PROTECT NATURE

S R I L A N K A

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Cover page: Sri Lanka Grey Hornbill - *Ocyceros gingalensis* (Shaw, 1811)

Captured at Talwatta, Kandy, Sri Lanka

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ZOOLOGISTS' ASSOCIATION OF UNIVERSITY OF PERADENIYA

UNIVERSITY OF PERADENIYA

SRI LANKA

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EDITOR'S NOTE

Dear Readers,

Welcome to the third volume of 'Protect Nature Sri Lanka', a celebration of the extraordinary beauty and diversity of our natural world by Zoologists' Association of University of Peradeniya. As we embark on this annual journey, we are reminded of the intricate connections between all living beings and the natural environment, and the importance of preserving these delicate ecosystems.

The urgent need to protect our environment is underscored in the present world. From the accelerating impacts of climate change to the alarming rates of species extinction, the challenges we face are immense. However, within these challenges lie opportunities for change and resilience. Our magazine is dedicated to exploring these opportunities while showcasing the incredible biodiversity struggling to survive in the face of numerous anthropogenic hazards. The objective of the magazine is to provide a platform for students and nature enthusiasts to showcase their nature-related creations and experiences, while increasing public awareness regarding the environment.

I hereby express my sincere gratitude to the Patron of ZAUP and the Head of the Department of Zoology, Faculty of Science, University of Peradeniya, Prof. Suyama Boyagoda for her gentle leadership. I am grateful to Dr. Chaminda Wijesundara, the Senior Treasurer of ZAUP, for his kind guidance. I sincerely thank our reviewers, Dr. Gajaba Ellepola, Ms. Chathurika Munasinghe and Dr. Nuwandi Pathirana for their great service. Moreover, I am thankful to all the staff members of the Department of Zoology, Faculty of Science, University of Peradeniya, and the members of ZAUP for their continuous support.

As always, I am grateful for the contributions of our writers, photographers, and researchers who bring nature's stories to life. Their passion and knowledge are the heart of this magazine, and we hope their work inspires you as much as it does us.

Thank you for being a part of our community of nature lovers. Together, we can appreciate, protect, and celebrate the wonders of our natural world.

Warm regards!

Nirmal Rathnasiri
Editor
Zoologists' Association of University of Peradeniya

UNIVERSITY OF PERADENIYA – THE GARDEN UNIVERSITY OF SRI LANKA

Sahiya Nasar

Faculty of Science, University of Peradeniya

Review Article

MANGROVE ECOSYSTEM OF NORTHERN PROVINCE, SRI LANKA: DISTRIBUTION, STATUS, THREATS AND CONSERVATION REQUIREMENTS

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Abstract

Mangrove ecosystem is one of the most productive biological hotspots on earth, which is under tremendous pressure due to overexploitation for traditional uses by growing human populations, natural degradation, tourism, coastal aquaculture, agriculture and land reclamation. Mangrove biodiversity and conservation has received significant importance in the recent past as research has increased the understanding of values, functions and attributes of mangrove ecosystems and the role they play in providing important ecological services and livelihoods for the mangrove associated communities. Consolidation of data pertaining to the extent and diversity of mangroves is a pre-requisite for the selection of any strategy for the conservation of existing or the introduction of newer cultivations. This review intends to identify the research gaps and provides a summarized account on mangroves of Sri Lanka, mangroves in Northern Province and identify their distribution, status, threats, and conservation. We also highlight the importance of implementating inclusive and coordinated approaches involving stakeholders from different backgrounds e.g. governmental and non-governmental organizations, and academia in mangrove restoration and sustainable mangrove management in the northern province of Sri Lanka.

Keywords: Mangrove ecosystem, Northern province, Ecosystem services, Threats, Sustainable management

Introduction

Mangroves are considered as one of the most productive and biologically important natural ecosystems in the world (Zvonareva *et al*., 2015). These unique intertidal, halophytic plants show remarkable adaptations to survive in saline, extreme tides, strong winds, high temperatures, muddy and anaerobic soils (Priyashantha and Taufikurahman, 2020). They may be either shrubs or small trees and primarily marginalize the intertidal zone along with sheltered coastal, estuarine and riverine areas in tropical and subtropical latitudes, and they also occur in coastal lagoons and the supralittoral zone. While occupying a margin between land and sea, mangrove swamps attract faunal components from adjoining terrestrial and aquatic ecosystems in addition to the species that have taken advantage of living in mangrove swamps permanently (Ranawana, 2017).

Mangrove forests are unique and functional ecosystems having much social, economic and biological importance. They provide important ecosystem supplies and services to human society as well as coastal and marine systems (Bouillon, 2003; FAO, 2007; Pillai and Harilal, 2018), such as essential food and fuel services, nesting, breeding, nursery and feeding grounds for aquatic fauna, coastal protection (against pollution, Tsunami, and storms), sequesters carbon and other sediments (Alongi, 2012), pollution abatement, recreation (Prasanna *et al*., 2019), as well as climate change mitigation and primary production (Arulnayagam, 2020).

Recent reports on the distribution of mangroves reveal that they are found in 123 countries globally (Mukherjee *et al*. 2014), covering an extent of about 152,000 km^2 of the global area (Nabeelah Bibi *et al*. 2019) and represents about 0.12% of the Earth's terrestrial surface (Moity *et al*. 2019). As reported by Hrudayanath *et al.*, (2016), about 84 mangrove species belonging to 24 genera and 16 families, have been identified in the world, out of which 11 species of mangroves have been categorized as threatened species by the IUCN (International Union for Conservation of Nature) (Saddhe *et al.*, 2016; Priyashantha and Taufikurahman, 2020).

Status of Mangroves in Sri Lanka

Sri Lanka is a tropical island located in the Indian Ocean toward the southeast of India, between latitudes 5°55′ - 9°51′ North and longitudes 79°41′ - 81°54′ East. Being an island nation, Sri Lanka is enriched with wide array of coastal ecosystems, such as mangroves, coral reefs, salt marshes, and seagrasses since it covers a total brackish water area of about 158,016 ha (Prasanna *et al.*, 2019). In Sri Lanka mangroves mainly occur in five provinces; Western, North Western, Northern, Eastern and Southern. Sri Lankan mangroves are unique, yet they are not distributed evenly throughout the island. As the tidal amplitude can be as low as 75 cm (Ranawana, 2017; Karunathilake, 2020), mangrove distribution tends to exhibit a narrow spread and seldom found as isolated forest patches (Ellepola, 2015; Arulnayagam, 2020; Veettil *et al*., 2023).

According to Ranawana (2017), about 160.12 km^2 of mangrove forests can be found in the island, and distributed mainly in Jaffna, Batticaloa, Kalpitiya, Rekawa and Trincomalee and is composed of 21 species of true mangroves and 24 species of mangrove associates (De Silva and Amarasinghe, 2021). Extensive mangrove patches can be found in the northwestern and northeastern coastlines. The largest patch is associated with Puttlam-Kalpitiya lagoon (Giri *et al*., 2015) While the second-largest is located in Jaffna peninsula. Mangrove forests in Trincomalee (2395 ha) and Batticaloa (2071 ha) are holding third place in this list. Lower population in eastern and the northwest part of Sri Lanka could be one of the reasons to have a higher area of mangrove forests (Priyashantha and Taufikurahman, 2020). Most of the mangrove forest areas in the island have been subjected to human interference and therefore, undisturbed mangrove forests are rarely found (Gunawardena *et al*., 2016; Priyashantha and Taufikurahman, 2020). Dominant mangrove genera in Sri Lanka include *Rhizophora*, *Avicennia*, *Bruguiera* a nd *Sonneratia* (Ratnayake, 2012**;** Ranawana, 2017). Flora and fauna associated with Sri Lankan mangrove ecosystems are highly diverse (Karunathilake, 2003; Fernando *et al*., 2022; Veettil *et al*., 2023)

Mangroves in Northern Province

Of the total mangrove areas available, more than 40% is located in Northern districts (Fig. 1). *Excoecaria agallocha*, *Lumnitzera racemosa* and *Avicennia marina* are the most frequently found species in Northern Province, including Jaffna, Mullaithivu, Kilinochchi and Mannar districts (Alawathugoda *et al*., 2018), while, *Rhizophora mucronata* (Rajkumar *et al*., 2019)*, Ceriops tagal, Bruguiera cylindrica, Pemphis acidula* (Gnaneswaran, 2017), *Acanthus ilicifolius, Avicenia officinalis, Ceriops roxburghiana, Clerodendron inerme, Derris scandens, Derris trifoliata* and *Heritiera littoralis* are also recorded in the Jaffna district (Jeyarani and Suganya, 2022). *Bruguiera cylindrica* shows a much-restricted distribution (Packiyanathan & Wijesundara, 2016), whereas *Avicennia marina* shows dominant distribution

especially in southern and western coastal lines of Jaffna (Rajkumar *et al*., 2019).

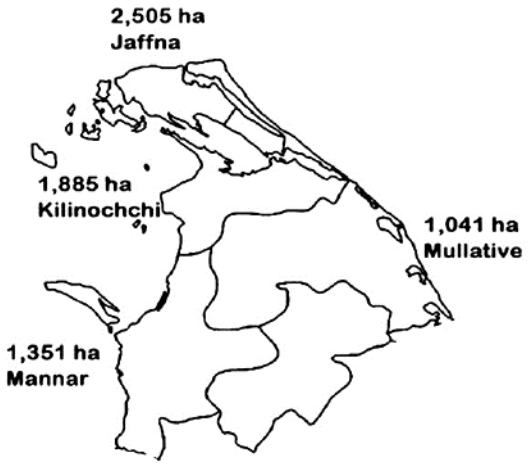

Fig 1: Distribution of mangroves in Northern Province

(© Edirisinghe *et al*., 2012; Ranawana, 2017)

The largest undisturbed mangrove forests in Northern province are found in Jaffna Peninsula (Fig. 2). It covers a shoreline of 403 km and comprises 17 lagoons that cover nearly 804 km^2 (Katupotha, 2016). Mangrove ecosystems in Jaffna are distributed in small, uneven patches and comprises of mangrove patches of about 25.05km^2 (2,505 ha) covering areas of Thondamanaru, Chundikulam and Jaffna lagoon. The Northern part of the island tends to be hot and dry in the dry season (February to September) and moderately cool and moist in the wet season (October to January). The area experiences an average temperature of about 28°C to 30°C all around the year and an annual rainfall of less than 1,250 mm where relative humidity fluctuates from 70% during the day to 90% at night (Katupotha, 2016). Due to these reasons, mangrove diversity is not that rich as in the other parts of the island, but they have a wider distribution throughout the province. Despite the climatic conditions, the freshwater influx is low making the brackish water in certain areas to be highly saline (Arulnayagam, 2020).

Fig 2: Distribution of mangroves in Jaffna Peninsula (© Gnaneswaran, 2017)

Ellepola *et al*. (2018) had reported that seven true mangrove species viz*., Avicennia marina, Excoecaria agallocha, Lumnitzera racemosa, Raizophora mucronata, Aegiceras corniculatum, Avicennia officinalis L*. and *Heritiera littoralis* are associated with Nayaru lagoon, Mullaithivu. Furthermore, they found that *Avicennia maraina* (relative density 60.6%) as the most dominant species and *Aegiceras corniculatum*, *Avicennia officinalis* and *Heritiera littoralis* as the least abundant species. In addition, *Cynometra iripa Kostel* was found to be a rare mangrove associate (Priyashantha and Taufikurahman, 2020). Most of the mangrove sites in Northern Province exhibited high density of saplings (trees less than 10 cm dbh), while tree (larger than 10 cm dbh) density was quite low. In Jaffna and Kilinochchi, a large proportion of Basal Area (BA/ha) is coming from sapling category, while in the sites in Mullaithivu, tree category was more prominent to contribute to Basal Area. Above ground biomass of these forests were quite low compared to mangrove vegetation in other parts of the country (Deepani *et al.,* 2018).

Fig 3: The mangrove distribution at Sangupiddy, Kilinochchi, the northern coast of Sri Lanka (© Arulnayagam, 2020).

Fig 4: Mangrove distribution at Vidattaltivu coast, Kilinochchi, the northern coast of Sri Lanka (© Courtesy WNPS).

Utilization of mangroves and its product in Northern Province

Mangroves are well recognized owing to its unique ecological functions, services and socio-economic values. Mangroves utilization in the island may be a traditional practice of the nation and poverty of the local people may be a reason for them to use these mangroves. Locals mainly utilized the mangrove areas to capture fish, crabs, shrimps and bivalves and selling those for small markets and as well for household consumption. In addition, mangroves are directly utilized by the locals in many different ways. Leaves of *Avicennia* spp. are used by the locals as agricultural manure, while stem is used as firewood and wood is used for house construction. Branches of *Avicennia* spp. are used for Brush pile traditional fishing. Prop roots from mangrove species such as *Rhizophora* spp. are used as fuelwood. Some mangrove species are cut down by the locals to obtain sticks for brooms and sweepers, making fish traps, fishing rods, stilt making, poles for fences and posts. Tender leaves of *Avicennia marina* are used as a vegetable. *Clerodendrum inerme* branches are specially used as firewood, while, *Ceriops tagal* is also used as firewood. In addition, bark of the stem is utilized in

several ways such as to prepare tannin, while bark decoction is used to stop hemorrhage, as an adhesive for fishing net protection, batik and mat making. In addition to *Ceriops tagal*, barks of *Bruguiera* spp. are used to extract tannin, which is important to dye cotton fish nets and sails of boats and ships (Gnaneswaran, 2017; Priyashantha and Taufikurahman, 2020).

Threats on Northern Province mangrove ecosystem

Mangrove ecosystems had been damaged due to the various tremendous pressures, mainly by three-decade long civil war and anthropogenic activities. Mangroves are probably the most misused resource in coastal ecosystems (Ranawana, 2017), as they are being used as garbage dumping sites. Use of mangrove areas for garbage disposal indicates how poorly island people look into this valuable ecosystem (Dayalatha and Ali, 2018). Apart from being used as garbage disposal sites, mangroves are also destroyed due to development of internal cross roads; eg. Chavakchcheri-Puloli main road has been constructed through the Sarasalai mangrove habitat (Aloysius et al., 2023), development of carpeted inner roads without any consideration about the water pathways in the lagoons, blocking water movement or stopped sea water inundation by construction of barrages, reduced number of culverts, encroachment of land for agriculture, activities to implement irrigation developments, cutting mangroves for firewood, Invasive Alien Species (IAS), disasters due to floods, tourism and coastal aquaculture (Gnaneswaran, 2017; Aloysius *et al.,* 2023).

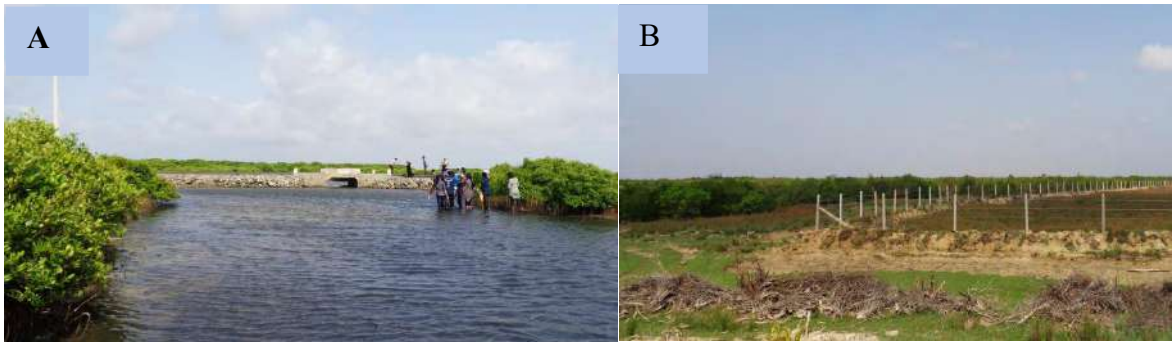

Fig 5: (A): Road built across a mangrove ecosystem, Mandaitivu; (B): mangroves clear cut for coconut cultivation, Sarasalai, Jaffna (© Raji Gnaneswaran, 2017)

Fig 6: Threats to the Sarasalai mangrove reserve. (**A**) Dumping of garbage; (**B**) Cleared mangrove *Lumnitzera racemosa* (©Aloysius, Madhushanka, and Chandrika, 2023)

Conservation of mangroves in Northern Province

Sri Lankan government has taken many steps in order to protect this valuable ecosystem including implementing the relevant legislations. Sri Lanka claims to be the first nation in the world to protect all its mangroves, making it illegal to cut down them anywhere in the island, and the first to open a mangrove museum (in Pambala, Chilaw). Sri Lanka has also named as a leader for conservation of mangroves in Commonwealth countries (Mombauer, 2019; Priyashantha and Taufikurahman, 2020).

Zero based projects, which can be implemented by the stakeholders to sustainably manage the mangrove ecosystem through co-management, such as implementing proper laws and regulations, creating awareness, identify the training needs to local communities on importance of mangrove major threats. must be undertaken. Market based policies such as pollution charges focused on reduction of pollution, reduction of volume of solid waste (landfill space, incineration, cost of waste disposal), unit charges – volume based fees, and control midnight dumping, convert the dumping site as a restored land, socio –environmental friendly ecotourism enhancement, revitalize the eco-tourism (bird watching) observation platforms, interpretation services by villagers, creating nature clubs, considering that women are the key stakeholders in initiatives focusing on mangroves, increasing the participation of various stakeholders, designate mangrove ecosystems as protected areas, ensuring that all development planned for mangroves are subject to an environmental impact assessment (EIA), continuous assessment on mangrove declining, establishment and monitoring of mangrove nurseries, management and research centers, plantation of mangroves with appropriate species with the support of academic and researchers (saplings to avoid the flood effects), replanting the mangroves jointly with visitors and local communities and continuous monitoring of restored plantation for its long-term conservation.

Conclusion

Mangroves are one of the most valuable ecosystems, which play a major role in the climatic conditions (mainly rainfall) of the Jaffna peninsula. Mangrove forests in Northern Province face multiple threats such as dumping of waste, development of carpeted inner roads with no consideration about the water pathways in the lagoons, blocking water movement or stopped sea water inundation by construction, reduction in the number of culverts, encroachment of land for agriculture activities and to implement the developments, cutting mangrove for firewood, Invasive Alien Species (IAS), disaster s such as flood, overexploitation, human settlements and a variety of other commercial and industrial activities. This has led to the reduction of the mangrove coverage in the area. To overcome these issues, some measures are needed to be taken by the government. Protection of mangrove forests by having laws and continuous monitoring of threats towards the mangrove destruction needs to be carried out to save these ecosystems. Complete banning of entry into the mangrove forests may not be a better idea to follow. One of the best ways to protect the mangrove vegetation would be to create benefits such as promoting ecotourism among the adjacent locals and motivate them to protect the vegetation through a co-management strategy.

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VIBRANT SPIDERS

Aargiope amoena

Wasp spider

Aargiope anasuja

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EMBRACE MOTHER NATURE

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The sweet scent of blossoms in breeze
Was carried away by the axe dust underneath
Their marbled hue glowing through the green
Stepped out behind the sun dappled wood in leas

The moss underfeet where tickling glows alight
Dances of flower petals where the graceful steps ignite
Where are them, the crispy mist that our mornings aligned
Carried away, by the human cynics in time

To our invincible paces where the senses get leaned
To ease them the minds, get wrapped in green
To sit in the shade, and the lost magics become seen
Why aren't you there yet? Where our muddy souls become clean

Being human, is to collide souls with nature
Hand in hand, dancing to songs of greenery flavor
Around the woven tree fabrics, sound and safer
Taking petal breaths, to embrace mother nature

UNTIL BECOMING A MOTH

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CLIMATE CHANGE

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Climate change, a term that reverberates across scientific discourse, policy debates, and everyday conversations, has emerged as a defining challenge of our era. At its core, climate change encapsulates the intricate alterations in Earth's climate patterns, predominantly attributed to human activities. This phenomenon, marked by escalating global temperatures, erratic weather events, and environmental transformations, demands our unwavering attention and collective action. In the following exploration, we delve into the causes, manifestations, and repercussions of climate change, underscoring its profound implications on ecosystems, human health, and the global socio-economic landscape. As we navigate this discourse, the imperative to comprehend, mitigate, and adapt to the evolving climate realities becomes increasingly apparent, urging us to chart a sustainable course for the well-being of our planet and future generations.

"Climate change refers to long-term shifts in temperatures and weather patterns.

Such shifts can be natural, due to changes in the sun's activity or large volcanic eruptions. But since the 1800s, human activities have been the main driver of climate change, primarily due to the burning of fossil fuels like coal, oil and gas."[1]

Climate change is principally propelled by the intensified release of greenhouse gases into the Earth's atmosphere. Human activities, particularly the combustion of fossil fuels, contribute significantly to this surge. Carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) emanate from industrial processes, transportation, and deforestation, creating a heat-trapping blanket around the planet. Deforestation, in particular, exacerbates the issue by reducing the Earth's capacity to absorb CO_2. These anthropogenic actions amplify the natural greenhouse effect, intensifying global warming. As we unravel the intricate web of

[1] United Nations, "What Is Climate Change?" (no date), [Online] Available at: https://www.un.org/en/climatechange/what-is-climate-change (Accessed: 03 December 2023).

causes, understanding the role each component plays becomes imperative in formulating effective strategies to mitigate climate change's relentless advance.

The evidence of climate change is unequivocal, manifested in a myriad of observable phenomena. Global temperatures are unequivocally rising, as evidenced by temperature records spanning decades. Shifts in weather patterns, marked by increased frequency and intensity of extreme events like hurricanes and droughts, underscore the Earth's changing climate. The shrinking ice caps and glaciers, particularly in Polar Regions, stand as tangible indicators of global warming. Rising sea levels, a consequence of melting ice and the thermal expansion of seawater, further accentuate the transformative impact.

These compelling signs collectively reinforce the urgency of acknowledging and addressing the undeniable reality of climate change.

Climate change poses a profound threat to Earth's ecosystems, triggering a cascade of adverse effects. Biodiversity loss is rampant, as species struggle to adapt or face extinction due to altered habitats and disrupted ecosystems. The delicate balance of ecosystems is further disrupted, leading to a decline in essential services such as pollination and water purification. Ocean acidification, resulting from increased carbon dioxide absorption, imperils marine life, particularly coral reefs and shell-forming organisms. As climate change reshapes ecosystems at an unprecedented pace, the repercussions reverberate across the interconnected web of life, emphasizing the critical need for conservation and sustainable practices to mitigate these far-reaching consequences.

Climate change presents a direct and indirect threat to human health, with multifaceted consequences. Rising global temperatures contribute to an increase in heat-related illnesses, stressing vulnerable populations. Altered climate patterns foster the spread of vector-borne diseases, exposing new regions to infectious threats. Food and water security are jeopardized as extreme weather events disrupt agricultural practices and water supplies. Respiratory issues escalate with worsened air quality due to changing environmental conditions. These health challenges necessitate adaptive strategies, resilient healthcare systems, and global collaboration to safeguard human well-being in the face of an evolving climate landscape.

Climate change resonates with far-reaching social and economic ramifications, reshaping the fabric of societies globally. Displacement of communities due to rising sea levels and extreme weather events amplifies social inequalities. Economic losses mount as industries grapple with climate-induced disruptions, impacting livelihoods and exacerbating poverty. Threats to food security intensify as agricultural systems face unprecedented challenges. The imperative to address these consequences extends beyond environmental stewardship, requiring inclusive policies, international cooperation, and innovative solutions to mitigate the social and economic strains imposed by the evolving climate landscape.

Mitigating climate change demands a concerted effort and a multifaceted approach. Transitioning to renewable energy sources, such as solar and wind power, reduces reliance on fossil fuels, curbing greenhouse gas emissions. Reforestation and conservation initiatives enhance carbon sequestration, mitigating the impact of deforestation.

Embracing sustainable agricultural practices promotes resilience and reduces emissions from the food production sector. International collaboration, exemplified by agreements like the Paris Agreement, fosters a united front in combating climate change. As we navigate these strategies, a collective commitment to innovation, policy reforms, and sustainable practices becomes imperative in shaping a more resilient and climate-conscious future.

Adapting to the inevitability of climate change necessitates proactive measures across various sectors. Building resilient infrastructure safeguards against the escalating threats of extreme weather events, minimizing damage and facilitating swift recovery. Climate-resilient agricultural practices enhance food security by fortifying crops against changing conditions. Preparedness strategies, encompassing early warning systems and community training, mitigate the impact of climate-induced disasters. Embracing adaptation measures underscores the importance of flexibility and foresight, enabling communities and nations to navigate the evolving climate landscape while minimizing vulnerabilities and safeguarding the well-being of populations.

Technology emerges as a pivotal force in the global battle against climate change. Innovations in clean energy, including solar and wind technologies, drive a crucial shift away from fossil fuels, reducing carbon

footprints. Carbon capture and storage (CCS) technologies offer a means to mitigate emissions from industrial processes. Sustainable transportation solutions, such as electric vehicles, contribute to decarbonizing the mobility sector. The tech sector's continuous advancements provide essential tools for monitoring climate patterns and enhancing resilience. As we harness the power of technology, it becomes a catalyst for transformative change, offering scalable solutions to combat climate change and pave the way for a sustainable future.

In the collective pursuit of addressing climate change, global initiatives and agreements play a pivotal role. The Paris Agreement stands as a landmark commitment, uniting nations to limit global temperature rise and enhance climate resilience. Sustainable Development Goals (SDGs) integrate climate action into broader development objectives, fostering a holistic approach. The Global Climate Action Summit provides a platform for non-state actors to contribute innovative solutions. These initiatives underscore the significance of international collaboration, emphasizing shared responsibility in mitigating climate change. As the world navigates this shared challenge, these agreements serve as beacons guiding coordinated efforts toward a sustainable and climate-resilient future.

The battle against climate change extends beyond global agreements, relying significantly on individual and community actions. Embracing sustainable lifestyles, including energy conservation and waste reduction, empowers individuals to reduce their carbon footprint. Community engagement and advocacy amplify collective voices, fostering awareness and influencing local policies. Educational initiatives nurture climate literacy, empowering communities to make informed choices. Small-scale, community-led projects for conservation and resilience contribute to broader climate solutions. Recognizing the potency of grassroots efforts, individual and community actions emerge as catalysts for change, emphasizing the crucial role each person plays in shaping a sustainable and climate-conscious world.

In conclusion, the trajectory of climate change demands urgent global attention and concerted action. The evidence is indisputable, showcasing the profound impact on ecosystems, human health, and socio-economic structures. Mitigation and adaptation strategies, coupled with technological innovations, offer pathways to

address this crisis. Global initiatives and agreements provide a framework for collaboration, emphasizing the shared responsibility of nations. Yet, the true power lies in individual and community actions, driving sustainable practices and fostering resilience. As we navigate this critical juncture, a collective commitment to transformative change becomes paramount, ensuring a harmonious coexistence with our planet and securing a sustainable future for generations to come.

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RIVER OVERGROWN

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THE SONGS OF THE EARTH

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The songs of the earth
You heard long ago
Are singing still
Hiding beneath a whispered glow

Evolution
The development
Dusty mist in city lights like a tinted garment
Viridescent hues long gone besides supermarkets
Birdsongs hushed behind the silver skyrockets
Wild turned to the world of wilted, inside a heated crusted socket

Hiding behind development means
The souls of the cynics, sway down the tress to seas
And wild to the creased
And oh, where the coasts rise up
And swallow the beings,
All our hearts will cease to beat, along with them trees

Where there are green mornings and moonlit nights
And crisp air to breath with wild animals in woods
Souls aligned with evergreen walk straight paths along

Like trees standing tall,

Like roots footing firm,

Like branches intertwined with light sweeping through

Where the beats of hearts will collide with the songs singing still

Which the whispers turned into our old favourite songs of the Earth

A SLUG, EATING FUNGI ON A STONE

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SRI LANKAN LEOPARDS: GUARDIANS OF THE ENCHANTED ISLE

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Introduction:

Nestled within the lush landscapes of Sri Lanka resides a truly enchanting creature — the Sri Lankan leopard (*Panthera pardus kotiya*), a subspecies endemic to the island. This elusive feline has long captured the hearts and imaginations of wildlife enthusiasts and researchers alike. In this exploration, we delve into the secrets of the Sri Lankan leopard, shedding light on their behavior and the captivating allure they bring to the rich tapestry of Sri Lanka's biodiversity.Habitat and Range:

The Sri Lankan leopard finds its haven in the island's national parks and protected areas, showcasing a remarkable adaptability to diverse ecosystems. From the dense rainforests to the arid plains, these leopards navigate their territories with a regal grace, embodying the essence of a truly wild existence. Notably, Yala National Park and Wilpattu National Park stand as vital strongholds, offering a window into the daily lives of these majestic predators.

Behavioral Marvels:

1. Solitude in the Shadows:

Sri Lankan leopards are renowned for their solitary nature, stealthily prowling through the wilderness alone. This behavior, characteristic of apex predators, allows them to capitalize on their exceptional stealth and surprise tactics during hunts.

2. Nocturnal Mastery:

With a penchant for the cover of darkness, Sri Lankan leopards are predominantly nocturnal hunters. This behavior not only speaks to their adaptation for avoiding human encounters but also showcases their exceptional night vision and masterful stealth during the hunt.

3. Territory, A Mark of Authority:

Territorial instincts run deep within these leopards. Males, in particular, establish and fiercely defend their territories through scent markings and vocalizations. These invisible boundaries serve not only to attract potential mates but also to ward off competing males.

4. Arboreal Acrobatics:

Surprisingly agile climbers, Sri Lankan leopards use trees not just for a vantage point during hunts but also to safeguard their kills from potential scavengers. Witnessing these majestic creatures navigate the treetops is a testament to their remarkable agility and adaptability

Capturing the Essence:

Forest Sentinel: Alert in the Underbrush

In the dense forests of Wilpattu National Park, a Sri Lankan leopard stands poised atop a small mound, its intense gaze piercing through the tangle of branches. This image beautifully captures the alertness and readiness that define this elusive predator's existence. The complex interplay of light and shadow weaves through the scene, enhancing the natural camouflage and highlighting the leopard’s stunning coat.

Watchful Sentinel: A Moment of Calm in Wilpattu

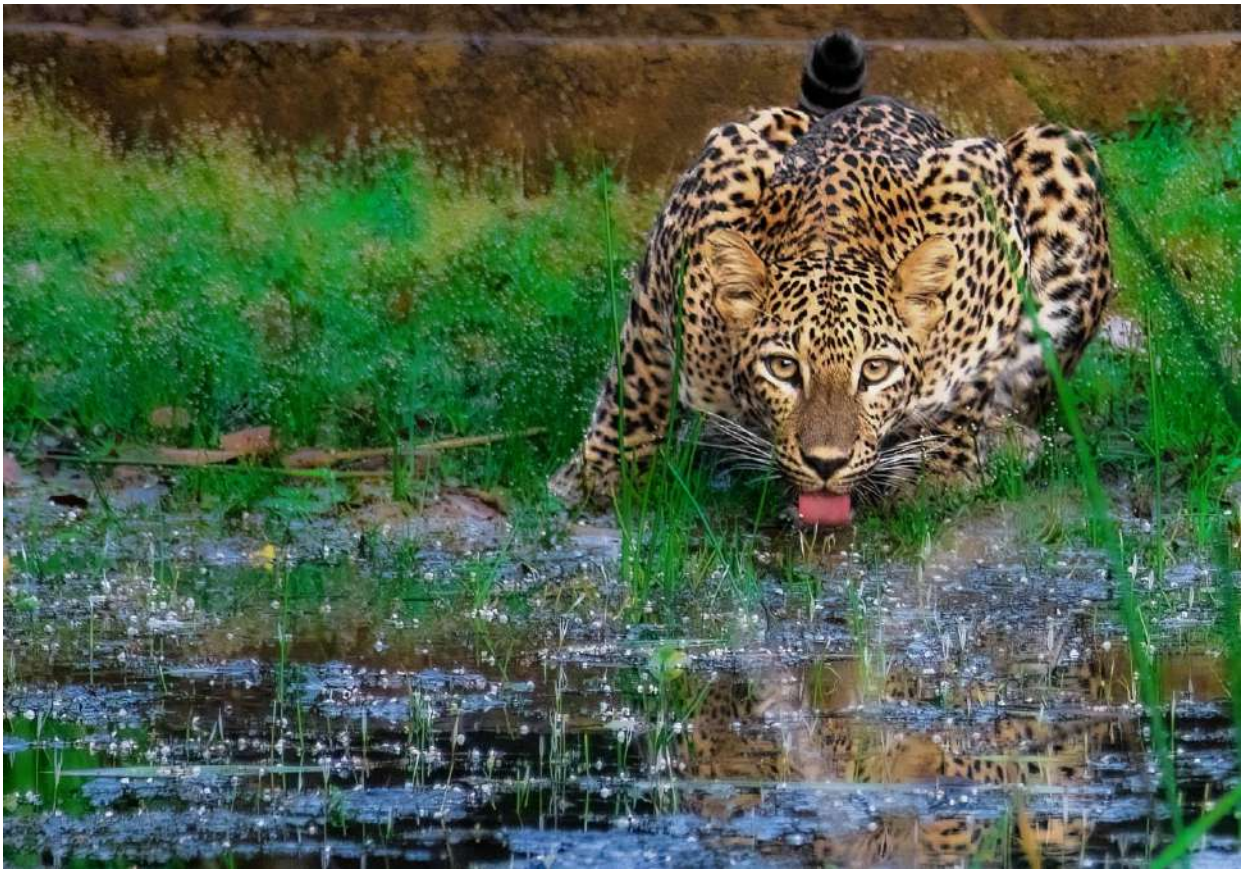
This evocative photograph captures a Sri Lankan leopard seated in the middle of a forest path in Wilpattu National Park, bathed in dappled sunlight filtering through the canopy. The leopard's intense gaze directly into the camera creates a striking connection with the viewer, illustrating the majestic and contemplative nature of this beautiful creature. The surrounding foliage and the soft light contribute to a serene yet powerful portrait of one of Sri Lanka's most iconic wild inhabitants.

“Neluma”: The Sovereign of Wilpattu

Captured in the verdant expanses of Wilpattu National Park, this striking image features "Neluma," known as the king of the park. This male leopard, with his distinctive and bold spotted coat, embodies the strength and majesty that have earned him his regal title among the locals. Neluma’s piercing gaze and powerful stance as he traverses the sandy terrain demonstrate his command over this lush wilderness, making him a central figure in the local wildlife hierarchy.

Gaze of the Wild: Intimate Encounter in Wilpattu

This poignant photograph features a close-up of a Sri Lankan leopard resting on a termite mound. The warm golden light bathes its spotted coat, casting deep shadows and illuminating its piercing gaze. This image offers a rare, intimate glimpse into the life of one of Sri Lanka's most elusive and majestic creatures.

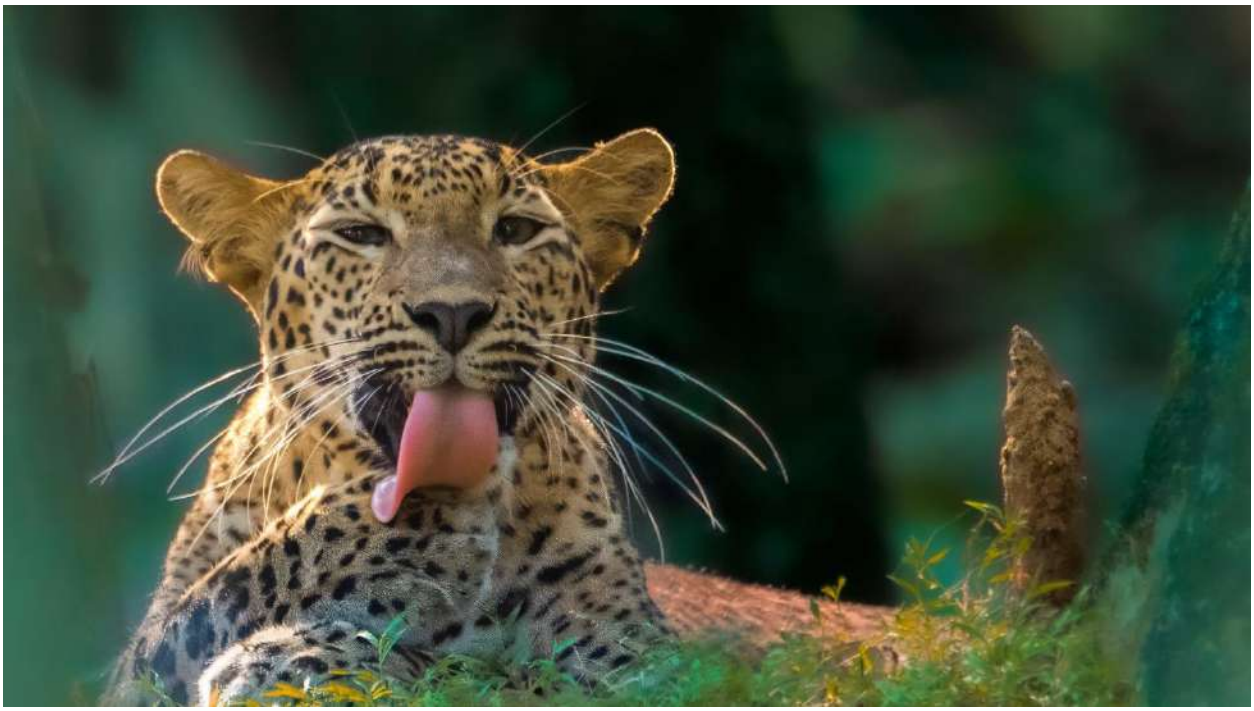


Reflections of the Hunt: Leopard at the Water's Edge

This breathtaking photograph captures a moment of intensity as a Sri Lankan leopard crouches close to the water in Wilpattu National Park. The leopard's focused expression and the mirrored reflection in the tranquil water create a striking visual symmetry. The lush greenery and soft ripples in the water enhance the scene, illustrating the natural elegance and predatory prowess of this remarkable animal.

Veiled Vigilance: A Leopard’s Cautious Stalk

This compelling image captures a Sri Lankan leopard moving stealthily through the underbrush of Wilpattu National Park. The leopard's intense gaze and poised stance are framed by the verdant foliage, creating a vivid portrait of this predator in its natural habitat. The soft focus on the surrounding greenery accentuates the leopard's sharp focus, embodying the essence of survival in the wild.



Lingering Whispers of the Wild: A Leopard's Gentle Moment

This captivating photograph, taken in the lush surroundings of Wilpattu National Park in Sri Lanka, showcases a Sri Lankan leopard in a rare, serene moment. The leopard, with its tongue playfully extended, seems to be enjoying a brief respite from the day's activities, giving us a glimpse into the softer side of this majestic predator. The warm, dappled light filtering through the canopy highlights its intricate spots and attentive expression, embodying the enchanting spirit of this elusive big cat.

Stealth in Motion: Sri Lankan Leopard on the Prowl

Captured in the vast wilderness of Wilpattu National Park, this stunning image showcases a Sri Lankan leopard in full stride. The leopard's intense focus and graceful form are emphasized against the backdrop of the park's diverse terrain, highlighting its role as a top predator in its natural habitat.

Conservation Imperatives:

However, despite their regal presence, Sri Lankan leopards face an array of threats, including habitat loss, human-wildlife conflict, and poaching. Urgent conservation efforts are imperative to ensure the survival of this iconic species. Safeguarding their natural habitats and fostering harmonious coexistence between humans and leopards must be prioritized.

Conclusion:

The Sri Lankan leopard stands as a symbol of Sri Lanka's extraordinary biodiversity, embodying the delicate equilibrium of the predator-prey relationship. As we unravel the mysteries of their behavior, it becomes our shared responsibility to champion their conservation. Only through collective efforts can we guarantee that future generations will marvel at the sight of these elusive and majestic felines roaming freely in the wild, continuing to be the guardians of the enchanted isle.

COMMON KINGFISHER AT UDAWATTAKELE FOREST RESERVE

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BIOLUMINESCENCE

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Have you ever seen a glowing ocean at night? This phenomenon is known as "Bioluminescence". Bioluminescence is the production and emission of light by living organisms. It happens due to the chemical reaction. Luciferin and luciferase are the enzymes which responsible for this kind of chemical reaction. It's a special adoption and it can be seen widely in marine organisms, some fungi species, some terrestrial arthropods and dinoflagellates. Bioluminescence is a useful adoption. It helps organisms to survive in the dark environment such as deep ocean. And also, it helps to attract prey and works as a defense mechanism against the predators. In addition to this, it's very helpful in choosing partner for mating.

Dragon fish is a scaleless fish and it lives in the deep sea. It has an ability to exhibit bioluminescence. This kind of fishes produce traditional blue-green color light. And also, it can produce red light. Fireflies possess light generating structures located in their abdomens. In this insect, the light pattern that flash is helpful in identifying different members belonging to the species and helps to differentiate female and male.

Dinoflagellates are a kind of unicellular algae. This organism is responsible for the bioluminescence which can be seen in ocean at night times. During this time, the ocean can glow and glitter like the stars. Glow worms also exhibit bioluminescence. They use this process to attract prey and mates. This organism emits light that is toxic enough. And some kind of fungi species are known to be bioluminescent. In some animals, the light is produced by symbiotic bacteria species.

VELVET-FRONTED NUTHATCH AT UDAWATTAKELE FOREST RESERVE

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