WWF

BRIEFING

AUS

2015

Queensland Protected Area Opportunities 2015-2020

NORTHERN HAIRY NOSED WOMBAT © QUEENSLAND GOVERNMENT

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Daintree Rainforest,
North Queensland
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KEY FINDINGS[1]

- We estimate the biodiversity and tourism benefits of three major protected area opportunities in Queensland, some already planned but not yet guaranteed secure funding:

  1. Gazette national parks already purchased with Commonwealth grants and awaiting gazettal
  2. Continue strategic transfers of high biodiversity value state forests to national parks
  3. Bring high value climate refuge properties into new national parks or private nature refuges

- This would protect another 4.4 million hectares or 2.4% of the land area of Queensland, but would cost only $15 million a year, over 5 years which includes $11 million a year to protect high value climate change properties, and $4 million a year increment in base funding for park rangers to keep pace with management needs. State forests are already owned and managed by the government, and little change in base management funding is thought to be needed for these forests.
- The benefits of these planned or proposed protected areas include:
  - 37 poorly protected native species would reach minimum standards of habitat protection;
  - 29% of the states identified climate refuges for threatened species would be protected compared with 17% at present;
  - Up to 10 million tonnes per year of excess soil erosion would be avoided in Great Barrier Reef catchments, enough to cover the Brisbane CBD in over 2 metres of soil every year;
  - Annual tourism spending generated by national parks is predicted to increase by 27% from $671 million to $850 million.
- For parks to realise all these benefits, they must be well resourced and strongly protected as sanctuaries for wildlife, forever safe from the negative impacts of development, livestock grazing, logging and mining.

ABOUT THIS BRIEFING

In our recent Safety Net report we quantified the many benefits of protected areas for Australian wildlife.

We celebrated the achievement that the number of threatened species reaching minimum protected standard over the past decade has more than doubled through strategic decisions such as the recent expansion of national parks over Curtis Island to protect habitat for the critically endangered Dawson Yellow Chat.[2]

DAWSON YELLOW CHAT © ROSS MONKS

Protected areas have enjoyed bipartisan support in Queensland. The present Newman government continued the allocation for parks acquisitions of the previous Bligh government as an election commitment in 2012. Conserving our state's unique wildlife like the Northern Hairy Nosed Wombat, and special places like the Great Barrier Reef is a critical issue that must be above politics.

We compiled protected area, species and climate refuge maps for Queensland.[3] We divided protected areas into five categories using these maps, two categories of existing protected areas and three of planned or potential protected areas (Fig 1):

Existing protected areas

a) Existing government protected areas (national or regional parks)

b) Existing non-government protected areas (nature refuges, coordinated conservation areas, Indigenous protected areas or non-government National Reserve System purchases)

Planned or potential protected areas

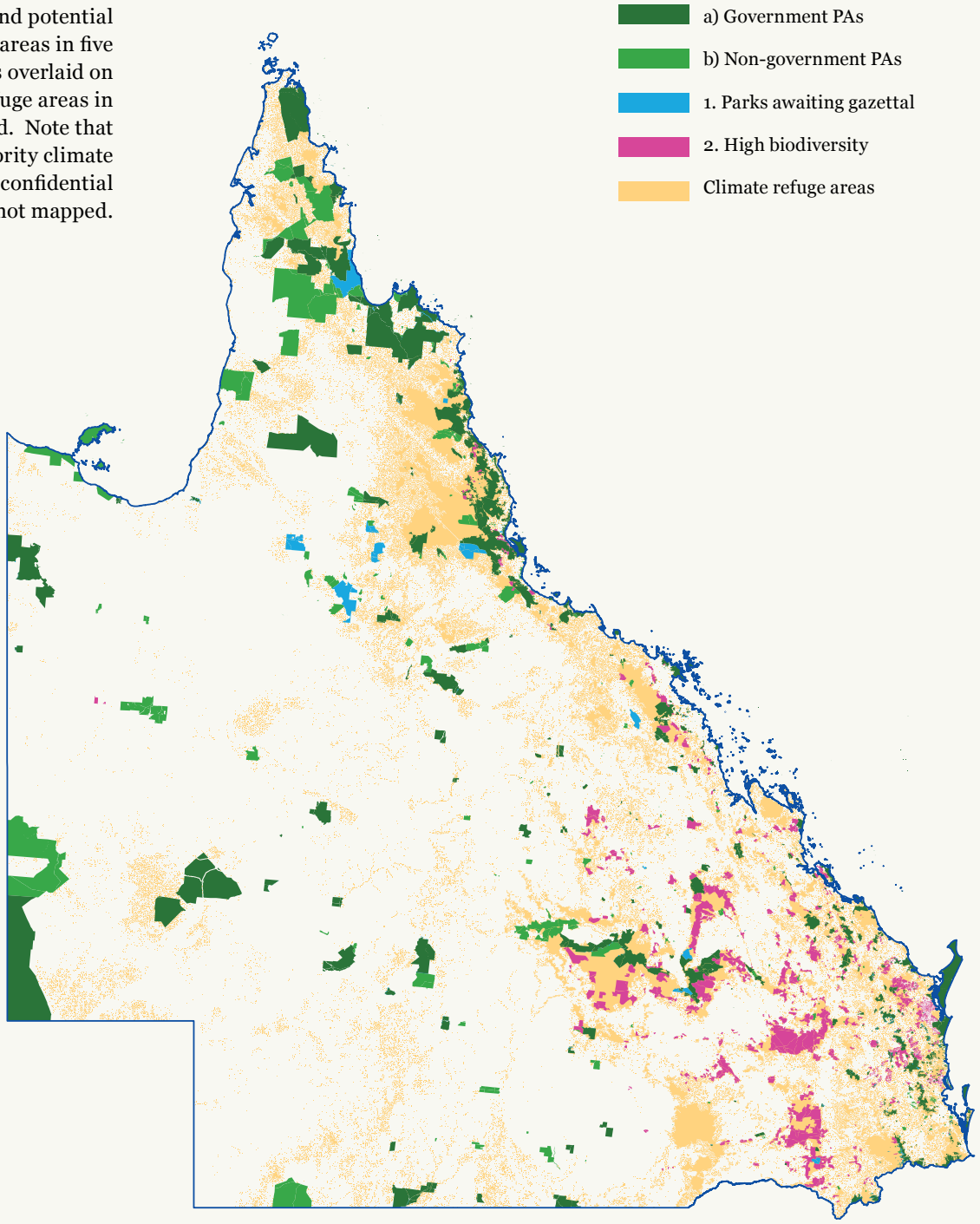
1) Government protected areas already acquired and awaiting gazettal (mostly purchased under Commonwealth National Reserve System grants program);

2) State forests, timber and forest reserves formerly on track for conversion to National Park under the State Forest Agreement, due to recognised high biodiversity values, but currently subject to ongoing logging, grazing and mining;[4]

3) High value climate refuge properties, 89 properties identified using Queensland Government methods, as the highest priorities to provide future climate refuges for threatened species.

FIGURE 1

Present and potential protected areas in five categories overlaid on climate refuge areas in Queensland. Note that 3) high priority climate refuges are confidential and not mapped.



Scale and cost of planned or potential protected areas

The total area that is proposed for protected is 4.4 million ha, about 2.4% of the state land area.

This is composed of about 0.6 million ha of national parks awaiting gazettal, about 2.9 million ha of high value state forests and nearly 1 million ha of high value climate refuge properties (see Table 1).

Table 1. Areas of existing, and planned or proposed protected areas.

Existing and potential protected areas	Area (ha)	% of state
Existing protected areas		
a) National or regional parks, 2014	8,917,582	4.8%
b) Non-government protected areas, 2014	4,474,831	2.4%
TOTAL	**13,384,601**	**7.2%**
Planned or proposed protected areas (this study)		
1) Gazette National parks awaiting gazettal	600,197	0.3%
2) Convert high biodiversity value state forests to national park	2,862,755	1.5%
3) Protect high value climate refuge properties	937,036	0.5%
TOTAL	**4,399,988**	**2.4%**

The protection of high value climate refuge properties either purchased as new national parks or through nature refuge agreements with existing landholders, would cost about $11 million a year or $55 million in total over the next five years.[5]

Additional management responsibilities occasioned by the increase in the size of the national parks estate resulting from the above additions, would require an increase in base funding of the park ranger force of about $4 million a year ($20 million over 5 years) to deal with new national parks.[6]

State forests are already owned and managed by the government, and management costs should actually decline once parks are declared, due to the removal of impacts from resource use that otherwise require amelioration.

In this analysis, we produce estimates of four value indicators for the planned and proposed protected areas to assess the value they would add to Queensland conservation and economy if implemented. These indicators are:

- Numbers of threatened species meeting a minimum standard of protection;[7]
- Proportion of mapped climate refuge areas for threatened species protected;
- Avoided soil erosion in Great Barrier Reef Catchments;
- Increase in tourism revenue.

THREATENED SPECIES PROTECTED

In our earlier report, we analysed overlaps of 389 threatened species that occur primarily in Queensland with protected areas in 2002 and 2012. We applied a minimum protected standard of 30% of known or likely to occur habitat protected and counted how many species had attained the standard. We found that the number attaining the standard had more than doubled over the decade of the study from 20% in 2002 to 42% in 2012, due to growth of parks and other protected areas.[8]

We repeat that analysis here using updated existing and proposed parks information as detailed above, but using the same methods as in the earlier report (Table 2).

Cooktown Orchid © Australian National Botanic Gardens

We find that adding new parks as proposed or planned would result in a significant further boost in threatened species meeting the minimum standard, from 42% to 52%, adding a total of 37 more species to the list meeting the standard. Species in this list include the Kuranda Tree Frog, the Eungella Day Frog, the Brigalow Scaly-foot legless lizard, the Pitcher plant and the iconic Cooktown Orchid, the floral emblem of Queensland.

This increase can be considered highly feasible, because the number of threatened species protected to minimum standard has already more than doubled from 79 in 2002 to 169 in 2014 in Queensland as a result of the strategic growth of protected areas.

Table 2. Attainment of the minimum habitat protection standard by threatened species with the majority of their range in Queensland.

	No. threatened species
Attained as of 2014	169
Attainable by protecting planned and proposed parks	37
Still below standard	183
Total	**389**

PROTECTION OF CLIMATE REFUGES FOR THREATENED SPECIES

In previous work, we mapped optimal climate refuge space for 500 threatened species across Australia. These are areas of greatest overlap for the most species of current and projected future distributions, considering the worst case scenario of largely unmitigated climate change that pertains at present.

Of this total climate refuge area, 27.6 million ha falls in Queensland primarily along the Great Dividing Range (Fig 1). Modest proportions of existing protected areas or those pending gazettal overlap this identified refuge area (24–40% in Table 3).

CLIMATE REFUGE FORESTS, KROOMBIT TOPS © QUEENSLAND GOVERNMENT

State Forests and high climate refuge value properties in contrast have very high proportional overlaps of 78-81%. Under all the planned and proposed protected areas, the proportion of the total climate refuge area protected would rise from 17% to 29%, a very substantial increase in protection of threatened species against projected changes in climate (Table 3). Overlap of the high value climate refuge properties with the wider climate refuge space is not 100% because whole properties are included, not all of which overlap the climate refuge area and because the Queensland Government methodology used for identifying high value properties is based on protecting climate refuges and connectivity for all wildlife, not just threatened wildlife.

Table 3. Overlap of identified climate refuge areas for 500 threatened species with present and potential protected areas in Queensland.

Present and potential protected areas	Portion that overlaps refuge area (%)	Overlap as % of all climate refuge areas
Existing protected areas		
c) National or regional parks, 2014	40%	13%
d) Non-government protected areas, 2014	24%	4%
Total		**17%**
Planned or proposed protected areas (this study)		
4) Gazette National parks awaiting gazettal	30%	1%
5) Convert high biodiversity value state forests to national park	78%	8%
6) Protect high value climate refuge properties	81%	3%
Total		**12%**

GREAT BARRIER REEF © WWF-VIEWFINDER

REDUCTION OF EXCESS SOIL LOSS IN GREAT BARRIER REEF CATCHMENTS

Recently we estimated that highly protected areas added from 2002 to 2012 in Great Barrier Reef catchments could avoid as much as 7.8 million tonnes per annum of soil loss, assuming that native vegetation and soils recover to pre-clearing levels of natural soil loss as a result of protection.[10]

Here we update that analysis considering the protected areas that could be added under the three categories above (Table 1) following the same methodology as the earlier report.

We find that if all three sources of new protected areas are added, as much as 10 million hectares of excess soil loss in GBR catchments could be avoided, enough to cover the Brisbane CBD in about 2m of soil every year (Table 4). This also represents a substantial 3.5% of the catchment-wide excess soil loss which is estimated at about 287 million tonnes per annum.[11]

Although these estimates of total soil losses are very high, only a fraction of all erosion ends up as sediment pollution reaching the Great Barrier Reef. Most soil erosion is re-deposited within the catchment as sediments on lower slopes and beds of inland water bodies. Recent estimates suggest total sediment pollution entering the Great Barrier Reef of the 287 million tonnes of excess soil loss is only in the range of 5-16 million tonnes a year.[12]

Table 4. Estimated avoided soil erosion in Great Barrier Reef catchments, if areas of potential protection are strictly protected.

Planned or proposed protected areas	% in GBR catchments	Avoided soil erosion (megatonnes per annum)
1) Gazette National parks awaiting gazettal	51%	2.0
2) Convert high biodiversity value state forests to national park	61%	1.2
3) Protect high value climate refuge properties	72%	7.0
TOTAL	**62%**	**10.2**

INCREASE IN TOURISM VALUE

FRASER ISLAND © MARCO SIMONI/OZSTOCK IMAGES

Wild nature tourism in Australia is on the increase despite a global shift of tourism from developed to developing countries, but we cannot attribute this clearly to the parallel growth of protected areas in Australia.[13] About $749 million/year in spent by tourists who visit national parks in Queensland who would not otherwise have visited Queensland, while $4.43 billion is spent by all visitors to national parks, based on visitor surveys in four regions and modelling. However, the authors of this 2009 report did not attempt to forecast growth in tourism in response to growth of the parks estate.[14] A simple approach is to assume that national park related tourism visitation and spending increases proportionally to increases in the area of national park.[15] However, this assumption is weak because many different factors drive nature tourism. The availability of destinations in the form of national parks is of course a necessary component. However the degree to which a destination attracts tourists depends on economics in tourist home countries, marketing, social trends, exchange rates, accessibility, services and experiences available and the weather.

In this update we attempt a better forecast of growth in tourism value due to projected growth of the Queensland parks system as proposed here. We accounted for non-park related factors by regressing visitor numbers on variables such as regional population size, size and location, in addition to the proportion of the region protected. We then generated predictions of the growth in tourism spending directly attributable to the presence of national parks due solely to the increase in proportions of regions protected, all else equal. We found that the predicted tourism spending generated by parks would increase by 27% from $671 million a year at present (between $342 and $1342 million with 95% confidence) to about $850 million a year (between $410 and $1810 million with 95% confidence). Note however that the results are subject to very large variations due to the limited data available and should therefore be treated with caution. Detailed methods are in endnote 16.

STRENGTHENING PARK PROTECTIONS

Recent decisions to allow development or livestock in national parks or to reopen state forests formerly on track to become national parks to logging or mining have undermined community expectations about the primary purpose of national parks. National Parks can only be relied upon to deliver the biodiversity and tourism benefits they currently provide if they are well resourced and strongly protected as sanctuaries for wildlife, forever safe from the negative impacts of development, livestock grazing, logging and mining.

ENDNOTES

1 Analysis by Martin Taylor, WWF-Australia, gratefully acknowledging the contributions of Mark Symons and Paul Donatiu, and the Queensland Government Department of Environment and Heritage Protection.

2 Taylor et al 2014. *Building Nature's Safety Net 2014: A decade of protected area achievements in Australia* (WWF-Australia, Sydney, www.wwf.org.au/buildingnaturesafetynet2014)

3 Spatial data layers used were "Protected areas of Queensland" issue dates 5/12/2012 and 9/4/2014. About 2.8 million hectares of state forests treated as national parks in waiting in the 2012 map, and assigned an IUCN management category, were no longer treated as such in the 2014 map, an outcome of a policy decision to halt the transfers of state forests to the national parks estate under the State Forest Process, a long term plan previously agreed to by the timber industry, to shift timber sourcing out of native forests onto a plantation only base by 2025.

We removed from the maps of state forests, forest reserves and timber reserves areas shown as plantations in the "Queensland Land Use" layer, issue date November 2014. Although the issue date for the latter is 2014, information currency ranges from 1999 in outback Queensland to 2013 in Southeast Queensland.

For all other protected areas private, indigenous and pending gazettal, we used the latest CAPAD 2014 (http://www.environment.gov.au/fed/catalog/search/resource/details.page?uuid=%7B4448CACD-9DA8-43D1-A48F-48149FD5FCFD%7D)

To select a set of most desirable climate refuge properties, we used the methodology provided in confidence by the Department of Environment and Heritage Protection in conjunction with climate refuge areas mapped under the worst case scenario RCP 8.5 of Fig 19 of Maggini et al 2011, *Protecting and restoring habitat to help Australia's threatened species adapt to climate change*. National Climate Change Adaptation Research Facility, Gold Coast (http://www.nccarf.edu.au/publications/habitat-australias-species-adapt-climate).

4 78 state forests were subject to logging concessions during 2013-14 (Answers to Questions on Notice 2014 Estimates Hearings, http://www.parliament.qld.gov.au/documents/Committees/AREC/2014/Estimates2014-15/rpt-042-01Aug2014.pdf)

5 We assumed 75% of the 937,000 ha of high value climate refuge properties would be purchased at historical average of $78.6/ha, and the remaining 25% placed under Nature Refuges at the historical average of $5.4/ha, for a total of $56 million (see Taylor et al 2014, Building Nature's Safety Net 2014 cited above). We rounded down to $11million p.a.

6 Considering not all the areas would be gazetted right away, we assumed an average area to be managed about half that to be gazetted (1) 0.6 million ha or purchased and gazetted (3) 75% of 0.94 million ha or 0.64 million ha to be managed. Average management costs for QPWS have ranged from $10-$20/ha over recent years (see Taylor et al 2014, *Building Nature's Safety Net 2014* cited above). We assigned a lower value of $6/ha considering that the new parks would not have visitor pressures immediately, and most of the cost would be for new rangers. After rounding this produced an estimate of $4 million p.a.

7 With modifications for species with small or exceptionally large ranges as in Taylor et al 2014. *Building Nature's Safety Net 2014* cited above.

8 Ibid.

9 Fig 19 of Maggini et al 2011, *Protecting and restoring habitat to help Australia's threatened species adapt to climate change*. National Climate Change Adaptation Research Facility, Gold Coast (http://www.nccarf.edu.au/publications/habitat-australias-species-adapt-climate).

10 Box 2 in Taylor et al 2014. *Building Nature's Safety Net 2014* cited above.

11 According to Taylor et al 2014 *Changing land use to save Australian wildlife* (WWF-Australia, Sydney, http://www.wwf.org.au/?11441/Changing-land-use-to-save-Australian-wildlife) total excess soil loss in the Great Barrier Reef catchments summed to about 287 million tonnes annually, based on the soil loss maps of Lu et al.

According to Bartley et al 2009 *Can improved grazing land management reduce sediment yields delivered to the Great Barrier Reef*? (Meat & Livestock Australia, Sydney, http://www.clw.csiro.au/publications/waterforahealthycountry/2009/wfhc-GBR-grazing-land-MLA.pdf), soil bulk density on cattle stations in the Burdekin River catchments generally exceed 1.5g/cm3 (same as tonnes/m3). According to the Queensland Government data layer "Locality boundaries – Queensland", Brisbane City has a projected area of 275 hectares. Using these conversion factors, 10 million tonnes a year is roughly equivalent to about 6 million m^3. Dividing by the 2.75 million m^2 of the CBD produces a soil depth of 2.2m.

12 Box 2 in Taylor et al 2014. *Building Nature's Safety Net 2014* cited above.

13 Taylor et al 2014. *Building Nature's Safety Net 2014* cited above; Balmford et al. 2009, A Global Perspective on Trends in Nature-Based Tourism. PLoS Biology 7(6): e1000144. doi:10.1371/journal.pbio.1000144

14 Ballantyne et al 2009. *Valuing tourism spend arising from visitation to Queensland national parks* (CRC Sustainable Tourism).

15 Taylor et al 2009, *20 million hectares by 2020: Protected areas, green infrastructure and green jobs for Queensland*. (WWFAustralia, Sydney, http://awsassets.wwf.org.au/downloads/bi030_20million_hectares_by_2020_qld_1may09.pdf).

16 We used the regional data on visitor nights and tourism spending generated by parks as reported in Ballantyne et al (2009, cited above) as shown in the Table below.

We reconstructed regions using the Queensland map of local government areas, and assigned each park present or potential to each region. We combined Mackay and Whitsunday regions because of the difficulty of discerning them apart in the maps provided by Ballantyne et al. (2009). We used the population numbers in the localities spatial layer of Geoscience Australia 2003. *GEODATA TOPO 2.5M 2003*. (Australian Government, Canberra), aggregated by regions. We used eight predictor variables, three continuous: population, regional areas, percent of region in parks; and five binary variables Urban, Iconic, Remote, Coastal and Tropical. The former three were as scored by from Ballantyne et al (2009). We used normalizing ln transformations of population, area and visitor nights for regression, and the arcsin-square root transformation for % of region in parks. We derived principal components to resolve the multiple collinearities among these variables.We then regressed total visitor nights on these principal components. Only the first principal component was found to be significant in regression. We then generated predicted values of this component and of visitor nights, based on the increased proportions protected in parks as envisaged here. From these predicted values we predicted new spending estimates based on same ratios as reported. Results are shown in Table below.

								$m spending parks-generated	
Region	Type	Visitor Nights (1000s)	Tourism spending parks generated ($m)	Population (1000)	Area (1000ha)	Parks area 2008 (%)	Parks potential area (%)	Predicted 2008	Predicted potential
Brisbane	Urban, Coastal	4,082	$ 82.88	1,392.5	1,037.3	3.5%	16.8%	$ 70.27	$ 110.40
Capricorn	Remote, Coastal	393	$ 17.59	77.3	1,825.2	3.3%	6.5%	$ 21.22	$ 24.57
Carnarvon	Remote	97	$ 4.34	36.1	15,985.7	3.3%	10.4%	$ 5.87	$ 7.80
Gold Coast	Urban, Coastal	4,058	$ 82.39	321.6	652.1	9.5%	10.1%	$ 69.66	$ 71.07
Great Sandy	Iconic, Coastal	972	$ 59.34	58.0	710.2	27.1%	41.1%	$ 154.93	$ 206.19
Mackay Whitsunday	Iconic, Coastal, Tropical	529	$ 64.59	101.3	9,009.0	2.8%	6.7%	$ 101.00	$ 121.00
Outback	Remote	38	$ 11.43	38.2	79,599.4	3.6%	3.6%	$ 29.87	$ 29.92
Sunshine Coast	Urban, Coastal	2,785	$ 56.55	185.4	1,002.1	10.4%	22.8%	$ 58.24	$ 80.66
TNQ	Iconic, Coastal, Tropical	4,485	$ 273.80	161.7	29,304.9	10.4%	12.9%	$ 61.07	$ 66.00
Toowoomba	Remote	454	$ 20.32	171.5	17,774.2	1.4%	9.0%	$ 7.31	$ 10.46
Townsville	Remote, Coastal, Tropical	866	$ 38.77	177.4	12,370.2	5.7%	10.6%	$ 19.41	$ 23.12
Wide Bay	Iconic, Coastal	612	$ 37.36	93.6	3,656.1	6.6%	16.9%	$ 72.39	$ 99.17
TOTALS		19,371	$ 749.36	2,814.5	172,926.4		Total predicted	$ 671.24	$ 850.35
							Lower 95% CI	$ 342.14	$ 410.15
							Upper 95% CI	$ 1,341.84	$ 1,810.44

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WWF has helped secure new highly protected areas that help recovery of fish populations and which build the resilience of the reef system.

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To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

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