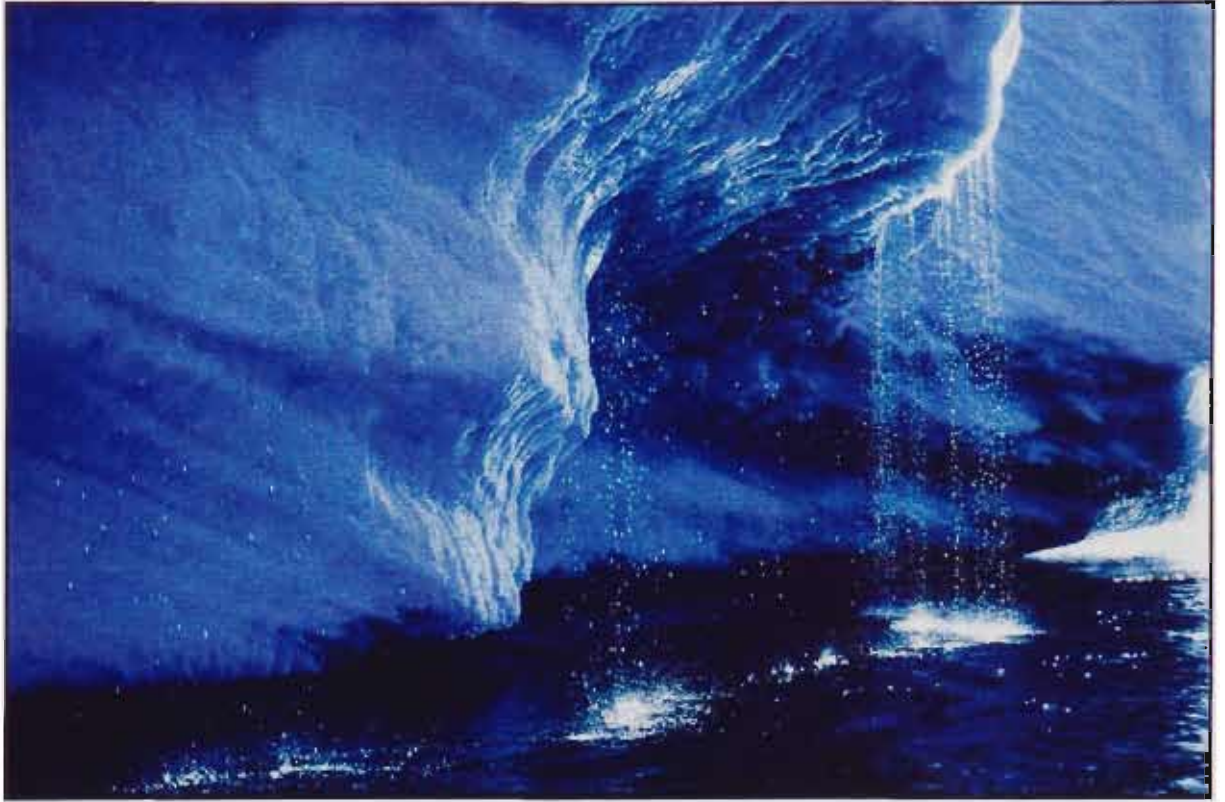

Managing Antarctic tourism



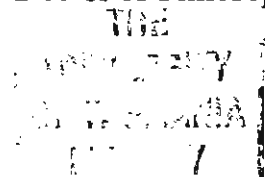
by

Phillip John Tracey, BAppSc(Hons)

Submitted in fulfilment of the requirements

for the Degree of

Doctor of Philosophy




Institute of Antarctic and Southern Ocean Studies
University of Tasmania
April 2001

Cont
Thesis
TRACEY
Ph.D.
2001



This thesis contains no material which has been accepted for a degree or diploma by the University or any other institution, except by way of background information and duly acknowledged in the thesis, and to the best of my knowledge and belief no material previously published or written by another person except where due acknowledgment is made in the text of the thesis.

This thesis may be made available for loan and limited copying in accordance with the *Copyright Act 1968*.


Phillip Tracey

10/4/01
Date

Abstract

Antarctic tourism began before the Antarctic Treaty was signed, and is now a substantial industry exhibiting rapid growth. Concern has been expressed about the effects of tourism on scientific, environmental and other important Antarctic values. The *Protocol on Environmental Protection to the Antarctic Treaty* forms the main mechanism for managing Antarctic tourism within the Antarctic Treaty System (ATS). This thesis argues that despite the framework provided by the Protocol, the tourism management system is inadequate, and that the management systems governing similar forms of tourism in other natural areas provide a superior model.

The research included a comprehensive analysis of the industry and its development. Physical, environmental, operational and geographical aspects of Antarctic tourism were analysed. An examination of site use and the spatial development of tourism shows that concern about high use levels is justified for a small proportion of sites, and identifies trends in the geographic spread of tourism activity. The impacts of tourism on Antarctic values were reviewed, with the main concerns identified as low-risk, high-magnitude impacts, and cumulative impacts. Social, economic, and industrial aspects of tourism were analysed. The economic analysis shows the market economic value of the industry to be approximately fifty five million US dollars for the 1996/97 season. A forecast of the development of Antarctic tourism predicts continued growth, increasing diversification, and development of substantial new markets.

The management of Antarctic tourism was examined in detail. The system includes tourism management within the ATS, measures imposed from outside the ATS, and industry self regulation. An analysis of the legislative and administrative approaches of different nations shows that there is considerable variation in the way that tourism management provisions of the Protocol are interpreted and applied.

Detailed case studies were conducted on the management of tourism at southern oceanic islands and northern polar locations. The case studies show that cruise tourism is managed very differently in these areas than in the Antarctic, with management planning regarded as the most appropriate model for management. Management measures specific to cruise tourism in high latitude locations were identified.

It is argued that there are significant shortcomings in the tourism management system, based on analysis of the existing system, the characteristics of the industry and the Antarctic environment, management planning theory, and the standards set by management of similar activities in the case study areas.

An alternative model for the management of Antarctic tourism using a management planning approach is proposed, taking into account the case studies, industry analysis and forecast, and the structure and implementation of the present system. The thesis argues that this alternative is suitable for application within the framework of the ATS, and that it would overcome the shortcomings identified in the existing management system.

Acknowledgments

I am very grateful to Bruce Davis, Marcus Haward and Rosemary Sandford for advice, insight, support and patience as supervisors.

The financial support of an Australian Postgraduate Award, and an Antarctic Cooperative Research Centre top-up scholarship is gratefully acknowledged. My employers over the period of my candidature have my appreciation for their understanding. I am indebted to the students and staff of the Institute of Antarctic and Southern Ocean Studies, University of Tasmania, and the Antarctic Cooperative Research Centre for the supportive and stimulating academic environment in which I studied. Thanks are due to my office colleagues, especially Ilse, Siobhan, Edmund and Caroline.

I would like to thank the following for kind and generous assistance, comment on the research, responses to requests for assistance, research materials, case study material, or other assistance: Tom Maggs, Martin Betts, Ewan McIvor, Lorne Kriwoken, Joe Montgomery, J. Brady, Michael Hall, Margaret Johnston, Peter Timonin, Gary Gauthier, Geoff Copston, Ruth Davis, Gordon Cessford, Paul Dingwall, Greg Mortimer, Darrel Schoeling, Kelvin Michael, Bill Fox, Lynn Peplinski, Marc Maguet, Clay Anderson, Toril Bakken, Svein Halvorsen, and many others. Important information was supplied by the following organisations among others: WWF Arctic Programme, Ministry of Environment (Norway); US NPS–Sitka National Historic Park; US NPS–Glacier Bay National Park and Preserve; US Environment Protection Agency; US NPS–Kenai Fjords National Park; Marine Section, Prairie and Northern Region, Transport Canada; Northern Region Canadian Coast Guard; Australian Antarctic Division; the UTAS Library Document Delivery Service; and Tasmanian Parks and Wildlife Service.

Many thanks are also due to my friends and family.

My warmest gratitude and heartfelt appreciation goes to Jenn for her understanding and support.

Contents

ABSTRACT	iv
ACKNOWLEDGMENTS	v
CONTENTS	vi
FIGURES, TABLES, AND MAPS	xiii
ACRONYMS AND ABBREVIATIONS	xv
INTRODUCTION	xvii
i.1 MANAGING ANTARCTIC TOURISM	xvii
i.2 DEFINITIONS AND KEY TERMS	xviii
i.3 INTRODUCTION TO ANTARCTIC TOURISM	xix
i.4 RESEARCH AIMS AND METHODOLOGY	xxiv
i.4.1 <i>Aims and objectives</i>	xxiv
i.4.2 <i>Justification for the research</i>	xxv
i.4.3 <i>Limitations of the research</i>	xxvi
i.5 THE RESEARCH APPROACH	xxvi
i.5.1 <i>Case study design</i>	xxvii
i.5.2 <i>Choosing the case studies</i>	xxviii
i.5.3 <i>Units of analysis</i>	xxix
i.6 THE STRUCTURE OF THE THESIS	xxxi
 CHAPTER 1: MANAGEMENT LITERATURE AND ANTARCTIC VALUES	 1
1.1 ISSUES FROM THE ANTARCTIC TOURISM MANAGEMENT LITERATURE	1
1.1.a Legal issues: sovereignty, jurisdiction and third parties	2
1.1.b Enforcement	5
1.1.c Growth of tourism	5
1.1.d ATS responses	5
1.1.e Protected areas and ASTIs	6
1.1.f Status of Recommendations	6
1.1.g Enabling legislation	7
1.1.h Role of states and national law	7
1.1.i Need for tourism research, monitoring and evaluation	7
1.1.j Vessel safety, liability, and insurance	9
1.1.1 <i>Problems with the existing system</i>	9
1.1.2 <i>Debate over the need for change</i>	14
1.1.3 <i>Suggested management options</i>	16
1.1.3.a Comprehensive approaches	21
1.1.3.b Summary of proposed management solutions	25
1.1.4 <i>Recent and ongoing tourism research</i>	27
1.1.5 <i>Summary of the management literature</i>	30
1.2 ANTARCTIC VALUES	32
1.2.1 <i>Use values</i>	34
1.2.2 <i>Non-use values</i>	35
1.2.3 <i>Non-economic values</i>	36
1.2.4 <i>Public preference values</i>	36
1.2.5 <i>Wilderness and aesthetic values</i>	36
1.2.6 <i>Physical, chemical and biological systems values</i>	37
1.2.7 <i>Tourism related values</i>	38
1.2.8 <i>Summary</i>	38

CHAPTER 2: PHYSICAL, ENVIRONMENTAL, OPERATIONAL AND GEOGRAPHICAL ASPECTS OF ANTARCTIC TOURISM	41
2.1 PHYSICAL, BIOLOGICAL AND CULTURAL CHARACTERISTICS	42
2.1.1 <i>Physical resource</i>	42
2.1.2 <i>Biological resource</i>	45
2.1.3 <i>Cultural resource</i>	46
2.2 TOURISM HISTORY AND GROWTH	47
2.3 SHIP BASED TOURISM OPERATIONS	50
2.3.1 <i>The ships</i>	51
2.3.2 <i>Ship and ship to shore operations</i>	54
2.3.2.a Ice navigation	54
2.3.2.b Ship to shore operations	55
2.3.3 <i>Management of voyages and landings</i>	56
2.3.3.a Crew and passenger briefings	57
2.3.3.b Landing management	57
2.3.4 <i>Environmental aspects of operations</i>	59
2.3.4.a Prevention of oil pollution	59
2.3.4.b Waste management	59
2.3.4.c Preventing the introduction of alien species	59
2.3.5 <i>Incidents and accidents</i>	59
2.3.6 <i>Operations outside the Peninsula region</i>	60
2.4 AIRBORNE TOURISM	61
2.4.1 <i>Operations landing tourists</i>	61
2.4.2 <i>Adventure Network International</i>	62
2.4.2.a Development of ANI	63
2.4.2.b Land based facilities	63
2.4.2.c Safety and Environmental Policy	64
2.4.2.d ANI tourist experience	66
2.4.2.e Incidents	67
2.4.3 <i>Overflights</i>	68
2.4.4 <i>Potential developments in airborne tourism</i>	70
2.4.4.a Airfield availability	70
2.4.4.b Summary and implications	71
2.5 COMMERCIAL YACHT OPERATIONS	72
2.6 SITE USE	72
2.6.1 <i>Site selection and itinerary planning</i>	74
2.6.2 <i>Peninsula Region</i>	74
2.6.2.a Frequency of site use across seasons	75
2.6.2.b Frequency of landings across seasons	75
2.6.2.c Visitor numbers to sites	76
2.6.2.d Summary of landing site use	78
2.6.2.e IRB cruising and helicopter overflights	78
2.6.2.f Change in site use over time	79
2.6.2.g Seasonal site use mapping	80
2.6.3 <i>Continental sites</i>	102
2.6.4 <i>Summary</i>	111
2.7 IMPACTS OF TOURISM	111
2.7.1 <i>Types of impact</i>	113
2.7.1.a Impacts on science	113
2.7.1.b Impacts on the environment	114
2.7.1.c Impacts on cultural heritage	118
2.7.1.d Impacts on wilderness and other values	118
2.7.1.e Positive impacts	119
2.7.2 <i>Identified or postulated impacts</i>	120
2.7.3 <i>Measuring and monitoring impacts</i>	123
2.7.4 <i>Summary</i>	123
2.8 CONCLUSIONS	124

CHAPTER 3: SOCIAL, ECONOMIC AND INDUSTRY ASPECTS OF ANTARCTIC TOURISM	125
3.1 DEMOGRAPHIC AND ATTITUDINAL CHARACTERISTICS OF ANTARCTIC TOURISTS	126
3.1.1 <i>Gender, age, work status, occupation and previous visits</i>	126
3.1.2 <i>Nationality of visitors</i>	127
3.1.3 <i>Attitudes, behaviour and ethics</i>	128
3.1.4 <i>Satisfaction, highlights and desire to return</i>	128
3.1.5 <i>Passenger education</i>	129
3.2 TOURIST MOTIVATION	129
3.2.1 <i>Motivations and expectations</i>	130
3.2.2 <i>Motivational summary</i>	131
3.3 ECONOMIC CONSIDERATIONS	132
3.3.1 <i>Literature on Antarctic tourism economics</i>	132
3.3.2 <i>Tourism and economic issues</i>	133
3.3.3 <i>Antarctica as a common property resource</i>	134
3.4 A PRELIMINARY ANALYSIS OF ANTARCTIC TOURISM ECONOMICS	135
3.4.1 <i>Methodology</i>	136
3.4.1.a <i>Calculation of airborne tourism estimate</i>	136
3.4.1.b <i>Calculation of overflight estimate</i>	136
3.4.1.c <i>Calculation of minimum estimate for shipborne tourism</i>	136
3.4.1.d <i>Calculation of enhanced revenue for shipborne tourism</i>	137
3.4.1.e <i>Assumptions and limitations of shipborne tourism calculations</i>	138
3.4.2 <i>Results</i>	139
3.4.2.a <i>Results for airborne tourism component</i>	139
3.4.2.b <i>Results for overflights</i>	139
3.4.2.c <i>Results for shipborne tourism</i>	140
3.4.2.d <i>Enhanced revenue results</i>	141
3.4.3 <i>Summary of results and conclusions</i>	141
3.5 THE TOURISM EXPERIENCE	143
3.5.1 <i>Tourism attractions and the tourism experience</i>	144
3.5.2 <i>Education as part of the tourism experience</i>	145
3.5.3 <i>Other activities</i>	146
3.6 ANTARCTIC TOURISM IN THE BROADER TOURISM INDUSTRY	147
3.6.1 <i>Antarctica as a tourism destination</i>	148
3.6.2 <i>Antarctica in the destination life-cycle</i>	151
3.6.3 <i>Antarctic tourism as ecotourism</i>	151
3.6.4 <i>Global tourism and cruise tourism</i>	153
3.6.5 <i>Expedition cruising</i>	155
3.7 STAKEHOLDERS	156
3.7.1 <i>Non-governmental conservation organisations</i>	156
3.7.1.a <i>Antarctic and Southern Ocean Coalition</i>	157
3.7.1.b <i>Other NGOs with Antarctic policies</i>	158
3.7.1.c <i>World Conservation Union</i>	158
3.7.1.d <i>Oceanites foundation</i>	159
3.7.2 <i>Non-governmental industry organisations</i>	160
3.7.2.a <i>International Association of Antarctica Tour Operators</i>	160
3.7.2.b <i>Other bodies</i>	164
3.7.3 <i>Science and science support organisations</i>	164
3.7.4 <i>Government agencies</i>	165
3.7.5 <i>Domestic stakeholders</i>	166
3.7.6 <i>Other uses of Antarctica</i>	166
3.8 FUTURE DIRECTIONS FOR ANTARCTIC TOURISM	167
3.8.1 <i>Growth and change in shipborne tourism</i>	167
3.8.2 <i>Growth and change in airborne tourism</i>	168
3.8.3 <i>Factors limiting growth</i>	170
3.8.4 <i>Changes in tourism products, experiences and markets</i>	171
3.8.5 <i>Use of larger vessels</i>	172
3.8.6 <i>Geographic change</i>	174
3.8.7 <i>Land based tourism</i>	174
3.9 SUMMARY	176

CHAPTER 4: THE ANTARCTIC TOURISM MANAGEMENT SYSTEM	179
4.1 TOURISM-SPECIFIC ATS MEASURES	179
4.1.1 <i>From concern to grudging acceptance: 1966–1970</i>	180
4.1.2 <i>The beginning of regulation: 1972–1979</i>	182
4.1.3 <i>Slow progress and the need for review: 1981–1990</i>	183
4.1.4 <i>Emerging options and a middle path: 1991–1994</i>	184
4.1.5 <i>The abandoned draft tourism annex to the Protocol—ATCM XVII</i>	185
4.1.5.a The debate over the draft annex	186
4.1.6 <i>ATCM XVIII, Kyoto 1994</i>	187
4.1.7 <i>Fine-tuning and regrouping: 1995–1998</i>	187
4.2 NON-ATS AGREEMENTS	190
4.2.1 <i>Compliance and re-flagging issues</i>	190
4.2.2 <i>Agreements applying to Antarctica</i>	190
4.2.3 <i>Ice navigation—a regime gap</i>	191
4.3 RESPONSIBILITIES OF PARTIES	193
4.4 ATS ALTERNATIVES	194
4.5 ENABLING THE PROTOCOL—LEGISLATION, REGULATIONS, AND PROCEDURES	195
4.5.1 <i>Australia</i>	196
4.5.2 <i>Chile</i>	197
4.5.3 <i>Finland</i>	197
4.5.4 <i>Japan</i>	197
4.5.5 <i>New Zealand</i>	199
4.5.6 <i>The Netherlands</i>	200
4.5.7 <i>Norway</i>	200
4.5.8 <i>Russia</i>	201
4.5.9 <i>South Africa</i>	202
4.5.10 <i>United States</i>	202
4.5.11 <i>Features of the legislative approaches</i>	203
4.6 THE ENVIRONMENTAL ASSESSMENT SYSTEM IN PRACTICE	206
4.6.1 <i>Impact assessment issues</i>	207
4.7 PROTECTED AREAS	209
4.8 INSPECTIONS AND OBSERVER PROGRAMS	214
4.9 VOLUNTARY MANAGEMENT MECHANISMS	215
4.9.1 <i>Membership of IAATO</i>	215
4.9.2 <i>Guidelines and codes of conduct</i>	216
4.9.2.a The IAATO guidelines	218
4.9.2.b The ATS guidance documents	220
4.9.2.c Effectiveness of voluntary guidance documents	221
4.10 TOURISM AND SCIENCE	222
4.10.1 <i>Managing tourism visits to stations</i>	223
4.11 CONCLUSIONS	224
 CHAPTER 5: SOUTHERN OCEANIC ISLANDS TOURISM MANAGEMENT CASE STUDIES	 227
5.1 SOUTHERN OCEANIC ISLANDS	227
5.1.1 <i>The case study region</i>	228
5.1.2 <i>The case studies</i>	228
5.1.3 <i>Case study presentation</i>	231
5.1.4 <i>General description of southern oceanic islands</i>	231
5.2 TOURISM ON SOUTHERN OCEANIC ISLANDS	232
5.2.1 <i>Tourism on non case study islands</i>	233
5.2.2 <i>Southern oceanic island tourism research</i>	235
5.2.2.a Overview papers	235
5.2.2.b SCAR/IUCN Workshop on protection, research and management of subantarctic islands	236
5.2.2.c Social research	237
5.2.2.d Physical impacts	238
5.3 TOURISM MANAGEMENT FOR THE NEW ZEALAND SUBANTARCTIC ISLANDS	238
5.3.1 <i>Physical and environmental resource</i>	238
5.3.2 <i>Historical use and resources</i>	240
5.3.3 <i>Tourist visits</i>	240
5.3.4 <i>Management of tourism</i>	241

5.3.4.a	Guidelines for tourism	243
5.3.4.b	Minimum impact code	244
5.3.4.c	Other features	244
5.3.5	<i>Summary</i>	244
5.4	TOURISM MANAGEMENT FOR MACQUARIE ISLAND	245
5.4.1	<i>Physical and environmental resource</i>	245
5.4.2	<i>Historical use and resources</i>	246
5.4.3	<i>Tourist visits</i>	246
5.4.4	<i>Management of tourism</i>	247
5.4.4.a	Guidelines for tourism	248
5.4.4.b	Minimum impact code	249
5.4.5	<i>Summary</i>	250
5.5	TOURISM MANAGEMENT FOR HEARD AND McDONALD ISLANDS	250
5.5.1	<i>Physical and environmental resource</i>	250
5.5.2	<i>Historical use and resources</i>	251
5.5.3	<i>Tourist visits</i>	252
5.5.4	<i>Management of tourism</i>	252
5.5.4.a	Guidelines for tourism	254
5.5.4.b	Code of conduct	254
5.5.5	<i>Summary</i>	255
5.6	TOURISM MANAGEMENT FOR THE PRINCE EDWARD ISLANDS	255
5.6.1	<i>Physical and environmental resource</i>	255
5.6.2	<i>Historical use and resources</i>	256
5.6.3	<i>Management of tourism</i>	257
5.6.4	<i>EIA of tourism on Marion Island</i>	258
5.6.5	<i>Summary</i>	259
5.7	TOURISM MANAGEMENT FOR GOUGH ISLAND WILDLIFE RESERVE	260
5.7.1	<i>Physical and environmental resource</i>	260
5.7.2	<i>Historical use and resources</i>	261
5.7.3	<i>Management of tourism</i>	262
5.7.4	<i>Summary</i>	264
5.8	TOURISM MANAGEMENT FOR SOUTH GEORGIA	264
5.8.1	<i>Physical and environmental resource</i>	265
5.8.2	<i>Historical use and resources</i>	266
5.8.3	<i>Tourist visits</i>	266
5.8.4	<i>Management of tourism</i>	267
5.8.4.a	Proposed visitor management policy	268
5.8.5	<i>Summary</i>	269
5.9	SUBANTARCTIC TOURISM MANAGEMENT DISCUSSION	270
5.9.1	<i>Management planning</i>	270
5.9.2	<i>Policies on tourism</i>	275
5.9.3	<i>Shore management provisions</i>	275
5.9.4	<i>Administration</i>	277
5.9.5	<i>Differences between the southern oceanic islands and the Antarctic</i>	278
5.9.6	<i>Drawing on other research</i>	279
5.10	CONCLUSIONS AND IMPLICATIONS FOR ANTARCTIC TOURISM	280

CHAPTER 6: TOURISM MANAGEMENT FOR NORTHERN POLAR LOCATIONS 283

6.1	INTRODUCTION	283
6.1.1	<i>Rationale and case selection</i>	283
6.1.2	<i>The northern polar region</i>	285
6.1.3	<i>Regional tourism activity</i>	288
6.2	ARCTIC-WIDE TOURISM PRINCIPLES	289
6.3	TOURISM MANAGEMENT FOR SVALBARD	292
6.3.1	<i>Physical and environmental resource</i>	292
6.3.2	<i>Historical use and resources</i>	293
6.3.3	<i>Tourism on Svalbard</i>	294
6.3.4	<i>Cruise tourism</i>	295
6.3.5	<i>Management of tourism</i>	296
6.3.5.a	Tourism regulations	297
6.3.5.b	Protected areas	297

6.3.5.c	Tourism management plan zoning	298
6.3.5.d	Additional elements of the management plan	299
6.3.6	<i>Summary</i>	300
6.4	TOURISM MANAGEMENT FOR GLACIER BAY NATIONAL PARK AND PRESERVE, ALASKA	301
6.4.1	<i>Physical and environmental resource</i>	302
6.4.2	<i>Historical and cultural use</i>	303
6.4.3	<i>Tourism use</i>	303
6.4.3.a	Cruise vessels	303
6.4.3.b	Tour boats	304
6.4.3.c	Visitor numbers	304
6.4.3.d	Tourist characteristics	305
6.4.4	<i>Management planning</i>	305
6.4.5	<i>Vessel management plan</i>	306
6.4.5.a	Daily entry restrictions	307
6.4.5.b	Seasonal entry restrictions	307
6.4.5.c	Other regulations	307
6.4.5.d	Concession system	307
6.4.5.e	Other management	308
6.4.6	<i>Summary</i>	308
6.5	TOURISM MANAGEMENT FOR THE CANADIAN ARCTIC	310
6.5.1	<i>Physical and environmental resource</i>	311
6.5.2	<i>Land tenure, national parks and protected areas</i>	312
6.5.2.a	Nunavut	312
6.5.2.b	Northwest Territories	313
6.5.2.c	Yukon	313
6.5.3	<i>Tourism activity</i>	313
6.5.3.a	Geographic areas	314
6.5.3.b	Tourist characteristics	315
6.5.4	<i>Vessel management and regulation</i>	315
6.5.5	<i>Additional requirements</i>	319
6.5.5.a	Federal requirements	319
6.5.5.b	Territory government requirements	319
6.5.6	<i>Summary</i>	320
6.6	THE RUSSIAN ARCTIC AND THE NORTH POLE	322
6.6.1	<i>USSR cruise activity</i>	323
6.6.2	<i>Foreign involvement and access</i>	325
6.7	CRUISE TOURISM TO OTHER ARCTIC DESTINATIONS	326
6.8	NORTHERN POLAR REGIONS TOURISM MANAGEMENT DISCUSSION	327
6.8.1	<i>General discussion</i>	327
6.8.2	<i>Destination characteristics and tourism experiences</i>	328
6.8.3	<i>Management systems and management planning</i>	329
6.8.3.a	Environmental assessment	329
6.8.3.b	Visitor experience	330
6.8.3.c	Limits on tourism	330
6.8.3.d	Research and monitoring	330
6.8.3.e	Codes of conduct	330
6.8.3.f	Management presence	330
6.8.3.g	Wildlife disturbance issues	331
6.8.3.h	Administrative arrangements	331
6.8.4	<i>Ice navigation</i>	331
6.9	CONCLUSIONS AND IMPLICATIONS FOR ANTARCTIC TOURISM	331

CHAPTER 7: EVALUATING THE ANTARCTIC TOURISM MANAGEMENT SYSTEM 333

7.1	ATS GOALS FOR TOURISM MANAGEMENT	333
7.2	PROTECTED AREA MANAGEMENT PLANNING THEORY	335
7.2.1	<i>A sample planning system</i>	335
7.2.2	<i>Wilderness management</i>	337
7.2.3	<i>Visitor management</i>	339
7.2.3.a	Carrying capacity	339
7.2.3.b	Recreation Opportunity Spectrum	339
7.2.3.c	Limits of Acceptable Change	341
7.2.3.d	Agency specific visitor management models	342
7.2.4	<i>Summary of protected area management planning</i>	345

7.3	RESULTS OF CASE STUDY ANALYSES	346
7.3.1	<i>Southern oceanic island tourism management</i>	346
7.3.2	<i>Tourism management for northern polar locations</i>	347
7.4	EVALUATING THE ANTARCTIC TOURISM MANAGEMENT SYSTEM	348
7.4.1	<i>Coverage</i>	348
7.4.2	<i>Adequacy</i>	350
7.4.2.a	Lack of a strategic management approach	350
7.4.2.b	Lack of a mechanism for implementing management measures	350
7.4.2.c	Unclear distribution of regulatory responsibility	351
7.4.2.d	Lack of management institutions	352
7.4.2.e	The environmental assessment system	352
7.4.2.f	Binding and non-binding measures	354
7.4.2.g	The protected area system	354
7.4.2.h	Neglect of wilderness and aesthetic values	355
7.4.2.i	Monitoring	356
7.4.2.j	Site management and management presence	357
7.4.2.k	Prevention of pollution	357
7.4.2.l	Safety	358
7.4.2.m	Self-sufficiency and contingency planning	358
7.4.2.n	Lack of an ice navigation regime	359
7.4.2.o	Conservation of flora and fauna	359
7.4.2.p	Level of impact	360
7.5	CONCLUSIONS	361
CHAPTER 8:	CONCLUSIONS AND RECOMMENDATIONS	363
8.1	GENERAL DISCUSSION	364
8.1.1	<i>Factors influencing and constraining tourism management</i>	367
8.1.2	<i>A need for change</i>	368
8.2	EVALUATION OF PROPOSED MANAGEMENT OPTIONS	369
8.2.1	<i>Comprehensive management systems</i>	372
8.3	MANAGEMENT RECOMMENDATIONS	376
8.3.1	<i>Antarctic tourism management needs</i>	378
8.3.2	<i>Management strategies and actions</i>	381
8.3.3	<i>A way forward</i>	383
8.3.4	<i>Implementing a system within the ATS</i>	385
8.4	CONCLUDING COMMENT	387
APPENDIX 1:	ELEMENTS OF THE ANTARCTIC TREATY SYSTEM	389
a1.1	THE ANTARCTIC TREATY SYSTEM	389
a1.1.1	<i>The Antarctic Treaty</i>	389
a1.1.2	<i>Functioning of the ATS</i>	391
a1.1.3	<i>Additional components of the ATS</i>	391
a1.2	THE PROTOCOL ON ENVIRONMENTAL PROTECTION TO THE ANTARCTIC TREATY	393
a1.2.1	<i>The Convention on the Regulation of Antarctic Mineral Resource Activities</i>	393
a1.2.2	<i>The negotiation of the Protocol</i>	394
a1.2.3	<i>The Protocol Articles</i>	394
a1.2.4	<i>Annex I to the Protocol: Environmental impact assessment</i>	397
a1.2.5	<i>Annex II to the Protocol: Conservation of Antarctic fauna and flora</i>	398
a1.2.6	<i>Annex III to the Protocol: Waste disposal and waste management</i>	399
a1.2.7	<i>Annex IV to the Protocol: Prevention of marine pollution</i>	400
a1.2.8	<i>Annex V to the Protocol: Area protection and management</i>	401
a1.2.9	<i>The proposed liability annex to the Protocol</i>	402
APPENDIX 2:	THE PROPOSED TOURISM ANNEX TO THE PROTOCOL	405
APPENDIX 3:	RECOMMENDATION XVIII-1 AND RECOMMENDATION VIII-9	407
REFERENCES		417
ANTARCTIC TREATY CONSULTATIVE MEETING DOCUMENTS CITED		435

Figures, tables, and maps

FIGURES

Figure 1.1:	Value categories and Antarctic values	35
Figure 2.1:	Seaborne tourist numbers	48
Figure 2.2:	Forecast seaborne tourist numbers, IAATO forecast, and line of best fit based on 1985/86 to 1998/99 figures	49
Figure 2.3:	Total number of landings over nine seasons at each landing site (Peninsula region)	76
Figure 3.1:	Product and destination life cycles	150
Figure 4.1	A summary of Rec. XVIII-1	189
Figure 4.2	Responsibilities of parties relating to tourism	193
Figure 6.1:	Code of conduct for Svalbard tourism	300
Figure 6.2:	Growth in visits on cruise ships and tour boats	304
Figure 7.1:	Framework for NPS Park Planning and Decision Making	335

TABLES

Table i.1:	Timeline of events relating to tourism in the Antarctic	xx
Table 1.1:	Tourism related values	38
Table 2.1:	Potential and actual activities by landform	45
Table 2.2:	Number (actual and forecast) of operators, ships, and voyages 1992/93 to 2001/02	50
Table 2.3:	Industry structure—ship passenger capacities	52
Table 2.4:	Antarctic tourism fleet vessel characterisation (1996/97)	53
Table 2.5:	Passengers carried by vessel type 1996/97	53
Table 2.6:	ANI and Polar Logistics activities and other use of Patriot Hills	64
Table 2.7:	Predicted or potential impacts of ANI activities	66
Table 2.8:	Reported ANI client numbers participating in different Patriot Hills programs over 6 seasons	67
Table 2.9:	Number of seasons sites were used (Peninsula region)	75
Table 2.10:	Total visits over 9 seasons (Peninsula region)	76
Table 2.11:	Average visitor numbers by number of sites (Peninsula region)	77
Table 2.12:	Details of sites where average annual visitation is more than 1000 (Peninsula region)	77
Table 2.13:	Peninsula sites ranking top 5 most visited for 3 or more of 9 seasons	78
Table 2.14:	Regularity of site use for IRB cruising or helicopter overflights (Peninsula region)	79
Table 2.15:	Total visits over 7 seasons for IRB cruising or helicopter overflights (Peninsula region)	79
Table 2.16:	Total landing sites and introduction of new landing sites	80
Table 2.17:	Areas used for visit mapping (Peninsula region)	101
Table 2.18:	Landing site use seasonal distribution (Continental region)	102
Table 2.19:	Average visitor numbers by number of sites (Continental region)	103
Table 2.20:	Continental region sites where average annual visitation is more than 150	103
Table 2.21:	Summary of predicted and actual tourism impacts	121
Table 3.1:	Gender, age, work status and previous visits of Antarctic tourists	127
Table 3.2:	Nationalities of travellers 1994/95 to 1997/98	127
Table 3.3:	Why people visit Antarctica	131
Table 3.4:	Total revenue calculation for airborne tourism	139
Table 3.5:	Overflight revenue per flight	139
Table 3.6:	Summary of minimum vessel / company calculations	140
Table 3.7:	Comparison between minimum revenue and enhanced revenue estimates	141
Table 3.8:	Industry structure: revenue and passengers by company	142
Table 3.9:	Elements of commercial tourism experiences	145
Table 4.1:	Summary timeline of ATS measures relating to tourism, with key events	181

Table 4.2:	Implementing the Protocol through legislation	198
Table 4.3:	Application of Protocol implementing legislation	199
Table 5.1:	Southern oceanic islands	230
Table 5.2:	Island visits—companies offering visits 1996/97 season	234
Table 5.3:	New Zealand subantarctic island visitor characteristics	238
Table 5.4:	Visits to New Zealand subantarctic islands	240
Table 5.5:	Visits to Macquarie island	247
Table 5.6:	Southern oceanic islands—management planning	271
Table 5.7:	Southern oceanic islands—shore management provisions	272
Table 5.8:	Southern oceanic islands—administrative and other provisions	273
Table 5.9:	Southern oceanic islands—conservation characteristics	274
Table 5.10:	Tourism management provisions	281
Table 6.1:	Protected areas in the Arctic	287
Table 6.2:	Summary of WWF principles for Arctic tourism, Code of Conduct for operators, and Code of conduct for tourists	290
Table 6.3:	Tourism management provisions for Svalbard	301
Table 6.4:	Cruise tourism management, Glacier Bay National Park and Preserve	310
Table 6.5:	Ship types and Shipping Safety Control Zone entry dates	318
Table 7.1:	Relevant IUCN Protected area management categories	335
Table 7.2:	Steps in the Limits of Acceptable Change Process	343
Table a1.1:	Summary of the provisions of the Antarctic Treaty	390

M A P S

Map 2.1:	Inflatable rubber boat (IRB) cruising or overflights – Peninsula Sites	81
Map 2.2:	Peninsula site use change series – 89/90 season	83
Map 2.3:	Peninsula site use change series – 90/91 season	85
Map 2.4:	Peninsula site use change series – 91/92 season	87
Map 2.5:	Peninsula site use change series – 92/93 season	89
Map 2.6:	Peninsula site use change series – 93/94 season	91
Map 2.7:	Peninsula site use change series – 94/95 season	93
Map 2.8:	Peninsula site use change series – 95/96 season	95
Map 2.9:	Peninsula site use change series – 96/97 season	97
Map 2.10:	Peninsula site use change series – 97/98 season	99
Map 2.11:	Major features and tourist sites (Ross Sea region, Oates Land and West Antarctica)	105
Map 2.12:	Major features and tourist sites (East Antarctica, Enderby Land to Terre Adelie)	107
Map 2.13:	Major features and tourist sites (Dronning Maud Land, Weddell Region and western East Antarctica)	109
Map 5.1:	Southern oceanic islands	229
Map 6.1:	Northern polar regions	286
Map 6.2:	Arctic Canada including Shipping Safety Control Zones	317

Acronyms and abbreviations

AAT	Australian Antarctic Territory
AEPS	Arctic Environmental Protection Strategy
AIRSS	Arctic Ice Regime Shipping Standards (Canada)
AMAP	Arctic Monitoring and Assessment Programme
ANARE	Australian National Antarctic Research Expeditions
ANI	Adventure Network International
ANLICA	<i>Alaskan National Interest Lands Conservation Act</i>
ASAC	Antarctic Science Advisory Committee (Australia)
ASMA	Antarctic Specially Managed Area
ASOC	Antarctic and Southern Ocean Coalition
ASP	Antarctic Specially Protected Area
ASPPR	Arctic Shipping Pollution Prevention Regulations
ASTI	Area of Special Tourist Interest
ATCM	Antarctic Treaty Consultative Meeting
ATCP	Antarctic Treaty Consultative Party
ATP	Antarctic Treaty Party
ATS	Antarctic Treaty System
BAS	British Antarctic Survey
CC	Carrying Capacity
CCAMLR	Convention on the Conservation of Antarctic Marine Living Resources (also Commission for the Conservation of Antarctic Marine Living Resources)
CCGN	Northern Region Canadian Coast Guard
CEE	Comprehensive Environmental Evaluation
CEMP	CCAMLR Ecosystem Monitoring Program
CEP	Committee for Environmental Protection (of the ATS)
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
CLIA	Cruise Line International Association
CMS	Conservation Management Strategy
COMNAP	Council of Managers of National Antarctic Programs
CRAMRA	Convention for the Regulation of Antarctic Mineral Resource Activities
DPWH	Department of Parks, Wildlife and Heritage (Tasmania)
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency, US
FACH	Fuerza Aérea de Chile
GNWT	Government of the Northwest Territories
HRSCERA	House of Representatives Standing Committee on Environment, Recreation and the Arts (Australia)
IAATO	International Association of Antarctica Tour Operators
IACS	International Association of Classification Societies
ICAIR	International Centre for Antarctic Information and Research
IEE	Initial Environmental Evaluation
IMO	International Maritime Organisation
IP	Information Paper (of the ATCM)
IRB	Inflatable Rubber Boat
IUCN	International Union for the Conservation of Nature and Natural Resources (World Conservation Union)
IWC	International Whaling Commission
LAC	Limits of Acceptable Change (management system)

MARPOL 73/78	The International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978
MBO	Management By Objectives
MPA	Multiple-use Planning Area
NERC	National Environment Research Council (UK)
NGO	Non-governmental Organisation
NMFS	National Marine Fisheries Service (US)
NORDREG	Arctic Traffic System (Canadian Coast Guard)
NPI	Norwegian Polar Institute
NPS	National Park Service (US)
NSF	National Science Foundation (US)
NWT	Northwest Territories
PAC	Project Antarctic Conservation
PATA	Pacific Asia Travel Association
PEE	Preliminary Environmental Evaluation
PERM	Preliminary Environmental Review Memorandum
Polar Code	International Code of Safety for Ships in Polar Waters
Protocol	Protocol on Environmental Protection to the Antarctic Treaty
Rec.	Recommendation (of the ATCM)
ROS	Recreation Opportunity Spectrum
SCALOP	Standing Committee on Antarctic Logistics and Operations (of COMNAP)
SCAR	Scientific Committee on Antarctic Research
SCUBA	Self-contained Underwater Breathing Apparatus
SGSSI	South Georgia and the South Sandwich Islands
SOLAS	International Convention for the Safety of Life at Sea, 1974
SOPEP	Shipboard Oil Pollution Emergency Plan
SPA	Specially Protected Area
SPRI	Scott Polar Research Institute (UK)
SRA	Specially Reserved Area
SSSI	Site of Special Scientific Interest
TANGO	Tourism and Non-Governmental Operations (working group of COMNAP)
TAP	The Antarctica Project
Treaty	Antarctic Treaty of 1959
UKAHT	UK Antarctic Heritage Trust
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea
USFWS	US Fish and Wildlife Service
VAMP	Visitor Activity Management Process
VERP	Visitor Experience and Resource Protection Framework
VIM	Visitor Impact Management process
VMP	Vessel Management Plan
WCMC	World Conservation Monitoring Centre
WP	Working Paper (of the ATCM)
WTO	World Tourism Organisation
WWF	World Wide Fund for Nature, also known as World Wildlife Fund