Saving Eden

A critical essay on Judith Wright's *A Coral Battleground*

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My first visit to the Great Barrier Reef (GBR) as a child was not a profound or life-changing moment. While I delighted in the vibrancy of life presented before me and in games of hide-and-seek played with fish of fantastical shapes and colours, my initial appreciation of the reef was more superficial in nature, entranced as I was by its charming displays of life. It was not until I next ventured there as a teenager that I felt the deep sense of wonder that has inspired so many before me. Judith Wright, author of *A Coral Battleground* (1977), famously described the reef as "the closest most people will come to Eden". This description resonated with me as I read it, encapsulating in a few short words the almost spiritual experience of exploring the GBR's underwater paradise. In *A Coral Battleground* Wright tells of the battle fought by dedicated conservationists to save our aquatic Eden from destruction by greedy industrialists and politicians with vested interests. Alarmingly large regions of the GBR were seen by some to be open to exploitation. An influential professor of geology was of the opinion that the GBR should be exploited "immediately and to the hilt". And indeed many interested parties had planned on doing just that, with limestone and oil mining companies set to take full advantage of the rich resources the GBR had to offer.

Talking 'Bout My Generation

A Coral Battleground begins in a time where conservation was very unfashionable and almost non-existent. Described by their opposition as "sentimentalists who want to put a barbed wire fence around everything", the first conservationists were seen by most as an eccentric minority. I get the sense that the mentality of the era was that the environment could take one (or so) for the team. Even the University of Queensland was not ecologically progressive in the initial stages of the fight for the reef, even going so far as to favour granting permits for mining on the GBR. Thankfully although the old guard of biologists at UQ were apathetic to the fate of the reef, the budding ecologists that formed the Littoral Society of Queensland fought side-by-side with Wright and her colleagues to defend the reef from its aggressors. I found it incredibly heartening that so many were willing to volunteer their time for such an unselfish and worthy purpose. It is thanks to the strength of these conservation pioneers in the face of a great deal of adversity that the reef even still exists as

we know it today. Wright described the situation they faced as “a David and Goliath battle”, an apt description considered the wealth of resources possessed by their opponents. Fortunately, as follows the progression of conservation in *A Coral Battleground*, these dated views on conservation have since evolved, leading to my generation being born into a society with a greater sense of environmental responsibility. That being said, there is still a long way to go before we achieve a sustainable balance of resource use, but I believe there is hope that it may be possible.

The First Hurdle

As Wright begins her story the reef had already been besieged by threats for many years. The detrimental effects of coral and shell collection, overfishing and increasing levels of tourist activity were becoming a cause of concern for some conservation groups. Their interest in the future of the reef was well timed; there was a much greater threat brewing.

In 1967 an application was discovered for a limestone-mining permit for offshore collection of coral from Ellison Reef. Conservation groups, such as Wright’s own Wildlife Preservation Society of Queensland and the Australian Conservation Foundation lodged their objections. Thus began the first fight in the battle to save the reef that still continues to this day. At this point in time very little ecological knowledge of the reef existed. Many prominent scientists, mainly geologists, believed there to be large areas of dead coral that contributed little to the ecosystem and were therefore available for exploitation. An American professor of geology was particularly vocal about his beliefs on the matter, asserting that “ninety-nine per cent of coral reefs… were ‘dead anyway’”. This line of thinking, that the reef existed as separate and isolated pockets of life rather than as an interconnected network of ecosystems, is used as a concurrent theme among the reef’s adversaries throughout the book to justify declarations that no harm would come to the reef via their actions. A Dr Ladd, commissioned by the Queensland Department of Mines, conducted a survey of the reef and concluded that “rich coral growths that give the reefs their name are extremely limited, averaging less than one-fourth of the surface and near-surface reefs… as a source of agricultural lime and limestone for cement manufacture, parts of the reef that do not now support living coral can be developed.”

Fortunately today the GBR is considered the largest living structure on Earth (Australian Government 2011), and the interconnected nature of life in the GBR has long been accepted. In fact marine populations in general are known to be strongly connected by pelagic larval

dispersal (Botsford et al. 2003; Bode, Bode & Armsworth 2006; Lukoschek 2013). Benthic marine organisms such as coral disperse primarily in their earliest life stage as larvae (Cowen & Spongaugle 2009). The fish that inhabit these corals also experience high levels of dispersal in early life stages, connecting local populations of fish (Botsford et al. 2003; Bode, Bode & Armsworth 2006). There is evidence to suggest that source-sink dynamics are at work in some local GBR populations (Bode, Bode & Armsworth 2006), meaning that some populations are dependent on immigration from source populations for persistence. Dr Frank Talbot utilised this knowledge in a message to the press in 1974, stating "many species become regularly lost to reefs by extinction of local populations, and that the richness of the reef is maintained by constant recruitment of larvae and juveniles, predominately from north to south." It seems to me a safe bet that the removal of up to three quarters of the reef's "dead" coral might just have had detrimental effects on the dispersal, settlement and recruitment of coral and fish larvae. Thankfully the efforts of Wright and her allies were not in vain, and the application for limestone mining off Ellison Reef was rejected. The battle did not end there however; on the horizon lurked another danger that, if realised, would have spelled the end of the most majestic reef system in the world.

The War Wages On

By 1969 permits for oil-drilling exploration had been issued down almost the full length of Queensland's East coast, from the tip of Cape York to below Brisbane. This level of exploitation painted a grim picture for the future of the reef. As Wright eloquently put it, "we envisaged the Reef dotted with oil-rigs, polluted by drilling muds and wastes, intersected by pipe-lines, crowded with supply ships, silted by mining operations." The GBR was saved from this fate through a horrific, though well-timed, incident off the coast of California. A blowout at an offshore oil-drilling rig at Santa Barbara released over 3 million gallons of oil into the ocean (Clarke & Hemphill 2002). Considered by some the catalyst that spurred on the start of environmental movements, populations of marine organisms were decimated by this disaster. Rescuers counted 3600 dead seabirds and numerous deceased dolphins and seals (Clarke & Hemphill 2002). The number of affected fish, invertebrates and marine plants was too great to quantify (Clarke & Hemphill 2002). Images of this calamity made headlines around the world, prompting public outcry and affirming that blowouts can all too easily happen. As Wright put it, "Santa Barbara's tragedy was the Reef's good fortune." The pressure of public opinion built until the fate of the reef became an election issue for the day's politicians. And though the race to have the GBR declared a Marine National Park still

had years left to run, the support of the public would eventually lead to victory, with the passing of Great Barrier Marine Park Act in 1975, and the establishment of the Great Barrier Reef Marine Park Authority. Covering 344,400 km^2, the GBR Marine Park is the largest of its kind in the world, protecting thousands of species within its boundaries (Australian Government 2011).

Tempting though it is to consider this a success story, the future safety of the reef is far from certain. Under circumstances that seem almost to be history repeating, approval has been granted by the Queensland Government to expand the Port of Gladstone for a new coal port terminal, which will require the dredging of 6.3 million tonnes of seafloor (Fight for the Reef 2013). Fifteen million tonnes of seafloor have already been dredged, 4.4 million of which has been dumped inside the World Heritage Area of the GBR (Fight for the Reef 2013). Excess sedimentation can be very detrimental to the health of reef ecosystems, smothering coral, decreasing recruitment and reproduction rates, and slowing growth rates (Loya et al. 2004; Rouzé et al. 2015). Sediment loads on the inner GBR have already greatly increased since European settlement in Australia due to agricultural run-off (McColloch 2002). The construction of a super port will also greatly increase the level of water traffic in the area. This raises concerns of a ship strike, for an oil spill by a tanker in such close proximity to the reef would cause inconceivable damage to plant and animal life in the area. Fortunately plans to dump dredge soil directly onto the reef were scraped, thanks once again to the pressure of public opinion and the hard work of lobbyist groups (ABC 2013). Organisations such as the WWF, Fight for the Reef, the Australian Marine Conservation Society and of course Wright's Wildlife Preservation Society of Queensland are still fighting to protect the biodiversity of the GBR from the many threats that it still faces. The WWF considers climate change to be the greatest threat to the GBR, with pollution, fishing practises and industrialisation also highlighted as hazards (WWF 2015). Fight for the Reef is most concerned with increasing industrial activity and the aforementioned dredging and increasing traffic in the region (Fight for the Reef 2013). The Great Barrier Reef Marine Park Authority also included extreme weather, such as cyclones, declining water quality, and Crown of Thorns starfish outbreaks in their list of threats to the GBR (Australian Government 2011). With the GBR getting attacked from so many different angles it doesn't come as a surprise that the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in 2014 gave the Australian Government a year to improve conservation efforts or else risk the GBR being officially classified as 'in danger' (UNESCO 2014; Cox 2015).

The battle continues…

As we look to the future we can only hope that we did enough to save our underwater Eden. To finish, I shall quote Wright yet again. “The battle to save it [GBR] is itself a microcosm of the new battle within ourselves”.

References

ABC (2013) Plans to dump dredge spoils on Great Barrier Reef heritage area axed. <http://www.abc.net.au/news/2013-11-16/government-axes-gladstone-reef-dredge-dumping-plans/5096744>.

Australian Government (2011) Facts about the Great Barrier Reef. *Great Barrier Reef Marine Park Authority*, <http://www.gbrmpa.gov.au/about-the-reef/facts-about-the-great-barrier-reef>.

Bode, M., Bode, L. & Armsworth, P.R. (2006) Larval dispersal reveals regional sources and sinks in the Great Barrier Reef. *Marine Ecology Progress Series*, **308**, 17-25.

Botsford L.W. & Hastings F.M. (2003) Principles for the design of marine reserves. *Ecol Appl*, **13**:S25-S31.K.A., Peterson, E.L., Dorfman, D., Mumby, P.J.,Lourival, R., Brumbaugh, D.R. & Possingham H.P. (2010) Conservation planning for connectivity across marine, freshwater, and terrestrial realms. *Biological Conservation*, **143**(3), 565-575.

Clarke, K.C. & Hemphill J.J. (2002) The Santa Barbara Oil Spill, A Retrospective. *Yearbook of the Association of Pacific Coast Geographers*, **64**: 157-162.

Cowen, R.K. & Sponaugle, S. (2009) Larval Dispersal and Marine Population Connectivity. *Annu. Rev. Mar. Sci.*, **1**: 443-466

Cox, L. (2015) Great Barrier Reef: government fights World Heritage 'in danger' listing, *Sydney Morning Herald*. < http://www.smh.com.au/federal-politics/political-news/great-barrier-reef-government-fights-world-heritage-in-danger-listing-20150202-1341o7.html>.

Fight for the Reef (2013) Mega Ports. <https://fightforthereef.org.au/risks/mega-ports/>.

Lukoschek, V. (2013) Larval dispersal: the critical connection in coral reef recovery. *ARC Centre of Excellence for Coral Reef Studies*. <http://www.coralcoe.org.au/seminars/larval-dispersal-the-critical-connection-in-coral-reef-recovery>.

Loya, Y., Lubinevsky H., Rosenfeld, M. & Kramarsky-Winter, E. (2004) Nutrient enrichment caused by in situ fish farms at Eilat, Red Sea is detrimental to coral reproduction. *Marine Pollution Bulletin* **49**: 344-353.

McCulloch, M., Fallon, S., Wyndham, T., Hendy, E., Lough J. & Barnes, D. (2002) Coral record of increased sediment flux to the inner Great Barrier Reef since European settlement. *Letters to Nature* **721**: 727-730.

Rouzé, H., Lecellier G., Langlade, M.J., Planes, S. & Berteaux-Lecellier, V. (2015) Fringing reefs exposed to different levels of eutrophication and sedimentation can support similar benthic communities. *Marine Pollution Bulletin* **92**: 212-221.

UNESCO (2014) The World Heritage Committee meeting in Doha (Qatar) today deferred for 12 months a decision on whether to inscribe Australia's Great Barrier Reef on the List of World Heritage in Danger. < http://whc.unesco.org/en/news/1149/>.

WWF (2015) Threats to the Great Barrier Reef. <http://www.wwf.org.au/our_work/saving_the_natural_world/oceans_and_marine/priority_ocean_places/great_barrier_reef/threats/>.