The Hon. Warren Entsch MP

Special Envoy for the Great Barrier Reef

Report to the Minister for the Environment the Hon. Sussan Ley MP

July – December 2020

Submitted | 20th January 2021

A note from The Hon. Warren Entsch MP

Minister I would like to start by expressing my gratitude to you and your team for the ongoing support you've shown to me and the consideration of my work as the Special Envoy for the Great Barrier Reef. It has certainly been a wild year, with plenty of horrific challenges that Australia and indeed the world has had to grapple with, most of which have resulted from the pandemic and its health and economic consequences.

In times like these we must find the silver linings, and in my view, there has been some significant global progress made towards securing a future with a decarbonised global economy. As you would appreciate these developments are of significant importance, because in order to secure the long-term sustainability of the Great Barrier Reef, greater progress is required to arrest global greenhouse gas emissions and curb anthropogenic warming.

In that regard, this year we have seen some new and compelling international commitments made. With China, Japan, South Korea and an incoming Biden Administration all committing to net zero by mid-century or soon thereafter. These are not insignificant emissions reduction commitments and it is likely they will markedly improve the world's prospects of reducing human induced warming.

This growing momentum has some experts indicating that the upper temperature limit of the Paris Agreement is now, for the first time within reach, with their projections suggesting the world is on track for 2.1 degrees of warming by the turn of the century. I am hopeful that this growing shift will encourage other nations to consider their own commitments and increase their ambition in turn.

For the Great Barrier Reef, we know that the long-term outlook is bleak. Even with just 1.5 degrees of warming it will be a vastly changed and deteriorated system. The Great Barrier Reef Outlook Report released in 2019 has downgraded the long-term outlook of the Reef from 'poor' to 'very poor' and identifies the leading factors that are driving the Reef's long-term decline.

The report states: *"The condition of the (Great Barrier Reef) Region is deteriorating due to anthropogenic global warming and other escalating drivers (such as population growth). Even a scenario of reduced greenhouse gas emissions that could restrict a global temperature increase to less than 1.5 degrees Celsius (which is what the Reef needs) would still see substantial changes occurring to marine ecosystems and associated community benefits. Future coral reefs are unlikely to be as diverse and colourful as they were a decade ago, and the fish life seen while snorkelling and caught while fishing may also change. People and Reef-dependent industries need to prepare for this change."*

"Recent evidence suggests oceans are heating up at about 40 per cent faster than previously estimated and the pace of change is accelerating at an unprecedented rate. Both the magnitude and rate of these changes exceed the extent of natural variation over the last millennium and over glacial-interglacial time scales. The extent to which the climate will change in coming decades depends on current and future greenhouse gas emissions."

As the Reef faces an assortment of growing pressures, we continue to step up our world leading reef management efforts. I note most recently the Citizens of the Great Barrier Reef has received funding to conduct the Great Reef Census. This will engage experts and citizen science to help us get a better understanding—at the in-water level—of the current status of the Reef. These efforts are critically important for us to ensure we have up to date and as much broad scale intel on the Reef as we can, particularly as it continues to face these growing pressures. The greater the quality and scale of the information we obtain, will help enable us to more effectively deploy resources and better target management efforts.

The Great Reef Census will make an important contribution to our growing suite of world class Reef management and monitoring efforts. These combined efforts are integral to achieving the best possible preservation of the Reef beyond the political constraints and global nature of developing effective climate change policy. Whether it is the crown-of-thorns starfish management program, the improvements we're making to water quality, the array of coral reef restoration initiatives underway or our long-term monitoring programs. These are all incredibly important and worthwhile tools at our disposal.

As enviable as these initiatives are, they alone cannot deliver a sustainable and healthy Reef for the long-term. The scale of the challenges presented by climate change are simply too large for direct management intervention to resolve. But given the pace of developments that are underway in the lead up to the COP26 in Glasgow, I am enthused and cautiously optimistic that the likelihood of further positive change is growing. I have actively encouraged Minister Taylor to pursue efforts that would see Australia no longer reliant on Kyoto carry over to meet our 2030 target and I am very pleased that the Prime Minister has recently announced he is very confident that this will be the case.

Australia has a significant stake in how climate change progresses in the decades ahead. The science is very clear on the implications for Australia and indeed the timelines we ought to be working towards. In my view we should be driving the dialogue, encouraging and inspiring others to grow their ambition, as it is in our interest—both for the future sustainability of the Great Barrier Reef, and for a myriad of other reasons as well. Given this, it should come as no surprise that I personally support a 2050 net zero emissions target being adopted as Federal Government policy.

I appreciate that there are some uncomfortable economic realities on the road to net zero emissions, but many of these are coming with, or without Australia adopting the target. We should face these challenges forthrightly, knowing that at the same time there are a multitude of economic opportunities for Australia on the journey to decarbonisation. If ever there was a time for significant reforms, it is now—and if COVID-19 has shown us anything, it is that the mainstream scientific advice of experts matters greatly. By taking their advice and acting pragmatically upon it, we have drastically improved outcomes for Australia, and Australians. We need to apply the same approach to tackling the challenges of climate change.

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Current Status of the Great Barrier Reef

Summer is now upon us and this is typically a time that experts are on heightened alert, as the Great Barrier Reef faces increased risk from more extreme weather events. Most notably the concerns are with the increased likelihood of marine heatwaves and cyclones. At the same time there are some positives, with the annual coral spawning event underway at the time of writing. This unique reproductive event takes place across the Great Barrier Reef in its entirety, with the dispersal of billions of eggs and sperm from corals occurring over the course of just a few days. This ecological marvel is crucial to developing the next generation of corals on our Reef.

Many Reef enthusiasts would have tuned into the ABC's *Reef Live* broadcast on the 4th and 6th of December to witness this unique event. I thought the program was terrific and illustrated clearly both the Reef's vibrancy and also its vulnerability. The program captured the once a year spawning event giving viewers an insight into the spectacular and extraordinary nature of how corals synchronise their reproductive efforts over the course of several days. It also gave viewers the opportunity to peer behind the scientific curtain, to see and learn about some of the cutting-edge science that is helping to manage the Great Barrier Reef.

On the weather front, the Bureau of Meteorology has declared that we are officially in a La Niña event, where we can reasonably expect an increase of cyclones and rainfall, as well as cooler than average temperatures. These conditions are of note as they will potentially have some implications for the Great Barrier Reef this summer. We can't pinpoint the specifics of when and where the La Niña driven localised weather events will occur, rather just that their occurrence will be above average levels.

One might reasonably deduce that the change in conditions brought on by La Niña might lend themselves to cooler sea temperatures—meaning we may have a better chance of avoiding another mass bleaching event this year. But what we must remember is that since the last significant La Niña event (2010-2012), global temperatures have continued to rise. Over the last decade they have risen by 0.2 degrees Celsius. In the context of this La Niña event, we are now in an environment that is functioning at a higher base level temperature.

While the predicted cooler weather and increased cloud cover could provide some reprieve for the Great Barrier Reef, corals may still face risk of bleaching from thermal stress—we have to remember they are very sensitive to small variances in temperature. How this plays out is all very much dependent upon how localised weather patterns develop over the summer period and we don't have a clear picture on that just yet—time will tell. I have complete faith that the Great Barrier Reef Marine Park Authority and its partners like the Australian Institute of Marine Science and the Bureau of Meteorology will be keeping a keen eye on the situation as it develops.

You will recall in my last report I discussed the implications from the bleaching event early in 2020. I noted that it was likely to take some additional time to gather a more comprehensive picture of the scale of the bleaching and the mortality of corals. Like most things this year, COVID-19 has had an impact. Because of on-water operational constraints due to the pandemic, it has resulted in less data on coral mortality/recovery outcomes than would have ordinarily been the case. The combined reporting from aerial surveys, used in conjunction with surveys from marine park rangers, marine scientists and researchers, as well as through reports received from tourism operators and through the Eye on the Reef program have been utilised to get a better picture and build upon the initial reports on the bleaching event.

The Authority has indicated that: *"Out of the 1036 reefs surveyed by scientists in a plane, 40 per cent had no or negligible bleaching, 35 per cent had moderate bleaching and 25 per cent had severe bleaching. Based on these numbers, the 2020 event is not as bad as the 2016 event, but is worse than the events in 2017, 2002 and 1998. A key factor in describing the severity of a bleaching event is how much coral dies, not just how much bleaches… Of the 1036 reefs, 60 per cent had either moderate or severe bleaching. However, this doesn't mean all the corals on those reefs were bleached, nor does it equate to 60 per cent of the entire Reef."*

For the major tourism areas of the Great Barrier Reef they mostly experienced no, negligible or moderate bleaching only, with the exception of one area in the southern part of the Marine Park that experienced severe bleaching. In the Cairns region it seems mostly low severity coral bleaching has been experienced. It's also worth pointing out that in the Cairns/Cooktown region the crown-of-thorns starfish control program has successfully culled crown-of-thorns starfish down to ecologically sustainable levels at five of the six reefs targeted by the program.

As I raised in my report from July this year, I am pleased that consideration and approval has been given for additional resourcing for the Great Barrier Reef Marine Park Authority to undertake aerial surveys should coral bleaching occur in future years. As currently the most practical way to understand the extent of bleaching, I'm pleased that these surveys are now guaranteed for the next three summers. It's also great to see that the funding will support trialling technologies (such as long-range drones or the use of satellites) to more quickly assess broad scale and finer scale coral bleaching impacts and cyclone damage.

Marine Tourism Update

Gareth Philips the CEO of the Association of Marine Park Tourism Operators (AMPTO), recently provided me an update on the current state of the marine tourism operators. Unfortunately, the industry is still reeling from the COVID-19 economic fallout and the associated travel restrictions. On average most operators are functioning at about 15 – 25 per cent capacity, with very soft forward bookings. There are several that are performing slightly better but still not many above the 30 per cent mark.

Running costs for the industry appear to be the biggest challenge, without JobKeeper most operators would find it very hard to operate viably. JobKeeper has enabled the industry to keep their heads above water, without this measure it is likely that most operators would have closed up shop already. There is some anxiety among operators, many are facing uncertainty when the rates of JobKeeper reduce in January 2021 and when the program concludes in March 2021.

At present the social distancing restrictions that operators must abide by are posing some serious economic challenges. The restrictions on the number of tourists who can be on a vessel is the primary factor that is straining the viability of marine tourism operations. Vessels with a capacity of less than 50 persons, must operate at 50 per cent capacity. Vessels with a capacity of greater than 50 persons, must comply with the 1 person per $4m^2$ outside and 1 person per $2m^2$ inside.

This essentially means that the larger vessels are operating at 25 – 30 per cent capacity which is barely viable. Something has got to give, ideally the restrictions would ease before JobKeeper concludes, otherwise it will be a very financially challenging situation for many of the operators. AMPTO has made several attempts to provide feedback into the decision making around vessel capacity restrictions. These have been rejected by Qld Health. AMPTO believes that the current capacity limitations imposed by the COVID-19 restrictions are not consistent with the severity of restrictions imposed on other similar industries or in similar scenarios.

Meeting with Australia's Chief Scientist Dr Alan Finkel AO

It was great to meet with Australia's Chief Scientist, we discussed a range of matters, principally we focused on the recent global climate change policy developments and the implications for Australia, the Great Barrier Reef and the transformation underway in our energy system. Dr Finkel and I spoke frankly on these matters and these discussions gave me a great insight into his scientific perspective on many of these challenges.

On emissions, and the role they play for the long-term future of the Reef, Dr Finkel suggested to me that a long-term emissions target is only one part of the equation. The other part is the tangible work of actually reducing emissions. If you were left with only one part of the equation, Dr Finkel made it clear—he would much prefer the part that details how to drive emissions down, rather than just the target to where they should be reduced to, because ultimately it is outcomes that matter. I certainly agree in principle, but it is clear to me that ideally you would have both, so you know where you're going and indeed how you intend to get there.

In Dr Finkel's view, it will be incredibly difficult for the world to keep warming to 1.5 degrees Celsius, owing to historical emissions and current trajectories. But he made the point that this stark realisation could provide renewed rationale and political impetus for focusing global efforts more intently on ensuring warming stays well below 2 degrees Celsius.

We also discussed the incredible opportunities that exist for Australia with hydrogen and ammonia. There is tremendous potential for Australia to lead in this area and to drive down emissions through advances in technology, this is particularly the case in many of the hard to abate sectors. Australia is uniquely positioned to take advantage of and lead in these new developments, particularly as our major trading partners will begin seeking lower emissions energy alternatives in the years ahead.

At the conclusion of this year Dr Finkel will complete his five-year term as Australia's Chief Scientist. I'd like to thank Dr Finkel for his time, insight and for the frank discussion; I found it very valuable. I wish Dr Finkel all the best with his future endeavours.

Engaging with Dr Andrew (Twiggy) Forrest AO
Chairman of the Minderoo Foundation and Fortescue

I had the opportunity to catch up with Twiggy recently via teleconference along with some of the leaders in his organisations that are focusing on some very interesting and innovative technologies and research. Twiggy ran me through some of the high-level thinking around what he aims to do in relation to plastic waste, the economics of plastic, marine research, climate change, emissions reduction and renewable energy.

Plastics:
What originally made me reach out to Twiggy was his work in relation to plastics. In my last report I indicated that it would be worth considering whether a tax, levy or other market mechanism could be applied to virgin plastic in order to resolve the two major challenges, firstly the environmental negative externality of plastic waste and secondly the pricing disparity between virgin and recycled plastic material.

This is precisely the challenge that Twiggy has been trying to tackle. Initially a global industry led contribution model was proposed, whereby a levy would be imposed at the highest levels in the plastic value chain and it would propagate down through the trillions of plastic items made each year. Applying a levy in this manner would assist with rectifying the pricing disparity as well as providing financial avenues to address the environmental negative externality from plastic waste. It was thought that at current global plastic production rates, such a levy could raise in the order of $10-20 billion dollars a year—which would go a long way to addressing these issues.

But again, COVID-19 has had an effect and along with the crash in the price of oil has meant that the companies that would need to be onboard with the model, are now operating in a recessionary environment. In the face of economic uncertainty many have become hesitant to the idea which would require taking a discretionary hit to revenue. It became apparent that The Minderoo Foundation would need to pivot the model in order to effect positive change.

It was suggested that many of the learnings from renewable energy could be applied to plastic, in so far as, over the last 10 years the cost of solar has reduced by 85 per cent. If similar efforts and mechanisms are applied, perhaps the cost of recycled plastic can be reduced with a similar trajectory. At present recycling is a difficult sector to invest in, there is high price volatility, counter party risk, and a lack of transparency across the value chain. Minderoo's model tries to address that by creating long-term forward contracts on recycled materials, that aim to create stability and certainty around the investment opportunity in recycling.

If they can get that right, it will go a long way to bridging the gap between recycled and virgin material and suddenly the costs of recycling start to come down quite dramatically. The model will be deployed at a country by country level, adapting to each territory's regulatory environment and tax regime. Indonesia is set to be the first country and Minderoo has partnered with the Indonesian Government, to co-invest and to launch this new platform for subsiding and scaling up recycling investment in Indonesia.

Emissions/Energy:
Within the next five years, Twiggy wants to move his Fortescue iron ore operations off the nearly one billion litres of diesel it uses each year and transition to green hydrogen and ammonia. He views this as a significant opportunity, it will also provide one of the first commercial large-scale investments in this new energy production technology. The cost reductions to energy production that renewables enable provide the base from which the hydrogen and ammonia can be created. Twiggy says if you can do this on a big enough scale you can compete with oil and gas.

Fortescue has committed to net zero emissions by 2040, which they see as opportunity and will provide them with a comparative advantage. Their focus in this area is about positioning themselves at the forefront and ensuring they are prepared to interact with an increasingly decarbonised global economy and doing it 10 years ahead of their competitors. This is some pretty visionary stuff and it illustrates that a commercially sustainable solution to addressing climate change is not that far out of reach. The challenge is that companies won't change until it becomes highly economic to do so, but as Fortescue is betting, there are significant benefits to moving fast and moving first.

This kind of change will require starting at a smaller scale to allow the supply chain for hydrogen electrolysers production volume to ramp up. With scale, comes price reductions in the same way that other more traditional renewable technologies have benefited from over the last 10 years. I think it's a fair assumption that green hydrogen is likely to be the only zero emissions pathway to displacing fossil fuels for energy use cases that can't already be easily electrified.

Which means to say that, heavy industry and other such energy intensive applications, here and abroad will require the use of green hydrogen (irrespective of cost) particularly in the years ahead as nations continue their journeys to net zero emissions. The question for Fortescue and indeed Australia is, can we set ourselves up as the lowest cost producer of green hydrogen in the world?

OceanOmics:
Twiggy's team is also undertaking some significant marine research, in October his research vessel undertook an expedition in the southern Great Barrier Reef. OceanOmics, as it's called is an ambitious new way to study the biodiversity that is present in our oceans. While still experimental, the Minderoo Foundation are seeking to prove the viability and reliability of this approach to marine research. This technique involves capturing samples of water which are then analysed in order to determine the array of DNA cells, both fragments and full cells. The purpose of which is to identify on a larger scale what types of marine and plant life inhabit a particular area.

I'm told this methodology is a relatively well established in terrestrial environments but is now extending into the ocean. If it can be successfully applied at significant scale—which is what the Minderoo Foundation is testing. The potential for greater insight into the biodiversity, greater visibility around fish stocks, populations of different species, invasive species and so on, is quite compelling. Provided the feasibility checks out, it may be that in a few years' time, we could see this type of approach to ocean surveying helping to better inform marine conservation efforts, improving management techniques and providing greater insights on species diversity and abundance. The more accurate and representative the data sets that can be acquired, I think will help to drive better conservation outcomes for marine ecosystems.

Great Reef Census

I was very pleased to learn that the Great Reef Census has been provided funding to undertake and coordinate a wider array of surveys on the Reef. I have always maintained that we need as much information and data across the Great Barrier Reef as is possible and I think the Great Reef Census is another step towards achieving Reef wide survey coverage.

It's important to note the significant role of in-water surveys, they are more labour intensive but can provide meaningful detailed insight and corroborate other conventional broad surface level data capturing approaches, such as aerial surveys. Obviously aerial data has some limitations, namely that the focus of the collection is typically skewed towards shallow water corals only, noting that as a trade-off, greater distances can be covered and consequently larger areas can be surveyed than would ordinarily be viable at the same scale for in-water surveys.

I am hopeful that we will receive a greater proportion of data and information pertaining to coral reef systems that might go beyond the visibility limitation of aerial surveys (which is thought to be about a depth of 5 metres). I'm advised that since the in-water operations commenced in October, the Great Reef Census has engaged the reef community, with a diverse range of people and industries getting involved from superyachts, to tourism vessels, dive liveaboards, a tugboat and research vessels. With this overwhelming support from the community, the Great Reef Census is on track to reach and exceed their target with well over 80 reefs surveyed with a number of long-range expeditions still in the field.

From the remote Far North to Lady Elliot Island, Citizens of the Great Barrier Reef have already received 5,500 image submissions to the website greatreefcensus.org, with everyone from scientists, skippers, dive crew, Master Reef Guides and even tourists jumping in fins-firsts to help capture data to protect the Reef.

As the Great Barrier Reef faces the cumulative impacts of climate change, crown-of-thorns starfish and poor water quality, the data captured during the Great Reef Census will help to fill critical data gaps from the over 3,000 reefs making up the Great Barrier Reef. This will help scientists and manager to ensure the Reef is managed in the best possible way moving forward.

This first year has been an ambitious trial to harness the power citizen science and the passion of the reef community to capture data at scale as traditional resources become increasingly stretched. Collaboration is at the core of how Citizens of the Great Barrier Reef operate and by working together, they hope to secure further funding deliver the Great Reef Census on an even larger scale in 2021.

The Great Reef Census is a Citizens of the Great Barrier Reef project, delivered in partnership with the Great Barrier Reef Marine Park Authority, the University of Queensland and the Australian Institute of Marine Science, with support from James Cook University and is funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation, the Prior Family Foundation and the Reef & Rainforest Research Centre.

Regional Development Australia – Tropical North
Update on the FNQ Regional Plastics Project Feasibility Study

I have received the report from RDATN into the Far North Queensland (FNQ) Regional Plastics Project's Feasibility. As you know the project aims to facilitate innovation in waste management and recycling, create local jobs and drive the shift to regional circular economies. What the report has found is that FNQ has a comparatively very low level of plastic recovery rates, approximately 1.9 per cent, as compared to 5.7 per cent in Queensland and 11.5 per cent in Australia—while concerning, and lower than I had expected, the low base rates of recycling represent a significant opportunity for improvement.

The report indicates that at present the Far North Queensland region's plastic that is captured is typically sent to south east Queensland and other states for recycling. There are also plastic producers and manufactures in the region that are importing recycled plastic back to Far North Queensland for use. The various cost benefit and feasibility analysis conducted suggest that broadly speaking the recycling hub concept in Far North Queensland is likely to be economically feasible.

Specifically, the report indicated that it is likely to divert approximately 5,500 tonnes of plastic per year away from landfill, which will increase the recycling rate to 17.1 per cent in 2022, it will also reduce embodied greenhouse gas emissions by around 5,082 tCO_2-e / year and create 83 full-time equivalent direct and indirect jobs in the regional economy.

Both RDATN and I see a very real opportunity to establish a pilot plastics recycling facility in Cairns. There are significant funding opportunities across Government and private investment will likely follow given the increasing incentives and policy initiatives that will help drive the domestic waste revolution. Now that the economics of the situation stack up, RDATN will be seeking to make an application to government to support a proposed regional plastics project. I look forward to discussing this report with you in greater detail in the new year.

Communications and Engagement

Significant meetings and public engagement

29th of June	AMPTO CEO – Gareth Phillips
9th of July	Teleconference: GBRF CEO – Anna Marsden
14th of July	Teleconference: Minister Ley
30th of July	Assistant Minister Evans
5th of August	Teleconference: Minister Ley & Assistant Minister Evans
6th of August	Teleconference: Close the Loop representatives
13th of August	Artificial Reef Inspection – Dave Donald
18th of August	Teleconference: Minister Taylor
24th of August	Teleconference: Minister Ley
15th of September	Citizens of the Great Barrier Reef CEO – Andy Ridley
16th of September	AMPTO CEO – Gareth Phillips
29th of September	Teleconference: GBRF representatives
8th of October	Assistant Minister Evans
8th of October	Minister Ley
9th October	RDA Tropical North representatives – Plastics Pilot
20th of October	GBRMPA CEO – Josh Thomas
21st of October	Environment Department representatives
21st of October	JJ Richards & Southern Oil representatives
26th of October	Teleconference: Assistant Minister Evans and Plastic Collective representatives
26th of October	Minister Ley and Assistant Minister Evans
28th of October	Australia's Chief Scientist – Dr Alan Finkel AO
9th of November	Teleconference: Dr Andrew Forrest AO
9th of November	Minister Ley

19th of November	Teleconference: Lucas Handley – Marine Scientist – 'Reef Live'
20th of November	Sam O'Connor MP – Qld State Shadow Environment Minister
26th of November	Teleconference: Robert Grant – Fortescue Renewables Briefing
30th of November	Minister Ley
1st of December	Blueprint Institute – Harry Guinness and Steve Hamilton
2nd of December	Teleconference: Minderoo Foundation – Tony Worby and Nakul Saran
7th of December	Minister Ley
7th of December	Assistant Minister Evans
7th of December	Teleconference: Regional Development Australia representatives
9th of December	Climate Change Authority representatives
10th of December	Teleconference: GBRMPA CEO – Josh Thomas and GBRMPA Chief Scientist – Dr David Wachenfeld
14th of December	Opening of Turtle Centre at Cairns Aquarium

Cover Photo: Stuart Ireland – Calypso Productions

Appendix

Media Releases:

2nd August 2020 – Joint Media Release: Protecting the world's largest green turtle population

27th September 2020 – Joint Media Release: Sweet victory for sugarcane growers

1st of October 2020 – Joint Media Release: $61.7 million boost for environment, jobs and tourism

8th of October 2020 – Joint Media Release: Census to shine a light on the Great Barrier Reef

26th of October 2020 – Joint Media Release: $28 million to support jobs and protect Qld's environment

10th of December 2020 – Media Release: Queensland to co-host new marine and coastal research hub

16th of December 2020 – Joint Media Release: Boost for Great Barrier Reef tourism operators