

# Contents

<b>1</b>	<b>History and Evolution of the DMZ Ecosystem</b>	<b>1</b>
1.1	Overview of the Past, Present and Future of DMZ	1
1.1.1	The Past of DMZ	1
1.1.2	The Present of DMZ	2
1.1.3	The Future of DMZ	6
1.2	Environmental Description of DMZ	11
1.2.1	Introduction	11
1.2.2	Topography	11
1.2.3	Functions of DMZ Ecosystem	12
1.2.4	Ecosystem in the Western DMZ	12
1.2.5	Ecosystem in the Middle DMZ	13
1.2.6	Ecosystem in the Eastern DMZ	13
1.3	Land Use Change in the DMZ	14
1.3.1	Research Method of Land Use Change	14
1.3.2	Comparison of Land Use between 1918, the Present and the Expected Future	15
1.3.3	Past and Present of the Selected DMZ Sites Based on Old Maps (1918), Landsat Imagery and Photographs	16
1.4	Evolution of the Wetlands	22
1.5	Evolution of Fire Resistance	24
1.6	Twenty (20) Years of DMZ History in Photos	24
<b>2</b>	<b>Landscape Ecology of the DMZ Area</b>	<b>29</b>
2.1	Introduction	29
2.2	Landscape Ecological Approach	29
2.2.1	Landscape Ecology at Regional Scale	29
2.2.2	Bioregional Approach Model	32
2.3	The Application	34
2.3.1	Classification of DMZ Ecosystem	34
2.3.2	Pattern Classification of DMZ Based on Forman's Pattern Classification	37

2.3.3	Landscape Ecological Analysis Based on Landscape Physiognomy and Composition . . . . .	49
2.3.4	Landscape Ecological Analysis Based on Ecological Network (International Biosphere Belt (IBB)) . . . . .	51
<b>3</b>	<b>Staus and Ecological Resource Value of the DMZ Area . . . . .</b>	<b>55</b>
3.1	Background of Ecological Survey . . . . .	56
3.2	Ecological Survey Methods . . . . .	56
3.2.1	Site Description . . . . .	56
3.2.2	Consolidation of Field Survey Outcomes . . . . .	57
3.2.3	Value Assessment Methods . . . . .	57
3.3	Status of Habitats . . . . .	58
3.3.1	Status of Wetland Ecosystems . . . . .	58
3.3.2	Status of Forest Ecosystems . . . . .	60
3.3.3	Status of Grassland Ecosystems . . . . .	62
3.4	Status of Species in the DMZ and CCZ . . . . .	62
3.4.1	Assessing the Value of Ecological Resources of DMZ . . . . .	63
3.5	Summary . . . . .	70
<b>4</b>	<b>Habitats in the DMZ Area . . . . .</b>	<b>73</b>
4.1	Analyzing the Habitat . . . . .	73
4.1.1	The Concept of Habitat . . . . .	73
4.1.2	Significance of Habitat Investigation . . . . .	74
4.1.3	The Process of Analyzing the Habitat . . . . .	74
4.1.4	Habitat Classification . . . . .	74
4.1.5	Habitat Investigation by Type . . . . .	79
4.1.6	Relevant Information Collection . . . . .	80
4.1.7	Preliminary Determination . . . . .	80
4.1.8	Site Visitation . . . . .	81
4.1.9	Determination of Habitat . . . . .	81
4.1.10	Mapping Process of Habitat Types . . . . .	81
4.2	The Application . . . . .	82
4.2.1	Site Selection . . . . .	82
4.2.2	Analysis by Habitat Type . . . . .	83
4.2.3	Type, Function, and Value of wetlands in Photos of the DMZ . . . . .	134
<b>5</b>	<b>Species in the DMZ Area . . . . .</b>	<b>145</b>
5.1	Overview of Survey and Analysis Methods of Species . . . . .	145
5.1.1	The Flora and Vegetation Survey and Analysis . . . . .	145
5.1.2	Fauna Survey . . . . .	147

5.2	The Application . . . . .	160
5.2.1	Methods Used in Analyzing Data . . . . .	160
5.2.2	Tool Development . . . . .	161
5.2.3	Survey Results . . . . .	161
5.2.4	Total Species by Western-Central Area of the DMZ . . . . .	161
5.2.5	Detailed Description by Species . . . . .	190
<b>6</b>	<b>Biodiversity . . . . .</b>	<b>299</b>
6.1	Components of Biodiversity . . . . .	299
6.1.1	Classification of Biodiversity . . . . .	299
6.1.2	Landscape Biodiversity . . . . .	299
6.2	Biodiversity and Ecosystem Values . . . . .	299
6.2.1	DMZ Biodiversity as a Wildlife Habitat . . . . .	300
6.2.2	Historical Value . . . . .	301
6.2.3	Recreational Opportunities . . . . .	301
6.2.4	Education . . . . .	301
6.3	Biodiversity Strategy . . . . .	301
6.3.1	An International Tendency . . . . .	301
6.4	Cases . . . . .	303
6.4.1	Biodiversity Strategy in Cheorwon . . . . .	303
6.4.2	DMZ Biodiversity Hotspot . . . . .	310
<b>7</b>	<b>Wetland-Type Classification . . . . .</b>	<b>399</b>
7.1	The Need for Wetland-Type Classification . . . . .	399
7.2	How to Classify Wetland Types . . . . .	400
7.3	New Classification System: Summary of Wetland Types . . . .	404
7.3.1	Overall Study Process . . . . .	405
7.3.2	Detailed Methods of Each Phase . . . . .	405
7.4	Application for the DMZ: Overview of the Study Site Wetland Classification . . . . .	409
7.4.1	Overview of Study Site: The DMZ Paju Phanmun Area . . . . .	409
7.4.2	Wetland Identification . . . . .	411
7.4.3	Wetland Delineation . . . . .	411
7.4.4	Wetland Survey . . . . .	414
7.4.5	Pollutant Sources and Land Use Status . . . . .	416
7.4.6	Threatening Factors . . . . .	416
7.4.7	Wetland Classification . . . . .	416
7.5	Summary of Wetland Types . . . . .	419
7.5.1	General Wetlands . . . . .	422

<b>8</b>	<b>Biological Integrity: Assessing the Health of Wetland Ecosystems</b>	429
8.1	Concept and Objectives of Bio-assessment	429
8.2	Wetland Integrity Assessment Process	430
8.3	Methodology and Design for Assessing the Health of DMZ	430
8.4	Case Presentation	434
8.4.1	Site Selection	434
8.4.2	The Process	435
8.4.3	Results	435
<b>9</b>	<b>Threatening Factors in the DMZ Area</b>	445
9.1	Homo Sapiens, an Endangered Species	445
9.2	SWOT Analysis of the DMZ Ecosystem	446
9.2.1	Strengths	446
9.2.2	Weaknesses	446
9.2.3	Opportunities	447
9.2.4	Threats	447
9.3	Development Pressure	447
9.3.1	Threats by Farming and Fishing	449
9.3.2	Threats to Military Activities	450
9.3.3	Forest Fire and Natural Disaster	452
9.3.4	Use of River Levees	455
9.3.5	Streams Transformed into Muddy Water	458
9.3.6	Conversion of Wetlands into Farmlands	461
9.4	Disturbance of the Ecosystem	462
9.4.1	Invasion of Exotic Species	462
9.4.2	Disappearance of Indigenous Species	472
9.5	Environmental Pollution	474
9.5.1	Soil Contamination	474
9.5.2	Water Contamination	476
<b>10</b>	<b>Conservation and Management Strategies</b>	479
10.1	Land Use Strategies	479
10.1.1	Site Selection	479
10.1.2	Process	479
10.1.3	Application of UNESCO/MAB Model	480
10.1.4	Application of Nature Environmental Audit	481
10.1.5	Application of Bioregional Approach Model	487
10.1.6	Application of Land Suitability and Carrying Capacity	491
10.1.7	Total Assessment and Zonation	494

10.2	DMZ Ecotourism and Wetland Tour. . . . .	496
10.2.1	Site Selection. . . . .	496
10.2.2	Plan for Ecotourism Route. . . . .	497
10.2.3	Ecotourism Resources of DMZ . . . . .	498
10.2.4	Development of DMZ Ecotourism Program. . . . .	506
10.2.5	Planning for DMZ Ecotourism. . . . .	506
10.3	Ecological Restoration . . . . .	520
10.3.1	Construction of Replacement Wetlands. . . . .	521
10.3.2	The Replacement Wetland Created in DMZ and CCZ. . . . .	521
10.3.3	Eco-Bridge . . . . .	528
10.4	Trans-boundary Cooperation . . . . .	535
10.4.1	One Ecological Unit: Biodiversity Management and Restoration . . . . .	535
10.4.2	Operational Strategy to Develop the DMZ TBR. . . . .	541
10.4.3	A Proposed Joint Project for North and South Korea. . . . .	544
10.4.4	Implementation Plan . . . . .	546
10.4.5	A Strategy for Regional Cooperation for Northeast Asian Migratory Species Sustainability: A Proposal for Northeast Asian ECONET. . . . .	548
<b>References . . . . .</b>		<b>573</b>
<b>Index . . . . .</b>		<b>577</b>

<http://www.springer.com/978-3-642-38462-2>

The Demilitarized Zone (DMZ) of Korea  
Protection, Conservation and Restoration of a Unique  
Ecosystem

Kim, K.-G.

2013, XIX, 583 p. 846 illus., 774 illus. in color.,

Hardcover

ISBN: 978-3-642-38462-2