

# NATURE'S UNSUNG HEROES

Why Wetlands Matter



Protecting People and Planet

A report by the Environmental Justice Foundation





## INTRODUCTION

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Wetlands cover less than 6% of the Earth's terrestrial surface,<sup>1</sup> yet **40%** of animal and plant species depend on them,<sup>2</sup> **four billion** people rely on their ecosystem services<sup>3</sup> and they store up to **30%** of Earth's soil carbon.<sup>4</sup> Given their relatively limited size, wetlands play a disproportionately large role in supporting biodiversity, maintaining human health and stabilising our global climate. Despite this, the rate of wetland loss far outpaces other biomes, making them one of our planet's most threatened ecosystems.<sup>5</sup> We must ensure widespread wetland protection and science-based restoration to secure the future of these precious ecosystems.

Wetlands are defined as areas of land that are periodically or permanently covered by water. They can be found on coasts or inland and may be formed naturally or artificially. They include a variety of ecosystems including peatlands, coral reefs, mangroves, deltas and marshes.



## 1. What makes wetlands so important?

Wetlands are some of the most biodiverse and productive ecosystems on Earth. They provide fresh drinking water, protect communities from extreme weather events, regulate our increasingly unstable climate, and support rich and abundant species diversity. When wetlands thrive, so do we.

- **Over 100,000 species have been identified in wetlands**, with an additional 200 new species being discovered every year.<sup>6</sup>

- Wetlands are also home to a **high number of endemic species** - those that are not found anywhere else in the world, such as Lake Baikal in Russia where 65% of species are endemic<sup>7</sup>, or in Lake Malawi where nearly all of their cichlid fish species are solely found there.<sup>8</sup>

- Wetlands are **home to 30% of all known fish species**,<sup>9</sup> providing vital breeding grounds and nurseries.<sup>10</sup>

- Wetlands are essential for people too. **Four billion people rely on wetland ecosystem services**<sup>11</sup> which could account for more than 20% of the total global value of ecosystem services.<sup>12</sup>

- One assessment estimates the **global value of wetlands to be \$14.9 trillion**.<sup>13</sup>

- As many as **1 in 8 people make their livelihoods from wetlands** in ways that also deliver food, water supplies, transport and leisure.<sup>14</sup>

- Wetlands are also some of **our biggest allies in the fight against the climate crisis**, with healthy wetlands playing a powerful role in climate mitigation. They do this by sequestering and storing huge amounts of carbon. For example, peatlands occupy just under 3% of the Earth's terrestrial surface<sup>15</sup> but **store a staggering 25% of the Earth's soil carbon** (600Gt carbon).<sup>16</sup>

- Wetlands also purify contaminated water by removing a range of organic and inorganic substances - including heavy metals, pesticides and antibiotics.<sup>17</sup> This improves the quality of drinking water for countless communities.

- They also regulate groundwater and soil moisture levels. For example, in 2016, peatlands supplied over **25% of the UK's drinking water**, valued at £888 million.<sup>18</sup>

- Wetlands can help protect communities against extreme weather such as flooding and storms. Coastal wetlands alone are predicted to offer **\$447 billion worth of storm protection each year, saving 4,620 lives**.<sup>19</sup>

- Cultures, communities and traditions have been tied to wetlands for centuries. Over 90% of Ramsar Sites have cultural value and over 50% have spiritual value.<sup>20</sup>

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## 2. Wetlands under pressure

Wetlands are facing unprecedented degradation globally, with key threats including agriculture, urban development, oil and gas extraction, pollution and the destructive impacts of climate breakdown. Degraded wetlands cannot sequester carbon as efficiently, and some have even transformed into significant carbon emitters.

- **35% of natural wetlands were lost** between 1970 – 2015 alone.<sup>21</sup> Wetlands are disappearing at a rate three times faster than forests.<sup>22</sup>

- This seriously impacts the biodiversity that depends on wetlands. **Freshwater species are believed to have declined by 83%** globally, which has been majorly driven by habitat loss.<sup>23</sup>

- **Agriculture** is believed to be one of the biggest threats to wetlands. Half of all Ramsar Wetlands of International Importance have been damaged by agriculture.<sup>24</sup> For example, in the

Pantanal, over 40,000 hectares of native vegetation were converted to pasture between 2012 to 2021.<sup>25</sup> This conversion released around **4.6 million tonnes of CO<sub>2</sub>, equivalent to burning 10.6 million barrels of crude oil**.<sup>26</sup>

- Wetlands are at risk from **urban development**, which sees areas drained, paved over, encroached on and ultimately destroyed. Urbanisation has resulted in the loss of 58% of wetlands in the United States since 1950.<sup>27</sup>

- **Pollution** is also a major threat to wetlands, and to the biodiversity and people who rely on them for clean, safe drinking water. Fertilisers, agricultural runoff, oil spills and plastic pollution all impact wetlands. An estimated **54% of Ramsar Wetlands of International Importance are impacted by pollution**.<sup>28</sup>

- The inherently destructive infrastructure and development of **oil and gas** extraction is also a major cause of wetlands decline. For example,

oil and gas-related activities in the Mississippi Delta increased plant death leading to overall wetland decline,<sup>29</sup> whilst coastal wetlands along the Bohai Sea coast in China are vulnerable to frequent and serious at-sea oil spills.<sup>30</sup>

- **Climate breakdown** threatens to destroy wetlands. Extreme weather patterns, intense droughts, wildfires and floods all impact water levels and the flora and fauna in these ecosystems.<sup>31</sup> For example, in 2020, fires in the Argentinian Paraná Delta burned out of control, killing countless plants and animals. This was caused by human activity and exacerbated by climate breakdown.<sup>32</sup>

- The climate crisis also destabilises wetlands' carbon storage capabilities, which only exacerbates climate breakdown. As a result, it has been stressed that **at least 50% (25 million ha) of the currently degraded peatland area should be restored by 2030** to keep global heating to below 1.5-2.0C.<sup>33</sup>



### 3. Okavango: Oasis of life

Nestled within the otherwise arid Kalahari desert, the Okavango Delta is a cradle of life. This wetland, the largest inland delta in the world, provides an irreplaceable sanctuary for endangered wildlife and a critical source of water and livelihood for communities in the region. The Okavango Delta is located in north-west Botswana but is formed by the River Okavango, which originates in Angola, spans 1600 km, and is the fourth longest river in Southern Africa.<sup>34</sup> At the height of Botswana's dry season, the pristine watershed flows from the Angolan highlands, through Namibia and into the Okavango where it creates a mosaic of marshes, floodplains, peat bogs, islands and deep lagoons that stretches over two million hectares.<sup>35</sup> This mosaic of waterways is said to support one million people.<sup>36</sup>

The Okavango sustains some of the world's most iconic and endangered species.<sup>37</sup> As the Delta floods, cheetahs, African-painted dogs, giant ground pangolins, and critically endangered rhinos descend onto the waterways, along with the largest population of wild African savanna elephants in the world. Without this essential water source and the unique ecosystems it fosters, biodiversity and keystone species will face insurmountable pressure. In its entirety, the wetland habitats support abundant biodiversity, including 1061 plants, 89 fish, 64 reptiles, 482 birds and 130 mammals.<sup>38</sup>

The Okavango is also a significant carbon store, like other emblematic wetlands. By locking vast amounts of carbon away for centuries, the Delta plays a crucial role in regulating our global climate. However, this fragile ecosystem is under enormous pressure, posing an existential threat to the people and biodiversity it supports.

Like many critical wetlands, the Okavango Delta is not safe from degradation or exploitation, threatening wildlife and people. This unique and irreplaceable wetland is under unprecedented pressure from persistent drought, upstream water abstraction and diversion, land use change, wildlife poaching and ivory trade, and fossil fuel extraction.

Compounding these threats to the future of the delta, most recently, a Canadian company has been granted oil and gas scoping licences in Namibia and Botswana, presenting a severe threat to the Delta. Exploration and drilling activity bring inherently destructive infrastructure development, new roads, and land use change, which destroy key habitats for numerous species. The company's operations have the potential to wreak havoc on this fragile ecosystem, and to date, they have shown a flagrant disregard for the rights of those living in and around the Delta. This has included a lack of consultation with Indigenous and local communities<sup>39</sup>, coercing communities into giving their consent<sup>40</sup>, as well as illegally bulldozing virgin conservancy forests to create roads for drilling.<sup>41</sup>

Without concerted protection efforts as well as clear, ambitious policies to protect the Okavango Delta and its lifegiving tributaries, we stand to lose this stronghold of biodiversity and provider of livelihoods forever. The Okavango is representative of the irreplaceable ecological, climatic and biological value of wetlands, and showcases why these ecosystems need further protection.



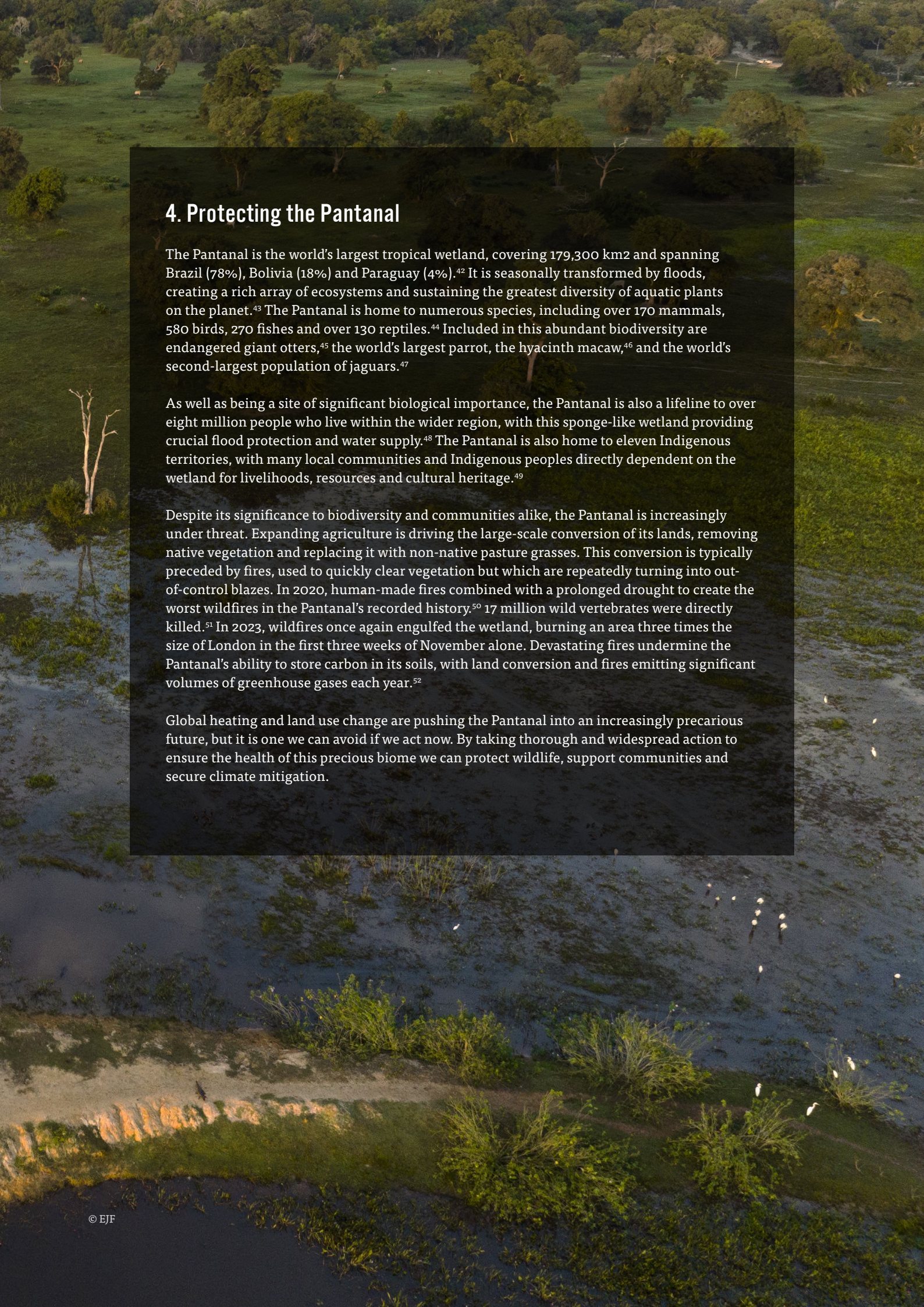


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An aerial photograph of the Pantanal wetland, showing a vast expanse of green grasslands and water. A dark, semi-transparent rectangular box is overlaid on the center of the image, containing white text. The background shows a mix of lush green vegetation and areas of water, with some trees and a small structure visible in the distance.

## 4. Protecting the Pantanal

The Pantanal is the world's largest tropical wetland, covering 179,300 km<sup>2</sup> and spanning Brazil (78%), Bolivia (18%) and Paraguay (4%).<sup>42</sup> It is seasonally transformed by floods, creating a rich array of ecosystems and sustaining the greatest diversity of aquatic plants on the planet.<sup>43</sup> The Pantanal is home to numerous species, including over 170 mammals, 580 birds, 270 fishes and over 130 reptiles.<sup>44</sup> Included in this abundant biodiversity are endangered giant otters,<sup>45</sup> the world's largest parrot, the hyacinth macaw,<sup>46</sup> and the world's second-largest population of jaguars.<sup>47</sup>

As well as being a site of significant biological importance, the Pantanal is also a lifeline to over eight million people who live within the wider region, with this sponge-like wetland providing crucial flood protection and water supply.<sup>48</sup> The Pantanal is also home to eleven Indigenous territories, with many local communities and Indigenous peoples directly dependent on the wetland for livelihoods, resources and cultural heritage.<sup>49</sup>

Despite its significance to biodiversity and communities alike, the Pantanal is increasingly under threat. Expanding agriculture is driving the large-scale conversion of its lands, removing native vegetation and replacing it with non-native pasture grasses. This conversion is typically preceded by fires, used to quickly clear vegetation but which are repeatedly turning into out-of-control blazes. In 2020, human-made fires combined with a prolonged drought to create the worst wildfires in the Pantanal's recorded history.<sup>50</sup> 17 million wild vertebrates were directly killed.<sup>51</sup> In 2023, wildfires once again engulfed the wetland, burning an area three times the size of London in the first three weeks of November alone. Devastating fires undermine the Pantanal's ability to store carbon in its soils, with land conversion and fires emitting significant volumes of greenhouse gases each year.<sup>52</sup>

Global heating and land use change are pushing the Pantanal into an increasingly precarious future, but it is one we can avoid if we act now. By taking thorough and widespread action to ensure the health of this precious biome we can protect wildlife, support communities and secure climate mitigation.





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## 4. Sundarbans: Safeguarding species

Located in Bangladesh, the Sundarbans are the world's biggest mangrove forest stretching 9,630 km<sup>2</sup>.<sup>53</sup> This vibrant biosphere lies on the delta of the Ganges, Brahmaputra and Meghna rivers in the Bay of Bengal. The wetlands are home to extraordinary biodiversity, including marine, terrestrial and aquatic species. Most notably, the Sundarbans are a haven for the highly endangered Bengal tiger; in fact, it is the only mangrove-dwelling population of the species found anywhere in the world.<sup>54</sup> The wetlands are also home to iconic species such as the Ganges River Dolphin, Irrawaddy Dolphin, the Indian Python and the Estuarine Crocodile.<sup>55</sup> According to UNESCO, 260 bird, 49 mammals, 59 reptiles, 8 amphibians, 210 white fishes, 24 shrimps, 14 crabs and 43 mollusc species reside in the Sundarbans.<sup>56</sup>

In addition to being highly biodiverse, the Sundarbans area is also home to four million people whose lives are intertwined with the delta and wetlands. There are 102 islands in the Sundarbans Delta, on 48 of which people live and engage in fishing, agriculture and wood and honey harvesting.<sup>57</sup>

The Sundarbans mangroves are also highly efficient at sequestering carbon. Mangroves are among the most carbon-rich biomes,<sup>58</sup> and have the highest area rates of sequestration compared with any other ecosystem, marine or terrestrial.<sup>59</sup> Scientists estimate that the Sundarbans wetlands sequester 2.79 Tg of carbon annually<sup>60</sup>, which is the same amount of carbon emitted from burning nearly 24 million barrels of oil.<sup>61</sup>

Despite being protected as a Ramsar site of International Importance and a World Heritage Site, the Sundarbans are severely degraded by deforestation, wildlife poaching, overexploitation of natural resources, habitat fragmentation and water pollution.<sup>62</sup> Scientists have predicted that over the past 30 years, carbon stocks and ecosystem services provided by the Sundarbans have been significantly diminished. They calculated that there has been a loss of USD\$3.3 billion worth of ecosystem services in this time.<sup>63</sup>

Although mangroves are known for their adaptability, they are extremely sensitive to changes in salinity. The Sundarbans sit only 1m above sea level on average, meaning the mangroves are highly susceptible to flooding, rising sea levels and erosion.<sup>64</sup>

As climate change causes sea levels to rise and mangroves get progressively more saline, changes to water quality will significantly affect the lives and livelihoods of poorer households.<sup>65</sup> Shortages in potable water will disproportionately impact women, who are mostly responsible for gathering water. As water gets more saline, freshwater fish will also be impacted leading to malnutrition and food instability for the communities that rely on these species for food. This will be catastrophic for populations around the Sundarbans as chronic and acute malnutrition levels are already higher than the World Health Organization's thresholds for public health emergencies.<sup>66</sup>

In addition, in December 2022, the government inaugurated one of the two units of the controversial 1,320-megawatt Rampal coal-fired power plant in Bagerhat district, near the Sundarbans mangrove forest.<sup>67</sup> Environmental Impact Assessments of the physical, biological, social and economic environment of the study areas indicated that most of the impacts of the coal-fired power plant will be negative and irreversible, pushing this already threatened wetland into further precarity.<sup>68</sup>

If mangroves are disturbed, the released carbon emissions are potentially catastrophic<sup>69</sup>; people lose livelihoods, food and water; and precious biodiversity such as the rapidly disappearing Bengal Tiger are pushed closer to the brink of extinction. Like wetlands globally, the Sundarbans need further protection from degradation before it is too late.





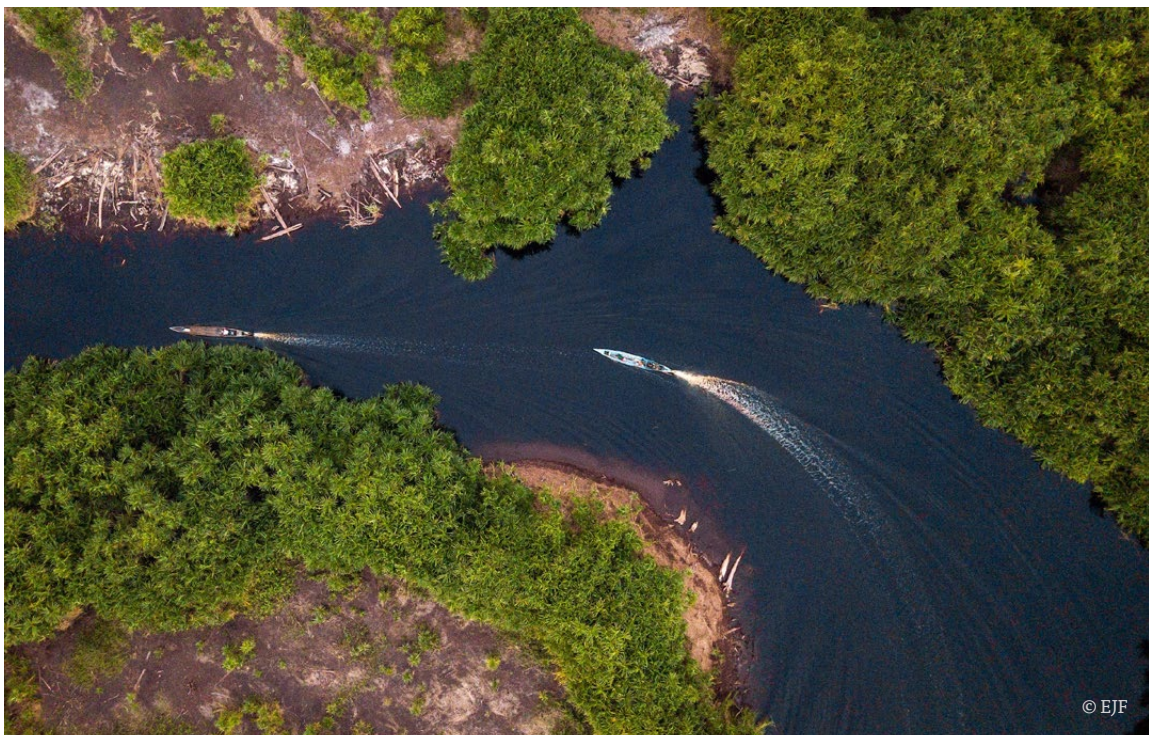


## 5. Recommendations

By protecting wetlands, we are protecting the people and biodiversity that depend on them. Without wetlands, we will face an even more unstable climate, billions of people will lose access to clean water, livelihoods and cultural practices, and the already catastrophic biodiversity crisis will worsen. We must act now to protect these environments. The following recommendations are essential steps needed to ensure we restore already damaged wetlands and safeguard wetlands from further catastrophic degradation.

### We call on policymakers, politicians and governments to:

1. Strengthen plans for wetland protection and restoration in National Biodiversity Strategies and Actions Plans (NBSAPs).
2. Include enhanced wetland restoration and protection in Nationally Determined Contributions (NDCs).
3. Ensure Indigenous peoples and local communities are meaningfully involved in wetland management.
4. Incorporate wetland protection and restoration in policies concerning improving human health.
5. Develop sustainable agriculture on and around wetland areas that does not affect the functioning of global wetlands.
6. Include wetland protection mechanisms in spatial planning and development.



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## Annex - Types of wetlands

Wetlands are found in every area of the world, including Antarctica. Many forms of wetlands are produced through different processes, meaning they support a huge variety of biodiversity.

### Peatlands

Peatlands are made up of water-logged peat soils that have built up over extended time periods. Peat is made up of partially decayed plant matter which is prevented from fully decomposing by low-oxygen conditions in water; this makes it particularly rich in carbon.

### Fens

Fens are a type of peatland fed by groundwater or surface water. This makes them nutrient-rich and able to support a variety of biodiversity.<sup>70</sup> The chemistry of the groundwater is determined largely by the geology of the rock, which in turn hugely impacts the characteristics of the fen, leading to many unique areas of biodiversity across the spectrum of fens.<sup>71</sup> Conversion to agricultural lands is the key threat to fens, where they can be drained for crop production, haymaking and grazing.<sup>72</sup>

### Bogs

Bogs are a type of peatland fed by rainwater. This makes them nutrient-poor and acidic, resulting in specially adapted biodiversity such as sphagnum moss that can survive in low nutrient availability.<sup>73</sup> They are widely recognised as significant habitats for biodiversity, including mammals like caribou, beavers and moose; Ireland's only known reptile, the viviparous lizard, calls bogland home.<sup>74</sup> Bogs are increasingly under threat from extreme weather caused by global heating, as well as burning and grazing management, and are extremely difficult to recover once lost owing to their development over thousands of years.<sup>75,76</sup>

### Deltas

Deltas occur when a river reaches another body of water, such as an ocean or lake. Here, the water in the river slows and deposits sediment, forming new land.<sup>77</sup> Deltas play a vital role in the human geography of regions, often becoming centres of trade and commerce, for example, the Pearl River Delta upon which Hong Kong and Macau sit, as well as Bangladesh on the Ganges–Brahmaputra Delta.<sup>78</sup> Although deltas are essential to absorbing flood and storm runoff, water filtration and limiting pollution further upstream, extensive river management undertaken by governments is rapidly shrinking delta wetlands, endangering vulnerable and threatened species.<sup>79</sup>

### Salt marshes

Saltmarshes are coastal wetlands that are flooded and drained by the movement of the tide. The earth here is made up of peat and mud, and are mostly found in low-lying lands in temperate climates, protecting shorelines from erosion by trapping sediment and buffering waves.<sup>80</sup> Like deltas, salt marshes also play a key role in absorbing flood and storm runoff, filtering water and metabolising excess nutrients.<sup>81</sup> In the US, salt marshes provide habitats and essential food for over 75% of fisheries species.<sup>82</sup>

### Mangroves

Mangroves replace salt marshes in the tropics and subtropics. Unlike salt marshes that have lower-growing plants, mangroves are dominated by salt-tolerant trees. Mangrove trees are specially adapted to survive in salty and often waterlogged conditions, including efficient filtration systems, salt excretion mechanisms and roots that protrude from the ground to maximise oxygen exposure and carbon sequestration.<sup>83</sup> In addition to mitigating storm damage, flood and coastal erosion, mangroves are home to fish, shellfish and other food sources, driving livelihood opportunities for local communities through ecotourism and fisheries.<sup>84</sup>

### Coral reefs

Coral reefs are found in tropical and subtropical regions and are an ecosystem created by coral polyps which over generations form reef structures through the excretion of calcium carbonate.<sup>85</sup> Over half a billion people are dependent on coral reefs for income, food, and coastal protection, by reducing wave action by up to 97%.<sup>86</sup> Coral reefs are worth an estimated £6 trillion per year, as well as contributing to the fishing and tourism sectors. The Great Barrier Reef alone contains over 400 coral species, 1,500 fish species, 4,000 mollusc species and six of the world's seven sea turtle species.<sup>87</sup> A key indicator in global ecosystem health, coral reefs deliver early warning signs of the devastating impact of global heating, with half of the world's coral lost to bleaching in the last 30 years, highlighting the importance of conservation.<sup>88</sup>







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