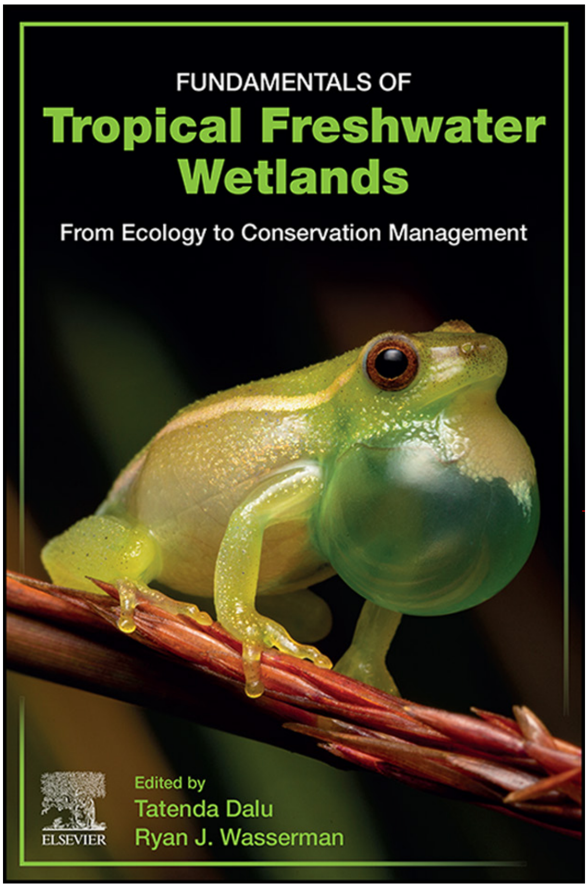

From Ryan J. Wasserman and Tatenda Dalu, Tropical freshwater wetlands: an introduction. In: Tatenda Dalu and Ryan J. Wasserman, editors, Fundamentals of Tropical Freshwater Wetlands. Chennai: Elsevier, 2022, pp. 1-22.
ISBN: 978-0-12-822362-8

Chapter 1

Tropical freshwater wetlands: an introduction

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Widely considered as among the most productive ecosystems on Earth, wetlands have been central for human societies throughout history. Forming as a result of a complex interplay between geomorphological, geological, and climatic conditions, wetlands are widespread and diverse environments. Wetlands are so diverse in form and function that the definition of the term "Wetland" needed to be broad enough to suitably encompass the many forms recognized as Wet Lands. To this end, wetlands are defined under the Convention on Wetlands (Ramsar and Iran, 1971) as: "*areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres*." which "*may incorporate riparian and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than six metres at low tide lying within the wetlands*".

While this definition is suitably inclusive and perhaps the most widely cited, it is a culmination of numerous discussions, often contentious, some of which are covered in the following articles (Elliott and McLusky, 2002; Ping et al., 1992; Semeniuk, 1987; Tiner 1999). According to Semeniuk and Semeniuk (2004), the consensus on wetlands is that they are "... *an area of land in which the period of waterlogging or inundation is sufficient to develop physical and chemical responses in the soil or sediment*" and that "*the presence of such pedogenic/diagenetically altered soils, together with an abundance of water during the normal growing season, should induce colonisation by recognisable communities of biota adapted to or tolerant of such conditions*".

Fundamentals of Tropical Freshwater Wetlands. DOI: https://doi.org/10.1016/B978-0-12-822362-8.00024-4

1.1 Wetlands importance

Wetlands are important features in many landscapes and are often among the most productive of ecosystems, providing many of the services that society depends on (Fig. 1.1), including habitat for a myriad of wildlife. Through the provision of billions of dollars of essential services every year, these environments also contribute to national and global economies (Barbier, 2011). These valuable wetland functions are the result of their unique natural characteristics. They provide great volumes of food in the form of particulate organic matter, microbes, and plants (phytoplankton, macrophytes) that attract and are used by many animal species for part of or all of their life cycle. Dead organic matter is readily broken down in the water to form small organic particles material which are enriched and are fed on by a large variety of aquatic invertebrates (zooplankton, aquatic insects) and vertebrates (juvenile fish) that are food for larger amphibians, birds, fish, reptiles, and mammals (including humans). The many biotic components are harvested for direct consumption, or as stock for enterprise, facilitating local and even nonlocal economies. Therefore wetland degradation and loss, which generally results in loss of biodiversity, also results in loss of associated ecosystem services, with economic implications (Fig. 1.1). Such degradation

BOX 1.1 Chobe River.

Wetlands have often been important/useful landmarks and boundaries for societies. Even today, wetlands such as rivers often form boundaries between countries. Here the Chobe River serves as the natural border between Botswana and Namibia in Southern Africa (Photo by Russell Brian Tate).

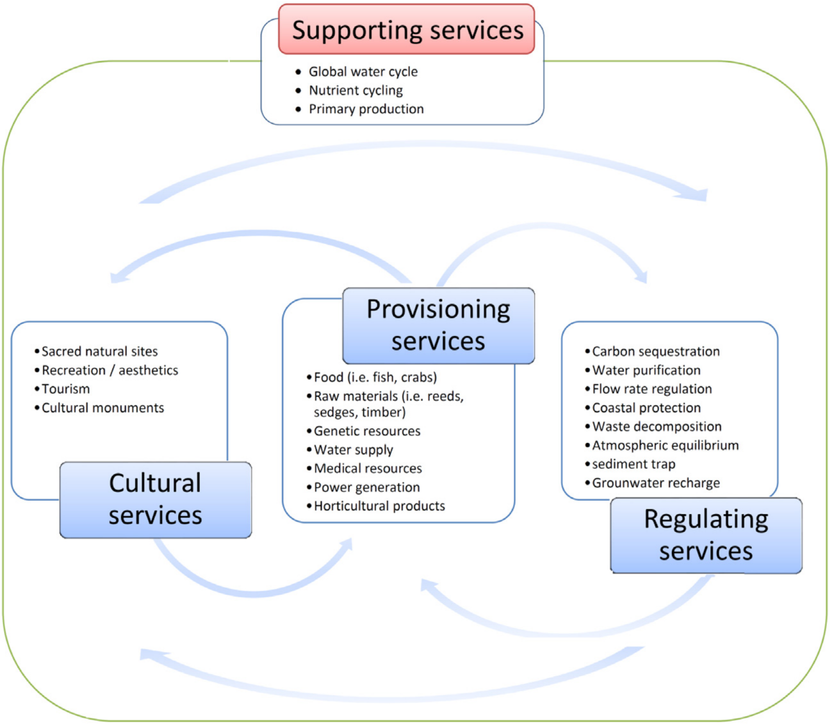

FIGURE 1.1 Ecosystem services provided by wetland ecosystems.

can even have implications for climate. Wetland microbes, plants, and wildlife form an integral part of global cycles for carbon, water, nitrogen, and sulfur, and we now know that atmospheric maintenance through moderation of climate conditions may be an additional function of wetlands (see Irvine et al., 2022, Chapter 19).

Individual wetland systems or types typically do not provide the full range of listed services. This is due to the fact that a particular wetland provides services which are determined by its characteristics and specific factors such as climate, geology, topography, and its size (Jogo and Hassan, 2010; Bassi et al., 2014). As such, prioritization of conservation and management of any one wetland/type can still lead to loss of services in nonprioritized habitats.

1.2 Wetland threats

Wetlands are dynamic and often complex ecosystems which provide a variety of beneficial services to humans and yet remain ecologically sensitive (Turner et al., 2000). Regardless of their sensitivity, wetlands are exploited and overexploitation has consequently led to degradation and loss of these ecosystems

(Skowno et al., 2019; Sievers et al., 2018). Most wetlands are under threat primarily from a variety of human activities (Gren et al., 1994; Dalu et al., 2017).

The remaining natural wetlands cover only a fraction of their original area and have been progressively declining around the world (Table 1.1) through drainage, road construction, agriculture, grazing, mining, de-vegetation, damming flow, dumping, dredging, and urban development, among others. Presently, these activities are particularly pervasive in the tropical areas, given economic development dynamics in these often low- and middle-income regions. Globally, approximately 87% of known inland wetland systems have been lost, with rates of loss having been greatest during the late 20th century (Joosten, 2010; Davidson, 2014). Major declines have also been observed in forested and tropical peatlands during this time (Joosten, 2010; Davidson, 2014). Artificial wetlands (i.e., artificial reservoirs' and rice paddies) have increased since the 1970s, but this is mostly due to conversion of natural wetlands

TABLE 1.1 Extent and area change of natural inland wetland classes.

Inland wetland	Wetland classes (million km^2)	Wetland subclasses[a] (million km^2)	Global area change (%)[b]
Peatlands	4.232		-0.97
Nonforested (bogs, mires, ferns)		3.118	+6.80
Forested		0.696	-25.32
Tropical		1.505	−28.00
Temperate and boreal		3.380	
Marshes and swamps in floodplain	2.530		
Tropical freshwater swamps		1.460	
Forested wetlands	1.170		

Light grey shading indicates no information available.
[a]*Different wetland subclasses are defined according to different criteria and do not necessarily add up to the total figure for the wetland class. The areas provided for temperate/boreal and tropical peatlands are not additive to those for nonforested and forested peatlands; rather, these are two different spatial disaggregations of all Peatlands.*
[b]*Year ranges for % area change vary between sources and wetland classes: peatlands, nonforested peatlands, forested peatlands 1990–2008, tropical peatlands 2007–15.*
Source: Modified from Davidson, N.C., Fluet-Chouinard, E., Finlayson, C.M., 2018. Global extent and distribution of wetlands: trends and issues. Marine and Freshwater Research, 69, 620–627, with permission from CSIRO Publishers.

(Davidson et al., 2018) and these homogenized environments are typically less biodiverse. For example, wetland conversion to rice–paddy fields is among the leading causes of current wetland loss in Asia, estimated at about 5000 km^2 per year (Gopal, 2013). The mounting pressures on wetlands in tropical regions of the world and the small fraction of protected wetlands call for urgent action.

Many populations of wetland dependent species are exhibiting long-term declines and are threatened with extinction based on recent assessments. The International Union for Conservation of Nature (IUCN) Red List highlighted that of the over 19,500 wetland dependent species globally, approximately 25% are threatened with extinction and about 25% and 6% of inland wetland dependent species are globally threatened and critically endangered, respectively, from over 18,000 taxa assessed (Collen et al., 2014; Ramsar Convention on Wetlands, 2018; Table 1.2). At a finer spatial scale, global threat levels of wetland dependent species vary greatly across different regions. Globally threatened freshwater taxa percentages vary between 20% and 37% across different biogeographic realms (i.e., areas with a broadly similar evolutionary history) (Collen et al., 2014), with the highest threats being recorded in the tropics (Boxes 1.3 and 1.4).

1.3 Sustainable use of the remaining wetlands

The sustainable use of wetlands and their management requires proper planning and taking into consideration of the circumstances of all affected parties (see Irvine et al., 2022, Chapter 19; Marambanyika et al., 2022, Chapter 22; Laltaika, 2022, Chapter 23). Thus further research on wetlands provides improved scientific understanding about these ecosystems and consequently helps inform improved management approaches (Ahmed, 2015). Additionally, the empowerment of all users, including landowners, through various programs and training, is crucial in planning the sustainable use of these wetlands. In turn, cooperation from all relevant stakeholders facilitates proper planning for the sustainable use of wetlands. Apart from the legislation, there are several existing programs, supported by both private and public institutions, which assist in safeguarding, rehabilitating, and restoring degraded wetlands. The majority of these programs insists on the sustainable management of wetlands, while also considering the livelihoods of surrounding communities.

Adamus and Stockwell (1983) suggested that scientists and managers dealing with wetlands should recognize three classes of wetland functions when preparing management plans, and these are:

1. hydrologic functions, such as the reduction of flood peak and groundwater recharge/exchange, shoreline, anchoring, and erosion control;
2. water quality improvement processes, which includes sediment accretion or nutrient uptake; and
3. wildlife habitat and food chain support.

BOX 1.2 Wetlands as a source of water supply and biodiversity, facilitating sustainable livelihoods.

Wetlands are a source of water supply and species diversity, fundamental to sustaining livelihoods. From top, left to right: water buffalo in Lake Kaliveli, India [Hamish Appleby, International Water Management Institute (IWMI)]; Mabamba Bay, Kenya (Photo by Kenneth Irvine); water crossing and transportation of cassava in Várzea floodplains, Mamirauá Sustainable Development Reserve, Central Amazônia (Photo by Jochen Schöngart); *Kingsleya* crabs in Várzea floodplains, Mamirauá Sustainable Development Reserve, Central Amazônia (Photo by Jochen Schöngart); cormorant *Nannopterum brasilianus* eating the red-bellied piranha *Pygocentrus nattereri* in Várzea floodplains, Mamirauá Sustainable Development Reserve, Central Amazônia (Photo by Jochen Schöngart); gardening in Sambandou wetlands, Vembe Biosphere Reserve, South Africa (adapted from Dalu and Chauke, 2020 under Creative Commons Attribution 4.0 International License); man with his harvest of *Lotus* flowers from a Sri Lankan wetland (Photo by Hamish Appleby, IWMI); fish market with fish being dried for sale in Kenya (Photo by Kenneth Irvine); women fishing in a wetland in Nepal (Photo by Andrew Reckers, IWMI).

Whereas, Stevens and Vanbianchi (1993) emphasized the development of a wetland inventory for proper management and suggested that this should mainly include data on the presence, extent, condition, characteristics, and functions of wetlands within a selected area. Such data would aid in documenting the wetland status in a given area and support

TABLE 1.2 Summary of the global threat status (IUCN Red List) of different wetland dependent taxa.

Wetland dependent taxon	Globally threatened (%)[a]	Critically endangered (%)
Lycopods and ferns[b]	36***	Unknown
Freshwater vascular plants[c]	17**	4*
Seagrasses	16**	0*
Mangroves	17**	3*
Corals	33***	1*
Nonmarine molluscs[c]	37***	10**
Crabs	32***	5*
Crayfish	32***	10**
Freshwater shrimp	28***	4*
Dragonflies	8*	1*
Fish		
Freshwater fish	29***	5*
Coral reef fish (parrotfish, surgeonfish only)	2*	0*
Amphibians	35***	9*
Reptiles		
Freshwater reptiles	40***	11**
Marine turtles	100***	33***
Waterbirds	18**	3*
Mammals	23**	3*
Wetland dependent megafauna (fish, reptiles, mammals >30 kg)	62***	27***

[a]*IUCN Red List status: Critically endangered, endangered, vulnerable.*
[b]*For Europe only.*
[c]*For some geographic regions only; global threatened colors: *** red > 25%, ** orange 10%–25%, and * green < 10% of the global threatened taxa.*
Source: Adapted from Ramsar Convention on Wetlands, 2018. Global Wetland Outlook: State of the World's Wetlands and Their Services to People. Ramsar Convention Secretariat. Gland, Switzerland.

decisions on more appropriate management approaches. However, Chuma et al. (2012) and Horwitz et al. (2012) suggested that in wetland management decisions, the human communities' connection with the wetlands also need to be taken into consideration and that the human community

BOX 1.3 Examples of wetland degradation from the (sub)tropical regions of the world.

Clockwise, from top right: wetland draining in Intunjambili Wetland, Matobo District, Zimbabwe (Photo by Thomas Marambanyika); rice farming in Pakistan (Photo by Faseeh Shams, IWMI); illegal artisanal mining, Taka forest, Chimanimani, Zimbabwe; fertilizer application to a rice farm in Nepal (Photo by Jim Holmes, IWMI); invasive nonnative water hyacinth *Eichihornia crassipes* and Kariba weed *Salvinia molesta* in Kenya (Photo by Kenneth Irvine); sand mining in Sambandou wetlands (sourced from Dalu and Chauke, 2020).

cannot be separated from the wetlands because of their dependency on services provided by these ecosystems for their well-being. They further suggested that wetland management processes should strive to understand the human communities' situation, hopes, and wishes, thereby sustaining their livelihoods.

1.4 Ramsar wetland classification

The Convention on Wetlands (http://www.ramsar.org) is "*...the intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources*." Also known as the Ramsar Convention, this collection of contracting parties has done much for the international recognition of wetland importance and protection. The mission of the International Convention on Wetlands is for "the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world." Under the Ramsar Convention, a classification system for wetland types was developed, providing a broad framework for wetland identification and management. Any collection of work on wetlands would not be complete without mention of this classification system. The "Ramsar Classification System for Wetland Type as approved by Recommendation 4.7 and amended by Resolution VI.5 of the Conference of the Contracting Parties" is discussed in the following sections.

1.4.1 Marine/coastal wetlands

A—Permanent shallow marine waters in most cases less than 6 m deep at low tide; includes sea bays and straits.
B—Marine subtidal aquatic beds; includes kelp beds, sea−grass beds, tropical marine meadows.
C—Coral reefs.
D—Rocky marine shores; includes rocky offshore islands, sea cliffs.
E—Sand, shingle, or pebble shores; includes sand bars, spits, and sandy islets; includes dune systems and humid dune slacks.
F—Estuarine waters; permanent water of estuaries and estuarine systems of deltas.
G—Intertidal mud, sand, or salt flats.
H—Intertidal marshes; includes salt marshes, salt meadows, saltings, raised salt marshes; includes tidal brackish and freshwater marshes.
I—Intertidal forested wetlands; includes mangrove swamps, nipah swamps, and tidal freshwater swamp forests.
J—Coastal brackish/saline lagoons; brackish to saline lagoons with at least one relatively narrow connection to the sea.
K—Coastal freshwater lagoons; includes freshwater delta lagoons.
Zk(a)—Karst and other subterranean hydrological systems, marine/coastal.

1.4.2 Inland wetlands

L—Permanent inland deltas.
M—Permanent rivers/streams/creeks; includes waterfalls.

N—Seasonal/intermittent/irregular rivers/streams/creeks.
O—Permanent freshwater lakes (over 8 ha); includes large oxbow lakes.
P—Seasonal/intermittent freshwater lakes (over 8 ha); includes floodplain lakes.
Q—Permanent saline/brackish/alkaline lakes.
R—Seasonal/intermittent saline/brackish/alkaline lakes and flats.
Sp—Permanent saline/brackish/alkaline marshes/pools.
Ss—Seasonal/intermittent saline/brackish/alkaline marshes/pools.
Tp—Permanent freshwater marshes/pools; ponds (below 8 ha), marshes, and swamps on inorganic soils; with emergent vegetation water-logged for at least most of the growing season.
Ts—Seasonal/intermittent freshwater marshes/pools on inorganic soils; includes sloughs, potholes, seasonally flooded meadows, sedge marshes.
U—Nonforested peatlands; includes shrub or open bogs, swamps, fens.
Va—Alpine wetlands; includes alpine meadows, temporary waters from snowmelt.
Vt—Tundra wetlands; includes tundra pools, temporary waters from snowmelt.
W—Shrub-dominated wetlands; shrub swamps, shrub-dominated freshwater marshes, shrub carr, alder thicket on inorganic soils.
Xf—Freshwater, tree-dominated wetlands; includes freshwater swamp forests, seasonally flooded forests, wooded swamps on inorganic soils.
Xp—Forested peatlands; peatswamp forests.
Y—Freshwater springs; oases.
Zg—Geothermal wetlands.
Zk(b)—Karst and other subterranean hydrological systems, inland.

1.4.3 Human-made wetlands

1—Aquaculture (e.g., fish/shrimp) ponds.
2—Ponds; includes farm ponds, stock ponds, small tanks; (generally below 8 ha).
3—Irrigated land; includes irrigation channels and rice fields.
4—Seasonally flooded agricultural land (including intensively managed or grazed wet meadow or pasture).
5—Salt exploitation sites; salt pans, salines, etc.
6—Water storage areas; reservoirs/barrages/dams/impoundments (generally over 8 ha).
7—Excavations; gravel/brick/clay pits; borrow pits, mining pools.
8—Wastewater treatment areas; sewage farms, settling ponds, oxidation basins, etc.
9—Canals and drainage channels, ditches.
Zk(c)—Karst and other subterranean hydrological systems, human-made.

This broad classification system highlights the diversity of wetland types, and considering that threats to these ecosystems are as diverse as the wetlands themselves, this gives some insight into why managing wetlands can be challenging. Not surprisingly, this diversity also presents some challenges when

BOX 1.4 Global assessment of inland wetland conservation status (Reis et al., 2017, with permission from CSIRO Publishing).

The total global inland seasonal wetlands cover approximately 6.1% of the Earth's land surface (excluding Antarctica), with 88.7% of these being unprotected. Among the 11.3% of the globally protected wetlands, 9.7% are within the IUCN categories I–VI, including 7.1% in the more strictly protected categories I–IV (i.e., areas of stricter protection) and 2.7% in the categories V–VI (i.e., areas that allow economic activities). The remaining 1.5% are designated as Ramsar sites (Table B1.4). It is important to note that inadequate consideration of the freshwater ecosystems ecological functioning when designing terrestrially focused protected areas could compromise the effectiveness of freshwater ecosystems conservation efforts and wetlands in particular (Pittock et al., 2015).

(*Continued*)

TABLE B1.4 Total wetland area summary highlighting the total wetland in protected areas (PA), and the percentage of wetland protection in each geographical unit.

Geographic unit	Total wetland area ($km^2 \times 10^6$)	Total wetland in PA ($km^2 \times 10^6$)	Total % of wetland protection	% of wetland protection per category of PA		
				IUCN I–IV	IUCN V–VI	Ramsar
South America	0.89	0.16	17.82	7.17	9.09	1.56
North America	2.46	0.30	12.24	9.30	0.09	2.00
Central America	0.04	0.01	20.30	14.87	2.82	2.62
Africa	0.74	0.09	12.88	6.18	3.35	3.35
Europe	0.75	0.11	14.93	7.87	4.63	2.42
Asia	4.11	0.33	8.01	5.03	2.26	0.72
Oceania	0.17	0.03	15.49	10.63	3.58	1.28

Source: Adapted from Reis, V., Hermoso, V., Hamilton, S.K., Ward, D., Fluet-Chouinard, E., Lehner, B., et al., 2017. A global assessment of inland wetland conservation status. Bioscience, 67, 523–533.

BOX 1.4 (Continued)

There is a strong association between wetland distribution within a particular landscape and human occupation, with the most significant threats to wetlands being associated with direct or indirect human use of these areas (Gibbs, 2011). Human pressure in wetlands varies widely among geographical units (Fig. B1.4). The low human influence for North America can be attributed to the large area of boreal and Arctic wetlands in Canada and Alaska (Reis et al., 2017).

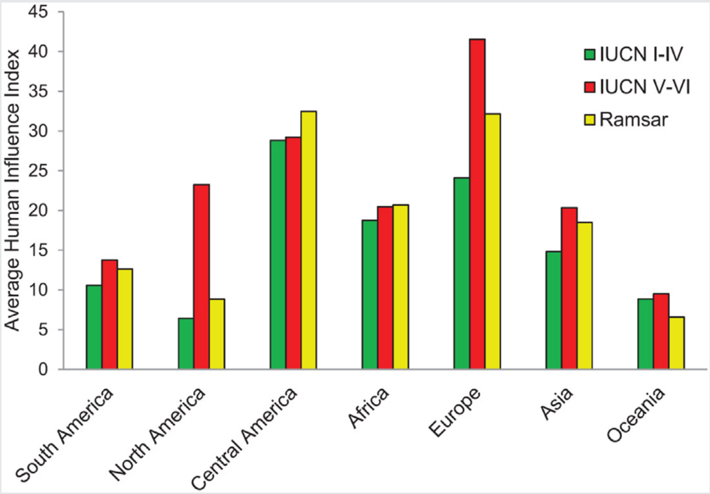

FIGURE B1.4 Human pressure in wetlands within different categories of protected areas, as is indicated by the average Human Influence Index (0, lowest; 100, highest human influence).

attempting to collate relevant information on wetlands, such as we have endeavored to do here. While not the first book on wetlands and likely not the last, *Fundamentals of Tropical Freshwater Wetlands* is among the first to focus exclusively on freshwater wetlands in tropical/subtropical regions (Box 1.5).

1.5 Book structure and content

During the conceptualization stage, the editors were eager to develop a book intended as a practical guide and important educational tool for researchers, managers, and students interested in tropical/subtropical wetlands. It was ultimately decided that the book would deal with natural freshwater wetlands typically found in tropical and subtropical regions. This meant that we needed to exclude marine/estuarine systems, lakes, reservoirs, and other man-made wetlands from the content. As it relates to the *Ramsar Classification System for Wetland Type* presented above, this meant that the book is largely focused on the *Inland Wetland* types. One of the main justifications for the exclusion of certain wetlands types was that there are already great collections of work that

BOX 1.5 Examples of (sub)tropical wetlands from around the world.

Clockwise, from top right: white-water flooded habitats (várzea) at the margin of the Solimões River, western Brazilian Amazonia (Photo by Leandro J.C.L. Moraes); a temporary wetland in the southeast of Zimbabwe, Southern Africa (Photo by Luc Brendonck); Reitboekvlei pan in Northern Kruger National Park, South Africa (Photo by Tatenda Dalu); Nwambi pan in Northern Kruger National Park, South Africa (Photo by Tatenda Dalu); a swamp wetland in a forest in Cameroon, West Africa (Photo by Russell Brian Tate); a swamp habitat from the Kota Damansara Community Forest, Malaysia (Photo by Cyren Wong Zhi Hoong).

deal with these systems, as are there excellent books dealing with wetlands in general, although focused mainly on temperate regions (e.g., Finlayson et al., 2018; Dennison and Berry, 1993; Wetzel, 2001; Finlayson et al., 2016; Perillo et al., 2018). Fig. 1.2 outlines the wetlands of the world, according to

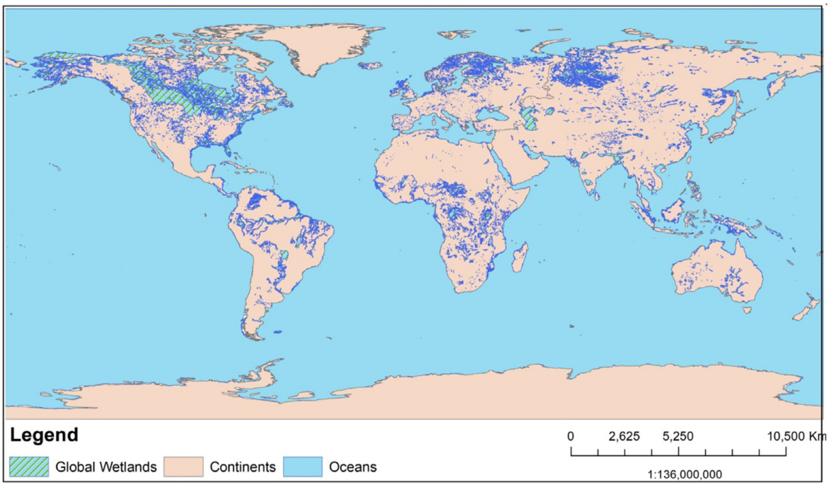

FIGURE 1.2 The Ramsar Wetland Systems of the world. Projection: WGS 84 and data used to create the map were sourced from UNESCO Intergovernmental Hydrological Programme.

the UNESCO Intergovernmental Hydrological Programme and from this figure it is clear that Northern Hemisphere, nontropical systems are well represented, and this is likely at least partly a result of more intensive research in these regions. Knowledge and data generation has been largely skewed toward high latitude wetland systems, particularly in the Northern Hemisphere. While much work has been directed toward wetlands in tropical environments, it is highly likely that as effort increases, the increased inclusion of tropical wetlands as areas of conservation concern will follow.

The next step involved determining the regions to be included as "tropical and subtropical", although this was not as straightforward as one may think. According to the Cambridge Dictionary, the word *Tropics* can be defined as "*the hottest area of the earth, the area on either side of the equator reaching to 23.5 degrees to the north and south*" while the word *Tropical* is defined as "*of or characteristic of the tropics (=the hottest area of the earth)*" (https://dictionary.cambridge.org/). These definitions explicitly place temperature centrally when categorizing "tropical" environments. The Köppen–Geiger climate classification system (see Fig. 1.3), on the other hand, incorporates both temperature and precipitation in its classification, separating the broad descriptors as Tropical, Arid, Temperate, Cold, and Polar climate types, with each further subcategorized (Peel et al., 2007). The updated Köppen–Geiger climate map relied on "*...observed data, rather than experience...*," in order to "*...minimise the number of subjective decisions*" wherever possible (Peel et al., 2007). The result is a complex, useful, and widely employed classification system in teaching and

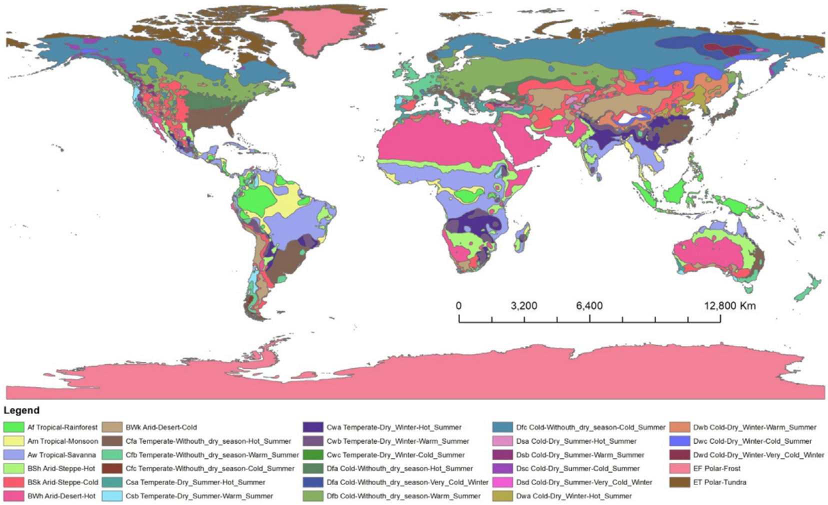

FIGURE 1.3 Modified Koppen–Geigher climate type map of the world. Projection: GCS Bessel 1841.

research. However, with regard to what is explicitly classified as "tropical" using this system, the criteria are that temperature of the coldest month is greater or equal to 18°C, with subcategories (Tropical Rainforest, Tropical Monsoon, and Tropical Savannah) including "*precipitation of the driest month*" and "*mean annual precipitation*." Although present in the original work by Köppen (Köppen 1884), from which the Köppen–Geiger climate classification system has been extensively modified, the "subtropical" designation no longer appears explicitly in the revised system. As such, the strict Köppen–Geiger classification of "tropical" was not followed for this book.

Another classic and widely used system worth mentioning is that of the life zone chart developed by Holdridge (1967) (Fig. 1.4). The three axes used for the barycentric division of the life zones in this chart are "*Precipitation*," "*Biotemperature*," and "*Potential Evapotranspiration*." The life zones are also overlain with the indicators "*Humidity Provinces*," "*Latitudinal Regions*," and "*Altitudinal Belts*." The system has been shown to be particularly reflective of tropical vegetation zones, Mediterranean zones, and boreal zones. This system does, however, still designate drier regions as "*Subtropical/Tropical*" if they fall within the lower latitudes. There are other such climate classification systems, many of which are covered in key reviews (e.g., Sanderson, 1999; Essenwanger, 2001). It is clear that large global patterns exist and that the development of categorization systems can be highly useful for teaching and research purposes. But as outlined in the philosophy behind

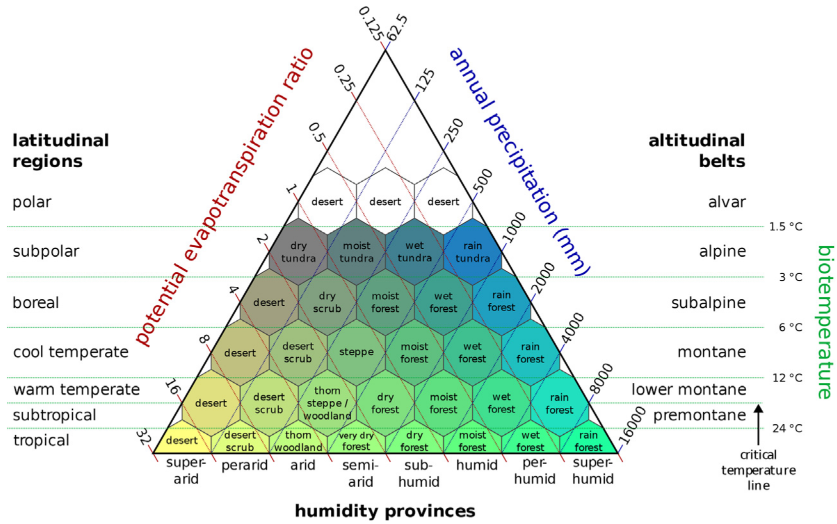

FIGURE 1.4 The modified life zone chart originally developed by Holdridge (1967). *Color image acquired from https://en.wikipedia.org/wiki/Holdridge_life_zones#/media/File:Lifezones_Pengo.svg. Created by Peter Halasz under CC BY–SA 2.5.*

the construction of the Köppen–Geiger climate map, data are key. As such, rather than insisting on the adoption of any one broad system of classification for areas deemed as "tropical" or "subtropical" for this book, we opted to allow the chapter authors freedom to explore topics within their own paradigms in this regard. As the denizens of data in their respective fields, we were confident that local case studies, general patterns, and gap identification across chapters would benefit from this less prescriptive approach.

This volume on *Fundamentals of Tropical Freshwater Wetlands* comprises a collection of 23 chapters, covering a range of relevant topics and authored by specialists working in tropical freshwater environments. While diverse and voluminous, the book is by no means comprehensive. Projects of this nature often involve compromise at various stages from conceptualization through to production, with this volume being no exception. The book does, however, provide considerable coverage of components typically regarded as important in wetland science and management, within the tropical context. As such, we trust the book will be well received by our target audience and hope that it inspires future work, potentially even addressing any gaps and biases associated with this volume. Following this introductory chapter, the book has been organized into three themed sections. The first section covers the abiotic processes theme for tropical wetlands (in order of appearance—Job and Sieben, 2022; Deemy et al., 2022a, b,c; Moyo, 2022). The second section deals with biota (in order of appearance—Piedade et al., 2022; Dalu et al., 2022; Brendonck et al., 2022a,b; Dube et al., 2022a,b; Reichard, 2022; Moraes et al., 2022; Tarakini et al., 2022; Vanhove et al., 2022) and biotic processes (in order of appearance—Pegg et al., 2022; Cuthbert et al., 2022; Gálvez et al., 2022). The final section is a compilation of chapters under the theme of monitoring, conservation, and management (in order of appearance—Irvine et al., 2022; Greenfield, 2022; Dube et al., 2022a,b; Marambanyika et al., 2022; Laltaika, 2022). Chapter content has been overviewed in the Preface section by Kenneth Irvine (Box 1.6).

BOX 1.6 Examples of charismatic fauna associated with (sub)tropical wetlands from around the world.

Clockwise, from top right: a male dragonfly (*Trithemis aurora*) from the Kota Damansara Community Forest, Malaysia (Photo by Cyren Wong Zhi Hoong); a white-lipped floodplain snake (*Lycodonomorphus obscuriventris*) from Banyani pan, Northern Kruger National Park, South Africa (Photo by Chad Keates); a tadpole shrimp *Triops granarius* from a temporary wetland in Save Conservancy, Zimbabwe (Photo by Luc Brendonck); a toad (*Rhinella margaritifera*) perched on herbaceous vegetation in the wetlands of the lower Juruá River, western Brazilian Amazonia (Photo by Leandro J.C.L. Moraes).

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