Contributors

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**Dr. Carl Cater** is a Lecturer in Tourism at Griffith University, Queensland, Australia. His research centres on the experiential turn in tourism and the subsequent growth of special-interest sectors. He is a fellow of the Royal Geographical Society, a qualified pilot, diver, mountain and tropical forest leader, and maintains an interest in both the practice and pursuit of sustainable outdoor tourism activity. He is co-author (with Dr. Erlet Cater) of *Marine Ecotourism: Between the Devil and the Deep Blue Sea* (CABI, 2007).

**Christopher Coxon** is currently employed as the Principal Advisor (Diving) for Workplace Health and Safety Queensland. In this role, he combines regulatory functions, including incident investigation and prosecution, with proactive advisory and educational work. He has been the leading player in the development and implementation of the regulatory regime for diving work in Queensland. His background in diving commenced with his undergraduate dissertation whilst at Cambridge University and has continued mainly in the recreational dive industry in the Caribbean, Mediterranean and on the Great Barrier Reef. The opinions expressed by this author do not necessarily represent those of the Department of Employment and Industrial Relations or the state of Queensland.

**Susanna Curtin** is a Senior Lecturer in Tourism Management at Bournemouth University. She has published a number of articles on marine ecotourism particularly regarding the tourist experience and the management of swimming with marine mammals. Her PhD is on the psychological and experiential benefits of nature-based/wildlife tourism.

**Kay Dimmock** is completing PhD studies at Southern Cross University, Lismore, Australia. In-water comfort with scuba divers is the central theme of that research. Her research interests include tourism and hospitality education and dive tourism. She has published in areas
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**Dr. Michael Eisinger** is a marine ecologist with focus on coral reef ecology reef rehabilitation. He was born in 1969 in Ludwigshafen am Rhein, Germany, and studied biology at the University of Heidelberg and marine biology at the Northeastern University, Boston, USA. In 2005, he completed his PhD on ecological and economical aspects of coral reef rehabilitation. Since 1996 he is research assistant at the University of Duisburg-Essen in Germany and participated in numerous projects in the Mediterranean, the Red Sea and the Gulf of Aden, including consultancies for UNDP and the Global Environmental Facility (GEF).

**Dr. Brian Garrod** is Senior Lecturer and Head of Tourism at the Institute of Rural Sciences of the University of Wales Aberystwyth. His research interests span all aspects of tourism and recreation, but focus particularly on sustainable tourism, ecotourism and heritage tourism. He is Book Review Editor of the Journal of Heritage Tourism, Associate Editor of the Journal of Ecotourism, and an editorial board member of Tourism in Marine Environments and the International Journal of Sustainable Development. He has published three books, and written over thirty journal papers and book chapters.

**Dr. Stefan Gössling** is an Associated Professor working at the Department of Service Management, Lund University, and research coordinator at the Centre for Sustainable- and Geotourism, Western Norway Research Institute. He has worked extensively in the various islands of the Western Indian Ocean, focusing on eco- and sustainable tourism development. His recent edited books include *Tourism and Development in Tropical Islands: Political Ecology Perspectives* (Edward Elgar, 2003) and *Tourism and Global Environmental Change* (Routledge, 2005, with Michael C. Hall).

**Jeanette Liljenberg, Jayne Helmersson and Serwa Qwarm** are former students of the Service Management programme, Lund University. In 2004, they participated in a project ‘Students do Research’ in Mauritius, an initiative to collect data in tropical destinations, with the ultimate goal to improve the working knowledge of quantitative methods.

**Dr. Olof Lindén** is professor of coastal environmental management at the World Maritime University in Malmö, Sweden, and holds an adjunct professorship at the University of Kalmar in Sweden. His research focuses on climate change and its impacts on coastal ecosystems. He is the project leader for the Indian Ocean-wide CORDIO project to assess the impacts of global change on coral reefs of the region. He has also carried out research on issues related to the impacts of maritime activities on coastal and marine ecosystems. His latest book is *Places of Refuge for Ships: Emerging Environmental Concerns of a Maritime Custom* (2006) (Publications in Ocean Development, Vol. 51). Leiden, The Netherlands; Boston, MA: Martinus Nijhoff (co-authored/edited with Dr. Aldo Chircop).

**Anna Lindgren, Jessica Palmlund and Ida Wate** recently completed the Masters programme in Service Management at Lund University, focusing on management issues in the
dive industry. They now hold various positions in the service industry, but still have an interest in marine environments, sustainable tourism, and corporate social responsibility.

**Dr. Callum Roberts** is Professor of Marine Conservation at the University of York in England. His research focuses on threats to marine ecosystems and species, and on finding the means to protect them. His work includes studies of the profound historical and recent alteration of marine ecosystems by fishing, on the extinction risk of marine species and on global conservation priorities for coral reefs. His best-known work is on the performance and design of marine reserves, areas that are protected from all fishing. His latest book, *The Unnatural History of the Sea*, charts the effects of 1000 years of exploitation on ocean life. Callum is a Pew Fellow in Marine Conservation.

**Claudia Townsend**’s interest in the sustainable marine tourism developed while working as a scuba instructor in the British Virgin Islands. Her personal and professional interest in the marine environment has continued over the past 6 years through her work on sustainable tourism in the UK, Caribbean and Africa.

**Dr. Peter van Treeck** was born in 1963 and from 1991 worked as research assistant and responsible coordinator for marine projects of the department of Hydrobiology at the University of Essen (Germany). His research has focused on reef restoration and rehabilitation technologies applying electrochemical accretion technologies and coral transplantation. In 2005, he completed his PhD on colonisation patterns of artificial reef substrates in the Red Sea near Aqaba (Jordan). In various projects he worked on integrated concepts of reef protection and innovative approaches for reef protection and sustainable tourism mainly in the Red Sea area. Additional work was as marine ecological consultant in the Emirates, Egypt and Iran and as project leader for a multinational EU project on natural marine resources and aquaculture in the Mediterranean (NOMATEC) completed his scientific features. Since 2005, he has been a high school teacher and ecological consultant.

**Dr. Jeff Wilks** is Director of Strategic Development with Surf Life Saving Australia and a Director of JTA Tourism, a company providing health and safety advisory services to the tourism industry. A qualified psychologist and lawyer, Jeff acts as a consultant to the United Nations World Tourism Organization and holds the position of Visiting Professor of Law at Northumbria University, UK.
Colourful fishes in coral reef environments, clear blue waters, white sands: a growing number of tourism destinations have made such images central to their advertising strategies. Accordingly, diving tourism has become an important market segment for destination countries to target and exploit. Marine environments are also the focus of countless documentaries and many movies, which has created and sustained an interest in dive experiences that is now being expressed in more and more countries. In its 2020 tourism forecast, the World Tourism Organization (WTO, 2001, p. 38) stated that “scuba diving is one of the fastest growing sectors of the tourism trade” and this claim is validated by the certification statistics of dive organisations. The Professional Association of Diving Instructors (PADI, 2007), for example, estimates that some 600,000 new divers are certified every year, representing a growth rate of about 6%. As their diving careers develop, many of these newly certified divers will want to combine their interest in diving with their holidaymaking.

While it is difficult to be precise about the overall size of the diving tourism market, observers generally agree that it has been subject to significant growth in recent years. PADI (2007) estimate that the total number of active certified divers now exceeds 10 million, while the WTO (2001) argues that one in three of these will take a diving-based holiday in any one year. Moreover, many diving resorts offer people the option of taking their diving certification while they are on holiday. It might be argued on this basis that diving has moved from a niche, special-interest form of tourism towards being a mass tourism activity. Indeed, as the WTO (2001) notes:

Whilst scuba diving is a sport, which is well known and practised worldwide, it is a market segment that is forecast to show strong growth over the next five to ten years. As the world becomes increasingly explored, and fewer destinations are left for tourists to discover, there is a trend to travel to unusual ‘territories’. Travel underwater is therefore gaining appeal in the marketplace (WTO 2001, p. 88).

The WTO goes on to note that ‘underwater sports’, also including submarine excursions, underwater walks and other such activities, are widely believed to hold the potential to grow as large as the ski tourism sector (WTO, 2001). According to the WTO, there were
approximately 25 million downhill skiers worldwide in 2001, with a further 10 million snowboarders, cross-country skiers and participants in fringe winter sports such as sledging and snow-biking. This suggests that the diving tourism market is expected to expand very quickly in the specified time frame.

Given the significance of diving in terms of absolute diver numbers, and projections for further growth, it is perhaps surprising that the subject of diving tourism seems to be of so little interest to the scientific community. Indeed, reviewing the scant scientific literature on diving tourism reveals just a modest number of studies that have appeared in journals, with the occasional chapter on diving being included in an edited book. Most of the scientific material on diving tourism is therefore to be found in a range of reports, which are diverse in terms of their focus, precision, depth and public availability. Furthermore, the current literature seems to focus largely on environmental impacts, with only a very limited reference being made to management issues. In view of these observations, the authors decided that an edited volume on diving tourism, integrating aspects such as the sustainability, safety, education, experiences and management of diving tourism would be in order.

Many people have supported this book, although we regret to report that none of the large dive organisations such as PADI, CMAS or NAUI was willing to cooperate with us in carrying out a survey that would have substantially improved our understanding of divers and the diving tourism market. We are thus particularly thankful to all those who have directly or indirectly support this book with comments, ideas, material or practical help. More specifically, the editors would like to thank Stephen Page for including this volume in his series, staff at Elsevier, in particular Joanna Scott and Helen Collins. We would also like to thank Tobias Klose (Dive Island) for providing us with information on diving at Thingvellir in Iceland and Malmö Dyktjänst for participating in a small survey on cold water diving. Carol Scarpaci, Carl Cater, Roger Horrocks, and André Maslennikov for providing many of the photographs included in this book. Stefan would also like to thank Robert Bockermann, Meike and Linnea Rinsche, Mathias Gößling for discussions and support, Johan Hultman, Szilvia Gyimothy, Erika Andersson-Cederholm, Mikael Bergmaston, Christer Eldh, Ola Thufvesson and Richard Ek for the fun-working environment on Level 4, Service Management — här är roligare än på tredje våningen. Brian would like to thank Alison, Lydia, Drew and Nick Garrod for their love and support.

Clearly, this book would not have been possible without the chapter contributors who have so graciously given their time and energies to writing up their chapters and responding to our editorial comments, and have been so forbearing to our various requests for additional information and material. We extend our warmest thanks to them. Meanwhile, we gladly accept any remaining errors or omissions as our own responsibility.

Finally, we would like to thank you for picking up this book. We hope that it meets your needs and expectations. Your feedback would be most welcome.

Brian Garrod and Stefan Gössling
Editors
References


Chapter 1

Introduction

Brian Garrod and Stefan Gössling

Diving has been a recreational activity for at least 75 years. Sport divers in the Mediterranean, for example, hunted fish by holding their breath as long ago as in the 1930s (Cherry, 1976, quoted in Dimmock, 2007). Basic forms of diving, such as free diving (or ‘breath-hold’ diving) and snorkelling, require a minimum of equipment, usually including only a mask, snorkel, fins, and some weight. The difference between free diving and snorkelling is that snorkellers remain primarily on the surface of the water, while free divers descend, holding their breath for one or two minutes. In contrast, scuba diving involves portable air supplies to remain underwater for longer periods of time and attain greater depths. Technically speaking, ‘scuba’ is an acronym (SCUBA), standing for ‘self-contained underwater breathing apparatus’, although the term is now so well known that it has been received into many languages as a simple noun (hence ‘scuba diving’, ‘scuba equipment’, and so on). The earliest prototype scuba-diving equipment, known as the aqua-lung, was developed by Jacques-Yves Cousteau and Emile Gagnan in the early 1940s. This apparatus, consisting of a diving cylinder containing high-pressure air and a regulator supplying the diver with it at ambient (i.e. reduced) pressure, is still the most commonly used in recreational scuba diving.

There are also a number of new technologies which enable underwater swimming, including rebreathers, which are technically different to scuba equipment in that they enable the user to rebreathe their exhaled air, either in a closed or semi-closed system, rather than for the air they exhale simply to be released into the surrounding water as bubbles (Orams, 1999). There is also ‘snuba’, a cross between scuba and snorkelling where the participant breathes air from tanks that are attached to a raft on the surface of the water, rather than being strapped to the participant’s back. This form of diving is particularly attractive in that it enables the diver to stay underwater for a longer period of time and to descend deeper than a free diver or snorkeller would be able to, yet does not require the formal certification that a scuba diver would normally require (Garrod & Wilson, 2003). Other new technologies include the DPV (diver propulsion vehicle), or ‘scooter’, and the...
‘sled’, which is pulled along the surface of the water by a boat. Divers hang on to such devices, enabling them to travel faster and thus further underwater.

Many divers dive simply for the fun of it, to enjoy the freedom of being underwater, to view the splendour of the underwater environment, to socialise with other participants and to tell their tales afterwards. This type of diver can conveniently be termed ‘recreational divers’ (Photo 1.1). However, there are also a number of distinct diving specialisms. These include various forms of technical diving (diving in challenging environments such as cave diving, wall diving, wreck diving, altitude diving, ice diving, night diving and drift diving); underwater photography and videography; diving with marine mammals such as whales, dolphins, seals and sea lions; undertaking underwater biological, geological or archaeological surveys; underwater rescue and many others. Some writers consider technical diving to represent a subset of recreational diving, while others separate the two because of the greater demands in terms of the knowledge, skills, equipment and physical exertion required of technical divers. Any of these diving specialisms may involve one or more of the diving formats noted above. Thus, for example, while swimming with marine mammals is something that is often restricted by law to free divers and snorkellers, in some countries scuba divers are also permitted to swim with marine mammals.

**Defining Diving Tourism**

Defining diving tourism is not entirely a straightforward task. The World Tourism Organization (WTO) defines scuba-diving tourism as comprising “persons travelling to destinations with the main purpose of their trip being to partake in scuba diving. The attraction
of the destination is almost exclusively related to its dive quality rather than any other factor, such as the quality of accommodation or land-based attractions” (WTO, 2001, p. 85). However, it might well be argued that this definition raises more issues than it clarifies. Theobald (2005) argues that definitions of tourism usually seek to serve one or both of two rather different purposes. The first is to serve as a conceptual definition, the function of this being to distinguish clearly between those individuals who may be described as tourists and those who may not. This is to enable meaningful theories to be developed and tested regarding such issues as tourists’ motivations, preferences and chosen activities. The second type of tourism definition is a technical definition, the purpose of these being to distinguish efficiently between tourists and non-tourist so that data on tourists may be collected for statistical, legislative purposes. In the case of diving tourism, the task of either type of definition is rather more complex, since such definitions must distinguish between four groups of individuals: diving tourists, divers who are not tourists, tourists who are not divers, and those who are neither tourists nor divers. The principle is nevertheless the same: to be practically useful, any definition of diving tourism will need to be able to distinguish effectively between those individuals who can be said to count as diving tourists and those who cannot.

There are, moreover, a number of complications in defining diving tourism, and considering these can shed some light on the adequacy of the WTO definition given above. Firstly, the degree to which going diving forms part of an individual’s travel motivation tends to vary considerably, with on one end of the scale the dedicated diving tourist who will make their choice of holiday timing and destination based very largely on the quality of the diving to be found at that time of the year in that particular diving location. On the other end of the scale will be the occasional diver, for whom the timing of their holiday and choice of tourism destination will have little to do with the availability of opportunities to dive, let alone the quality of diving to be found at the destination at that particular time of the year. Furthermore, while the former group of diving tourists may intend to dive every day (perhaps even twice daily), those in the latter group may intend to dive only when diving conditions are particularly favourable or when they have no other leisure activities planned for the day. This latter group has been termed ‘sideliner divers’ by the WTO (2001) and ‘resort divers’ by Davis and Tisdell (1995). However, it is clear from the WTO definition given above that such individuals would not strictly be considered to be diving tourists, since scuba diving is not their prime motivation for taking the holiday.

Secondly, diving is clearly not an activity that is undertaken exclusively by tourists. Certainly it is true that modern international tourism and the recreational sport of scuba diving both have their origins in the period immediately following the Second World War. It is also true that both activities witnessed a considerable and unabated growth in popularity over the second half of the twentieth century. Indisputably, the growth of international tourism has played an important role in increasing the popularity of diving, enabling enthusiasts to partake in their sport in a wider range of locations and times of the year than would be possible if they were restricted to diving in their home locality. Indeed, many divers reside in the northern hemisphere developed countries, over one-third being European (WTO, 2001). Many are also from the United States. Meanwhile the majority of ‘world-class’ diving locations are in the tropical regions, particularly where coral reefs are to be found. International travel is hence very much a part of the way in which divers tend to access their recreational opportunities. Yet, as the WTO (2001) acknowledges, only one
in three scuba divers regularly take an overseas diving holiday. The remainder dive either close to home, on the basis of a day trip, or else travel further within their own country to go diving, over a period of more than one day. The latter can confidently be described as diving tourists, since they are travelling away from their place of residence in order to undertake diving activities. The former group should not, however, be overlooked in any analysis of diving as a form of recreational leisure activity. Indeed, the volume and value of such activities worldwide is not well known in either case, owing to a severe paucity of data on diving activities in general, and dive tourism in particular. Information at the national, regional and local levels is at best only patchy. It may therefore be that these activities are substantially more significant than international diving tourism, about which the data are rather better (although still inadequate) and slightly more is known.

Thirdly, and perhaps most importantly, diving tourists are not just interested in scuba diving. As we have seen in the previous section, a number of other important diving formats exist, including free diving (Photo 1.2), snorkelling, snuba and the use of rebreathers. While there are many specialists, who like to participate in just one of these diving formats, there are also a good many generalists. An individual may thus go scuba diving on one day of their holidays and snorkelling on the following day, or scuba dive in the mornings but go free diving in the afternoons. The same may be observed in terms of the diving formats an individual chooses over their diving ‘career’. Thus, for example, an individual diver may get into the sport at a young age through snorkelling, perhaps while they are on a family holiday, and then take up scuba diving once they have the personal finances needed to acquire the necessary certification and buy some diving equipment.

In view of the foregoing discussion, the following conceptual definition of diving tourism is offered:

![Free diver, in the background Zambezi sharks (Carcharhinus leucas) (Photograph: Roger Horrocks).](image-url)
Diving tourism involves individuals travelling from their usual place of residence, spending at least one night away, and actively participating in one or more diving activities, such as scuba diving, snorkelling, snuba or the use of rebreathing apparatus.

Unlike the WTO definition given above, the definition offered here does not require diving to be the main motivation for their trip; nor does it require them to participate specifically in scuba diving. On the other hand, the definition offered here does require travellers to spend at least one night away from home, thus ensuring that they are genuinely tourists rather than ‘day visitors’. It should be noted, however, that this does not imply that they should undertake international travel. Indeed, domestic diving tourism is entirely possible under this definition.

The Development of Diving Tourism

Orams (1999) suggests that scuba diving and snorkelling are by far the most popular diving activities worldwide. Unfortunately, reliable data on either of these activities is scarce, particularly at the global level but also at the national, regional and local levels. As such it is not possible to determine the relative significance of these two diving formats. Snorkelling is rather more accessible as a recreational activity because of the lower demands of equipment and training, which ensures that it has a wider appeal and higher participation rate than scuba diving. On the other hand, snorkelling often generates the interest in marine environments that leads to a dive certification (see Lindgren et al., Chapter 6, this volume). Meanwhile, scuba diving has become an important recreational activity in its own right. PADI, the Professional Association of Diving Instructors, certified more than half a million new divers in 2000, with cumulative dive certifications in 2000 totalling more than 10 million since 1967, the year in which the organisation was founded (PADI, 2007). Figure 1.1 illustrates the growth of diver certification with PADI, which may be taken as indicative of the numerical growth of divers worldwide. PADI, which claims to certify 60% of all divers worldwide, estimates that there are now more than 10 million active divers worldwide (PADI, 2007).

![Figure 1.1: PADI certifications worldwide](Source: PADI, 2007).
A similar estimate for the year 2000, i.e. 7 million, has been presented by the World Tourism Organization (WTO, 2001), along with a forecast of 10 million active divers by 2005. Cater and Cater (2001), meanwhile, quote a higher figure of 14 million active divers (taken from Viders, 1997) which, assuming a rate of growth similar to that predicted by the WTO, would imply that there are at least 28 million active divers in the world today. The WTO (2001) estimate that one in three divers will take an international holiday every year. Accordingly they estimate the international diving tourism market to be worth between US$4–6 billion (€4.7–7.1 billion; all Euro values are in the following provided for the respective year; values before 1999 are calculated as ECU equivalent) in 2000. The WTO report also indicates that divers are becoming more adventurous, with one in four active scuba-diving tourists constantly seeking new dive locations. More and more locations around the world are consequently trying to tap the diving tourism market and establish themselves as international diving destinations. This recent strong growth in the dive market might be explained by an increasing societal interest in marine tourism in general (e.g. Garrod & Wilson, 2003), the search for new, adventurous leisure activities (Swarbrooke, Beard, Leckie, & Pomfret, 2003), and cheaper and more easily accessible tourism destinations offering diving opportunities, particularly in tropical islands such as the Maldives or Seychelles (Photo 1.3).

Historically, the interest in marine environments has also been shaped by television and movies. Jacques-Yves Cousteau deserves to be mentioned here as one of the first marine explorers making underwater environments accessible to a mass audience. His first film was made as early as 1936, and during his life, Cousteau presented over a 100 films, including...
the Oscar-winning documentaries Silent World (1956), The Golden Fish (1959) and The World Without Sun (1965) (Cousteau Society, 2007). Even movies such as the James Bond films Thunderball (1965) and Octopussy (1983), The Big Blue (1989), Disney’s The Little Mermaid (1989), Finding Nemo (2003), and recent documentaries such as Deep Blue (2004) and Sharkwater (2007) have heightened the interest in marine environments and experiences. These films have simultaneously raised interest in warm, tropical destinations. Indeed, movies like Thunderball might have been among the first to deliver images of the ‘tropical paradise’ to a broad audience, presenting coastal zones and marine environments as playgrounds for the wealthy jet set of that time. Other movies, such as Steven Spielberg’s Jaws (1975), are not likely to have shaped perceptions of marine environments favourably, but the movie is nevertheless important, as it has created particular understandings of the open sea as a dangerous place, inhabited and dominated by dangerous creatures. Jaws might have influenced the perception of an entire generation, turning sharks into dangerous, aggressive predators. Such images of the sea are important, as they simultaneously create an understanding of diving as an adventurous activity. Indeed, divers are often portrayed as tough, and diving certainly contains an element of machismo and sexuality. This image can be reinforced by movies, such as the more recent Into the Blue (2005), a narcissist adventure of a group of young divers. However, the image can also be encountered in dive destinations, where tight neoprene suits underline masculinity as well as femaleness, while powerful boat engines (Photo 1.4) and the often military-like arrangement of dive excursions emphasise an element of seriousness and toughness. This might indicate that diving is not just a recreational activity containing elements of play, freedom, spontaneity and fun, as for instance pointed out by Dimmock (2007), but may also be seen as serious leisure. An apparent paradox is that the very same dive experience might contain both elements of fun and seriousness, with an individual, diver-dependent gradient existing between the two extremes.

Photo 1.4: Powerful boats and engines are part of the diving experience (Photograph: Stefan Gössling).
Table 1.1: 100 Top dive sites.

1. Yongala, Australia
2. Thistlegorm, Egyptian Red Sea
3. Blue Corner Wall, Palau, Micronesia
4. Barracuda Point, Sipadan Island
5. Shark and Yolanda Reef, Egyptian Red Sea
6. Manta Ray Night Dive, Kailua Kona, Hawaii
7. Navy Pier, Australia
8. Big Brother, Egyptian Red Sea
9. Great Blue Hole, Belize
10. Liberty, Bali, Indonesia
11. Elphinstone Reef, Egyptian Red Sea
12. Sodwana Bay, South Africa
13. Ras Mohammed, Egyptian Red Sea
14. President Coolidge, Vanuatu
15. Sha’ab Rumi South, Sudan
16. Bloody Bay Wall, Little Cayman
17. Straits of Tiran, Egyptian Red Sea
18. Great White Wall, Tavieuni Fiji
19. Tubbataha, Palawan, Philippines
20. Richelieu Rock, Thailand
21. Grand Central Station, Gizo, Solomon Islands
22. Darwin Island, Galapagos
23. Similans, Thailand
24. Osprey Reef, Coral Sea, Australia
25. Poor Knights, New Zealand
26. Blue Hole, Dahab, Egyptian Red Sea
27. Cod Hole, Northern Great Barrier Reef
28. The Zenobia, Cyprus
29. Darwin Arch, Galapagos
30. Jackson Reef, Egypt
31. Barra Reef, Mozambique
32. Stingray City, Grand Cayman
33. Pedras Secas, Noronha, Brazil
34. Holmes Reef, Coral Sea, Australia
35. Puerto Galera, Philippines
36. Shark Alley, Grand Cayman
37. Half Moon Wall, Belize
38. Protea Banks, South Africa
39. Wolf Island, Galapagos
40. Peleliu Express, Palau
41. Dos Ojos (Los Cenotes), Playa Del Carmen, Mexico
42. The Canyons, Utila, Honduras
43. Canibal Rock, Komodo, Indonesia
44. Mnemba Island, Tanzania
45. Cozumel, Mexico
46. Gili Air, Indonesia
47. The Point, Layang Layang
48. Dirty Rock, Cocos Island, Costa Rica
49. Rainbow Warrier, New Zealand
50. The Express, Kuredu, Maldives
51. Daedalus, Egyptian Red Sea
52. Garuae Pass, Fakarava Island, French Polynesia
53. Hilma Hooker, Bonaire
54. Hanging Garden, Sipadan
55. Booroo, Isle of Man
56. Sound Drift, Isle of Man
57. Chickens Rock, Isle of Man
58. Toucari Caves, Dominica
59. Wreck of the Bahama Mama, New Providence, Bahamas
60. Blue Hole, Malta
61. Joel’s, PNG
62. Tiputa Pass, Rangiroa, Polynesia
63. Seal Rocks, NSW, Australia
64. Diamond Rocks, Kilkee, Ireland
65. Fujikawa Maru, Truk Lagoon (Chuuk Lagoon)
66. Sugar Wreck, Grand Bahama Island
67. Umbria, Sudan
68. Fish Rock, off South West Rocks in NSW, Australia
69. Office, Mozambique
70. South Point, Sipadan
71. Chios Island, Greece
72. Pixie Pinnacle and Pixie Wall, GBR, Australia
73. Palancanar Bricks, Cozumel, Mexico
74. Bay of Pigs, Cuba
75. Tiputa Pass, Rangiroa, New Zealand
76. St Johns, Egypt
The most popular dive destinations are primarily in warm waters. Dimmock (2007), for instance, lists the costal areas of the United States, Australia and Japan, the Wider Caribbean, the Pacific coast of Central America, the Pacific Islands, Papua New Guinea, Thailand and Malaysia, as well as the Red Sea, the Indian Ocean and the Philippines as important dive destinations. A similar list is provided by WTO (2001). A more specific distribution of popular dive sites can be derived from the list of 100 favourite dive locations provided by Scuba Travel (2007), a UK-based travel website providing the opportunity for divers to rank their favoured dive sites (see Table 1.1 and Figure 1.2). While there might be other rankings offering somewhat different insights, the Scuba Travel list highlights dive hotspots in the Wider Caribbean (22 sites) and the Red Sea (11 sites), the latter probably representing the highest spatial concentration of dive sites. Countries that are especially popular for diving include Egypt, Australia, South Africa, and Thailand. The ranking is likely to also provide an indication of the overall number of diving participants, as it might be reasonable to assume that more-frequently dived sites might be chosen more often as top dive sites. The list also reveals that the distribution of dive spots is skewed between tropical, temperate and cold waters. Tropical waters account for the great majority of dive sites, while only few temperate (e.g. Cyprus and Malta) or what might be considered cold-water dives sites (such as the Galapagos, the Isle of Man and Orkney) are represented in the list. It is also interesting to note that 99 dive spots are in the sea, while there is only one lake (i.e. Lake Malawi).

Indeed, temperate and cold-water destinations and lakes have become increasingly significant in recent years, even though in terms of absolute growth, tropical destinations remain far more important. For many destinations, temperate and cold-water diving opportunities have opened up new business opportunities, also addressing new tourist markets and contributing to a growing interest in marine protected sites (e.g. at the location of wrecks). Temperate and cold-water diving sites might generally offer another kind of

Table 1.1: (Continued)

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<thead>
<tr>
<th>Number</th>
<th>Destination</th>
<th>Location</th>
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<tbody>
<tr>
<td>77.</td>
<td>Turtle Tavern, Sipadan</td>
<td>Malaysia</td>
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<tr>
<td>78.</td>
<td>Hin Muang, Thailand</td>
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<td>79.</td>
<td>Great Basses Reef, Sri Lanka</td>
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<td>80.</td>
<td>Port Royal, Roatan, Honduras</td>
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<td>81.</td>
<td>Eye of the Needle, Saba</td>
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<td>82.</td>
<td>Steel Forest, Nassau Bahamas</td>
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<tr>
<td>83.</td>
<td>Alcyone, Cocos Island, Costa Rica</td>
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<td>84.</td>
<td>Tormentous, Cozumel, Mexico</td>
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<td>85.</td>
<td>Eel Garden, Dahab, Egyptian</td>
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<td>86.</td>
<td>Boulari Pass, New-Caledonia</td>
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<td>87.</td>
<td>Am Chesonet, St Lucia WI</td>
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<td>88.</td>
<td>Aliwal Shoal, South Africa</td>
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<td>89.</td>
<td>RMS Wreck of the Rhone, British</td>
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<td>90.</td>
<td>Santa Rosa Wall, Cozumel,</td>
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<td>Mexico</td>
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<td>91.</td>
<td>New Dropoff, Palau</td>
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<td>92.</td>
<td>Kunkungan, Lambeh Strait,</td>
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<td>N. Sulawesi, Indonesia</td>
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<td>93.</td>
<td>Cenotes, Playa Del Carmen,</td>
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<td>94.</td>
<td>Fernando de Noronha, Brasil</td>
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<td>95.</td>
<td>Port Jackson, Sydney, Australia</td>
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<td>96.</td>
<td>Punta Sur, Cozumel, Mexico</td>
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<td>97.</td>
<td>Lake Malawi, East Africa</td>
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<td>98.</td>
<td>Japanese Gardens, Koh Tao,</td>
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<td>Thailand</td>
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<td>99.</td>
<td>James Barrie, Scapa Flow</td>
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<td>100.</td>
<td>Los Testigos Islands, Venezuela</td>
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Source: Scuba Travel (2007).
experience, as attractions may, in the absence of colourful marine life, more often include wrecks or geological formations. These attractions become available with the expansion of dive markets in temperate and cold waters, but sinking ships and other structures may also increasingly create wreck-dive attractions. Malta and Gozo, islands in the Mediterranean, are examples of destinations that have started to do this systematically, with the goal to expand dive tourism. One goal of Malta’s Tourism Plan, published in 2006, is to “continue supporting the scuttling of wrecks aiming at providing a fair distribution of this product offer around the various diving areas of the islands” (Ministry for Tourism and Culture, 2006, p. 44), indicating that dive tourism is increasingly considered in national tourism development plans.

Visibility might be another important attraction factor that can help to develop a dive destination. Dive sites such as Thingvellir in Iceland, said to be the clearest freshwater body in the world, boasts visibilities exceeding 100 m. There are several dive sites at Thingvellir, the most popular being Silfra, a tectonic rift between the Euroasian and American plates. The lake in which Silfra is located, Þingvallavatn, is filled primarily with water from a nearby glacier. Low nutrient levels, water temperatures of 1–3 °C, the national park status of the area, and low human pressure contribute to the unique visibility found in this water body. The geological feature of the rift, with depths of 40–60 m adds to the attractiveness of the dive site:

Diving is permitted in two submerged rifts in the National Park, Silfra and Davíðsgjá. Silfra is one of the best spots for diving in Iceland and many people find the rift unique on an international scale. The reason for its fame is the astounding visibility in the clear, cold ground water and the magnificent
surroundings. Davíðsgjá is in the north-eastern part of Lake Þingvallavatn. The rift is in the lake itself and to reach it you have to swim some distance. It is quite shallow nearest to the bank, but deepens and widens further out.

Divers have to fulfil all regulations and conditions regarding qualification and equipment for diving. They must abide by all rules concerning diving and agree to respect the National Park regulations. It is prohibited to dive alone, to enter caves while diving and to dive to a greater depth than 30 metres. Diving is entirely at the divers’ own responsibility and risk. (Thingvellir, 2006, p. 1)

Thingvellir is thus providing an example of an emerging dive site that simultaneously appears to be well managed. Environmental problems associated with diving seem to primarily come into existence in emerging dive destinations seeing rapid growth in diver numbers (e.g. Barker & Roberts 2004; Hawkins et al., 1999; Tratalos & Austin 2001; Zakai & Chadwick-Furman, 2002), and in areas where coastlines are still poorly managed.

**Environmental, Economic and Social Aspects of Diving**

Diving has become a global activity, involving most water bodies, and occurring in the tropical, temperate and even arctic latitudes. As pointed out earlier in this chapter, diving is most popular in warm waters, with a concentration of diving activities in certain regions, notably the Red Sea. Particularly in these regions, and specially at popular dive sites within them, diving has sometimes put significant pressure on marine ecosystems, with environmental impacts including the breakage or abrasion of corals, the raising of sediments, behavioural change and altered feeding habits of marine fauna, and disturbances caused by diving with marine mammals (for a detailed overview of these impacts see chapters by Lindgren et al., Chapter 6; van Treeck & Eisinger, Chapter 8; Curtin & Garrod, Chapter 5, all in this volume). However, while these impacts of diving can potentially be addressed through soft and hard management strategies (see Lindgren et al., Chapter 6; Barker & Roberts, Chapter 9; van Treeck & Eisinger, Chapter 8, all in this volume), one of the most problematic and largely unrecognised impacts associated with diving tourism may be its contribution to climate change.

Diving is highly energy intense due to its tendency to involve long-haul flights, often to remote corners of the planet (see Figure 1.2), the use of energy-intensive accommodation and powerful, fuel-hungry boat engines. In fact, with the exception of cruise ship vacations (Klein, 2002), there might be no other form of tourism involving such high energy use on a per capita, per day basis.

However, diving is seldom the sole reason for local environmental change (e.g. Rouphael & Hanafy, 2007; Wilkinson, 2004), and some authors have pointed out the dive industry’s potential to contribute to the preservation of ecosystems. Diving can for instance generate revenue for marine protected areas (MPAs), which have been established in many parts of the world to provide refuge and breeding habitat for overfished or otherwise threatened species (Roberts & Hawkins, 2000). MPAs can, after relatively short periods of time (i.e. several years), see increases in marine species abundance and diversity, and thus become of interest for divers. As Roberts and Hawkins (2000, p. 90) point out, “the mere act of designating a site as a reserve increases its attraction for divers, and the protection offered will pay further dividends over time as animal populations build up”.

**Introduction**

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Numerous studies have addressed the economic value of diving for protected and other areas. For instance, Cesar and van Beukering (2004) calculated that more than 14.6 million snorkelling trips and 870,000 dives were sustained by coastal zones in Hawai‘i, corresponding to a total economic value of US$264 million (€216.7 million) for snorkelling and US$40 million (€32.8 million) for diving. White and Rosales (2003) report that virtually all local divers and close to 80% of foreign divers were willing to pay user fees for diving at Moaobal, Cebu, Philippines. Locals were willing to pay US$1.25 (€1.06) per person per trip, while the foreigners’ bid was almost US$9 (€7.8) per person per trip. A similar survey in Siquijor, Philippines, revealed even higher willingness to pay. Here, 87% of locals and 83% of foreigners were positive to paying entrance fees, with average per trip bids of US$4.62 (€4) for locals and US$17 (€14.8) for foreigners (White & Rosales, 2003). However, both Roberts and Hawkins (2000) and White and Rosales (2003) report that it is of great importance for divers to know that such revenue is invested in conservation of marine areas rather than being collected by the government for other purposes.

The economic contribution of divers can also provide alternative income opportunities, easing the pressure on marine resources. For instance, Roberts and Hawkins (2000, p. 43) report:

In southern Belize, some commercial fishers in the area of a coastal marine park are being retrained as fly-fishing guides, easing the pressure on the fishery and enabling them to improve their incomes. Others have been undertaking scuba diving courses, improving their appreciation of local coral reef resources and allowing them to get work as dive guides for tourists. Such developments can be promising alternatives to exploitive fisheries and other activities degrading the marine resource base (for a review of the economic value of diving see also Barker & Roberts, Chapter 9, this volume). However, in a systems perspective, it is worth noting that tourism always increases resource demands, particularly through the tourists’ preference of certain types of seafood, thus increasing pressure on marine resources – locally or elsewhere. As Roberts and Hawkins (2000, p. 35) report, a single bluefin tuna can yield prices of US$10,000 (€10,490) in Japan, with the consequence that this rare and endangered species is hunted intensely. In fact, the catch is so valuable that spotter planes are used to locate remaining shoals of the fish. Similar mechanisms might also be found in tourism. In many areas, the purchasing power and demand of the tourism industry increases prices for marine resources, making even the time-consuming fishing of already rare species profitable, and thereby aggravating problems of overfishing (e.g. Gössling, 2001; Gössling, Kunkel, Schumacher, & Zilger, 2004). Tourism is thus, in environmental terms, usually a double-edged sword, and it remains difficult to say whether the benefits it can bring will outweigh the costs.

It is clear that environmental education and management could generally improve the situation in many areas, but is so far not comprehensively addressed by dive organisations and tour operators (see Lindgren et al., Chapter 6, this volume), even though there might be some progress recently (Barker & Roberts, Chapter 9, this volume). However, the majority of operators do not as yet seem to focus on environmental education, informing their customers of the kinds of environmental impact associated with diving and asking them to take appropriate action to avoid or minimise such impacts. One positive example
might be the online tour operator Responsible Travel, which provides guidelines for appropriate diver behaviour (see Table 1.2).

Table 1.2: Responsible diving guidelines, Responsible Travel.

Make sure your dive does not destroy what you have come to see

It is a privilege to be able to enter and experience the magical underwater world. However, coral reefs around the world are under extreme threat, and if we want to ensure that our kids can enjoy the same wonderful experiences then we need to dive responsibly. My top tips for responsible diving:

1. Anchors cause serious damage to reefs. Ask your skipper if they will be using a mooring, and about how they ensure the reefs will not be damaged.
2. Make sure that your point of entry to the water is away from fragile corals, it is all too easy to damage them as you enter.
3. Practice your buoyancy over sand before moving towards corals and reefs. Even the sand kicked up by fin kicks close to corals and vulnerable organisms can damage them.
4. Look — do not touch. Even robust looking corals and polyps can be destroyed by the gentlest touch.
5. Resist the temptation to feed fish and discourage others from doing so. You might affect normal patterns of behaviour and/or encourage aggression.
6. Ask your tour operator for their responsible tourism and diving policy — if they have not got one they are probably not taking it seriously. Find responsible dive operators on www.responsibletravel.com.
7. Coral reefs are under immediate threat from global warming. If you have flown to your destination offset the carbon emissions of your flight via www.co2.org.
8. Poorly treated waste from hotels destroys water quality and corals. Ask your hotel how they manage grey water.
9. Do not buy and gifts or souvenirs that are made from corals, shells or hardwoods. If you witness trade in these items report it to www.earthdive.com via their science log.
10. Remember that local communities may have used the seas and reefs for their own purposes for generations. Make sure that they are compensated for allowing us to enjoy their heritage by ensuring local communities benefit financially from tourism — think local about hotels, restaurants and where you buy your crafts.

Finally, a word about diving with sharks. The state of Florida banned chumming to attract sharks in 2001 because it changes their natural behaviour (and in some cases may attract sharks to tourist areas with possible consequences for safety).

Of course diving with sharks is a huge thrill, valuable as a way to educate people about sharks, and a good way to earn local communities an income. However, if you choose to dive with sharks our view is that you should do so with a responsible operator that dives with small groups, causes minimal obtrusion to the environment and ideally does not use the enticement of chumming.

Justin Francis, Managing Director, Responsible Travel

Source: Responsible Travel (2007).