

Contents

Introduction

MARTÍN H. IRIONDO, JUAN CÉSAR PAGGI, AND MARÍA JULIETA PARMA1

Part I The Physical and Chemical Environment5

1 Physical Geography of the Basin

MARTÍN H. IRIONDO AND ALDO R. PAIRA7

1.1 Introduction7

1.2 Geology7

1.3 Climate9

1.4 Hydrography12

References31

2 Geomorphology

MARTÍN H. IRIONDO33

2.1 The Surrounding Regions33

2.2 Neotectonics38

2.3 Climate39

2.4 Climatic Changes in the Quaternary39

2.5 The Sediments40

2.6 Geomorphology40

References51

3 Origin, Evolution, and Types of Floodplain Water Bodies

ALDO R. PAIRA AND EDMUNDO C. DRAGO53

3.1 Introduction53

3.2 The Middle Paraná Floodplain53

3.3 Origin and Shape of Lentic Water Bodies64

3.4 Lake Morphometry68

3.5 Lake Evolution75

3.6 Aquatic and Riparian Vegetation as a Morphological Factor76

3.7 Concluding Remarks77

References80

4 The Physical Dynamics of the River–Lake Floodplain System

EDMUNDO C. DRAGO83

4.1 Introduction83

4.2 Water Regime of the Floodplain Lakes83

4.3	Suspended Sediments	95
4.4	Bottom Sediment Resuspension, Mixing Depth, and Sedimentation Rate	100
4.5	Water Temperature	102
4.6	Lake Heat Content	112
4.7	Work of the Wind and Stability of Stratification	114
4.8	Conclusions	116
	References	119
5 Fluvial Sediments: Main Channel and Floodplain Interrelationships		
	MARIO L. AMSLER, EDMUNDO C. DRAGO, AND ALDO R. PAIRA	123
5.1	Introduction	123
5.2	Basic Concepts	124
5.3	The Main Channel	124
5.4	Sediment Transport and Processes in the Alluvial Plain	134
5.5	Conclusions	140
	References	141
6 The Geochemistry of the Paraná River: An Overview		
	PEDRO J. DEPETRIS AND ANDREA I. PASQUINI	143
6.1	Introduction	143
6.2	Geological and Hydrological Framework	144
6.3	The Chemistry of Dissolved Components	148
6.4	The Signature of Weathering in the Drainage Basin	153
6.5	The Provenance of Sediments	159
6.6	Main Biogeochemical Characteristics	165
6.7	Conclusions	170
	References	171
Part II Plant Life		
7 Phytoplankton		
	YOLANDA ZALOCAR DE DOMITROVIC, M. DEVERCELLI, AND M.O. GARCÍA DE EMILIANI	177
7.1	Introduction	177
7.2	Phytoplankton Distribution Along the Main River and at Cross Channel	178
7.3	Temporary Variations during Normal Hydrological Cycles and Extraordinary Periods in the Main Channel	182
7.4	Temporary Changes in Side Channels of Different Size and Connectivity Degree	184
7.5	Temporary Variations in Floodplain Lakes with Different Water Residence Time and Vegetation	189
7.6	Conclusions	200
	References	202

8 Aquatic Macrophytes	
RAFAEL A. SABATTINI AND VICTOR H. LALLANA	205
8.1 Introduction	205
8.2 Plant Communities and Succession	207
8.3 Habitat Characteristics and Ecological Factors	212
8.4 Plant Dynamics and Growth	218
8.5 Biomass and Productivity	219
8.6 Use of Resources	222
8.7 Conclusions	223
References	224
Part III Invertebrate Animal Life	227
9 Zooplankton	
SUSANA JOSÉ DE PAGGI AND JUAN CÉSAR PAGGI	229
9.1 Introduction	229
9.2 Zooplankton of Rivers and Floodplain Shallow Lakes: Similarities and Differences	230
9.3 Factors Regulating Zooplankton Abundance and Seasonal Distribution in Floodplain Lakes	233
9.4 Flood Pulse, Physical Variables and Potamozooplankton Dynamics	236
9.5 Zooplankton of the Main Channel and the Contribution of High Reaches and the Floodplain	240
9.6 Connectivity and Species Richness	242
9.7 Conclusions	244
References	245
10 Benthic Invertebrates	
INÉS EZCURRA DE DRAGO, MERCEDES MARCHESI, AND LUCIANA MONTALTO	251
10.1 Introduction	251
10.2 Spatiotemporal Longitudinal Patterns	253
10.3 Spatiotemporal Lateral and Vertical Patterns	260
10.4 Temporary Marginal Wetlands	261
10.5 Floodplain Lakes	262
10.6 Vertical Dimension	264
10.7 Factors Influencing the Benthic Structure	265
10.8 Functional Feeding Groups and Food Webs	266
10.9 Bivalvia Invasive Species in Benthic Communities	268
10.10 Conclusions	269
References	271
11 Littoral Communities. Macrocrustaceans	
PABLO COLLINS, VERONICA WILLINER, AND FEDERICO GIRI	277
11.1 Introduction	277
11.2 Biological Features	279
11.3 Intra-Interspecific Population Interaction	282

11.4	Trophic Relationships of Freshwater Decapods	286
11.5	Reproduction in Freshwater Decapods	291
11.6	Abiotic Factors Influence in Decapods	294
11.7	Conclusions	295
	References	296
Part IV	Vertebrate Animal Life	303
12	Fishes	
	LILIANA ROSSI, ELLY CORDIVIOLA, AND MARÍA JULIETA PARMA	305
12.1	Introduction	305
12.2	Richness, Distribution and Abundance of Species	305
12.3	Migratory Displacements	310
12.4	Reproductive Strategies and Life Histories	312
12.5	Feeding Habits	314
12.6	Respiratory Metabolism	318
12.7	Conclusions	321
	References	321
13	Amphibians	
	PAOLA M. PELTZER AND RAFAEL C. LAJMANOVICH	327
13.1	Introduction	327
13.2	Amphibian Diversity and Natural History	328
13.3	Characterization of the Main Habitats that Provide Reproduction Sites or Refuges/Food	329
13.4	Final Remarks	338
	References	338
14	Reptiles	
	ALEJANDRO R. GIRAUDO, VANESA ARZAMENDIA, AND SOLEDAD M. LÓPEZ	341
14.1	Introduction	341
14.2	Species Richness and Ecological Traits	342
14.3	The Paraná River Floodplain as Biogeographical Corridor of Tropical Species	350
14.4	Influence of Flood Pulses and other Environmental Factors on the Reptile Community	351
14.5	Discussion and Conclusions	357
	References	360
15	Birds	
	ADOLFO H. BELTZER AND MARTIN A. QUIROGA	363
15.1	Introduction	363
15.2	Trophic Groups	364
15.3	Seasonal Dynamics	368
15.4	Reproductive Biology	370
	References	375
	Subject Index	379