

CORAL REEFS

Challenges and Opportunities for Sustainable Management

SUB Göttingen 7 210 395 826

> Proceedings of an Associated Event of the Fifth Annual World Bank Conference on Environmentally and Socially Sustainable Development

Cosponsored by the World Bank and the International Center for Living and Aquatic Resources Management

Held at the World Bank, Washington, D.C. October 9-11, 1997

Marea E. Hatziolos, Anthony J. Hooten, and Martin Fodor, Editors

The World Bank Washington, D.C.

Contents

Acknowledgments viii

Foreword ix

Opening Session 1

Keynote Address

Coral Reef Conservation: Science, Economics, and Law Ismail Serageldin 3

Objectives of the Conference Marea E. Hatziolos 8

Status of the International Coral Reef Initiative *Richard Kenchington* 11

The Global Coral Reef Monitoring Network: Reversing the Decline of the World's Reefs Clive Wilkinson and Bernard Salvat 16

Partnerships for the International Coral Reef Initiative *Timothy E. Wirth* 20

Panel One. Destructive Fishing Practices 23

Chair: Sofia Bettencourt

Abatement of Destructive Fishing Practices in Indonesia: Who Will Pay?

Rili Djohani 25

Is Harvesting Wild Groupers for Growout Sustainable? R. E. Johannes and N. J. Ogburn 30

Destructive Fishing Practices in the Asia-Pacific Region Nancy MacKinnon 32

Destructive Fishing with Dynamite Solomon Makoloweka 35

Policy Reform and Community-Based Programs to Combat Cyanide Fishing in the Asia-Pacific Region *Charles Victor Barber and Vaughan R. Pratt* 39

Ocean Harvesting of Ornamental Marine Life: A Mechanism for Reef Preservation *John C. Walch* 50

Macroalgal Culture as a Sustainable Coastal Livelihood in Coral Reef Areas *José A. Zertuche-González* 53

Discussion 55

Panel Two. Illegal and Sustainable Trade in Reef Products versus Certified Trade and Sustainable Bioprospecting 63

Chair: Michael Rubino

Convention on International Trade in Endangered Species of Wild Fauna and Flora James Armstrong and Jared Crawford 65

Reef-Destructive Practice versus Opportunities for Sustainable Mariculture: Coral Reefs and Pharmacologic Potential David J. Newman 68

Coral Reefs: Conservation by Valuation and the Utilization of Pharmaceutical Potential Walter H. Adey 72

Marine Pharmaceuticals from the Reef: A View from the Field Patrick L. Colin 76

The Marine Aquarium Fish Trade Daniel Pelicier 79

The Marine Aquarium Fish Council: Certification and Market Incentives for Ecologically Sustainable Practices *Jamie Resor* 82

Discussion 85

Panel Three. Marine Protected Areas 91

Chair: Jan Post

The Relationship of Tourism-Related Revenue Generation to Coral Reef Conservation

Donald E. Hawkins 93

Permanent No-Take Zones: A Minimum Standard for Effective Marine Protected Areas Callum M. Roberts 96

Tropical Marine Reserves Should Encompass Spawning Aggregation Sites R. E. Johannes 101

The Role of Marine Protected Areas in Coral Reef Conservation Tundi Agardy 103

The Reefs at Cancún; A Social Laboratory Juan E. Bezaury Creel 106

Entrepreneurial Marine Protected Areas: Small-Scale, Commercially Supported Coral Reef Protected Areas Stephen Colwell 110

Various Factors in Coral Reef Protection in Jamaica and the Role of the South Coast Conservation Foundation *Peter Espeut* 115

GREEN GLOBE: The Tourism Industry and Sustainability Carolyn Hill 118

Environmental Responsibility and Tourism on Tropical Islands Richard C. Murphy 121

Discussion 124

Panel Four. Marine Information and Education 129

Chair: Marea E. Hatziolos

ReefBase: Status and Plans J. W. McManus 131

Coral Reefs: Harbingers of Global Change? *Phillip Dustan* 139

The Global Coral Reef Monitoring Network: Communities, Governments, and Scientists Working Together for Sustainable Management of Coral Reefs

Clive Wilkinson and Bernard Salvat 143

Marine Information Management and Environmental Education *Janine M. H. Selendy* 147 Discussion 151

Panel Five. Economic Valuation of Coral Reefs 155

Chair: Maritta Koch-Weser

Economic Values of Coral Reefs: What Are the Issues? John A. Dixon 157

Indonesian Coral Reefs: A Precious but Threatened Resource Herman Cesar 163

Cost-Effectiveness Analysis of Coral Reef Management and Protection: A Least-Cost Model for the Developing Tropics *Richard Huber* 172

Discussion 175

Summary 181

Hard Decisions and Hard Science: Research Needs for Coral Reef Management Nancy Knowlton 183

Summary and Recommendations Marea E. Hatziolos 188

Epilogue Ismail Serageldin 191

Appendixes 193

- A. Conference Recommendations 195
- B. International Coral Reef Initiative Regional Summaries 198
- C. Selected Educational Materials Pertaining to Coral Reefs Barbara J. Ornitz 200
- D. World Wildlife Fund and Coral Reef Conservation Sue Wells 202
- E. World Wildlife Fund Projects Involving Coral Reefs 206
- F. Coral Reef Conservation in the Wider Caribbean through Integrated Coastal Area Management, Marine Protected Areas, and Partnerships with the Tourism Sector Alessandra Vanzella-Khouri 209
- G. Conference Participants 212