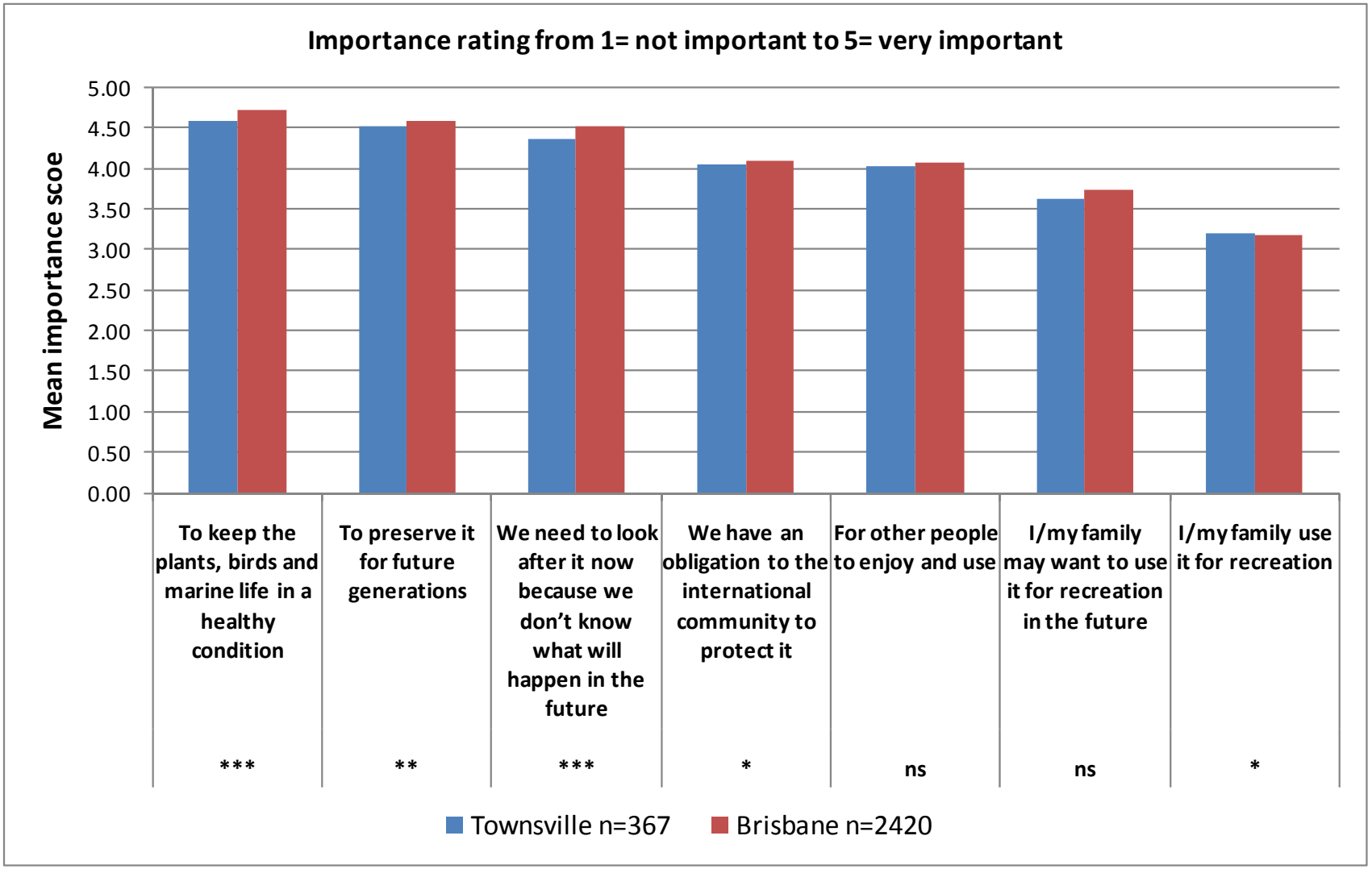
Plans for future use



Opinion about GBR condition over past 10 years



Reasons for protection: non-use values are more important



Summary values

- Average annual household willingness to pay is $22.50 per 1% of GBR (CI = $16 - $30)
  - Average willingness to pay is $6.40 per 1,000 km^2
- Present value across Qld households is $110 Million per 1% improvement
  - Assumes 75% of households support protection
- Average value for each 1% improvement in certainty of outcomes is $7.50 per household

Values for management options

- Including the management options generated higher values
  - Increasing conservation zones most preferred
  - Reducing greenhouse gases least preferred

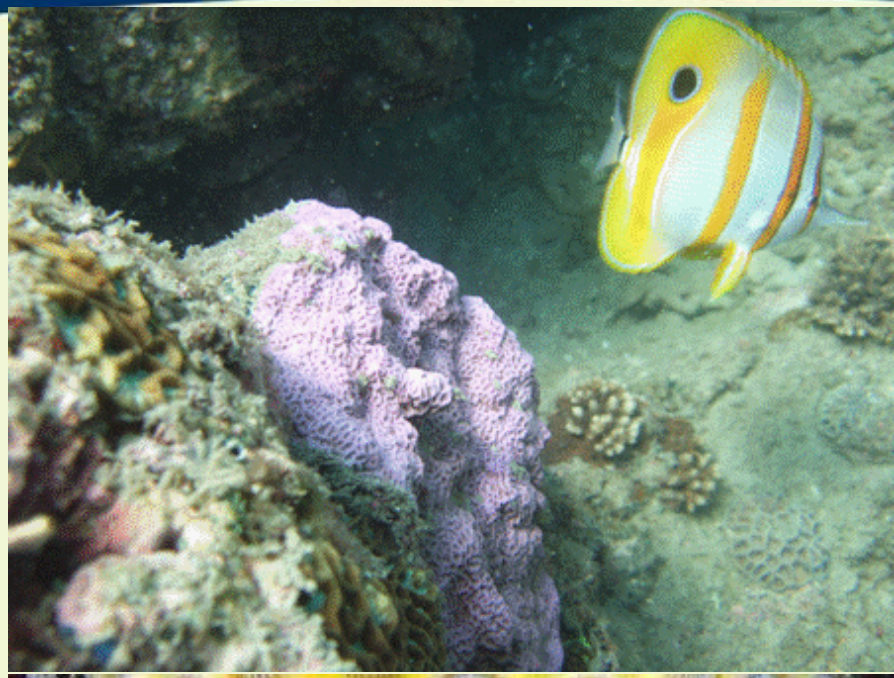
WTP for 1% improvement	**GBR**	**Certainty**
Mngt options GBR (avg)	$22.47***	$7.50***
Improve water quality	$26.01***	$1.30
Increase conservation zones	$33.01***	$6.11**
Reduce greenhouse gases	$8.72	-$0.34

Values for GBR regions versus whole GBR

- Can find little difference in values between the whole GBR and a GBR region (25% of the area)
- Results consistent over a number of split-sample experiments
- May be a strong iconic effect where people treat it as a single asset

Values for regional population

- Values held by regional population (Townsville) consistently higher than Brisbane
  - Regional population had higher use of asset
  - Regional population were more likely to think condition had declined



Apportioning values

- Some split sample experiments have presented the GBR as three key assets
- Results disaggregate values across the assets
- Values per 1% improvement
  - Area of coral reefs = $12.80
  - Number of fish species = $7.90
  - Area of seagrass = $4.90

Application to Reef Rescue

- Investment in Reef Rescue is $200 Million
- For the Qld public to receive full value, improvement in GBR is needed of between 1.8% and 2.7% (depending on assumptions about participation rate)
- Level of improvement needed is lower when remaining Australian values are included

Summary

- This study is the first comprehensive study assessing protection values for the GBR
  - Values are more conservative than those estimated by Oxford Economics
- Results are directly applicable to policy settings because they are marginal values
- Results indicate that values are higher when:
  - Management options are specified
  - There is high certainty that outcomes will be achieved