



Tourism Queensland

Great Barrier Reef Tourism Climate Change Action Strategy 2009-2012 ABRIDGED



Australian Government
**Great Barrier Reef
Marine Park Authority**



In partnership with



Acknowledgements

The Tourism Climate Change Action Group

This document was created and released by the Great Barrier Reef Tourism Climate Change Action Group (TCCAG) under the leadership of the Great Barrier Reef Marine Park Authority. The TCCAG has representation from across the Great Barrier Reef and at the time of printing the membership of this group consisted of the following:

QTIC is fully committed to work with industry and government to keep the Reef healthy and keep the industry at the leading edge of sustainability.

Daniel Gschwind
Queensland Tourism Industry Council (QTIC)

AMPTO is vitally concerned about the effects of climate change on our magnificent Great Barrier Reef and the flow on effects to our businesses.

Col McKenzie
Association of Marine Park Tourism Operators (AMPTO)

This Strategy clearly identifies the challenges we face while providing real objectives and outcomes we can achieve.

Tony Baker
Quicksilver Group

We must take action now; we are heading for a situation where our current day-to-day issues will pale into insignificance.

Peter Gash
Lady Elliot Island Resort

The WCBIA is committed to reducing the marine tourism industry carbon footprint.

Deb Lewis
Whitsunday Charter Boat Industry Association (WCBIA)

Tourism Queensland is proud to be part of this crucial process and will continue to support our partners, including GBRMPA, in this major initiative.

Therese Phillips
Tourism Queensland

Our response to climate change needs to be swift and based on continual improvement.

Tony Charters
Ecotourism Australia

This Strategy is an essential step for the future health of the Reef and the tourism industry that relies upon it.

Lisha Mulqueeny
Great Barrier Reef Marine Park Authority

As we rally behind global efforts to limit greenhouse gas concentrations, we all must take measures to adapt to the range of climate induced changes that lie ahead.

Paul Marshall
Great Barrier Reef Marine Park Authority

DERM welcomes the insights and understanding coming from this strategy.

John Hicks
Department of Environment and Resource Management

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The Great Barrier Reef, Climate Change and Tourism

Climate change poses one of the greatest threats to coral reefs worldwide.

The Great Barrier Reef is one of the largest, healthiest, and best managed reef systems in the world, but it is at a crossroads. While it can cope with stress better than most reefs, the Great Barrier Reef (the Reef) is not immune to climate change. Its vulnerability is inextricably linked to its diversity, its size and the strong reliance by communities and industries on a healthy and resilient ecosystem.

As an iconic global destination, the Reef and its future outlook is integral to the sustainability of the tourism industry. By taking proactive action to tackle climate change, Reef resilience is enhanced and the marine tourism industry that relies on the Reef continues to be positioned as a top international and national travel destination.

Through strong partnerships developed over many years, tourism industry leaders and the Great Barrier Reef Marine Park Authority, working together as the Tourism Climate Change Action Group (TCCAG), developed and released the Great Barrier Reef Marine Tourism Climate Change Action Strategy 2009-12 (the Strategy). The abridged version of the Strategy is intended to highlight key actions the industry and individuals can take to make a difference to the future of the Reef and the tourism industry.

Reef Tourism Facts

- Reef tourism contributes AU\$5.1 billion to the Australian economy*
- Reef tourism supports over 50,000 jobs*
- 1.9 million people visit the Reef annually using tourism services**
- More than 770 operators are permitted for tourism in the Reef

* (Access Economics Pty Limited, 2006/07)

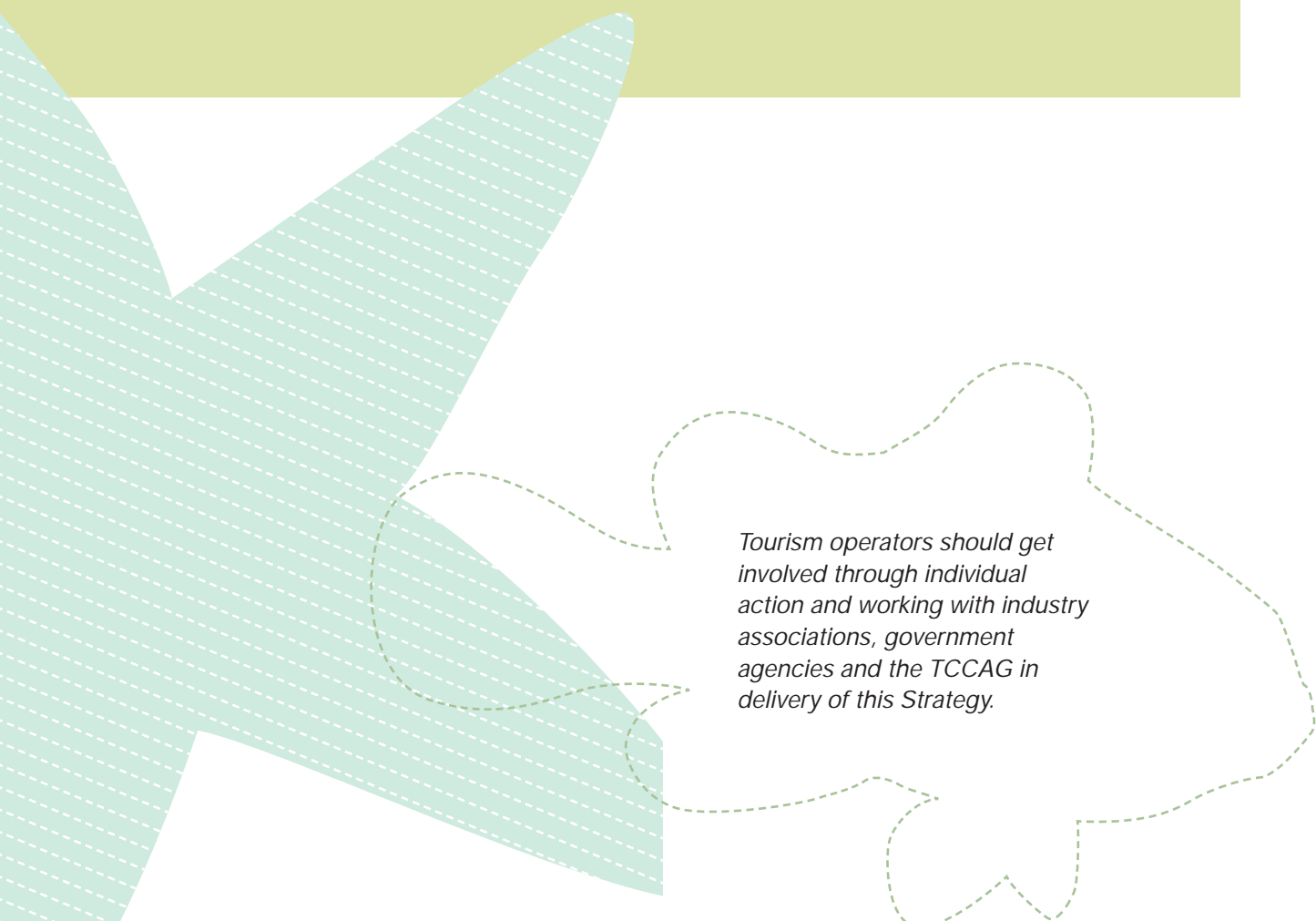
** (Based on Environmental Management Charge returns 2007)

Tourism is the major commercial user of the Reef and is an important tool in its protection and presentation.

The full version of this document is online at www.gbrmpa.gov.au

The Strategy

- Provides a way forward and framework of actions for the tourism industry to respond to climate change.
- Engenders action by individual operators which contributes to Reef health, stewardship and conservation.
- Offers a means to leverage resources to implement an effective climate change response.
- Is a tool to coordinate related projects proposed by government, research institutions, and industry partners.
- Delivers a mechanism for government and the industry to work in partnership to achieve the required policy and institutional settings to proactively manage required changes.



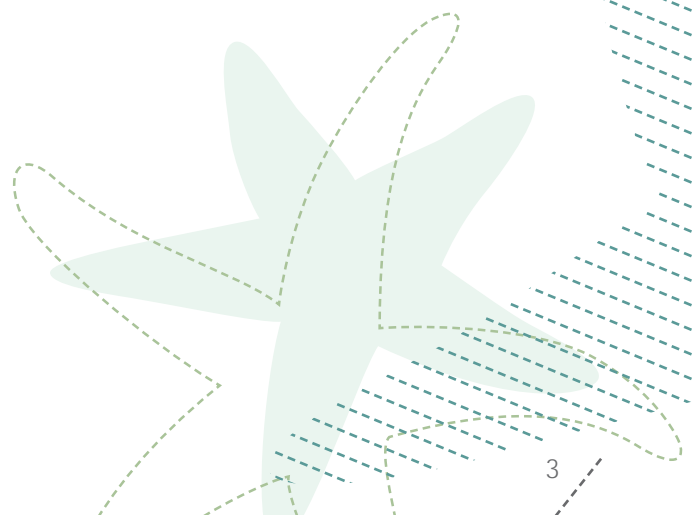
Tourism operators should get involved through individual action and working with industry associations, government agencies and the TCCAG in delivery of this Strategy.

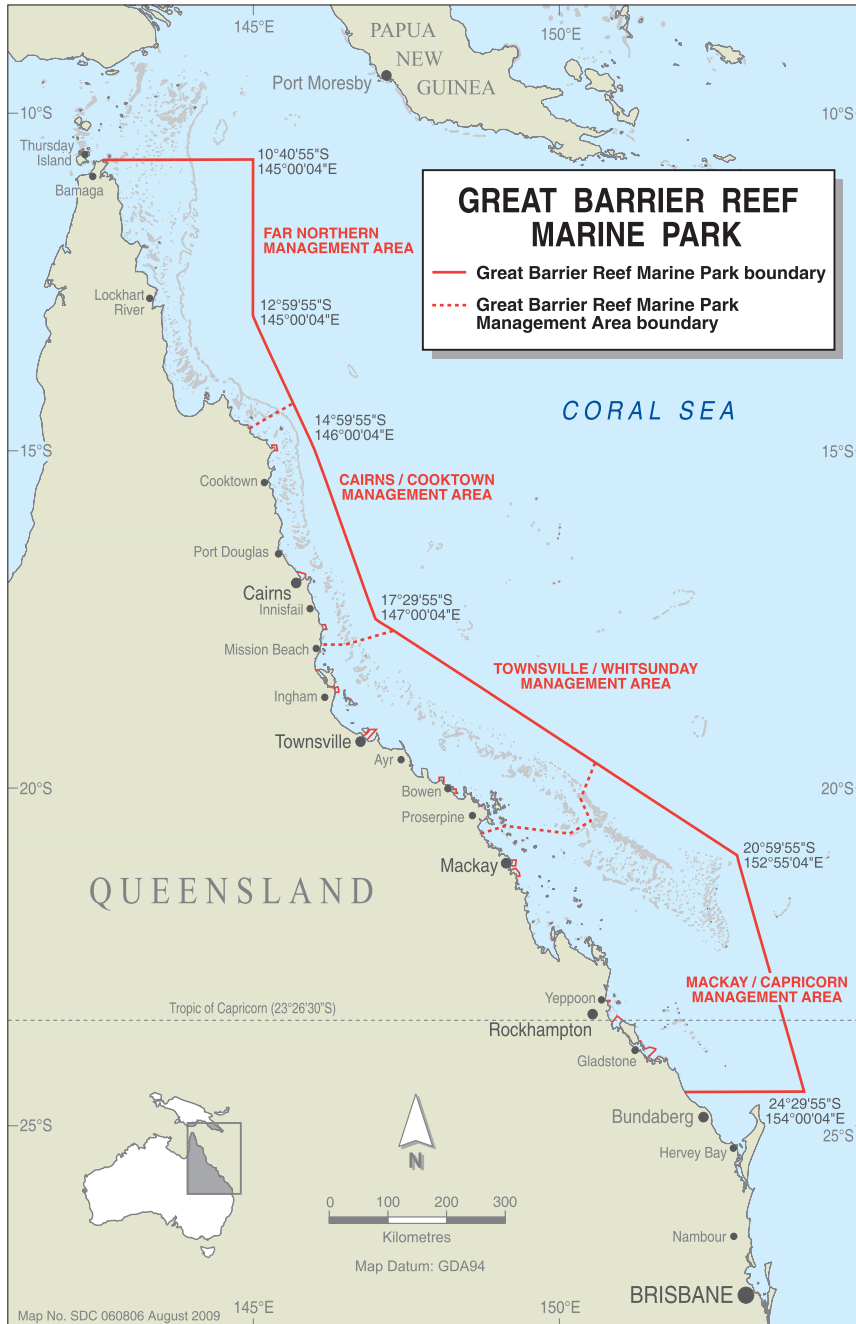


A shared vision

Through a series of industry workshops, conferences, Great Barrier Reef Tourism & Recreation Reef Advisory Committee and TCCAG meetings (commencing in 2005 and involving national and international experts on climate change, tourism, insurance, and the Reef) the TCCAG defined and embraced a shared vision for responding to climate change.

A Great Barrier Reef marine tourism industry that understands climate change and its impacts, is taking action to minimise its climate footprint, is business-ready to adapt to a climate change future, and is helping to protect the Great Barrier Reef.





Map of the Great Barrier Reef Marine Park

Reef snapshot

- A maze of reefs and islands spanning an area of 348,000 km².
- Protected by a World Heritage Area and Marine Park.
- It is one of the largest and most diverse coral reef ecosystems in the world.
- The Reef supports approximately 1,500 species of fish, 350 species of hard coral, more than 4,000 species of mollusc, 500 species of algae, six of the world's seven species of marine turtle, 24 species of seabird, and more than 30 species of whale and dolphin and the dugong.



Climate change issues and implications

There is now scientific consensus that human activities have increased the concentration of greenhouse gases in the atmosphere dramatically, and caused significant changes in global and regional climate (see Figure one). Atmospheric carbon dioxide (CO₂), the principal gas of concern, is at levels unprecedented in at least the last 650 000 years.

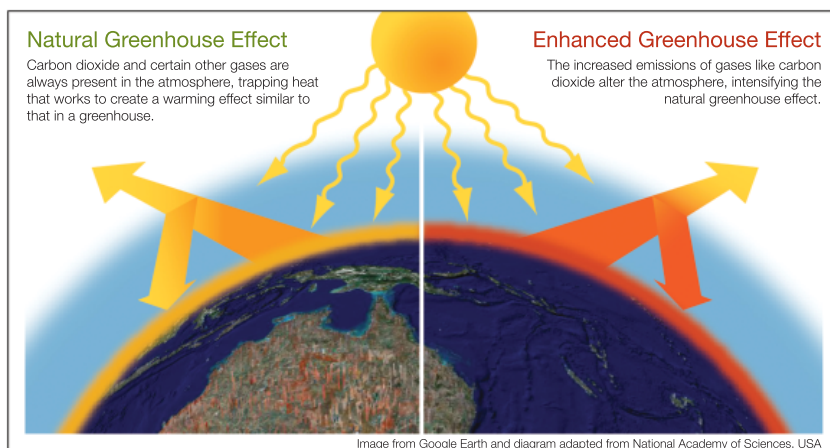


Figure 1. The Earth's blanket of greenhouse gases allows high energy light to pass through to the Earth's surface. At the surface, some light is converted to lower energy heat radiation. As the heat is re-radiated back to space, greenhouse gases trap some of it in the atmosphere. This process, called the greenhouse effect, warms earth to a temperature that can support life. However, human activities have increased the concentration of greenhouse gases in the atmosphere, which traps more heat. This 'enhanced' greenhouse effect is driving global climate change (Image from Google Earth and diagram adapted from National Academy of Sciences, USA).

How is the climate changing in the Great Barrier Reef region?

Regional projections of air temperature, sea temperature and sea level rise for northeast Australia and the Reef are now considered conservative (Table one) with significant changes already recorded by the Bureau of Meteorology.

In the last century, the average sea surface temperature has increased by 0.4°C, and since 1991, sea level in the Great Barrier Reef has risen by 50mm (Lough, 2007).

Table 1. Projected changes in climate for the Great Barrier Reef for 2020 and 2050.
(adapted from *Climate change and the Great Barrier Reef: a vulnerability assessment*)

Projected change	2020	2050
Air temperature*	+0.6 to +1.4°C	+0.9 to +2.6°C
Sea surface temperature*	+0.5°C	+1.1 to +1.2°C
Sea level rise*	+7 to +38cm	+13 to +68cm
Rainfall	– Reduction in total rainfall – Increase in intensity of droughts – Increase in intensity of high rainfall events	
Tropical cyclones	– Intensity of tropical cyclones expected to increase	

* relative to 1961-1990 average

Climate change will have a significant impact on the Great Barrier Reef, which will be exposed to various effects of climate change:

- Increased nutrient levels due to changes in rainfall, sea level rise, and ocean circulation.
- More frequent and severe storms will cause major physical damage.
- Higher water temperatures are likely to increase the incidence of coral diseases and may cause mass coral bleaching (Figure three).
- Ocean acidification, which is damaging to calcification of key reef-building species.
- Animals that rely on reefs for food and protection, such as fish, crustaceans, and molluscs, will be impacted as coral reef areas are lost.
- Fish, shark and ray populations will suffer from reductions in reef habitat and will decline in abundance and diversity.
- Changes in temperature and habitat are likely to have substantial impacts on fisheries.
- Changes in ocean currents may cause shifts in marine mammal migration patterns.
- Marine turtles and seabirds may also face declines as a result of higher temperatures and sea level rise (Figure four).
- Mangroves, islands and cays will be affected by sea level rise, increased soil salinity, lowered water tables and cyclone damage.





Figure 3. Photo A shows a healthy, brightly coloured coral reef before mass bleaching. Photo B is a reef on the Great Barrier Reef that has bleached due to unusually hot sea temperatures. Most of the corals in photo C have died as a result of mass bleaching. The white corals in this photo are still alive, but all the others have died and are overgrown with seaweed-like algae (GBRMPA).

Figure 4. Climate change impacts are already being observed in marine turtles and seabirds. The gender of marine turtles is determined primarily by incubation temperature experienced by their eggs, and higher temperatures increase the proportion of females. (Vulnerability of marine reptiles in the Great Barrier Reef to climate change, Harman, Limpus & Read, 2007). Mass mortalities of seabird chicks have been observed for wedge-tailed shearwater, sooty tern and black noddy seabirds in the Great Barrier Reef during unusually warm summers. It appears that warmer seas and changing circulation patterns affect the location and depth of cool water bodies preferred by the fish that seabirds eat. As a result, seabirds appear unable to feed their chicks (Vulnerability of seabirds on the Great Barrier Reef to climate change, Congdon & O'Neil, 2007).



Resilience and Reef health

The thriving Great Barrier Reef marine tourism industry depends on the health of the Reef. A healthy and resilient reef system has the best chance of coping with stresses and pressures, such as higher sea temperatures which lead to coral bleaching. A resilient reef is more likely to bounce back and adapt to change, resulting in more sustainable tourism businesses, especially those reliant on high quality reefs to market their products.

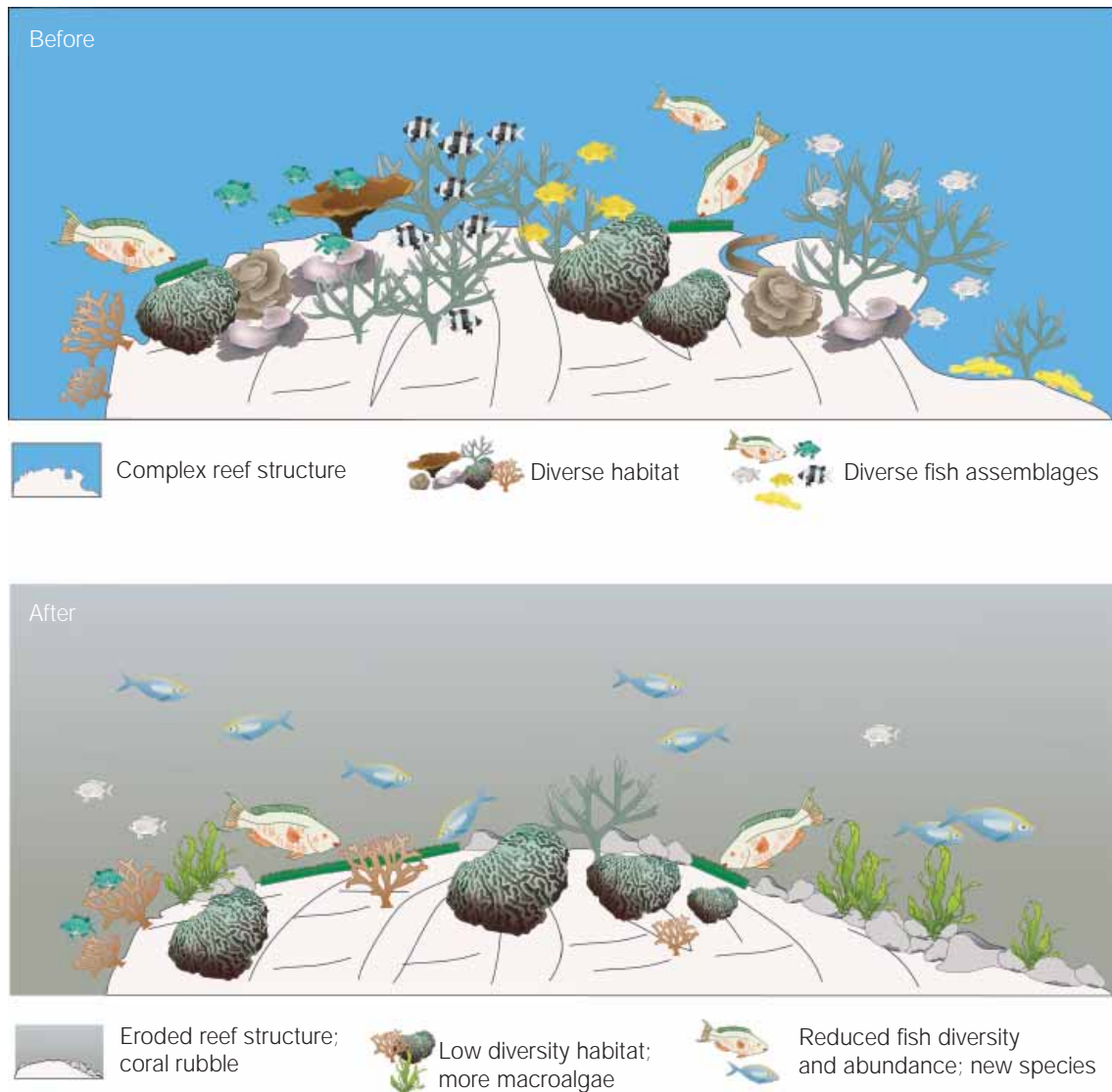


Figure 5. Transition of a coral reef environment due to climate change. Existing concentrations of greenhouse gases mean that some change in the Reef is inevitable. The extent of change will depend on the rate and severity of climate change as well as the resilience of the reef ecosystem. Under a worst-case climate scenario, coral reefs will change from high diversity, complex ecosystems (before) to low diversity systems dominated by seaweeds, herbivorous fish, and rubble (after) (GBRMPA Climate Change Action Plan).

How will climate change affect Reef marine tourism?

The effects of climate change are not waiting off in the future; they are already being felt across the Reef. Tourism operators are experiencing the loss of coral cays, higher rainfall events, severe coral bleaching has affected localised areas, and there have been other severe weather events. Consequences include increased trip cancellations and rescheduling, damage to infrastructure, impacts on insurances, and need for itinerary changes and product marketing changes.

Climate change impacts could jeopardise the entire \$5.1 billion Reef tourism industry. Over 85 per cent of visitors go to the offshore Cairns/Port Douglas and Whitsunday areas, meaning localised climate change impacts could still have significant implications for the management of the Great Barrier Reef tourism industry and Australia's international reputation as a world class destination.

Unless the tourism industry comes to grips with the impacts of climate change on the Reef, there is a high risk that many current tourism activities will not be sustainable either environmentally or economically.

Table 2. Reef tourism activities that may be negatively impacted by anticipated climate-induced changes.

Anticipated climate-induced changes	Sample changes in the Reef ecosystem							Sample changes in the weather						\$
	Less coral cover and less coral diversity	Reduced fish diversity and abundance	Fewer sharks and rays	Changes to marine mammal migrations	Reduced seabird populations	Reduced marine turtle populations	Increased water and insect borne diseases	Increased severity and frequencies of storms	Higher sea level	More frequent flooding	More frequent droughts	Higher air temperatures	More frequently higher wind speeds	
Bareboating														
Bird watching														
Camping														
Charter boating														
Cruise ships														
Diving														
Fishing														
Island and cay visits														
Motorised water sports														
Opportunities to interact with marine mammals														
Opportunities to interact with turtles														
Snorkelling														
Whale and dolphin watching														

*Note: the degree of impact is not differentiated in the table and varies across both activity and impact type.

Taking action

Forty-nine actions, sitting under six objectives, provide the framework for mobilising the Great Barrier Reef tourism industry and its stakeholders on climate change.

Objective 1.

Raise awareness about climate change impacts to the Great Barrier Reef

Strategy 1.1. Raise the awareness of Reef marine tourism operators		
Action	1.1.1	Continue the Great Barrier Reef Tourism Climate Change Action Group and disseminate relevant information through industry channels.
	1.1.2	Hold a series of industry workshops about the potential impacts of climate change, risks to the Reef marine tourism industry, and opportunities for operators to respond (See 5.1.2).
	1.1.3	Highlight success stories and best practices in reducing emissions and adapting to climate change. Create a business case for the change required (See 1.2.2).
	1.1.4	Train staff. Implement the GBRMPA Tourism Staff Training Course to provide operators with information about climate change impacts, industry responses and the importance of individual actions.
	1.1.5	Survey operators on awareness, adaptation and mitigation strategies in place to provide a baseline for future measurement of the effectiveness of initiatives.
	1.1.6	Integrate action being taken on climate change into the High Standard Tourism Program. Align Climate Action certification with the High Standard Tourism Program.
Strategy 1.2. Raise the awareness of visitors		
Action	1.2.1	Support the development of material to assist operators in the provision of high quality interpretive material related to climate change. For example <i>Reef Facts for Tour Guides</i> (Climate Change Edition) will provide tour guides with simple facts they can share with tourists to increase their understanding of climate change, its impacts on the Reef, and what they can do to help.
	1.2.2	Support the development of an International Reef Dive Site Rating System. This system will provide for the independent rating of dive sites around the world against predetermined criteria including factors such as environmental management and action taken on climate change. This system will provide a tool to showcase the dive sites of the Reef and their relative competitiveness in terms of quality of experience to other dive sites around the world.
Strategy 1.3. Raise the awareness of government agencies and tourism industry partners		
Action	1.3.1	Highlight the socio-economic benefits of responding to climate change. Develop a partnership between the communications staff of industry and related government agencies to implement a communications strategy that effectively conveys the socio-economic implications of climate change on tourism.
	1.3.2	Work with other tourism industry organisations to raise climate change as a key policy issue. Collaborate with other industry associations that are engaged in climate change, such as the Australian Ski Areas Association and Ecotourism Australia, to establish a unified voice in working with government on climate change policies.
	1.3.3	Raise awareness in local communities. Develop a communications strategy to deliver climate change messages in tourism-based communities along the Reef. Involve partners such as resorts, operators, councils, DERM, and tourism industry associations. This action links to Actions 1.1.2 and 6.1.3.



Objective 2. Reduce carbon footprints

Strategy 2.1. Audit and reduce operational greenhouse gas emissions		
Action	2.1.1	Calculate and reduce operator emissions. Support operators to use the Tourism Operator's Emissions Calculator developed by the GBRMPA as a tool for operators to calculate and monitor their emissions over time and identify ways to reduce their emissions.
	2.1.2	Support operators to become certified through accredited programs such as Ecotourism Australia's Climate Action Certification Program, to assist them adopt best practice on climate adaptation and mitigation (see 6.1.3).
	2.1.3	Where possible, partner with 'climate friendly' businesses and practice green purchasing. By preferentially partnering with tourism businesses that are actively taking steps to minimise greenhouse gases, water pollution and other environmental impacts, individual operators are creating incentives that will improve environmental practices across the industry.
Strategy 2.2. Offset emissions		
Action	2.2.1	Identify regional 'reef friendly' options for offsetting greenhouse gas emissions. This action will identify suitable carbon offsetting programs that will benefit the North Queensland region by investing carbon credits in an accountable manner that delivers social and multiple environmental dividends.
	2.2.2	Assist visitors in offsetting greenhouse gas emissions caused by travel by operators offering options to offset their visitors tour emissions.



Objective 3. Support climate change monitoring, reporting and research

Strategy 3.1. Support research that fosters understanding of climate change and its impacts		
Action	3.1.1	Understand how climate change will affect the Reef environment. Identify easily translatable scenarios about how climate change will affect relevant attributes of the Reef environment at local to regional scales over timeframes relevant to business planning.
	3.1.2	Understand how climate change will affect visitor choices. Facilitate and disseminate research on how changes in ecosystem and weather conditions (eg. reduction in abundance of iconic species, weather effects etc) will influence visitor choices. This research should identify best and worst-case scenarios by sector at timeframes that are relevant to business planning (see 5.1.2).
	3.1.3	Understand future trends in marine tourism. Compile information and undertake analysis of the economic drivers of the key tourism trends in tourist patterns, flows, and destination choices as necessary to inform the risk assessment described in Action 5.1.2.
	3.1.4	Model the economic drivers of marine tourism and the impacts of climate change. Work with partners to model the economic risk that climate change poses to various sectors of the marine tourism industry (eg, rising insurance costs; increased safety costs/risk; cancellations due to bad weather or deteriorating environmental amenity; damage to tourism-related infrastructure).
	3.1.5	Learn from other reef regions already affected by mass coral bleaching. Compare the adaptation responses of marine tourism businesses from other reef regions affected by high levels of coral mortality.
	3.1.6	Experiment with techniques to prevent coral bleaching at high value sites. Work with partners to provide a synthesis of scientific information relevant to making decisions about techniques for site enhancement at tourism sites (including techniques to prevent coral bleaching by shading and cooling).
Strategy 3.2. Support Reef monitoring and reporting programs		
Action	3.2.1	Participate in GBRMPA's Eye on the Reef, Sightings Network, and Marine Water Quality Monitoring programs. Through these partnerships, long term data can be collected on Reef health indicators, iconic and protected species, and emerging issues, such as climate change impact.
	3.2.2	Participate in BleachWatch. Tourism operators, tourists, and local community members can support resilience of the Reef by participating in GBRMPA's BleachWatch program, which is designed to provide reliable reports about bleaching and reef condition from a wide range of sites throughout the Reef.
	3.2.3	Participate in Crown-of-thorns Starfish (COTS) Watch to aid in monitoring other negative impacts on Reef resilience.



Objective 4. Improve the resilience of the Great Barrier Reef

Strategy 4.1. Minimise physical impacts to the Reef		
Action	4.1.1	Minimise coral damage from snorkelling, diving and anchoring. Individual tourism operators will implement this action by following the Responsible Reef Practices for snorkelling, diving and anchoring outlined in the GBRMPA's 'Onboard' handbook for operators.
	4.1.2	Minimise vessel groundings. Individual tourism operators will implement this action by following the Responsible Reef Practices for boating outlined in the GBRMPA's 'Onboard' handbook for operators and undertaking risk assessments and modifying operations in reference to the identified risks.
	4.1.3	Take action on operators not meeting minimum standards. Operators need to be held accountable through appropriate enforcement action and auditing. Operator workshops focussed on education in key compliance areas will continue to be undertaken.
	4.1.4	Report marine incidents such as pollution and Zoning Plan infringements, especially illegal fishing in Green Zones.
Strategy 4.2. Minimise negative impacts to water quality from daily operations or construction activities		
Action	4.2.1	Be active in water quality issues by participating in community-based activities that aim to improve water quality in Reef catchments.
	4.2.2	Minimise water pollution from boating and pontoons. Operators will implement this action by following the Responsible Reef Practices for wastewater outlined in the GBRMPA's <i>Onboard</i> handbook and by continuing to be accountable through permits, legislation and Environmental Management Plans.
	4.2.3	Assess best practices and facilities for wastewater management in light of climate change. The GBRMPA will work with partners to review existing policies and facilities in light of climate change.
	4.2.4	Minimise water pollution from tourism-related construction. Coastal construction is regulated by government agencies in and adjacent to the Reef to minimise impacts to water quality. TCCAG partners will collaborate to review existing permitting guidelines in light of climate change.
	4.2.5	Partner with businesses that minimise water pollution. By preferentially partnering with responsible tourism businesses that are actively taking steps to minimise water pollution, greenhouse gases and other environmental impacts, individual operators are creating incentives that will improve environmental practices across the industry.



Tall Ship Adventures

Objective 5.

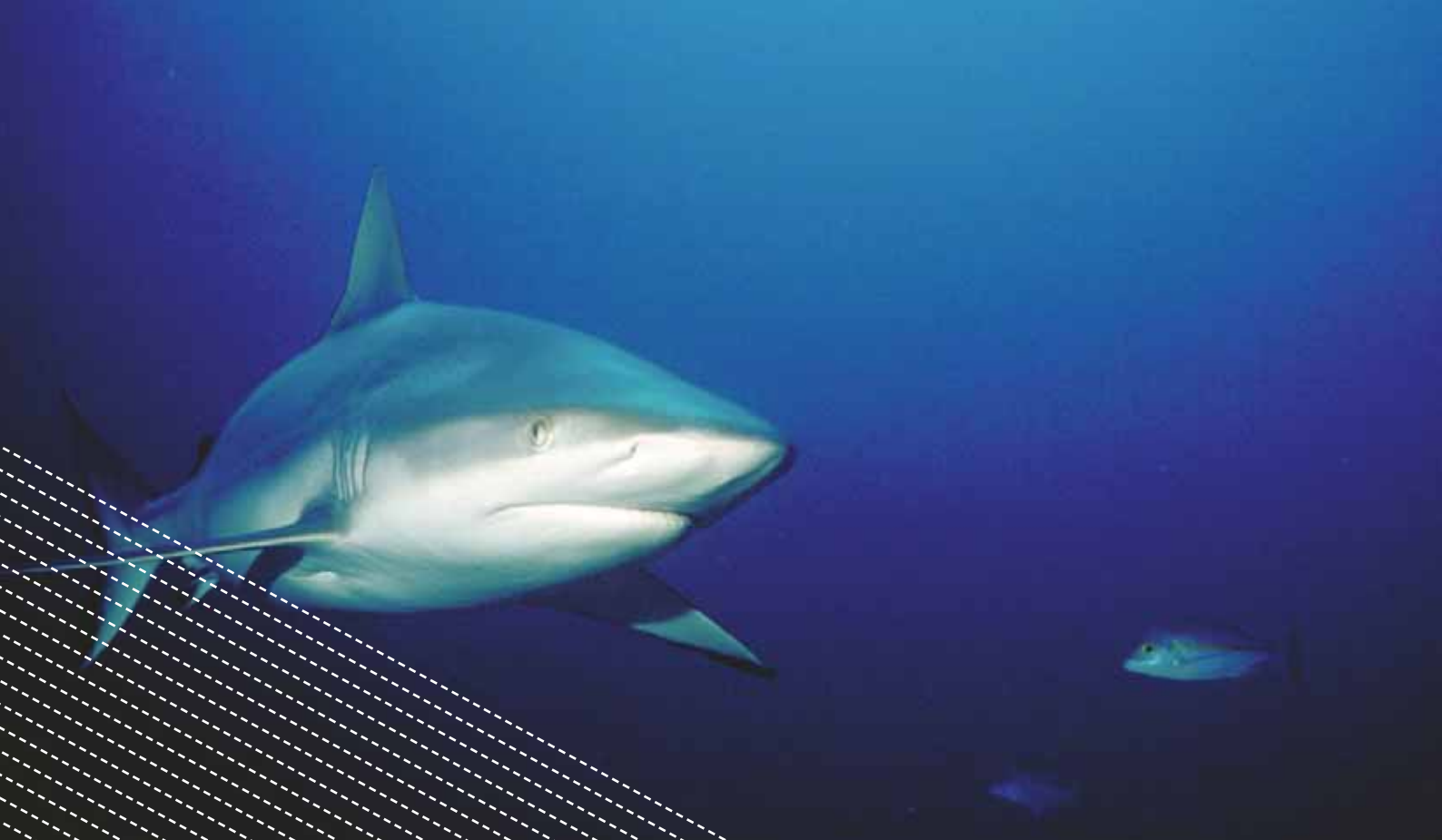
Integrate climate change into business operations and planning

Strategy 5.1. Plan for declining reef conditions and changing climate		
Action	5.1.1	Develop a <i>Climate Incident Response Plan for the Tourism Industry</i> as a component of the overall Reef Climate Change Incident Response Framework. Undertake scenario planning to inform likely futures and adaptive management responses.
	5.1.2	Develop operator-specific risk management plans. Guidance, including through face to face workshops, will be provided to operators to develop risk management plans for their businesses and to be informed by the research and modelling conducted under Actions 3.1.1 to 3.1.6.
	5.1.3	Strengthen or develop risk management plans by local area. Expected increases in storm frequency and intensity as a result of changing climate means that government and industry planning and policy may need to be strengthened to address likely scenarios, particularly inundation, wind damage, and implications for essential coastal infrastructure. Industry to work collaboratively and proactively with government in priority areas to review, strengthen, or develop, as necessary, local risk management plans (see Action 5.1.2).
	5.1.4	Work with the insurance industry to identify strategies (operational procedures and technologies) that reduce risk and help achieve affordable insurance for industry operators in the future.
Strategy 5.2. Develop business strategies to mitigate the impacts of climate change		
Action	5.2.1	Assess 'green' and 'climate-neutral' technologies and strategies. This will include assessments related to biofuels, solar power, wind power, and designs that maximise passive cooling, which could be used by operators to reduce their emissions and environmental impact.
	5.2.2	Identify responsive business strategies. Informed by the results of Actions 3.1.1 to 3.1.6, this action will identify new tourism business opportunities (eg. service enhancements and diversification) and opportunities for businesses to reduce and minimise environmental impacts.
Strategy 5.3. Maintain industry viability		
Action	5.3.1	Invest in infrastructure, and remove impediments to infrastructure development, to assist with climate change contingency planning. The tourism industry requires opportunities to continue operation (eg. through the availability of alternate moorings) in the event of significant climate change impacts effecting Reef conditions.
	5.3.2	Develop management arrangements which provide appropriate climate change contingency planning for industry and investigate possible site enhancement options for sites degraded through climate change impacts. A clear understanding of the scientific merits of such approaches is critical.
	5.3.3	Ensure compliance with existing management arrangements. To ensure a level playing field across the industry, this action aims to support Reef protection and address underperformance by stepping-up enforcement of legislative and regulatory requirements on tourism operators (see Action 4.1.3).
	5.3.4	Implement a public relations and marketing strategy. Develop a collaboration amongst industry, state and Commonwealth marketing and protected agencies. Address the negative perceptions surrounding climate change impacts on the Reef and consequential impacts on visitation to the Reef and Australia.
Strategy 5.4. Develop environmental management and engineering strategies		
Action	5.4.1	Collaborate with agencies responsible for coastal development to implement engineering and technical solutions that reduce infrastructure risk from climate change impacts such as increased frequency and severity of storms, sea-level rise, and changes in weather patterns, which threaten infrastructure that are vital to Reef marine tourism; specifically, ports, marinas, pontoons, roads, seaside buildings, and boats.

Objective 6. Influence and facilitate change

Strategy 6.1. Establish incentives to facilitate change		
Action	6.1.1	Demonstrate adaptive management and ensure government plans reflect appropriate actions and priorities. Specific plans that should be targeted include the Australian National Climate Change Adaptation Framework, the GBRMPA Climate Change Action Plan, the Queensland Tourism Strategy, and the Queensland Climate Change Adaptation Strategy.
	6.1.2	Develop incentives for undertaking climate change action including for the uptake of emerging technologies and Climate Action Certification.
	6.1.3	Identify incentives that can facilitate change and adoption of best practice for climate change action. This includes the development of the International Reef Dive Rating System but could take the form of small grants and/or tax breaks to help operators implement energy saving strategies and invest in green technologies (see Actions 1.1.3 and 1.2.2).
Strategy 6.2. Foster industry capacity to implement change		
Action	6.2.1	Continue to engage an industry liaison position focused on climate change action within the tourism industry who will work with partners to assist implement this Strategy.





Implementing the Strategy

The implementation of this Strategy relies on the engagement and oversight by tourism industry partners and protected area managers from across the Reef. Leadership and guidance will be provided through the TCCAG. Additional input will be sought from tourism operators and a broad range of key stakeholders and government agencies.

As this Action Strategy is not 'set in stone' feedback provided by the tourism industry partners implementing the Strategy will be critical for future revisions and updates of this document.



How individual tourism operators can make a difference

Individual Reef tourism operators in direct contact with visitors are uniquely positioned to deliver powerful action on climate change both on and off the Reef.

Raise awareness

1. Engage tourists in understanding how climate change is impacting coral reef ecosystems locally and globally, and act as a change agent to climate change by encouraging visitors to take action at home. (Action 1.2.1)
2. Talk to government representatives, colleagues and friends about climate change. Let them know it's already affecting business and promote the benefits of taking positive actions to implement adaptation and mitigation strategies. (Strategy 1.3)
3. Become engaged in the GBRMPA and community-based activities that address water quality and other issues that impact reef resilience. (Strategy 4.2)

Reduce the operation's carbon footprint and improve energy efficiency

4. Become certified as an EcoCertified and Climate Action Certified operator. High Standard Operators in the Marine Park are eligible for incentives such as 15 year permits. (Action 2.1.2)
5. Use the Tourism Operator's Emissions Calculator available on the GBRMPA's website to calculate the operation's overall carbon footprint. Reduce greenhouse gas emissions as much as possible and then offset any remaining emissions by purchasing carbon credits, using local offset programs where possible. (Action 2.1.1)
6. Be fuel-efficient when running vessel engines, use alternative fuel sources such as biodiesel and ethanol, and order new vessels and retrofit old vessels with more fuel efficient engines. (Action 5.2.1)
7. Minimise the energy used and the waste generated by tourism operations and offices. Recycle, buy 'green power' and reduce business-related travel to cut emissions. (Action 2.1.3)
8. Assist clients in offsetting greenhouse gas emissions caused by their travel and accommodation, using local offset programs where possible. (Action 2.2.2)
9. Educate tourists on actions they can take to reduce their greenhouse gas emissions at home. (Action 1.2.1)

10. Partner with 'green' businesses that are actively taking steps to minimise greenhouse gas emissions (Action 2.1.3), water pollution (Strategy 4), and other environmental impacts.

Monitor and report changes

11. Understand what is happening at the sites you visit by participating in the GBRMPA's management and partnership initiatives such as Eye on the Reef, Sightings Network and BleachWatch to provide reliable reports about coral bleaching and reef condition. (Action 3.2.1)
12. Support existing research on climate change by hosting scientific researchers on your vessels who are working with managing agencies and distributing visitor satisfaction surveys to your passengers.

Improve the resilience of the reef

13. Minimise coral damage from anchors, divers and vessel groundings so existing coral cover is more resistant to the effects of climate change. Facilitate responsible use of public and private moorings. (Action 4.1.1 and 4.1.2)
14. Embrace the improvement of water quality as a tourism issue! Become actively engaged in community programs aimed at improving water quality, and make sure waste and wastewater are disposed of appropriately. (Action 4.2.1)
15. Work with TCCAG to deliver the Strategy.

Integrate climate change into business operations and planning

16. Maintain visitor satisfaction with Great Barrier Reef tourism experiences by improving amenities. Changes may aim to reduce discomfort resulting from climate change, such as more stable boats, or to increase visitor comfort and customer service more generally. (Actions 3.1.2 and 5.2.2)
17. Integrate climate change adaptation into business planning by diversifying tourism activities. Diversification might involve a shift in products, destinations, marketing strategies or logistical operations. (Action 5.2.2)
18. Plan for extreme events by developing risk management plans to assist in preparing for and responding to significant events, such as mass coral bleaching. (Action 5.1.2)

