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# 'Loved to Death': Coral Collecting in the Great Barrier Reef, Australia, 1770–1970

BEN DALEY

*Department of Environmental and Geographical Sciences  
Manchester Metropolitan University  
John Dalton Building, Chester Street, Manchester M1 5GD, UK  
Email: b.daley@mmu.ac.uk*

PETER GRIGGS

*School of Tropical Environment Studies and Geography  
James Cook University – Cairns Campus  
PO Box 6811, Cairns, Queensland, Australia 4870  
Email: peter.griggs@jcu.edu.au*

## ABSTRACT

Recent scholarship has investigated the rate of deterioration of the Great Barrier Reef of Australia since European settlement and the severity of human impacts on that ecosystem. Yet in previous environmental histories of the Great Barrier Reef, the impacts of coral collecting have not been adequately documented. Using documentary and oral history sources, a reconstruction of historical coral collecting is possible; analysis of those sources indicates that the extent, duration and intensity of coral collecting led to profound transformations of some coral reefs, with particular degradation at Double, Green, Heron, Masthead and Lady Musgrave Islands, and at Wistari Reef. That degradation was due to the combined impacts of prolonged, cumulative coral souveniring by tourists and to the removal of large amounts of material by commercial collectors. Although coral collecting has been restricted since 1933, both licensed and unlicensed collecting continued after that year. Extensive documentary evidence indicates that coral collecting was accompanied by the deterioration of coral reefs; those documentary accounts are supported by oral history evidence. Evaluation of the precise impacts of coral collectors in the Great Barrier Reef requires further scientific research and monitoring, although comparison with other coral reef ecosystems suggests that those impacts are likely to have been severe.

## KEY WORDS

Queensland Government Tourist Bureau; coral souvenirs; coral curios; coral licences; Great Barrier Reef Marine Park Authority

## INTRODUCTION

Given the increasing concern about the condition of marine ecosystems world-wide, many authors have acknowledged that coral reefs have undergone a critical decline due to climate change, pollution and over-harvesting of marine species.<sup>1</sup> For instance, Pandolfi et al. argued that many coral reefs now exist in conditions that are far from pristine. Those authors stated:

The overall historical trajectory of reef degradation across all cultural periods is markedly linear [...]. Most importantly from the perspective of reef conservation and management, most of the reef ecosystems were substantially degraded before 1900. Recent widespread and catastrophic episodes of coral bleaching and disease have distracted attention from the chronic and severe historical decline of reef ecosystems [...].<sup>2</sup>

On the basis of archaeological and historical information about the profound transformations of marine ecosystems resulting from human activities, Hughes et al. argued that some marine ecosystems have now deteriorated to the extent that recovery to their original state can no longer be attained.<sup>3</sup>

The collection of coral, for both recreational and commercial purposes, has occurred in many coral reef ecosystems with various ecological impacts. Such impacts include coral morbidity, the depletion of some coral reef species (particularly the hermatypic, 'reef-building' species and the precious black corals, *Antipathes*), alterations in predator-prey interactions, and the physical destruction of coral reef habitats.<sup>4</sup> The problem of coral collecting has been investigated by several authors. Gomez acknowledged the general scarcity of scientific data about this activity, but nonetheless stated: 'little attempt has been made to control trade or even to regulate the harvesting of stony corals anywhere else [besides the Philippines] in the Pacific'. Gomez also argued that localised depletions of particular species of corals can be partly attributed to coral collecting and emphasised the importance of effective marine protected areas for coral conservation. Another study indicates that coral collection has threatened the viability of reefs off Key Largo, Florida; the indirect impacts of coral and shell collectors – including breakage of coral and the resultant exposure to infections from blue-green algae – have also been acknowledged to cause rapid coral morbidity. Other studies of the specific degradation inflicted on coral species investigated reefs in Brazil and Papua New Guinea; those studies called for management initiatives to curb the collection of coral.<sup>5</sup>

The Great Barrier Reef of Australia, shown in Figure 1, is the largest complex of coral reefs and associated species – and one of the most biologically diverse ecosystems – known to exist. The ecosystem extends for over 2,000 kilometres along the north-eastern coast of Queensland and contains more than 2,900 coral reefs. Although the Great Barrier Reef has supported coastal Indigenous Australian societies for millennia, after European settlement in Australia the natural



FIGURE 1. The geographical extent of the Great Barrier Reef World Heritage Area (GBRWHA).

Source: Based on D. R. Wachenfeld, J. K. Oliver and J. I. Morrissey (eds), *State of the Great Barrier Reef World Heritage Area* (Townsville: GBRMPA, 1998), 4.

resources of that ecosystem were subjected to more intensive exploitation, especially after 1900.<sup>6</sup> Very rapid European settlement in the area that would become Queensland began around Brisbane during the 1820s; in the following decades until 1900, the occupation of land by pastoralists transformed the landscape to the north and inland. Many ports were founded to support pastoralist (and later agriculturalist) settlers, which in turn stimulated the growth of other industries in coastal Queensland: timber getting, gold mining, dairying and the cultivation of sugar cane.<sup>7</sup>

Direct exploitation of the Great Barrier Reef by European settlers commenced in the latter half of the nineteenth century in the form of *bêche-de-mer* (or trepang) and pearl-shell harvesting. Dugongs and green turtles were also fished from various inshore localities (such as Heron Island, Cardwell and Repulse Bay) throughout the Great Barrier Reef, and dugongs, pearl oysters and green turtles were harvested to the point where those resources were acknowledged to have been severely over-exploited by 1890, 1927 and 1930, respectively.<sup>8</sup> Another use of the Great Barrier Reef commenced when the first island tourist resorts were built on several islands (e.g. Heron; Green), and a nascent reef fishing industry was also established; the increased accessibility of coral reefs in the vicinity of tourist resorts allowed larger numbers of coral collectors to work those reefs. Since 1960, European use of the natural resources of the Great Barrier Reef has been largely confined to reef fishing, tourism and a regulated coral collecting industry.<sup>9</sup>

The condition of the Great Barrier Reef has received particular attention since that ecosystem is the largest and one of the most undisturbed coral reefs in the world; nonetheless, the Great Barrier Reef displays systemic decline, indicated by a substantial reduction in coral cover since around 1960. Terrestrial sediment and nutrient run-off, coral bleaching episodes, commercial and recreational fishing, tourism and coastal development are some of the main present-day impacts on the Great Barrier Reef.<sup>10</sup> The degradation of the Great Barrier Reef is thought by some observers to have occurred, or worsened, since European settlement, with the most severe degradation affecting the inshore habitats in the most accessible parts of the Great Barrier Reef World Heritage Area (GBRWHA): in the Cairns, Townsville and Whitsunday regions, which have experienced intensive human use and substantial terrestrial run-off.<sup>11</sup> In addition to scientific accounts, anecdotal reports of decline in the Great Barrier Reef have attributed the degradation of coral reefs and their associated species to many human impacts: marine shipping, pollution, sediment and nutrient run-off, habitat destruction, coastal development, commercial and recreational fishing, and the over-collection of marine specimens. In the absence of sufficient scientific data about changes in the ecosystem for the period before 1970, however, the Great Barrier Reef Marine Park Authority (GBRMPA) has been unable either to confirm or to refute such anecdotal claims of coral reef degradation.

Nonetheless, any assessment of anecdotal claims about the deterioration of the Great Barrier Reef requires an appropriate historical context, as Hughes et al. have emphasised.<sup>12</sup> Qualitative sources represent a valuable, alternative source of evidence of changes in the Great Barrier Reef for the period before 1970. Archival and oral history sources, in particular, have been little used to investigate changes in coral reefs and they have the potential to inform rich accounts of the environmental history of the Great Barrier Reef.<sup>13</sup> However, other than the works by Bowen,<sup>14</sup> and by Bowen and Bowen,<sup>15</sup> few scholarly accounts of the environmental history of the ecosystem exist. Indeed, accounts of the historical extent and impacts of coral collecting for any coral reef ecosystem – including the Great Barrier Reef – are scarce. Hence, an account of the history of coral collecting can inform an evaluation of the current state of the GBRWHA; such an account also suggests implications for the contemporary management of the ecosystem.<sup>16</sup>

The Great Barrier Reef is a dynamic ecosystem characterised by ecological and morphological changes at various spatial and temporal scales: largely in response to geomorphological and climatic factors. In addition to natural variability, however, many coral reefs have been subjected to additional pressures as a result of increasing human exploitation of the ecosystem, and those impacts can be correlated with the spread of European settlement on the Queensland coast since around 1860. In that context, we suggest that coral collecting represents an impact on the Great Barrier Reef that has previously been underestimated in scholarly accounts. Here, we argue that coral collecting occurred in the Great Barrier Reef in more places, and for longer periods, than has previously been documented. We present documentary and oral history evidence of the impacts wrought by collectors; this evidence indicates that the damage caused by collecting could be sustained and widespread, and that some coral reefs were probably far from pristine at the time of the formation of the Great Barrier Reef Marine Park (GBRMP) in 1975. As the rate of coral removal was almost imperceptible, the precise extent of coral collecting cannot be reconstructed, but the evidence suggests that a very large amount of coral must have been removed from the Great Barrier Reef prior to 1970.<sup>17</sup>

We have reconstructed the impacts of coral collectors using an array of qualitative methods, although our account is based mainly on extensive analysis of archival and oral history materials, especially the official records of the Queensland Department of Agriculture and Stock (QDAS), Queensland Department of Harbours and Marine (QDHM), Queensland Environmental Protection Agency (QEPA), Cairns City Council (CCC) and Queensland Premier's Department held in the Queensland State Archives (QSA) in Brisbane. In addition to these archival sources, we used the official reports published in the *Queensland Parliamentary Papers (QPP)*, the export statistics published in the *Statistics of the Colony of Queensland (SCQ)* and in the *Statistics of the State of Queensland (SSQ)*, and a sample of several hundred historical books. Oral histories, in the

form of 47 semi-structured interviews with key and expert informants, recorded between October 2002 and December 2003, supplemented the documentary sources. The oral history material has been deposited at the GBRMPA Library in Townsville; in the account that follows, we refer to these original interviews using the abbreviation OHC (Oral History Cassette), followed by the cassette number, the date of the interview and the transcript page number(s).<sup>18</sup>

Our evidence of the permits issued to commercial coral collectors by the Queensland Government requires some explanation. We have relied on many archival records of the QDHM and the QEPA for information about coral collecting, especially the files relating to the preservation of coral from exploitation, the issue of coral licences, and the *Fish and Oyster Acts, 1914–1935*. The records of the QDHM held at the QSA begin and end abruptly, and contain major discontinuities, and archivists at the QSA suggested that other files may have been lost in 1974 during the Australia Day flooding of the Departmental offices in Brisbane. The sequence of coral licences suggests that more areas were leased to coral collectors than are revealed by the surviving records. Unlicensed commercial coral collecting at several locations, including Green Island, is also evidenced by documentary and oral history sources; this activity either pre-dated the system of coral licences or occurred without legal authority. Coral collecting was probably more widespread than our account reveals.

## CORAL COLLECTING IN THE GREAT BARRIER REEF

Four main types of coral collecting have occurred in the Great Barrier Reef: informal collecting, scientific collecting, commercial collecting prior to the introduction of the coral licence system, and licensed collecting. A recent investigation into the coral harvest fishery in Queensland stated that coral harvesting in Queensland has been regulated since 1933, when the first restrictions on the removal of coral from foreshores in Queensland were introduced, by which time an industry had formed to supply the souvenir market.<sup>19</sup> Analysis of numerous documentary records, including Queensland Government reports, archival records held at the QSA and a selection of historical books, reveals that informal coral collecting predated the regulation of this fishery in Queensland; furthermore, that activity was intensive and sustained at many locations in the Great Barrier Reef. Although individual occurrences of coral collecting were comparatively small and localised when considered in the context of the scale and diversity of coral reefs, the cumulative impacts of many coral collectors, in many places, over a prolonged period of time is likely to have been considerable. In particular, at major tourist centres – such as Green and Heron Islands – the degradation of coral reefs could be severe; one oral history informant suggested that parts of the Great Barrier Reef had been ‘loved to death’ by visitors.<sup>20</sup> Furthermore, in

addition to the informal removal of coral by visitors to the Great Barrier Reef, commercial coral collecting has been a consistent impact on numerous reefs.

The reconstruction of both informal and commercial coral collecting is difficult for many reasons: the lack of systematic records, the impossibility of estimating coral harvests as a result of illegal collecting, the problems in identifying coral species, the limited extent of monitoring and policing of the activities of collectors, the vast geographical range of coral reefs in which collectors worked, and the reluctance of some coral collectors to contribute oral history evidence of their activities. In addition to these problems, individual instances of coral souveniring have been regarded as trivial and the changes that have resulted from souveniring were often imperceptible because they occurred so gradually. Nonetheless, the account presented below contains a discussion of the general scope of coral collecting, including several examples of coral collecting in specific locations, in order to provide an overview of the extent of this activity.

The strongest evidence of the scale of the commercial coral collecting industry is found in the records of the coral licences that were issued to professional collectors; the surviving licences are held at the QSA. Some oral history sources, historical books and photographs supplement these records with additional details of the extent of coral collecting and its impacts. However, in the surviving records of coral and shell-grit licences issued by the QDHM, uncertainty exists about the precise use for which the permits were intended. The sequence of licences is continuous with the licences that were issued for coral mining, which initially took place for the manufacture of agricultural lime; however, terrestrial sources of agricultural lime probably replaced lime manufactured from coral, and coral collected since the 1950s increasingly supplied the curios and ornamental trades.<sup>21</sup> Yet early instances of the ornamental use of coral date at least to 1879, and the collection of coral from the Great Barrier Reef for curios has taken place continuously throughout the period of European settlement.

In addition to the collection of coral for curios and souvenirs, coral was also collected for scientific investigations by early European explorers and naturalists since those aboard the *Endeavour* in 1770. For instance, describing the scientific apparatus of the *Endeavour*, one correspondent wrote to the renowned taxonomist, Carl von Linné (Linnaeus):

No people ever went to sea better fitted out for the purpose of Natural History. They have got a fine library of Natural History; they have [...] all kinds of nets, trawls, drags and hooks for coral fishing; they have even a curious contrivance of a telescope, by which, put into the water, you can see the bottom at great depth.<sup>22</sup>

Coral collecting was a feature of many subsequent European exploratory voyages, including those of Joseph Beete Jukes, who discussed his own coral collection in a letter of 27 July 1844, as follows:



I shall be entitled to a few weeks' holiday when I return, before setting to work in London, as I suppose I shall have to do if I bring home a good collection. I am, however, still in absolute uncertainty as to what is to be done with the results of my labours – whether I am to do what I like with them, or whether they are to go to the British Museum [...]. How you would envy the corals which we get here! The most magnificent masses of branched corals are now dying on the poop; but, alas, they are too bulky and too brittle to get home, so I shall content myself with small pieces.<sup>23</sup>

Other instances of coral collecting by early European explorers, naturalists, natural historians and scientists were described by Bowen and Bowen, who showed that large collections of coral were transported from the Great Barrier Reef to institutions in Sydney and London.<sup>24</sup> Oral history evidence also suggests that large scientific coral collections were created before 1960, including a large collection made during a voyage aboard the *Cape Moreton* by Professor Stephenson of the University of Queensland and Dr Wills of Cornell University, and another collection made during the scientific expedition to Low Isles in 1954, although those collections were not maintained.<sup>25</sup>

However, those collections were few in number and highly selective; they formed a small part of the cumulative impact of coral collecting.<sup>26</sup> In contrast, the collection of coral for commercial ventures represented a much more significant impact on coral reefs. The coral trade had commenced by 1879, when six packages of coral were exported from Queensland to New South Wales.<sup>27</sup> In 1890, Saville-Kent stated that:

A remarkable species of coral that is not infrequently obtained by the pearl-shell divers in Torres Straits and throughout the Barrier region is the black coral, *Antipathes arborea*. This coral possesses a high commercial value in the Indian market, the supplies hitherto having been chiefly derived from the vicinity of Jeddah, in the Red Sea. I am informed that the produce of the Jeddah Fishery has greatly diminished within the last few years, and that the discovery of new sources of supply would be gladly welcomed. There is, I consider, every element in favour of the development of a profitable black-coral fishery in North Queensland waters.<sup>28</sup>

By around 1900, coral collection was taking place at Masthead Island, as Figure 2 illustrates, and by 1929 the commercial collection of coral – including other species besides *Antipathes arborea* – for sale as curios and ornaments had increased. An account of Green Island produced by the Cairns Harbour Board stated: 'There is a caretaker on the island who has a very fine exhibition of reef products and marine life, and pretty coral specimens are obtainable at a very low cost'.<sup>29</sup> In addition, visitors to the island were encouraged to explore the reef at low tide for themselves, and the opportunity to collect coral souvenirs was regarded as one of the attractions of the island resorts.

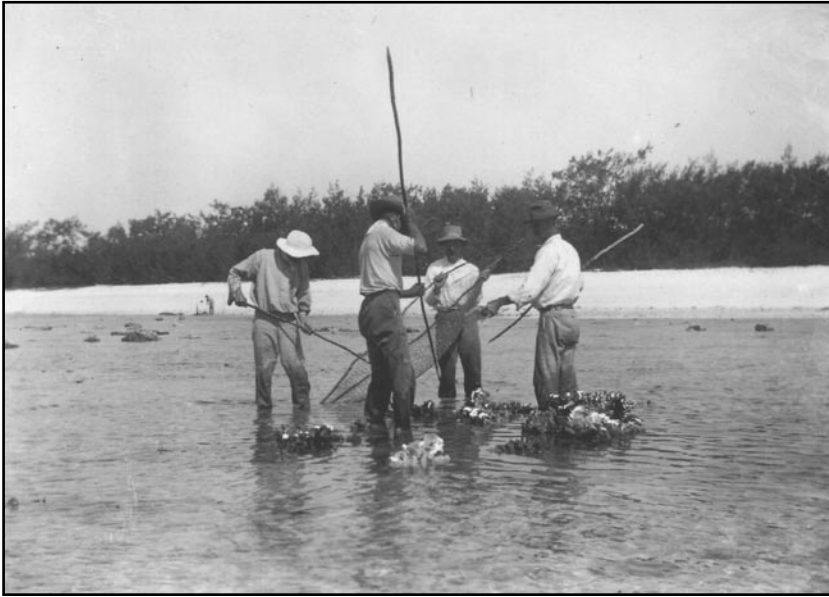


FIGURE 2. Coral collecting at Masthead Island, c. 1900.

Source: Negative No. AP3:433, Robert Etheridge Photograph Collection, Australian Museum Archives.

However, the activities of tourists – in particular, taking coral from the reefs – caused concern about environmental degradation at the major resorts, including Hayman, Heron and Green Islands where, from 1930 onwards, coral specimens were readily available as ornaments and curios.<sup>30</sup> One account of coral collecting at Hayman Island in 1932 and 1933, for instance, written by Marks, stated:

The excitement was intense as, again and again, the diver who accompanied us returned to the surface grasping bunches of living jewels plucked from the depths. Soon the boat was full of pieces of coral of different shapes and sizes, but the illusion was lost. The dainty fairy-like forms proved to be mere slimy skeletons, and the colour blurred and faded as the living organisms within, away from their natural element, gradually succumbed to the heat of the tropical sunshine, and began to give out a most offensive odour. But even in death the fragments retained their beauty of form, and, cleaned and bleached, were eagerly sought after as souvenirs. To return from the Great Barrier Reef without some specimens of its coral framework was unthinkable!<sup>31</sup>

The corals collected during this particular expedition included 'mushroom' and 'brain' corals, which were removed from the reef using pick-axes.<sup>32</sup>

Concerns about the damage to coral reefs caused by this type of souveniring – and the likelihood of anticipated additional damage as the tourist industry developed – were expressed, as the following account by the Secretary of the Provisional Administration Board of the QDHM illustrates:

a suggestion was made to this Department by the Director of the Queensland Government Tourist Bureau that it is desirable to prohibit or restrict the removal of live coral from Queensland waters, in view of anticipated developments of the tourist traffic to islands in the Barrier Reef area and the possibility of considerable destruction of growths of coral forming scenic attractions in the neighbourhood of the tourist resorts.<sup>33</sup>

Nevertheless, some degradation of coral reefs had already occurred, the Secretary reported: for example, in ‘the Stone Island area where tourists and others have done some damage to the coral formations from a scenic point of view’.

Another area about which early concerns about the coral collecting were publicised was the Whitsunday Islands; one account, written by H. G. Lamond in 1933, requested the Queensland Government to prohibit coral collectors ‘from removing oysters or coral, shells and other beauties from the Molle reefs’ since degradation was occurring in those places. In another letter, Lamond argued that damage to the reefs was occurring, not only as a result of the removal of specimens, but also because other corals were damaged in the process. In the same year, the Queensland Government passed legislation to protect the most vulnerable locations by prohibiting the taking of coral from the foreshores and reefs of eighteen islands: Masthead, Heron, Lady Musgrave and North West Islands (Bunker Group); Middle and South Islands (Percy Isles); Tern and Red Bill Islands (Northumberland Islands); Scawfell, Molle, Shaw, Lindeman, Hayman, St Bees and Brampton Islands (Cumberland Islands); Stone Island (Edgcombe Bay); Bait Reef; and the foreshores and reefs of Cid Harbour (Whitsunday Island).<sup>34</sup> The locations of these early protected areas are shown in Figure 3. In 1937, the foreshore and reef surrounding Hamilton Island (Whitsunday Passage) were added to the list of protected areas, followed by other foreshores and reefs in the Whitsunday and Cumberland Islands, in 1939.<sup>35</sup>

Nevertheless, coral collecting remained a popular activity amongst both amateur collectors and naturalists. Ellis described the attraction of coral collecting as follows:

So far as naturalists are concerned, I can hardly imagine one being happier than when taking a stroll at low spring tide on the Barrier Reef, with its wealth of shells, corals, crabs, sea-urchins, beche-de-mer, and other strange things that only a naturalist could classify. Every stone one turns over reveals material for a collection; every piece of live coral broken off seems to add its share; not only the polyp which made the structure, but the weird and wonderful tiny crabs, shrimps, and little fish that make their homes among the branching coral. Everything seems to be teeming with life. And it is not necessary to be a naturalist to enjoy these

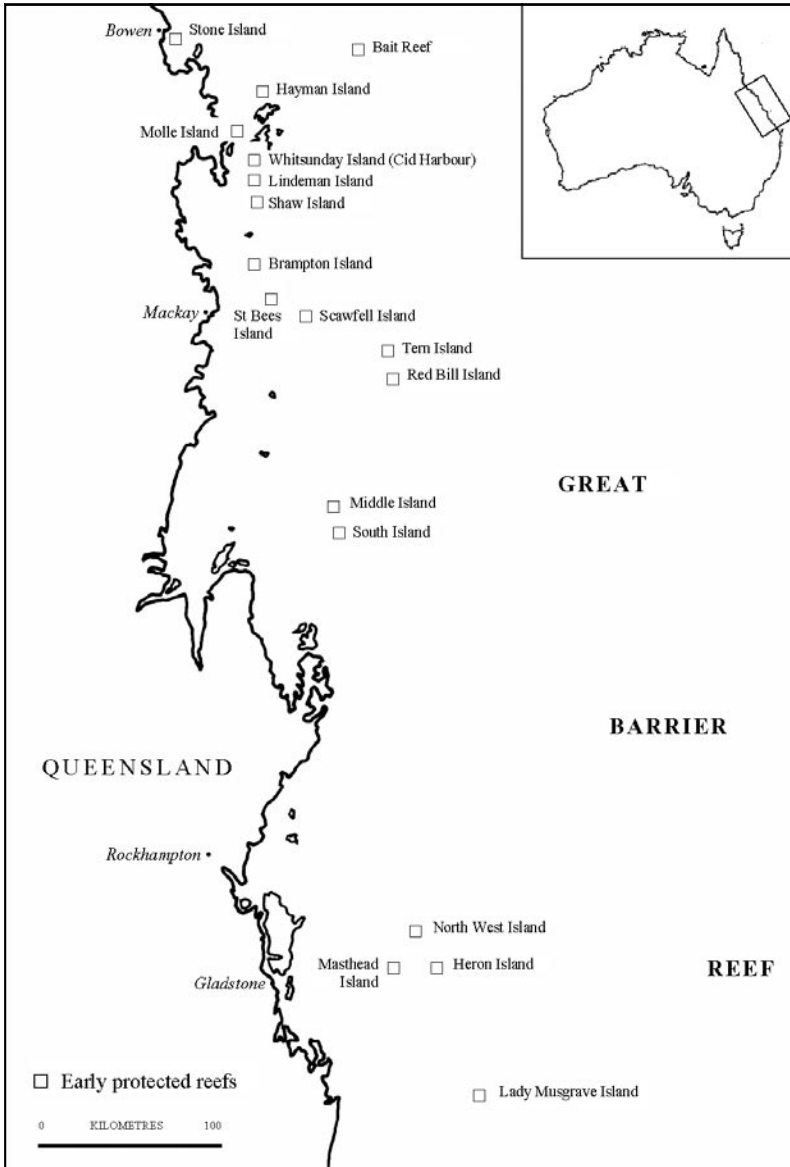


FIGURE 3. The first coral reefs and foreshores protected by legislation, in 1933.  
 Source: *Order in Council*, 1 June 1933.

wonders; any one with a love of nature would be thrilled. The scale on which things are done, too, is befitting the noble proportions of this great reef.<sup>36</sup>

In contrast, Ratcliffe described the disappointment he experienced when walking across a dead coral reef between Dunk Island and a smaller island of the Family Group, at low tide, and finding few biological specimens. Yet the practice of coral collecting and the treatment of specimens had by then become well-established; an efficient method of cleaning coral by covering it in coral sand for about a week was commonly practiced, and coral specimens were then tinted in an attempt to reproduce the colours of the living reef.<sup>37</sup>

In spite of the legal protection of some coral reefs that existed since 1933, complaints were still made about the degradation of other reefs by coral collectors. As Bowen and Bowen acknowledged, early conservation concerns had already been expressed by representatives of the Great Barrier Reef Committee (GBRC). The GBRC was founded in 1922, largely as a result of the efforts of Henry Richards, Professor of Geology at the University of Queensland, to promote the systematic scientific investigation of the Great Barrier Reef. The GBRC had two explicit aims: to investigate the nature and formation of the Great Barrier Reef; and to develop fuller knowledge of the development and growth of the products of great economic value in the Great Barrier Reef 'so that the Commonwealth may use them in the most efficient and wealth-producing manner'.<sup>38</sup> The formation of the GBRC followed the Pan-Pacific Scientific Conference of August 1920, at which the need for a marine biological survey of the Great Barrier Reef was acknowledged. In 1920, Richards had written to Sir Matthew Nathan, Governor of Queensland, outlining a programme for Great Barrier Reef research, including studies of its economic potential.<sup>39</sup> Richards also argued for an investigation of the economic resources of the Great Barrier Reef, stating that 'the exploitation of the economic wealth of the Great Barrier Reef has gone on and we stand idly by'.<sup>40</sup>

Richards' views were shared by the eminent reef scientist, Charles Hedley, of the Australian Museum in Sydney, who argued for the conservation of natural resources and who warned about the dangers of uncontrolled exploitation of the Great Barrier Reef. In part, however, these early expressions of conservation thought were motivated by patriotism and a desire to regulate the activities of foreign harvesters. Concerns had already been expressed about the degradation of the Torres Strait pearl fisheries; increasingly, other concerns were expressed that Government fisheries regulations allowed the exploitation of marine resources by 'vagrant licensees' until the resource base collapsed. Bowen and Bowen argued that, during this period, patriotic policies were introduced with the aim of replacing the 'wandering and foreign population which subsists on our marine tropical products, by resident European fishermen, in turn supported by scientific cultivation through zoological research and legislative protection'.<sup>41</sup> Hence, during this period, early conservation thought developed due to motives that were largely protectionist and oriented to the economic development of

Queensland. The GBRC acknowledged that some of the economic resources of the Great Barrier Reef – in particular, pearl-shell and *bêche-de-mer* – had already been heavily exploited; other resources, including 'certain species of reef corals for bleaching, painting and sale as curios' and 'other kinds of decorative soft corals', required increased protection from casual depredation.<sup>42</sup>

The increasing engagement of the GBRC with conservation during this period can be understood in the context of the wider development of the conservation movement in Queensland. Following a period of unchecked expansion and exploitation of natural resources during the nineteenth century – and as a result of which the complete destruction of some shell and timber resources occurred – the Queensland Government had by 1900 commenced designating small land areas as national parks. The dominant drive to clear the land for agriculture had caused the widespread destruction of forests and wildlife; the pace and extent of that land clearance led, in turn, to controversies about the need for protection of terrestrial resources.<sup>43</sup> In contrast to terrestrial environments, however, the Great Barrier Reef remained virtually inaccessible to the public and a low priority for the Government.<sup>44</sup> While the GBRC advocated the scientific investigation and economic exploitation of the Great Barrier Reef, it increasingly faced political pressures and protests about the impacts of those activities. In particular, many complaints were made about the plunder of reef resources – especially dugongs, trochus and *bêche-de-mer* – by Japanese crews. Some charismatic figures, such as the 'beachcomber', Edmund Banfield, and the marine cinematographer, Noel Monkman, expressed concerns about the degradation of the Great Barrier Reef resulting from activities such as mining, animal harvesting and resort development.

By 1930, the use of the Great Barrier Reef had increased considerably as its waters had become a major shipping route. Reef tourism also expanded during the 1930s; this industry was prompted after 1930 when the Mackay Chamber of Commerce initiated the development of Lindeman Island as a tourist resort. The Queensland Government Tourist Bureau (QGTB) was created as a publicity and booking office, and was functioning in both of those roles by 1932. The main strategy of the QGTB was to attract visitors from Southern states to Queensland, and the organisation launched a promotional literature campaign to highlight the attractions of the Great Barrier Reef, including its 'economic possibilities'.<sup>45</sup> By 1935, a major campaign to attract tourists to Queensland was in progress; that effort was reflected in the Queensland 'travel and description' literature, in works such as *On the Barrier Reef*, by Napier, and *Wonders of the Great Barrier Reef*, by Roughley.<sup>46</sup> While the Great Barrier Reef experienced increased visitation and usage after 1930, however, the lack of a single co-ordinating authority to manage the Great Barrier Reef led to isolated responses to instances of degradation, and to several authorities administering various parts of the ecosystem in response to varying pressures and concerns, but an overall strategy for protecting the marine resources of the ecosystem was lacking and

the GBRC attempted to persuade the Queensland Government of the need for at least a basic level of regulatory control over the Great Barrier Reef.<sup>47</sup>

Significant conservation initiatives and legislation were introduced in Queensland during the 1930s. In 1930, the National Parks Association of Queensland (NPA) was formed, followed in 1932 by the North Queensland Naturalists' Club, in Cairns. In 1933, the protection of wildlife on some islands of the Great Barrier Reef was increased when several sanctuaries were proclaimed under the *Animals and Birds Act, 1921*. Increased protection for various marine parts of Great Barrier Reef was afforded by means of a series of *Orders in Council*: in 1933, 1937 and 1939, the removal of coral from many reefs and foreshores was prohibited; in 1935, all the islands of the Great Barrier Reef were declared wildlife sanctuaries; and, by 1939, one hundred islands had been designated as national parks. Enforcement of these regulations occurred through a system of Honorary Inspectors given legal powers under the *Fish and Oyster Acts*, and Honorary Rangers under the *Fauna and Native Plant Protection Act*. The QGTB was also requested to provide advice to visitors about the regulations and to encourage compliance with their provisions.<sup>48</sup> The introduction of these initiatives and regulations suggests that, during the early 1930s, the combination of increased visitation and usage of the Great Barrier Reef and wider acknowledgement of the economic potential of its marine resources generated considerable interest in affording a minimum standard of protection to the ecosystem.

At the beginning of 1938, the Honorary Secretary of the GBRC, E. O. Marks, wrote to the Queensland Treasurer, stating:

This Committee has for many years felt much anxiety in regard to the harm which must result from promiscuous gathering of marine and other trophies, and thoughtless destruction of fauna and flora along the Queensland coast. The effects of such vandalism are necessarily greatest in the most accessible places – especially in the vicinity of tourist resorts.<sup>49</sup>

The degradation was of particular concern in the Whitsunday region; another report, by the lessee of South Molle Island, Mr A. W. Bauer, claimed that 'the coral reefs surrounding Mid Molle and Denman Islands are suffering through the action of persons removing coral'. The Director of the QGTB suggested that those two islands should be given the same legal protection from coral collectors as other protected reefs. In July 1939, the number of foreshores and reefs protected under *The Fish and Oyster Acts, 1914 to 1935* was increased to include the remainder of Whitsunday Island as well as Mid Molle, Denman, Hook, Border, Deloraine, West Molle and Long Islands in the Whitsunday Group, and Seaforth Island in the Cumberland Group.<sup>50</sup>

Yet the legal protection of coral reefs did not prevent their degradation by coral collectors, who continued to souvenir specimens illegally. The attractions of 'reefing' were described by the Secretary of the Queensland Office of the Commissioner for Railways who, after visiting Lady Musgrave Island, wrote that:

## 'LOVED TO DEATH'

Lady Musgrave has extensive coral reefs which provide ample opportunities for reefing at low tides when tourists can see every variety of marine growth and life. [...] On the edge of the reefs and in coral pools, coral gardens flourish in all their beauty.<sup>51</sup>

However, the Secretary reported that the reef specimens were so numerous that 'it becomes difficult to prevent tourists from collecting them'. He also reported that, in an attempt to dissuade visitors from taking coral, the caretakers of Lady Musgrave Island, Mr and Mrs Bell, 'discourage the removal of marine growths in every way and to assist in this object specimens of reef life are not even collected for display purposes at the settlement'.<sup>52</sup>

The impacts of coral collectors were not limited to the resort islands, such as Lady Musgrave Island; other islands in the vicinity of resorts were also affected as tourists undertook day-trips. One report, written in 1940 by a National Parks (NP) Ranger, G. Gentry, acknowledged that Hoskyn and Fairfax Islands were being damaged since they were visited regularly by tourists from Lady Musgrave and Heron Islands; his report stated: 'There is no doubt that a fair quantity of coral is taken as specimens. Some most outstanding coral beds are to be found around these two islands'. Similarly, Ranger E. McKeown reported that camping parties from the districts between Cairns and Innisfail that regularly camped on High Island, in the Frankland Group, were removing coral specimens from the Frankland Islands. By 29 October 1940, the foreshore and reef of Green Island had been included on the list of islands from which the removal of coral was prohibited; by the end of the same year, the reefs at Hoskyn and Fairfax Islands, and those at the Frankland Islands, had also been protected.<sup>53</sup>

However the removal of coral continued. At Green Island, Noel Monkman, the Honorary NP Ranger and Honorary Inspector of Fisheries, complained in 1944 about the removal of specimens by American servicemen, stating that:

I am having an extremely difficult time in protecting the Reef at Green Island from destruction by servicemen spending their week-end leave here. As you are no doubt aware, we have from 200 to 300 men arrive on the island each week-end. I have done my best to prevent the despoiling of the Reef but it is beyond my control. On many occasions when I have requested men to cease breaking off coral and filling their knapsacks with it or collecting kit boxes full of shells and starfish, the men have in many instances become very abusive and aggressive.<sup>54</sup>

Investigation of this issue revealed that Monkman himself, with his brother-in-law, sold corals at the Green Island kiosk; a display of those corals is shown in Figure 4. In response, Monkman argued that the corals at the kiosk were not taken from Green Island reef; instead, he stated, coral collectors 'have collected these specimens by boat on distant reefs adjacent to the Island, and also purchase from the Island boys [*sic*] on the luggers visiting Green Island'. After the introduction of legislation, hence, some impacts of collecting were transferred to reefs that were not protected by restrictions.<sup>55</sup>



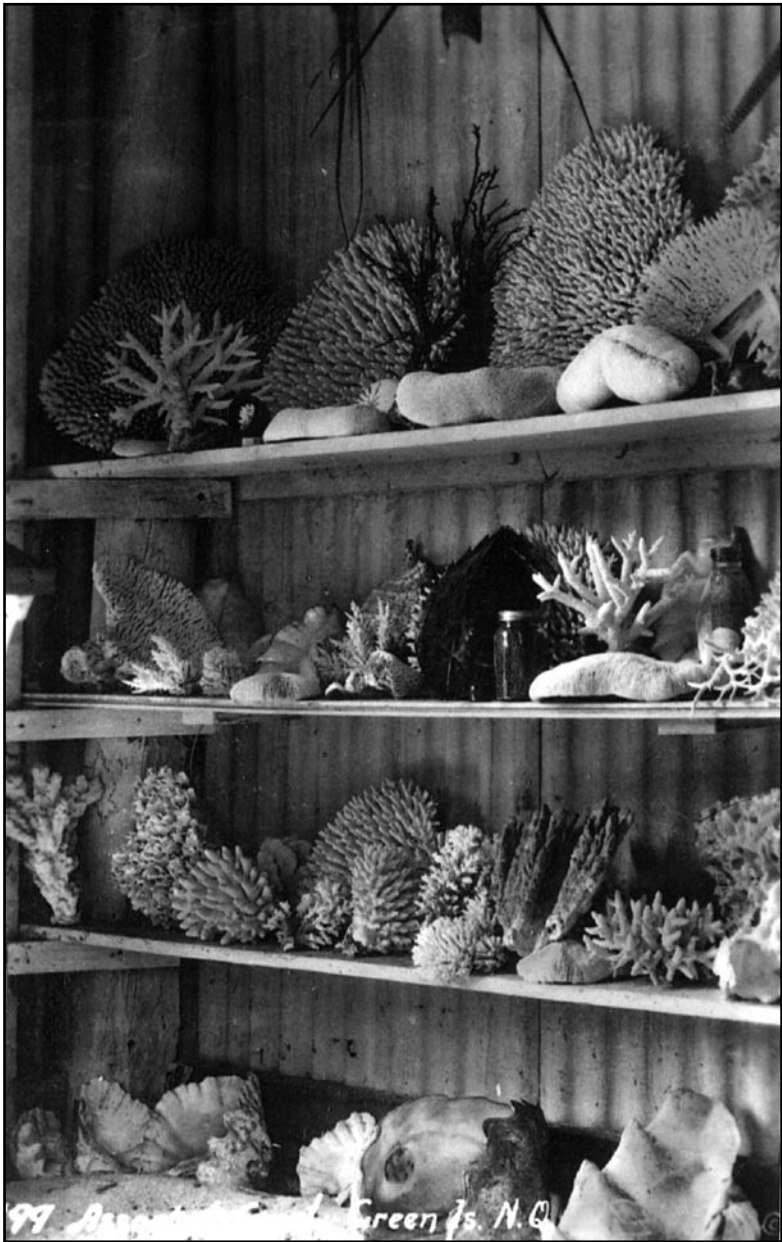


FIGURE 4. Assorted coral displayed at the Green Island kiosk, c.1940.

Source: Uncatalogued photograph obtained from Cairns Historical Society, courtesy of G. Jennex.

The damage wrought by coral collectors – including by reef-walking – was apparent to many observers. At Heron Island, Gentry saw ‘evidence that shells and coral have been removed in the past’, and at Green Island, A. C. C. Lock stated, ‘it was evident that some of the coral had been broken apart, and killed, by visitors walking upon it’.<sup>56</sup> In addition to those reports, Serventy stated:

coral and shell have developed into a minor industry. So much so that most tourist islands in self defence have had to prohibit the ‘picking’ of coral and the gathering of shells, at least in large quantities. Boats working from Cairns bring in coral for the tourist trade [...].<sup>57</sup>

Furthermore, the extent of manipulation of coral reefs had increased to the point where the ‘transplantation’ of coral from unprotected reefs to resorts, in which coral depletion had taken place, was feasible. By 1952, at Green Island, coral specimens were imported from adjacent reefs in order to supplement the coral gardens that surrounded the underwater observatory’, with the result that a total length of seventy feet of coral gardens could be viewed by tourists.<sup>58</sup>

Green Island was not the only location to experience degradation due to coral collecting; Heron Island reef was also depleted by tourist souveniring, as shown in Figure 5. Commercial coral collecting also took place at Heron Island reef and Wistari Reef, and the depletion of species there was reported by Monkman, when he was the Honorary NP Ranger and Honorary Fisheries Inspector at Heron Island, who stated that:

the *Don Juan* [...] anchored inside the Heron Island reef for several days, whilst the crew of that boat, *i.e.* two young men and a woman, had been systematically combing the reef during the period of each low tide, both day and night, and had already collected a considerable number of living shellfish and colonies of coral. [...] These people were conducting a business of the sale of such specimens by making the shells into jewellery and bleaching and colouring the coral. [...] I went out to this boat, and found coral bleaching on the deck [...].<sup>59</sup>

Monkman also reported that, although this incident took place at Heron Island, the owner of the boat ‘did most of his collecting of coral and shells on Wistari Reef, adjacent to Heron Island’.

As a result of the cumulative impacts of tourist souveniring and the increasing impacts of commercial coral collecting, Wistari Reef and One Tree Island reef had deteriorated by 1955. Describing the decline of these reefs, Monkman stated:

I have been working on the Reef for 25 years as a marine biologist and film producer, and during that period have seen the sad sight of some of our most beautiful reefs being destroyed as thing of beauty and wonder, and have seen the selling of coral and shells become an outrageous racket. Wistari Reef has already commenced to deteriorate through these depredations, and I would implore your Department to protect this reef before it suffers the same fate as so many other



FIGURE 5. Tourists gathering coral specimens from Heron Island reef, c.1930.  
*Source:* QS189/1 Box 17 Item 73, Queensland Industry, Services, Views, People and Events; Photographic Proofs and Negatives; Islands – Barrier Reef, QSA.

reefs. This also applies to One Tree Reef, but I see no reason at all why all the reefs on the Great Barrier should not be rigidly protected.<sup>60</sup>

Regardless of the prohibition of coral collecting, visitors continued to remove specimens from the Great Barrier Reef throughout the 1960s. Coral was also used for commercial and official purposes; one collection was used to decorate the Qantas office in Tokyo, and a much larger collection, comprising over 1,350 coral specimens and six giant clams, was displayed at the 1967 Exposition in Montreal.<sup>61</sup>

Other than the informal collecting of souvenirs, coral collecting took place in a more organised manner, encouraged by the Queensland Government, using a system of coral collecting licences. Evidence of these licences survives in the QSA for the period 1962-1969, and nineteen coral areas have been identified using these records, but it is likely that the industry was more extensive than the extant records indicate. The nineteen coral collecting areas that have been reconstructed using archival evidence were located at twelve reefs and islands, as shown in Figure 6. The distribution of the coral areas indicates that during this period the coral collecting industry exploited reefs in the vicinity of the major ports of Cairns, Townsville, Mackay and Gladstone, with a concentration of activity in the Cairns area. Although archival files held at the QSA contain details of the boundaries and lessees of the nineteen coral collecting areas, they do not reveal the criteria by which the coral areas were selected nor whether any monitoring and policing of commercial collecting took place. Details of the lessees and locations of the coral areas are given in Table 1.

Some additional evidence provides more detail about the coral collecting industry. Applications for coral collecting licences had to be made to the Queensland Government and were accompanied by sketch maps of the proposed area. In addition to the nineteen areas reconstructed using the QSA files, other applications for coral collecting were made, such as A. F. Paterson's application for a licence to remove coral from Otter Reef, near Cardwell. However, regarding this application, the Harbour Master at Townsville stated that:

Present policy requires that coral leases are normally submerged at all times and remote from public areas. This proposed lease on 'Otter Reef' is a popular fishing ground and anchorage for amateur fishermen. I recommend that this application should be refused.<sup>62</sup>

Thus, one requirement of the coral areas was that they should not be visible from the surface; the coral areas were required to remain below low water mark. Nonetheless, some coral was removed from Otter Reef, as Paterson stated that live coral was 'easily obtained at low water and is abundant'.

The impacts of commercial coral collectors were greater than those of individual tourists, although the numbers of the former were far smaller. Commercial operators sometimes took coral from protected reefs, such as Green Island reef, as one oral history informant has revealed.<sup>63</sup> Commercial collectors

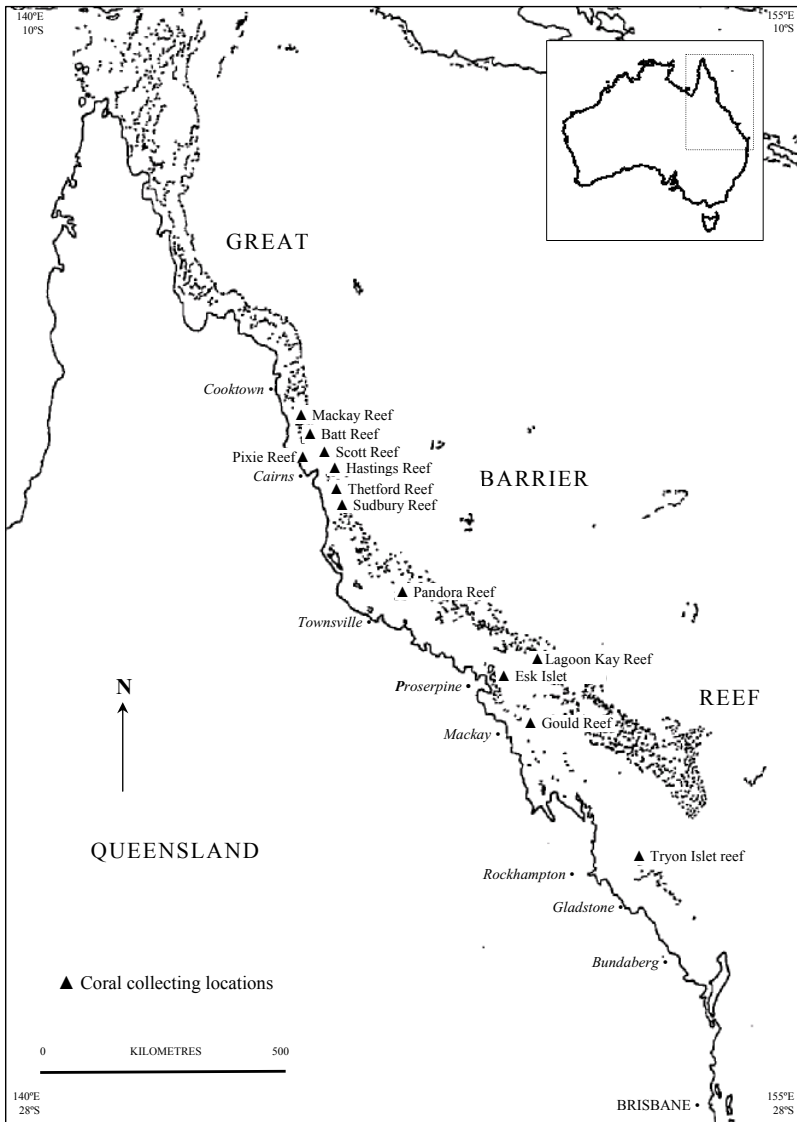


FIGURE 6. Coral collecting areas in the Great Barrier Reef, 1962–1969.

Source: Compiled from archival files found in Folder 1964, PRV14712/1 Item 788 Box 190, QSA.

## 'LOVED TO DEATH'

TABLE 1. Summary of coral collecting leases in the Great Barrier Reef, 1962–1969.

Coral collecting location	Period	Operator(s)
<i>Coral Area No. 2 Cairns</i> (Scott Reef)	1962–1969	Peggy Corbett; R. W. H. Philpot and M. E. Philpot
<i>Coral Area No. 3 Cairns</i> (Sudbury Reef)	1962–1969	J. and M. Hoeg-Staun (Cairns Coral Curios)
<i>Coral Area No. 4 Cairns</i> (Hastings Reef)	1962–1966	George Leonard Alexander Snow
<i>Coral Area No. 5 Cairns</i> (below low water mark, western side of Scott Reef)	1967	Vincent Vlasoff
<i>Coral Area No. 6 Cairns</i> (below low water mark, south-western side of Hastings Reef)	1963–1969	Arthur Hugh Read
<i>Coral Area No. 7 Cairns</i> (below low water mark, western side of Hastings Reef)	1964–1969	Denis Charles Wrightson
<i>Coral Area No. 9 Cairns</i> (below low water mark, north-western face of Pixie Reef)	1964–1969	Gordon Oke
<i>Coral Area No. 10 Cairns</i> (below low water mark, Mackay Reef, 11 miles east of Cape Tribulation)	1964–1969	Ronald McKaige
<i>Coral Area No. 11 Cairns</i> (below low water mark, northern face of Thetford Reef)	1964–1969	Roland John Edwards
<i>Coral Area No. 14 Cairns</i> (below low water mark, south-western side, Batt Reef)	1969	E. I. Cleland and J. R. Henson
<i>Coral Area No. 1 Townsville</i> (below low water mark, southern side of Pandora Reef)	1966–1969	Douglas Tarca
<i>Coral Area No. 15 Mackay</i> (below low water mark, western side of Esk Islet)	1963–1969	B. E. Keong and P. R. Jansen (Mandalay Coral Gardens)
<i>Coral Area No. 17 Mackay</i> (below low water mark, 20 chains on that part of Gould Reef at approximately 148°48'E 19°27'S)	1966–1968	Cyril James Looke
<i>Coral Area No. 18 Mackay</i> (below low water mark, near Esk Islet)	1966–1969	Herbert Charles Liddell
<i>Coral Area No. 19 Mackay</i> (Lagoon Kay Reef, approximately 40 miles from Hayman Island, normally submerged)	1967–1969	William Wallace
<i>Coral Area No. 20 Mackay</i> (northern extremity of Gould Reef)	1969	Lillian Cowern
<i>Coral Area No. 1 Gladstone</i> (below low water mark, north-western corner of Tryon Islet reef)	1968	Harold Frederick Manning
<i>Coral Area No. 8 Gladstone</i> (eastern portion of a reef surrounding Tryon Islet)	1963–1969	Joyce Burnett and Sirian Hamilton Harlow

Source: Compiled from archival files found in Folder 1964, PRV14712/1 Item 788 Box 190, QSA.

also removed enormous quantities of corals from individual reefs; examples of abundant coral harvests are shown in Figures 7 and 8, which illustrate the collecting business of the pioneering aviator, Tom McDonald, who also operated



FIGURE 7. Frank Kelly, Inky Nicholls, Harry Bird and Tom McDonald gathering coral at Double Island reef, c. 1930.

Source: Image No. P09768, Image Library, Cairns Historical Society.



FIGURE 8. Jack Clarke aboard the *Suva* gathering coral for Tom McDonald, c.1930.  
 Source: Image No. P09769, Image Library, Cairns Historical Society.

a jewellery business using coral specimens. McDonald and his co-workers collected coral from reefs in the Cairns area, including Double Island reef. Yet no documentary evidence of their business was found in the archival materials that were searched at QSA; their coral collecting pre-dated the coral licence system and indicates that extensive commercial removal of material had already taken place by the time that coral leases were first issued.

Hence, during most of the period of European settlement in Queensland, widespread coral collecting occurred. An indication of the scale of the industry is provided in the Annual Reports of the QDHM, in which the numbers of coral and shell-grit licences issued in Queensland for the period 1931-1968 were reported; by the end of that period, more than 1,000 coral and shell-grit licences had been issued.<sup>64</sup> These data suggest that, by 1962, a significant industry had been established – and probably operated along similar lines – until the formation of the first Marine Parks in 1974. As Lawrence et al. stated:

coral collecting remained a popular pastime for tourists. The limited restrictions on collecting under Queensland Fisheries legislation that remained in force well into the 1970s were an indication that coral souveniring continued to be a popular activity. The Queensland Government declared marine park status over two



heavily used reef sites, the Heron-Wistari Reef and Green Island Reef in 1974, under the Queensland *Forestry Act 1959*.<sup>65</sup>

Overall, from the earliest regulation of coral collecting in 1933 until the 1980s, coral collection in the Great Barrier Reef increased, as Harriott has shown. Since the formation of the GBRMP, the coral fishery has been regulated and collectors now remove around 50 tonnes of material per year from 50 authorised coral areas. The nature of commercial coral collecting has also altered, as Oliver has acknowledged, from a focus on the souvenir trade – in which one species, *Pocillopora damicornis* (also called ‘brown-stem’), dominated the harvest – to supplying the live aquarium industry with high-value species, including soft corals, anemones and other Cnidarians.<sup>66</sup>

## IMPLICATIONS FOR CONTEMPORARY MANAGEMENT

Analysis of the evidence presented above suggests several implications for the contemporary management of the GBRWHA. Since the GBRWHA represents a marine ecosystem of global significance, the management responsibilities that apply to this area have necessitated the development of a distinctive policy framework, as Bowen and Bowen, and Lawrence et al., have acknowledged.<sup>67</sup> Yet the management of the GBRWHA has been hindered by the relatively short period over which systematic scientific research and monitoring has taken place, and the activities of coral collectors in the Great Barrier Reef have not yet received extensive scientific investigation. Hence, we argue that further scientific research and monitoring of the GBRWHA – linked with agreed performance indicators – is necessary for the effective management of the ecosystem. Nevertheless – and in spite of scientific uncertainty about the precise scale and significance of coral collecting – the qualitative evidence presented here indicates that many coral reefs were probably far from pristine at the time of the formation of the GBRMP in 1975, and that some reefs have been significantly degraded. Consequently, some nearshore reefs – especially in the Cairns area – require considerable protection from remaining human impacts if the World Heritage values of the region are to be conserved.

Coral collecting has resulted in cumulative impacts which were reported to have been severe at the major tourist resorts of the Great Barrier Reef, including those resorts at Heron, Green, Lady Musgrave and Lizard Islands. Those impacts were sustained over more than fifty years and were concentrated in the most accessible parts of the most frequently visited reefs. The damage caused by coral souveniring at tourist resorts extended beyond the period when coral specimens could be legally removed, as numerous documentary and oral history sources testify. In addition to the souveniring of coral by many visitors, the coral collecting industry – regulated by the Queensland Government – was responsible for the removal of large amounts of the most attractive coral from at least twelve

coral reefs. As a result, coral collecting contributed to the decline of many coral reefs: particularly nearshore and fringing reefs, and reefs in the Cairns area. Furthermore, the damage caused by coral collectors can be correlated with the most accessible parts of specific coral reefs, and with particular decades, with the result that those reefs could theoretically be used as sites for the scientific monitoring of the impacts of coral collecting. However, it would be difficult to distinguish the impacts of coral collecting from other confounding impacts on those reefs without appropriate control sites.

In the context of recent concerns about the deterioration of coral reefs world-wide, Pandolfi et al. have argued that the contemporary management of the Great Barrier Reef should be concerned with 'restoring the reefs that are clearly far from pristine'; those reefs require to be 'promptly and massively protected from human exploitation' if they are to survive. Similarly, Hughes et al. argued that archaeological and historical information about the profound transformations of marine ecosystems resulting from human activities should inform their contemporary environmental management.<sup>68</sup> Such comments are applicable to the coral collecting locations in the Great Barrier Reef especially since, as Hughes et al. stated, ecologists increasingly focus on the 'cumulative and interactive effects of sequences of events, rather than concentrating solely on the most recent insult that leads to ecosystem collapse'. Given the comparatively recent deterioration of the Great Barrier Reef, coral collecting represents one of many pressures that may have caused some reefs to experience such a phase shift beyond which recovery to their former state may be extremely unlikely. The ongoing need for such protection was recognised in July 2004 when 33 per cent of the area of the GBRMP was closed to all extractive industries and many reefs were designated to receive additional protection from coral collectors.<sup>69</sup>

## CONCLUSION

We have presented evidence of considerable coral collecting activity in the Great Barrier Reef spanning two centuries, from 1770 to 1970, and have shown that the exploitation of coral reefs by collectors had become a critical issue for some coral reef observers by 1933, when the first restrictions on the removal of coral from foreshores in Queensland were introduced. With the acceleration and intensification of tourist development in the Great Barrier Reef in the succeeding decades, the extent and intensity of coral collecting increased. Our research indicates that the exploitation of the Great Barrier Reef took place earlier, for a longer period, in more locations and more intensively than has previously been documented. Consequently, the GBRMPA inherited management responsibility for an ecosystem that was far from pristine in 1975.

Our results indicate the need for further scientific research and monitoring of the coral reefs of the GBRWHA in order to quantify the precise impacts of

coral removal. However, we suggest that scientific research and monitoring should be linked with agreed performance indicators in order to maximise the likelihood of achieving adequate conservation of the GBRWHA. Our research has identified some potential baselines, since the locations and dates of various coral collecting impacts have been reconstructed with relative precision; hence particular sites could be used as test sites for scientific monitoring of the recovery of coral reefs from exploitation, if suitable control sites can be identified. Thus these sites may function as valuable indicators of coral reef resilience or vulnerability.

Since 1981, very rapid expansion of the Great Barrier Reef tourism industry occurred, with the development of tourist resorts at Lizard, Green, Dunk, Magnetic and several of the Whitsunday Islands. Coastal tourist facilities, such as the developments at Port Douglas and Port Hinchinbrook, have also expanded since that date; the growth of those facilities coincides with increases in international tourism and domestic migration to Queensland. Given that the GBRWHA has been nominated for protection as a result of its 'superlative natural phenomena', the condition of its coral reefs is of critical importance. Our account of the extent of historical coral collecting in the Great Barrier Reef suggests the importance of 'assessing and actively managing resilience' and maintaining effective marine no-take areas (NTAs) in the GBRWHA from which the removal of coral is entirely prohibited. In common with the work of Bellwood et al., our findings suggest the need for a range of 'more vigorous, innovative and adaptive management strategies' for the Great Barrier Reef in order to ensure the conservation of its coral reef landscapes and biodiversity.<sup>70</sup>

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<sup>20</sup> OHC 13, 4 August 2003, 6.

<sup>21</sup> OHC 31, 4 October 2003, 1, 3 and 5–6; Ben Daley and Peter Griggs, 'Mining the Reefs and Cays: Coral, Guano and Rock Phosphate Mining in the Great Barrier Reef, Australia, 1844–1940', *Environment and History* 12 (4) (2006): 395–433, doi: 10.3197/096734006779093686.

<sup>22</sup> J. C. Beaglehole (ed.) *The Voyage of the Endeavour, 1768–1771* (Cambridge: Cambridge University Press, 1955): cxxxvi.

<sup>23</sup> Joseph Beete Jukes, *Letters and Extracts from the Addresses and Occasional Writings of J. Beete Jukes*, ed. C. A. Browne (London: Chapman and Hall, 1871): 230.

<sup>24</sup> Bowen and Bowen, *Great Barrier Reef*, *passim*.

<sup>25</sup> Bowen and Bowen, *Great Barrier Reef*, *passim*; OHC 4, 14 January 2003, 2.

<sup>26</sup> Bowen and Bowen, *Great Barrier Reef*, provide details of various scientific expeditions to the Great Barrier Reef; they acknowledge that progress in studying the biology of the ecosystem was hindered by the lack of a marine research station prior to 1952. Those authors stated that, by 1958, coral reef research remained small-scale and under-resourced, and that the Low Isles Expedition of 1928–1929 remained the most significant research study in the Great Barrier Reef; see Bowen and Bowen, *Great Barrier Reef*: 317.

<sup>27</sup> *SCQ* 1879, 174.

<sup>28</sup> William Saville-Kent, 'Bêche-de-Mer and Pearl-Shell Fisheries of Northern Queensland', *QPP* 3 (1890): 727–34, 734.

<sup>29</sup> Cairns Harbour Board, *Annual Report*, Fourth Revised Pamphlet on The Port of Cairns, North Queensland, Australia (Cairns Post Pty Ltd: Cairns, 1929), PRV8340/1 Item 1, QSA: 46.

<sup>30</sup> Charles Barrett, 'The Great Barrier Reef and its Isles: The Wonder and Mystery of Australia's World-Famous Geographical Feature', *National Geographic Magazine* 58 (1930): 355–82, 375.

<sup>31</sup> Hilda V. Marks, *A Christmas Holiday on the Great Barrier Reef, 1932–1933* (Sydney: Harris and Sons, 1933): 14–15.

<sup>32</sup> Marks, *A Christmas Holiday on the Great Barrier Reef*: 9–10.

<sup>33</sup> Anonymous, Out-letter Ref. 32/3263, Secretary, Provisional Administration Board, QDHM, Brisbane to Under-Secretary, Treasury, Brisbane, 10 May 1933, PRV8340/1 Item 1, QSA.

<sup>34</sup> H. G. Lamond, In-letter Ref. 06598, H. G. Lamond, Molle Islands to Under-Secretary, QDAS, Brisbane, 15 March 1933, PRV8340/1 Item 1, QSA; H. G. Lamond, In-letter Ref. 4488, H. G. Lamond, Molle Islands to Queensland Department of Harbours and Fisheries, Brisbane, 10 August 1933, PRV8340/1 Item 1, QSA; *Order in Council*, 1 June 1933.

<sup>35</sup> *Order in Council*, 27 September 1937, *Order in Council*, 20 July 1939.

<sup>36</sup> A. F. Ellis, *Adventuring in Coral Seas* (Sydney: Angus and Robertson, 1936): 83.

- <sup>37</sup> F. Ratcliffe, *Flying Fox and Drifting Sand: The Adventures of a Biologist in Australia* (London: Chatto and Windus, 1939): 139; H. C. Richards, 'Some Problems of the Great Barrier Reef', *Journal and Proceedings of the Royal Society of New South Wales* 71 (1937): 67–85, 73.
- <sup>38</sup> Bowen and Bowen, *Great Barrier Reef*, 237.
- <sup>39</sup> Richards' proposals were outlined in a paper of 1922, published in the *Queensland Geographical Journal*, including the need for a comprehensive geological survey and charting of the whole Great Barrier Reef; see Richards, 'Some problems of the Great Barrier Reef'.
- <sup>40</sup> H. C. Richards to Governor Sir Matthew Nathan, cited in Bowen and Bowen, *Great Barrier Reef*, 234–5.
- <sup>41</sup> Bowen and Bowen, *Great Barrier Reef*, 234.
- <sup>42</sup> S226 Box 3, University of Queensland Archives, cited in Bowen and Bowen, *Great Barrier Reef*, 239.
- <sup>43</sup> J. M. Powell, *An Historical Geography of Modern Australia: The Restive Fringe* (Cambridge: Cambridge University Press, 1988), 165–6.
- <sup>44</sup> Bowen and Bowen, *Great Barrier Reef*, 290.
- <sup>45</sup> Bowen and Bowen, *Great Barrier Reef*, 287–8.
- <sup>46</sup> E. S. Napier, *On the Barrier Reef: notes from a no-ologist's pocket-book* (Sydney: Angus and Robertson, 1928); T. C. Roughley, *The Wonders of the Great Barrier Reef* (Sydney: Angus and Robertson, 1936).
- <sup>47</sup> Bowen and Bowen, *Great Barrier Reef*, 290–1.
- <sup>48</sup> Bowen and Bowen, *Great Barrier Reef*, 294–5; Lawrence et al., *Great Barrier Reef*, 25–8.
- <sup>49</sup> E. O. Marks, In-letter Ref. 38/14394, E. O. Marks, Honorary Secretary, GBRC, Brisbane to Hon. F. A. Cooper, Treasurer, Brisbane, 12 December 1938, PRV8340/1 Item 1, QSA.
- <sup>50</sup> Mr A. W. Bauer, cited in Anonymous, In-letter Ref. 39/6316, Director, QGTB, Brisbane to Secretary, QDHM, 1 June 1939, PRV8340/1 Item 1, QSA; *Order in Council*, 20 July 1939.
- <sup>51</sup> Anonymous, In-letter Ref. L40.2373.11, Secretary, Office of the Commissioner for Railways, Brisbane to Secretary, QDHM, Brisbane, 22 May 1940, PRV8340/1 Item 1, QSA.
- <sup>52</sup> Anonymous, In-letter Ref. L40.2373.11.
- <sup>53</sup> G. Gentry, In-letter Ref. 225/45, Geo Gentry to Secretary, Sub-Department of Forestry, Brisbane, 11 October 1940, PRV8340/1 Item 1, QSA; E. McKeown, In-letter Ref. 225/45, E. McKeown, NP Ranger, Tully to Secretary, Sub-Department of Forestry, Brisbane, 20 September 1940, PRV8340/1 Item 1, QSA; Anonymous, Out-letter Ref. 4868, Secretary, QDHM, Brisbane to Secretary, Sub-Department of Forestry, Brisbane, 29 October 1940, PRV8340/1 Item 1, QSA; J. D. W. Dick, Extract 40/13764, G.D.Q. 225/45, J. D. W. Dick, CIF, QDHM, Brisbane to Secretary, Forestry Sub-Department, Brisbane, 4 December 1940, SRS5416/1 Box 10 Item 59, NP219 Bunker, QSA; J. D. W. Dick, Extract 40/13764, G.D.Q., 225/45, J. D. W. Dick, CIF, QDHM, Brisbane to Secretary, Forestry Sub-Department, Brisbane, 4 December 1940, SRS5416/1 Box 10 Item 58, NP220 Bunker, QSA.

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- <sup>55</sup> Anonymous, In-letter, Honorary Secretary, NQNC, Cairns to Mr Jones, Hon. Min. for Lands, Brisbane, 17 July 1944, SRS5416/1 Box 66 Item 447, NP836 Trinity 'R' – Green Island – Protection of marine life, QSA; J. D. W. Dick, Out-letter, J. D. W. Dick, CIF, Brisbane to Secretary, Queensland Forestry Sub-Department, Brisbane, 23 February 1945 SRS5416/1 Box 65 Item 443, NP836 Trinity 'J' – Green Island, QSA; Noel Monkman, 'Copy of Letter Attached', 25 January 1945, SRS5416/1 Box 65 Item 443, NP836 Trinity 'J' – Green Island, QSA.
- <sup>56</sup> G. Gentry, Letter written by G. Gentry, NP Ranger, addressee not stated, 10 May 1944, SRS5416/1 Box 10 Item 61, NP231, Bunker – Heron Island, QSA; A. C. C. Lock, *Destination Barrier Reef* (Melbourne: Georgian House, 1955).
- <sup>57</sup> V. Serventy, *Australia's Great Barrier Reef: A Handbook on the Corals, Shells, Crabs, Larger Animals and Birds, With Some Remarks on the Reef's Place in History* (Melbourne: Georgian House, 1955): 77.
- <sup>58</sup> C. J. Trist, In-letter, C. J. Trist to NP Ranger McKeown, Tully, 17 January 1952, R836 Trinity 'P', QSA.
- <sup>59</sup> Noel Monkman, In-letter Ref. 2A/D0, 152/4335, Noel Monkman, Honorary Ranger, Honorary Fisheries Inspector, Heron Island to W. Wilken, Secretary, Brisbane, 3 January 1955, SRS5416/1 Box 66 Item 446, NP836 Trinity 'P' – Green Island – Underwater observation chamber, QSA: 1–2, 1.
- <sup>60</sup> Monkman, In-letter Ref. 2A/D0, 152/4335, 1.
- <sup>61</sup> Anonymous, QS189/1 Box 17 Item 73, Queensland Industry, Services, Views, People and Events; Photographic Proofs and Negatives; Islands – Barrier Reef, QSA; A. J. Peel, Annual Report, QDHM, *QPP*, Vol. 2, 1966, pp. 841–57, 852.
- <sup>62</sup> Anonymous, In-letter, Harbour Master, QDHM, Townsville to Secretary, QDHM, Brisbane, 3 July 1964, Folder 1964, PRV14712/1 Item 788 Box 190, QSA; A. F. Paterson, In-letter, A. F. Paterson, Southport to QDHM, 1 June 1964, Folder 1964, PRV14712/1 Box 190 Item 788, Subject batches – Oyster, coral and shell grit, QSA.
- <sup>63</sup> OHC 31, 4 October 2003, 1.
- <sup>64</sup> Details of the numbers of coral and shell-grit licences issued in Queensland between 1931 and 1968 are given in Daley and Griggs, 'Mining the Reefs and Cays', 420.
- <sup>65</sup> Lawrence et al., *Great Barrier Reef*, 27.
- <sup>66</sup> Harriott, *Sustainability of Queensland's Coral Harvest Fishery*, 11; J. Oliver, *An Evaluation of the Biological and Economic Aspects of Commercial Coral Collecting in the Great Barrier Reef Region*, Report to the GBRMPA (Townsville: GBRMPA, 1985).
- <sup>67</sup> Bowen and Bowen, *Great Barrier Reef*; Lawrence et al., *Great Barrier Reef*.
- <sup>68</sup> Hughes et al., 'New Paradigms for Supporting the Resilience of Marine Ecosystems', 2; Pandolfi et al., 'Global Trajectories of the Long-Term Decline of Coral Reef Ecosystems', 957.
- <sup>69</sup> GBRMPA (Great Barrier Reef Marine Park Authority), *Great Barrier Reef Marine Park Zoning Plan 2003* (Townsville: GBRMPA, 2004).
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