SABAH STATE GOVERNMENT

SABAH Biodiversity Strategy 2024-2034

SaBC

Sabah Biodiversity Centre (SaBC)

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EXECUTIVE SUMMARY

The Sabah Biodiversity Strategy is a 10-year roadmap that outlines Sabah's commitment and contribution towards biodiversity conservation. The first Sabah Biodiversity Strategy was developed for the period of 2012 – 2022 through extensive stakeholder consultation, as well as referencing Malaysia's National Policy on Biological Diversity 1998, Sabah Conservation Strategy 1992, and the Convention on Biological Diversity (CBD)'s Strategic Plan for Biodiversity 2011-2020 and Aichi Targets. The Strategy emphasised on engaging the people of Sabah to harness the collective reach and commitments in conserving biodiversity, while reducing pressures from economic activities and to integrate biodiversity conservation into the economic sphere.

Major achievements that have come from the Sabah Biodiversity Strategy include improved protection of major habitats and natural resources, notably through the establishment of new protected areas, improved environmental management practices and standards, improved species conservation through targetted action plans, and increased public participation. Biodiversity conservation aspects have also been embedded into recent development plans in Sabah, notably the Sabah Maju Jaya Development Plan (2021-2025), Sabah Development Corridor (SDC) Blueprint 2.0, Sabah Structure Plan 2033, and Sabah State Policy on the Environment, and Sabah Environmental Education Policy.

As of 2022, 23% of actions in the Sabah Biodiversity Strategy was reported as being completed, while 44% of actions were reported as on-going, and the remaining 28% of actions have not yet started implementation. While most strategies have showed positive implementation progress, none have achieved total completion of action plans, highlighting implementation challenges and difficulties. However, biodiversity conservation is a long and continuous process. As such, it is to be expected that some actions may not be completed within a decade.

The need for a revised Sabah Biodiversity Strategy comes at a period where the global, national, and state collective continues to realign itself to protect and conservation biodiversity. The Kunming-Montreal Global Biodiversity Framework was launched at the end of 2022 as the new global roadmap for biodiversity conservation. The Framework is guided by a shared vision of "**Living in Harmony with Nature by 2050**", which covers aspects such as maintaining ecosystem connectivity and resilience, halting human-induced extinction, ensuring sustainable usage and management of biodiversity (including fair and equitable sharing of benefits), protecting traditional knowledge, and improving implementation capacities, especially financial resources and technical capacities. Subsequently, Malaysia has also revised the National Policy on Biological Diversity for a renewed period of 2022-2030 to take into account the goals and targets of the Global Biodiversity Framework as well as other national goals and commitments.

The **Sabah Biodiversity Strategy 2024-2034** represents a renewed commitment to protect and conserve Sabah's biodiversity, while also ensuring sustainable utilisation of natural resources as Sabah continues to progress and develop its economy. The framework has been revised to provide a more cohesive and direct approach to guide conservation efforts for all stakeholders. The new Sabah Biodiversity Strategy now contains a total of **5 Goals, 18 Strategies and 57 Actions** which have been developed through an extensive review process that takes into account present and future conservation challenges and needs, while also acknowledging progress and success that have been made in the last decade to protect Sabah's Biodiversity.

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LIST OF ABBREVIATIONS

ABS	Access and Benefit Sharing
AGC	Attorney General Chamber Sabah
AI	Artificial Intelligence
APMM	Malaysia Maritime Enforcement Agency (*Agensi Penguatkuasaan Maritim Malaysia*)
ASEAN	Association of Southeast Asian Nations
BMRI	Borneo Marine Research Institute
CAGR	Compound Annual Growth Rate
CBD	Convention on Biological Diversity
CBO	Community-Based Organisation
CBT	Community-Based Tourism
CPO	Crude Palm Oil
CSO	Civil Society Organisation
CTI	Coral Triangle Initiative
DID	Department of Irrigation and Drainage
DOA	Department of Agriculture
DOF	Department of Fisheries
DVS	Department of Veterinary Services
ECOS	Energy Commission of Sabah
EEZ	Exclusive Economic Zone
EFT	Ecological Fiscal Transfer
EIA	Environmental Impact Assessment
EPD	Environment Protection Department Sabah
FERTAS	Federal Rural Tourism Association Sabah
FMU	Forest Management Units
FPIC	Free, Prior, and Informed Consent
FR	Forest Reserve
FRIM	Forest Research Institute Malaysia
FBEA	Faculty of Business, Economics and Accounting, UMS
FSNR	Faculty of Science and Natural Resources, UMS
FTF	Faculty of Tropical Forestry, UMS
GDP	Gross Domestic Product
GSTC	Global Sustainable Tourism Council
GWh	Gigawatt per hour
HCV	High Conservation Value
HCVA	High Conservation Value Area
HoB	Heart of Borneo
IAS	Invasive Alien Species
IBA	Important Bird Areas
IPLC	Indigenous Peoples and Local Communities
ITBC	Institute for Tropical Biology and Conservation
ITP	Industrial Tree Plantation
IUCN	International Union for Conservation of Nature
IUU	Illegal, Unreported, and unregulated
JHEANS	Native Affairs Department (*Jabatan Hal Ehwal Anak Negeri Sabah*)
JKR	Department of Works Sabah (*Jabatan Kerja Raya Sabah*)

JMG	Department of Mineral and Geoscience Sabah (*Jabatan Mineral dan Geosains Malaysia, Sabah*)
JPAN	Department of Civil Service (*Jabatan Perkhidmatan Awam Negeri*)
JPP	Sewerage Services Department (*Jabatan Perkhidmatan Pembetungan*)
JTU	Land and Survey Department (*Jabatan Tanah dan Ukur*)
KKM	Ministry of Health (*Kementerian Kesihatan Malaysia*)
LCC	Live Coral Cover
LMO	Living Modified Organisms
MAFFI	Ministry of Agriculture, Fisheries and Food Industries
MCB	Malaysian Cocoa Board
MCM	Million Cubic Meter
MFF	Malaysia Forest Fund
MHEANS	Native Affairs Court (*Mahkamah Hal Ehwal Anak Negeri Saba*h)
MIDE	Ministry of Industrial Development and Entrepreneurship
MLGH	Ministry of Local Government and Housing
MMO	Marine Mammal Observers
MOF	Ministry of Finance (Sabah)
MPOB	Malaysia Palm Oil Board
MRF	Marine Research Foundation
MTCE	Ministry of Tourism, Culture, and Environment
MTCS	Malaysian Timber Certification Scheme
NGO	Non-Governmental organization
NRO	Natural Resource Office
OECM	Other Area-Based Conservation Measure
PA	Protected Area
PDRM	Royal Malaysia Police (*Polis Diraja Malaysia*)
PMM	Proposal for Mitigation Measures
PRF	Permanent Reserve Forest
PWD	Public Works Department
REDD	Reducing Emissions from Deforestation and Forest Degradation in Developing Countries
RET	Rare, Endangered, and Threatened
RSPO	Roundtable for Sustainable Palm Oil
SaBC	Sabah Biodiversity Centre
SaBIIS	Sabah Biodiversity Information Integrated System
SBS	Sabah Biodiversity Strategy
SCAC	Sabah Climate Action Council
SDC	Sabah Development Corridor
SDG	Sustainable Development Goals
SDVS	Sabah Department of Veterinary Services
SEARRP	South East Asia Rainforest Research Partnership
SEDIA	Sabah Economic Development and Investment Authority
SEEA	System of Environmental and Economic Accounting
SEEN	Sabah Environmental Education Network
SFD	Sabah Forestry Department
SFM	Sustainable Forest Management
SIRIM	Standards and Industrial Research Institute of Malaysia
SMJ	Sabah Maju Jaya
SP	Sabah Parks

SPA	Sabah Port Authority
SSL	Self Sufficiency Level
STB	Sabah Tourism Board
STIA	Sabah Timber Industry Association
SWD	Sabah Wildlife Department
TAS	Timber Association of Sabah
TMDL	Total Maximum Daily Load
TMP	Tun Mustapha Park
TPA	Totally Protected Area
TRPD	Town and Regional Planning Department
Tcf	Trillion cubic feet
UMS	Universiti Malaysia Sabah
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UPEN	State Economic Planning Unit (*Unit Perancang Ekonomi Negeri*)

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PART 1

SABAH - A BIODIVERSITY HAVEN

A SHARED RESPONSIBILITY TOWARDS CONSERVATION

Sabah still remains renowned for its remarkable biodiversity and ecosystems. On land, the vast forest reserves and mountainous ranges harbour most of its flora and fauna communities. Sabah also has extensive marine resources as it faces three seas: the South China Sea in the west, Sulu Sea in the northeast, and Celebes Sea in the southeast. These in turn host a rich array of marine habitats and species. This has made Sabah as one of the focal areas for tropical biodiversity research. The state has a long and deep history still attracts some of the best researchers around the world to contribute and expand the body of knowledge regarding tropical biodiversity and of Borneo island.

However, Sabah's biodiversity has also faced unrelenting pressures since the late 20th century. The primary sector (i.e., timber, palm oil, and cocoa) were among the major contributors of Sabah's revenue since the 1960s. This in turn has caused severe deforestation. At the same time, rampant fish bombing has destroyed many coral reefs and has affected fisheries production. Poaching and illegal wildlife trade continues to loom in the background of biodiversity exploitation. All these issues and threats have exerted immense pressure on Sabah's biodiversity, pushing species to extinction and disrupting crucial ecosystem services. As of 2015, the Sumatran rhinoceros has been declared extinct in Sabah, while other species such as the Bornean Banteng, Sunda Pangolin, bearded big, dugong, Sunda clouded leopard, orangutan, proboscis monkey, green turtle, hawksbill turtle, and many others, are still at risk of extinction.

In spite of all this, Sabah will continue to expand its economical growth. The need to protect and conserve Sabah's biodiversity is even more apparent now in the 21st century, given how rapid sectors are growing in the midst of the 4th Industrial Revolution (IR 4.0). As such, the responsibility of conserving Sabah's natural treasures does not rest solely on its government, but involves each and every stakeholder. The "Whole-of-Society" approach has become the core approach to ensure effective biodiversity conservation outcomes for Sabah.

THE NEED FOR A REVISED STRATEGY

The Sabah Biodiversity Strategy (SBS) is a 10-year plan that intended to outline the State's commitment and contribution towards biodiversity conservation. The SBS was first drafted in 2012 through extensive stakeholder consultation, as well as referencing Malaysia's National Policy on Biological Diversity 1998, Sabah Conservation Strategy 1992, and Convention on Biological Diversity (CBD)'s Strategic Plan for Biodiversity 2011-2020. This was ultimately to ensure that SBS contributes towards Malaysia's obligation in implementing the Aichi Biodiversity Targets.

The original tenure of the SBS has come to pass and there is a need for a new and updated SBS to guide biodiversity conservation in Sabah for the next decade. At the global context, the CBD has launched the Kunming-Montreal Global Biodiversity Framework in 2022 which replaces the Stratefic Plan for Biodiversity 2011-2020 and the Aichi Targets. The Framework is guided by a shared vision of "**Living in Harmony with Nature by 2050**". More specifically, the Framework has identified four long-term goals for all member countries to work towards:

Goal	Aspects
A	• Maintaining, enhancing, or restoring integrity, connectivity, and resilience of all ecosystems • Halting human-induced extinction of threatened species, reducing extinction rates, and restoring population of native wild species to healthy and resilient levels • Safeguarding genetic diversity of wild and domestic species
B	• Ensuring sustainable usage and management of biodiversity • Valuing, maintaining, enhancing, and restoring ecosystem services and functions
C	• Fair and equitable sharing of monetary and non-monetary benefits from utilization of genetic resources, digital sequence information and traditional knowledge with local and indigenous communities • Protection of traditional knowledge associated with genetic resources
D	• Ensuring adequate means to implement the GBF including financial resources, capacity building, technical and scientific cooperation, and access to and transfer of technology

In lieu of this, the Malaysian government has also revised its National Policy on Biological Diversity for a renewed period of 2022-2030 which takes into account the goals and targets of the Global Biodiversity Framework, as well as national circumstances. Besides the Global Biodiversity Framework, biodiversity conservation is also being emphasised in other global frameworks, notably in the Sustainable Development Goals (SDGs), and the United Nations Framework Convention on Climate Change (UNFCCC), which Malaysia (and Sabah) are party to.

At the state level, biodiversity conservation has also been maintreamed into major development strategies, especially in the Sabah Maju Jaya Development Plan (2021-2025), Sabah Development Corridor (SDC) Blueprint 2.0, and the Sabah Structure Plan 2033, as well as other environment related policies, notably the Sabah State Policy on the Environment and Sabah Environmental Education Policy.

As such, the revision of the SBS comes in a timely period where the global, national, and state collective continues to realign itself to protect and conservebiodiversity together as a means to ensure sustainable development.

PROGRESS SINCE THE SABAH BIODIVERSITY STRATEGY 2012-2022

As of 2022, 23% (37 actions) of actions from the SBS 2012-2022 were reported as completed, and 44% (71 actions) reported as on-going. The remaining 28% of actions have not started at the end of the implementation period [1] (**Chart 1-1**).

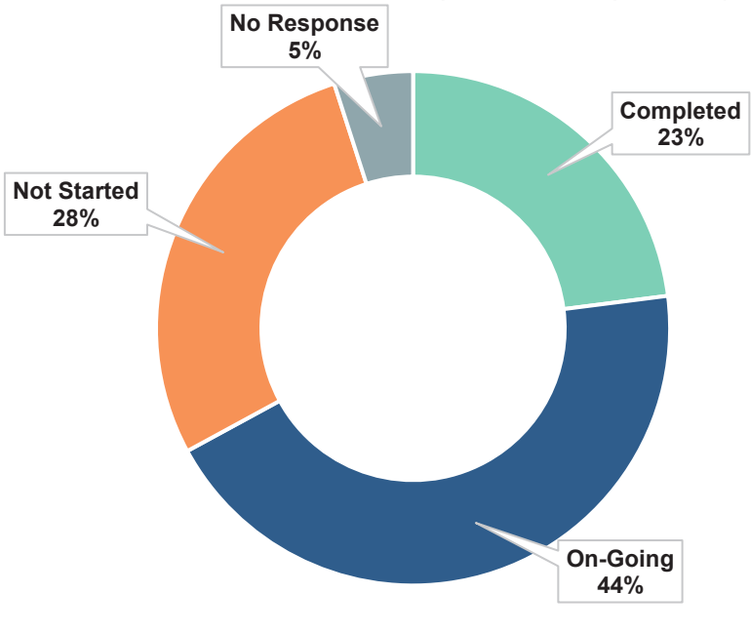


Chart 1-1: Overall Implementation Status of SBS 2012-2022

Most strategies showed positive implementation progress as most actions were reported as either completed or on-going (with the exception of **Strategy 5: Strengthening Our Capacity to Manage Biodiversity**). However, none of the strategies have achieved total completion of action plans, highlighting the challenges and difficulties faced during implementation period. However, it should be noted that some actions are long-term and continuous which may not be completed within a decade.

[1] No response was received for 8 actions (5% of the SBS) during the review process

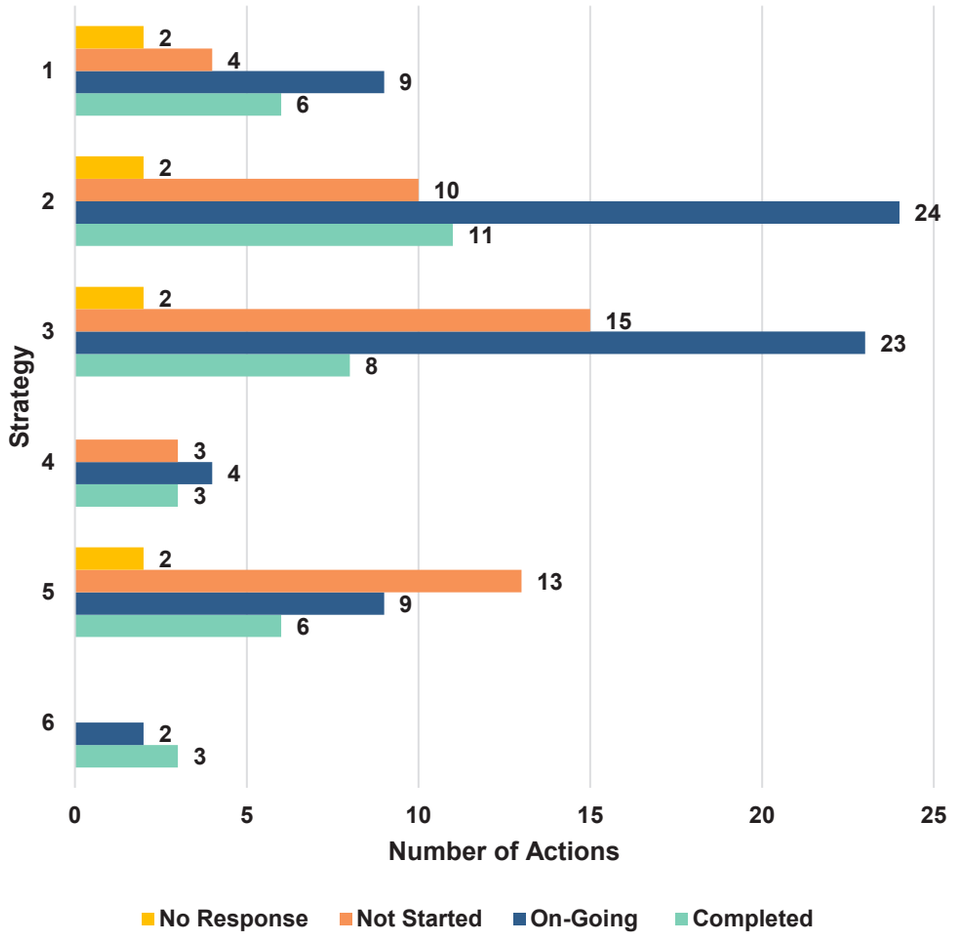


Chart 1-2: SBS 2012-2022 Implementation Status According to Strategy

Key Achievements

The SBS 2012-2022 has several major achievements throughout its first decade of implementation. This includes improved protection of natural resources and environmental management practices, as well as increased public participation in environmental initiatives, which are briefly elaborated in the following.

a. Protection of Natural Habitats and Resources

Through the SBS 2012-2022, there has been improved protection of both terrestrial and marine natural habitats through the gazettement of additional forest reserves and Marine Protected Areas. A major example is the gazettement of the 900,000 ha. Tun Mustapha Marine Protected Area in 2015 (Action 3.40), which is the state's and country's largest multi-use marine protected area.

The Heart of Borneo (HOB) Strategic Plan of Action has led to the expansion of Totally Protected Areas in Sabah (Action 3.6). As of 2022, 26% of land area has

been gazetted as protected areas, furthering efforts to contribute to the global and national target of gazetting 30% of land as protected areas by 2030 (“30 by 30”). In addition, the status of several forest reserves was also revised to improve protection. An example is the reclassification of 3,867 ha. of the Menumbok FR from Class V (Mangrove Forest) to Class I (Protection Forest) to protect the wetlands and freshwater ecosystems and stopping all forms of resource extraction (Action 3.18).

The Sabah Forestry Department (SFD) has also conducted extensive forest restoration and rehabilitation initiatives. These were through collaborations with other state government agencies, international and local scientific communities, NGOs, business entities, and local communities. Examples of major efforts include the restoration of 11,796.3 ha. of degraded areas in the Bukit Piton FR and mangrove rehabilitation in the Weston Menumbok area (Action 3.6 and Action 3.21). Under the Sabah EU-REDD+ project, 1,401,90 ha. of degraded land are under active restoration, together with the establishment of 2,632 ha. of conservation in the lower Kinabatangan area (Action 5.20). As of 2021, 431,969 ha. of degraded areas have been rehabilitated through silviculture treatments, while 65,509 ha. of degraded forests have been rehabilitated through planting of indigenous tree species (Action 3.5).

The SBS 2012-2022 has also strived to further protect Sabah’s natural habitats through international and national frameworks. A major achievement was the designation of the Kota Kinabalu Wetlands as a Ramsar site in July 2017 (Action 5.28). On-going efforts are still in place to nominate the Maliau Basin, Danum Valley and Imbak Canyon as UNESCO World Heritage Sites, as well as the Lower Kinabatangan as a UNESCO Biosphere Reserve (Action 5.29).

b. Improved Environmental Management

The SBS 2012-2022 has also paved the way for improvements on environmental management practices and standards in Sabah. The major achievement was thorough improvements to the state’s Environmental Impact Assessment (EIA) requirements and sustainability certification initiatives.

The Environment Protection Department (EPD) Sabah has mandated that all oil palm plantation establishment and replanting are subject to an EIA to ensure that proper mitigation measures are in place to minimise environmental impacts (Action 2.2). This is currently enforced under the Environment Protection (Prescribed Activities) (Environmental Impact Assessment) Order 2005 which requires submission of proposal for mitigation measures (PMM) and EIA for oil palm plantation development under First and Second Schedule of Order respectively.

In addition, the EIA implementation handbook, along with sector specific guidelines have been established to ensure assessments are conducted in a comprehensive manner. Management plans for key rivers and river sand mining guidelines have been prepared and implemented for effective river management (Action 2.30).

The total certified areas under the Malaysian Timber Certification Scheme (MTCS) have increased to 821,678 ha. This was after Usahawan Borneo Greenwood received its certification as a Forest Plantation. Furthermore, certified Forest Management Units (FMUs) under the FSC certification scheme currently covers as area of 629,834 ha. (77% of all FMUs in Sabah), while FMUs under the MTCS certification scheme is 198,320 ha. (24% of all FMUs in Sabah) (Action 2.12).

c. Improved Species Conservation

The SBS 2012-2022 has also seen the continuous improvement in habitat and species conservation through the establishment and implementation of various conservation action plans. The SFD has led the establishment of a state-level working group for plant conservation (Action 3.29). This has seen the full completion to inventories threatened or rare plant species, which have been thoroughly documented and published (Action 4.7), notably the Sabah Plant Red List of Dipterocarpaceae.

The Sabah Wildlife Department (SWD) has also led the formulation and implementation of various species action plans to improve wildlife conservation and protection. Among these are the Bornean banteng, Sunda clouded leopard, proboscis monkey, and Bornean elephant action plans which cover species conservation activities until 2030 (Actions 3.34 - 3.37). In addition, SaBC and WWF-Malaysia also launched the Wildlife Atlas of Sabah on December 2023, which aims to serve as a reference book for government officers overseeing wildlife management, technical advisers involved in infrastructure projects and environmental impact assessments, nature tour guides, as well as researchers and students in Sabah.

d. Increased Public Participation

Strategy 1 of the SBS 2012-2022 focuses on “Engaging the People of Sabah” to be involved in biodiversity conservation through increased participation in relevant initiatives. This is also in line with the Sabah Environmental Education Policy aims to improve awareness and participation of the public in environmental aspects.

As of April 2023, the Sabah Environmental Education Network (SEEN) has increased its membership to 44 members and is involved in organizing state-level programme on environmental education (i.e., SERASI award) and monitoring of the Third Sabah Environmental Education Policy 2015-2020 (Action 1.3). The Junior Rangers programme, and Honorary Wildlife Warden programme are some of the major achievements in increasing public participation in biodiversity conservation, as well as biodiversity mainstreaming in civil society (Action 1.8, 1.9, 1.18).

The local community forest rehabilitation programme was also successfully implemented (Action 1.21). This action has enabled local communities to rehabilitate and restore degraded forest while providing avenues to learn tree planting techniques and forest rehabilitation measures.

SABAH'S BIODIVERSITY TROVES - WHAT WE MUST CONTINUE TO PROTECT

Terrestrial Habitats

a. Forest Ecosystems

Sabah's forests, like the rest of Borneo, is thought to have evolved in response to changes in the physical environment during ancient times since the Mesozoic Era. Tectonic movements that split landmasses and uplift landforms, coupled with changes to sea levels throughout the Sundaland have influenced the distribution of plants and their diversity.

Sabah's forest formations can be classified into nine types (**Table 1-1**). These forested provide habitats to a vast array of flora and fauna species, many of which are endemic to this region.

Table 1-1 Forest Ecosystems in Sabah

Forest Type	Description	Extent (ha)	Percentage (%)
Beach Forest	• Found along coastal areas and islands • Low stature shrubs and inland coastal trees	58,480	0.8
Mangrove Forest	• Covers half of Malaysia's mangroves • Avicennia-Sonneratia forest found in seaward zone • Rhizophora mangroves found at the main mangrove zones around river mouths • Brugeira forest occur in inland areas	413,688	5.6
Peat Swamp Forest	• Forests that are seasonally inundated by flood waters during monsoon periods • Highly important as carbon sinks	118,977	1.7
Freshwater Swamp Forest		334,336	4.5
Lowland Mixed Dipterocarp Forest	• Occurs between 0 – 500m asl • Harbours between 600 – 700 species	3,481,238	47.1
Upland Mixed Dipterocarp Forest	• Occurs between 500 – 1,000m asl • Harbours between 600 – 700 species	1,360,906	18.4
Heath Forest	• Also known as Kerangas forest • Fragile ecosystem found on podzoic soils which are infertile because of low nitrogen and high sand content • Trees are stunted in height with small diameters • Less species rich than other lowland forest	1,227,965	16.6

Forest Type	Description	Extent (ha)	Percentage (%)
Ultramafic Forest	• Found on ultramafic outcrops at altitidues up to 3,100 m asl. • Rich flora diversity despite being nutrient deficient soils • 4,252 species from 207 families and 1,047 genera with high proportion of endemics • Remarkable capacity to absorb heavy metals and metalloids in leaf tissue	198,428	2.7
Montane Forest	• Lower montane forests occur within 1,000 – 2,500m asl • Upper montane forests occur within 2,500 – 3,500m asl • Highly specialised plants to adapt to young and thin soil • Wildlife sightings generally rare due to lack of food resources	195,878	2.6

Source: Wildlife Atlas of Sabah (2022)

b. Inland Waters

River systems

There are over 20 major river systems in Sabah [2]. The longest rivers are the Kinabatangan River and Padas River. Kinabatangan river is the longest river in the state with main channel spanning about 560km in length [3]. The catchment is approximately 16,800km^2 in area which covers 23% of the total land in Sabah. The second largest river basin in the state is Padas river which covers large area of 8,726km^2 [4]. The river system in Sabah is not only vital for the natural ecosystems and biodiversity of the area but also plays a crucial role in the livelihoods of local communities, agriculture, transportation, and tourism.

Oxbow lakes

Oxbow lakes are characterized by their crescent or horseshoe-shaped feature which is formed as a result of the natural processes of meandering rivers. In Sabah, these lakes mainly occur along the lower reaches of the Kinabatangan, Sugut, and Segama rivers. The unique features of these lakes provide wide range of habitat and breeding grounds for diverse aquatic flora and fauna.

[2] Department of Irrigation and Drainage Sabah (2023)
[3] Global Water Partnership (2023)
[4] Sabah Structure Plan (2016)

c. Terrestrial Protected Areas

Key conservation effort to protect forest ecosystem in Sabah is recognized through gazettement as protected areas (PA). Implementation of conservation efforts of these PAs fall within direct responsibility of government agencies which includes Sabah Forestry Department (SFD), Sabah Wildlife Department (SWD), and Sabah Parks. Gazetted land in Sabah covers approximately 3,848,597 ha, inclusive of Forest Reserves (FR), Sabah Parks, Wildlife Sanctuary and Wildlife Conservation Area which are equivalent to 52.3% of Sabah's land area (**Figure 1-1)**.

Forest Reserves

Forest Reserves in Sabah presently cover approximately 3,574,468 ha (48.6%) with a total of 333 recorded sites throughout the state. These are classified into seven functional classes:

Table 1-2 Classification of Forest Reserves in Sabah

	Description	Area (ha)
Class I Protection FR	Conserved for the protection of forests, watershed areas, soil & other essential climatic & environmental factors. Timber harvesting is not permitted in this FR.	1,421,717
Class II Commercial FR	Allocated for harvesting to supply timber & other forest produce and carried out according to SFM principles.	1,655,483
Class III Domestic FR	Conserved for consumption of local communities & the commercial use is discouraged.	4,634
Class IV Amenity FR	Reserved to provide amenities for recreation activities to local inhabitants.	11,403
Class V Mangrove FR	Reserved to supply of mangrove timber & other mangrove produce to meet the general demand of trade. The FR can also be used for recreation & tourism.	234,680
Class VI Virgin FR	Conserved strictly for forestry research purposes such as ecological baseline research, biodiversity & genetic conservation.	107,048
Class VII Wildlife FR	Reserved mainly for wildlife protection, conservation & research.	139,503
	Total	**3,574,468**

Source: Sabah Forestry Department (2023)

Totally Protected Areas (TPA)

Forest Reserves gazetted under the Sabah Forest Enactment 1968 and forest areas that are safeguarded under Sabah Parks and Sabah Wildlife Enactment are categorised as TPAs in Sabah. As of 2022, Sabah's TPA coverage is approximately 1,942,397 ha representing 26.4% of total land area in the state (**Table 1-3**).

Table 1-3 Totally Protected Areas in Sabah

Protected Areas	Legislation	Area (ha)
Forest Reserve (Class I FR)	Forest Enactment 1968	1,421,717
Virgin Jungle (Class VI FR)	Forest Enactment 1968	107,048
Wildlife Reserve (Class VII FR)	Forest Enactment 1968	139,503
Sabah Parks	Parks Enactment 1984	245,172
Wildlife Sanctuary	Wildlife Conservation Enactment 1997	26,103
Wildlife Conservation Area	Wildlife Conservation Enactment 1997	2,854
	Total	**1,942,397**

Source: Sabah Forestry Department (2023)

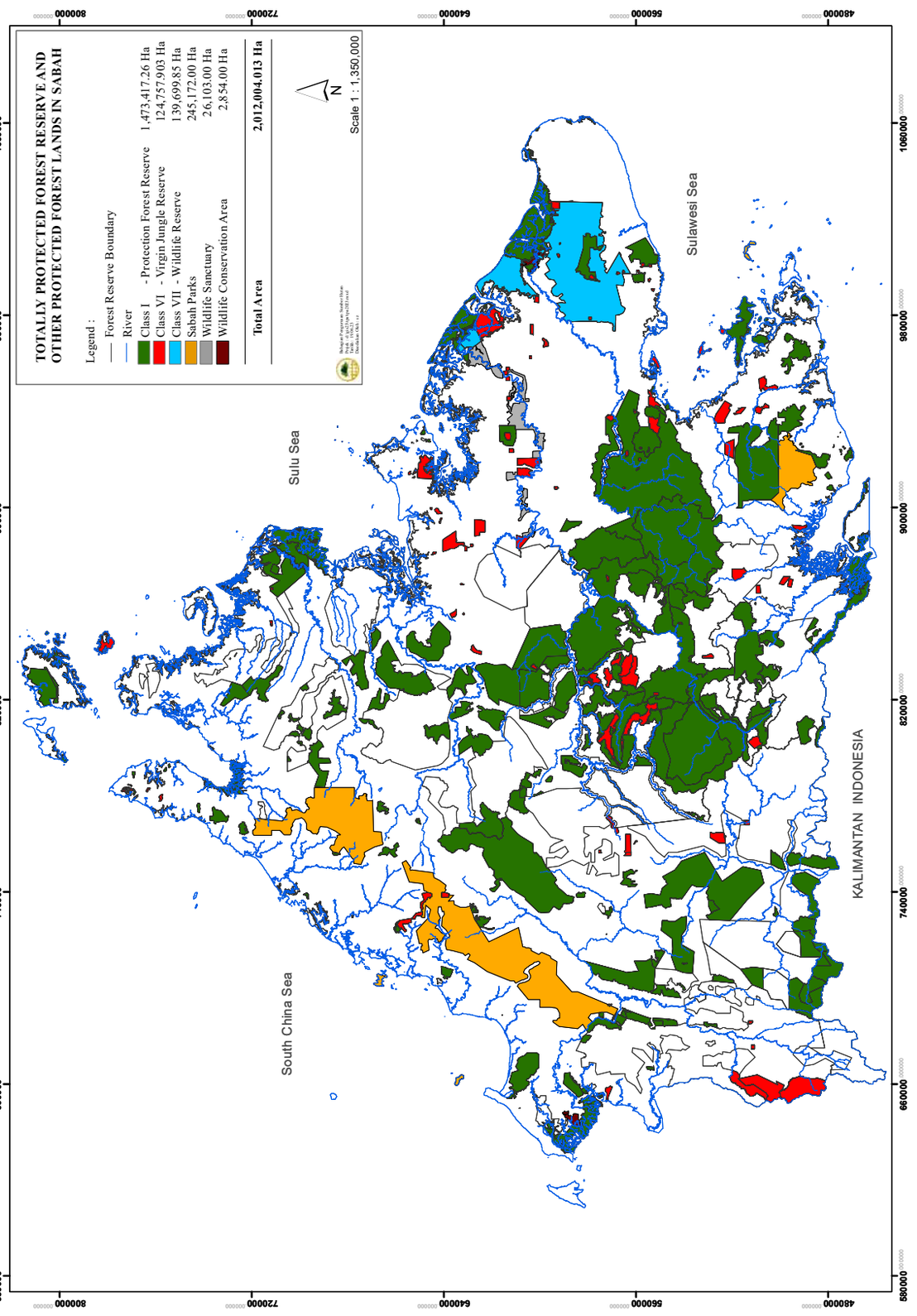


Figure 1-1: Forest Reserve and Terrestrial Protected Areas in Sabah

Source: *Sabah Forestry Department*

Marine & Coastal Habitats

a. Coral Reefs

Sabah supports over 70% of coral reefs in Malaysia. There are total of 471 hard coral species belonged to 79 genera and 21 families have been recorded in Sabah waters[5]. Some of the common genera includes *Astreopora*, *Fungia*, *Leptoseris*, *Porites*, *Acropora*, *Lobophyllia*, *Montipora*, *Pavona*, and *Turbinaria*. Most of the coral reef formation in Sabah are the fringing type, except for Pulau Layang-Layang which is an atoll.

The highest number of coral species in Sabah are reported within east coast waters particularly in Semporna reef complex, Banggi group of islands, and Darvel Bay[5]. These areas fall within the Coral Triangle region which is known as the most diverse and biologically complex marine ecosystem globally. The region supports over 500 coral species which make up at least 76% of the world's coral species[6].

b. Seagrass

Seagrass beds in Sabah mainly occurs in the west and south-eastern coast of the state[7]. These beds mainly consist of mixed species beds inhabiting intertidal zones on substrates ranging from sand, muddy sand, to coral rubble. There are presently ten seagrass species reported throughout Sabah (**Table 1-4**).

Table 1-4 Seagrass Species in Sabah

Family	Species	Remarks
Hydrocharitaceae	*Enhalus acoroides*	Common and widespread throughout Malaysia.
	Halophila minor	Restricted to a few sites in Sabah i.e., Pulau Gaya, Pulau Selingan, and Pulau Bakungan Kecil.
	Halophila ovalis	Common and widespread throughout Malaysia.
	Halophila spinulosa	Restricted to a few sites in Sabah.
	Halophila decipiens	
	Thalassia hemprichii	Common in Sabah.
Cymodoceaceae	*Cymodoceae rotundata*	Common and widespread throughout Sabah.
	Cymodoceae serrulata	
	Halodule pinifolia	Common and widespread throughout Malaysia.
	Halodule uninervis	

Source: Japar Sidik et al. (2006) & Asian Development Bank (2014)

There are four intertidal seagrass-coral reef areas reported in the west coast of Sabah namely Tanjung Mengayau, Bak-Bak, Sepangar Bay, and Pulau Gaya. Four

[5] Asian Development Bank (2014)
[6] WWF (2020)
[7] Japar Sidik *et al*. (2006)

subtidal seagrass areas growing on coral rubble can be found along the south-eastern coast of Sabah. These are mainly near the isolated offshore islands of Pulau Maganting, Pulau Bohey Dulang, Pulau Tabawan, and Pulau Sipadan[7]. Other major seagrass beds in Sabah are in Tunku Abdul Rahman Park, Pulau Selingan, and Pulau Bakungan[5].

c. Seaweed

Seaweeds commonly occur near coral reef, mangroves, mudflats, or rocky shores. There are about 85 seaweed species recorded within Sabah's coastline which consist of the red seaweed (Rhodophyta), brown seaweed (Phaeophyta), and green seaweed (Chlorophyta). Commercial seaweed farming was initially introduced in Semporna, Sabah since 1978. It has since become an economically important natural resource in Sabah and Malaysia as a whole[8].

Seaweed is categorised as high value commodity along with aquaculture and ornamental fish under the National Agrofood Policy (2021 – 2030). This sector contributes substantially to the aquaculture development in Sabah amounting at 307,942 tonne of production in 2022[9]. A total of 1,554 licensed seaweed farmers from 4,464 ha of culture area were reported in the same year. Some of the commonly cultured seaweed includes red seaweed (*Kappaphycus alvarezii* & *Euchema denticulatum*) and green seaweed (*Caulerpa lentillifera*)[8] [10].

d. Marine Protected and Conservation Areas

There are a total of six Marine Protected Areas established in Sabah under the Sabah Parks Enactment 1984 (**Table 1-5, Figure 1-2**). The establishment of these Marine Protected Areas are to legally protect and conserve marine biodiversity, particularly coral reef ecosystem. Tun Mustapha Park (TMP) is the largest marine protected area in Malaysia spanning over 800,000 ha which comprises of three districts: Kudat, Kota Marudu, and Pitas. The area serves as a multiple used are that is managed for or strict protection, tourism, and fisheries.

Table 1-5 Marine Protected Areas of Sabah

Name	Year Gazetted / Established	Size (ha)
Tunku Abdul Rahman Park	1974	5,000
Turtle Islands Park	1977	1,740
Pulau Tiga Park	1978	15,800
Sugut Islands Marine Conservation Area	2003	46,317
Tun Sakaran Marine Protected Area	2004	35,000
Sipadan Island Park	2004	16,860
Tun Mustapha Park	2016	898,762

Source: Sabah Parks (2023)

[8] Ali & Ariff (2006)
[9] Department of Fisheries (2022)
[10] Hussin & Khoso (2017)

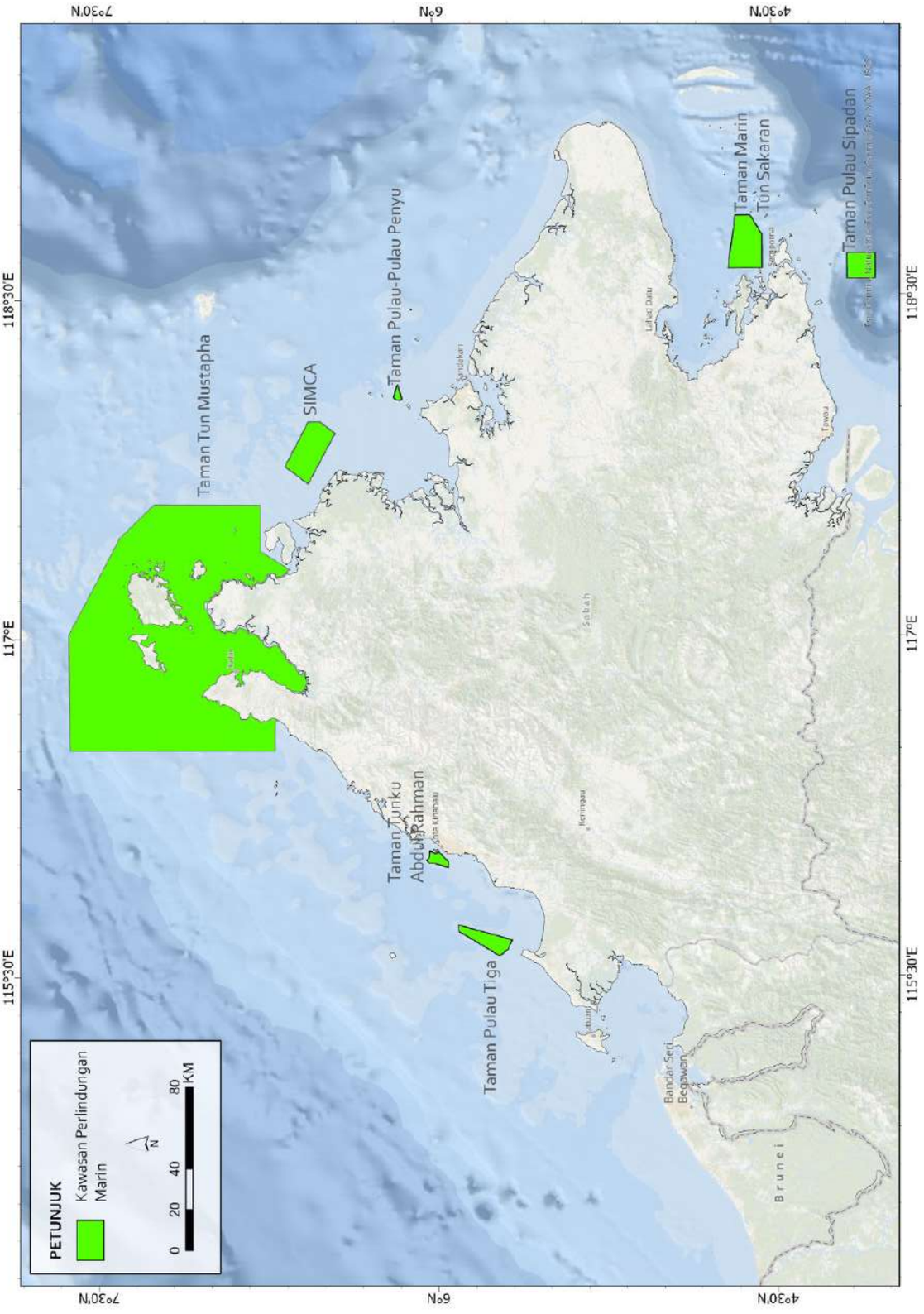


Figure 1-2: Marine Protected Areas in Sabah

Source: *Sabah Parks*

Flora & Fauna Diversity

a. Flora Composition

Sabah harbours approximately 8,000 taxa of vascular plants in which one third is considered endemic[11]. However, these plants' diversity and composition in Sabah has still not been fully inventoried. The Tree Flora of Sabah and Sarawak project attempted to document and update taxonomic status of all tree species native to Sabah and Sarawak. The project was launched in 1991 and initiated by Forest Research Institute Malaysia (FRIM), Sabah Forestry Department, Sarawak Forestry Department, research institutions, and universities.

The Red List of Sabah Endemic Trees has compiled the conservation status of 291 endemic trees published in IUCN Red List of Threatened Species between 2018 – 2022[12]. About 70% (204 species) of these endemic trees fall within the categories Critically Endangered (CR), Endangered (E), and Vulnerable (VU). It was indicated that major threats towards these threatened species includes climate change and severe weather conditions. However, the assessment further concluded that about 66% are still stable in terms of their population trends[13].

The Sabah Plant Red List of Dipterocarpaceae assessed the conservation status of 182 species of dipterocarp species in Sabah, of which 91% (166 species) were found within Sabah's Totally Protected Area network. The assessment findings concluded the following:

- 16 species assessed as Critically Endangered (CR) (**Table 1-6)**
- 23 species assessed as Endangared (EN)
- 48 species assessed as Vulnerable (VU)
- 7 species as Data Deficient (DD)
- Remaining 88 species as either Near Threatened (NT), or Least Concern (LC)

Additionally, a further 16 dipterocarp species were documented outside the Totally Protected Area Network. From this list:

- 6 species assessed as CR (**Table 1-6**)
- 1 species assessed as EN
- 2 species assessed as VU
- 7 species assessed as DD

These assessment findings serve as the basis for more targeted conservation approaches for species listed in threatened categories (CR, EN, VU), as well as more ground surveys for those listed as DD.

[11] Pereira *et al.* (2015)
[12] The Borneo Post (2023)
[13] New Straits Times, 2023

Table 1-6: List of Critically Endangered Dipterocarps in Sabah

Species name	Vernacular name	Threats
Anisoptera laevis	Pengiran durian	Encroachment, land use change
Dipterocarpus condorensis penangianus	Keruing gasing	Drought, forest fire, encroachment
D. crinitus	Keruing mempelas	Land use change, drought, forest fire
D. lamellatus	Keruing jarang	Drought, forest fire, encroachment
D. sublamellatus	Keruing kerut	Land use change
Dryobalanops aromatica	Kapur barus	Drought, forest fire, encroachment
D. rappa	Kapur paya	Drought, forest fire, encroachment
Hopea centipeda	-	Land use change
H. micrantha	Selangan lunas	Land use change, forest fire
H. pedicellata	-	Land use change
Shorea myrionerva	Seraya urat banyak	Land use change
S. platycarpa	-	Drought, forest fire, encroachment, land use change
S. quadrinervis	Seraya sudu	Drought, forest fire, encroachment, land use change
S. retusa	Seraya daun tumpul	Encroachment, forest fire
S. revoluta	Seraya daun tajam	Drought, forest fire, encroachment, land use change
S. rugosa	Seraya buaya hantu	Land use change
S. slootenii	Seraya kepong kasar	Encroachment, drought, forest fire
S. teysmanniana	Seraya bunga	Encroachment, drought, forest fire, land use change
S. biawak	Selangan batu biawak	Encroachment
Upuna borneensis	Upun	Drough, forest fire, encroachment
Vatica havilandii	Resak degong	Encroachment, land use change
Vatica venulosa venulosa	Resak banka	Encroachment, land use change

Source: Sabah Plant Red List of Dipterocarpaceae

b. Terrestrial Wildlife

Mammals

Sabah is home to many well-known mammals. The current estimate is now 216 mammal species belonging to 11 orders in Sabah[14]. Bats (*Order Chiroptera*) are the most common mammals recorded in Sabah's forests which consist of about 91 different species. This is followed by rodents (squirrels, rats, and porcupines), with approximately 59 species.

[14] Wildlife Atlas of Sabah

Table 1-7: Present Mammalian Orders and Composition in Borneo and Sabah

Order	Borneo	Sabah
	No. of species	
Eulipotyphyla (Shrews)	10	10
Scandentia (Treeshrews)	10	7
Dermoptera (Colugos)	1	1
Chiroptera (Bats)	98	91
Primata (Primates)	21	12
Pholidata (Pangolins)	1	1
Rodentia (Rats, squirrels, procupines)	66	59
Carnivora	26	26
Proboscidea (Elephants)	1	1
Perissodactyla (Odd-toed ungulates)	1	1*
Artiodactyla (Even-toed ungulates)	7	7
TOTAL	**242**	**216**

Source: Wildlife Atlas of Sabah

*Declared locally extinct in Malaysia in 2019

The Heart of Borneo (HoB) is the largest heaven for mammals in Sabah. The relatively undisturbed forests provide food and shelter for many charismatic mammals species, some less known and growing number of newly discovered species. These include up to 13 primate species, Borneo pygmy elephant (*Elephas maximus borneensis*), Sunda clouded leopard (*Neofelis diardi*), and Bornean banteng (*Bos javanicus lowi*). Approximately 60 mammal species have been recorded to reside within the Sabah HoB, in which 21 species were Bornean endemics. Out of the total mammals reported, 22 species are categorised as Critically Endangered (CR), Endangered (EN), and Vulnerable (VU). The assessment concluded that some of the major threats towards mammals community in the landscape are rampant poaching and illegal hunting[15].

[15] Suis et al. (2023)

Source: Sabah Tourism (2023)
Plate 1-1
Bornean orangutan
(*Pongo pygmaeus*)

Source: Sabah Tourism (2023)
Plate 1-2
Sunda clouded leopard
(*Neofelis diardi*)

Source: WWF (2023)
Plate 1-3
Borneo pygmy elephant
(*Elephas maximus borneensis*)

Source: WWF (2023)
Plate 1-4
Bornean banteng
(*Bos javanicus*)

Avifauna

Sabah harbours approximately 626 avifauna species in which 37 species are endemic to Borneo[6] [16]. Some of the endemic avifauna species recorded in Sabah includes the Black-crowned pitta (*Erythropitta ussheri*), Bornean black-capped babbler (*Pellomeum capistratoides*), Friendly bush warbler (*Locustella accentor*), White-crowned sharma (*Copsychus stricklandii*), Sabah partridge (*Tropicoperdix graydoni*), and White-fronted falconet (*Microhierax latifrons*) (Sabah Tourism, 2023). Species that of conservation importance that are experiencing various pressures include the great Argus pheasant (*Argusianus argus*), Storm's stork (*Ciconia stormi*), Helmeted hornbill (*Rhinoplax vigil*), Rhinoceros hornbill (*Buceros rhinoceros*), Straw-headed bulbul (*Pycnonotus zeylanicus*), and White-crowned sharma (*Copsychus stricklandii*).

Out of 55 number of Important Bird Areas (IBAs) in Malaysia, 14 areas were recognised in Sabah [17] (**Figure 1-3**). Some of the largest IBA forests in Sabah includes Mount Kinabalu, Kinabatangan floodplain, Danum Valley Conservation Area, Maliau Basin Conservation Area, and Tabin Wildlife Reserve. These IBAs face their own sets of threat which includes oil palm conversion, logging, forest fires, mining, hunting, and development activities. Danum Valley and Maliau Basin for example are exposed to emerging oil palm conversion which will result in habitat fragmentation between these two IBAs.

Source: eBird (2023)

Plate 1-5 Black-crowned pitta (*Erythropitta ussheri*)

[16] Avibase (2023)
[17] BirdLife International (2023)

Source: eBird (2023)
Plate 1-6
Bornean
black-capped babbler
(*Pellomeum capistratoides*)

Source: eBird (2023)
Plate 1-7
Friendly Bush warbler
(*Locustella accentor*)

Source: eBird (2023)
Plate 1-8
White-crowned sharma
(*Copsychus stricklandii*)

Source: Chien C. Lee
Plate 1-9
Great argus pheasant
(*Argusianus argus*)

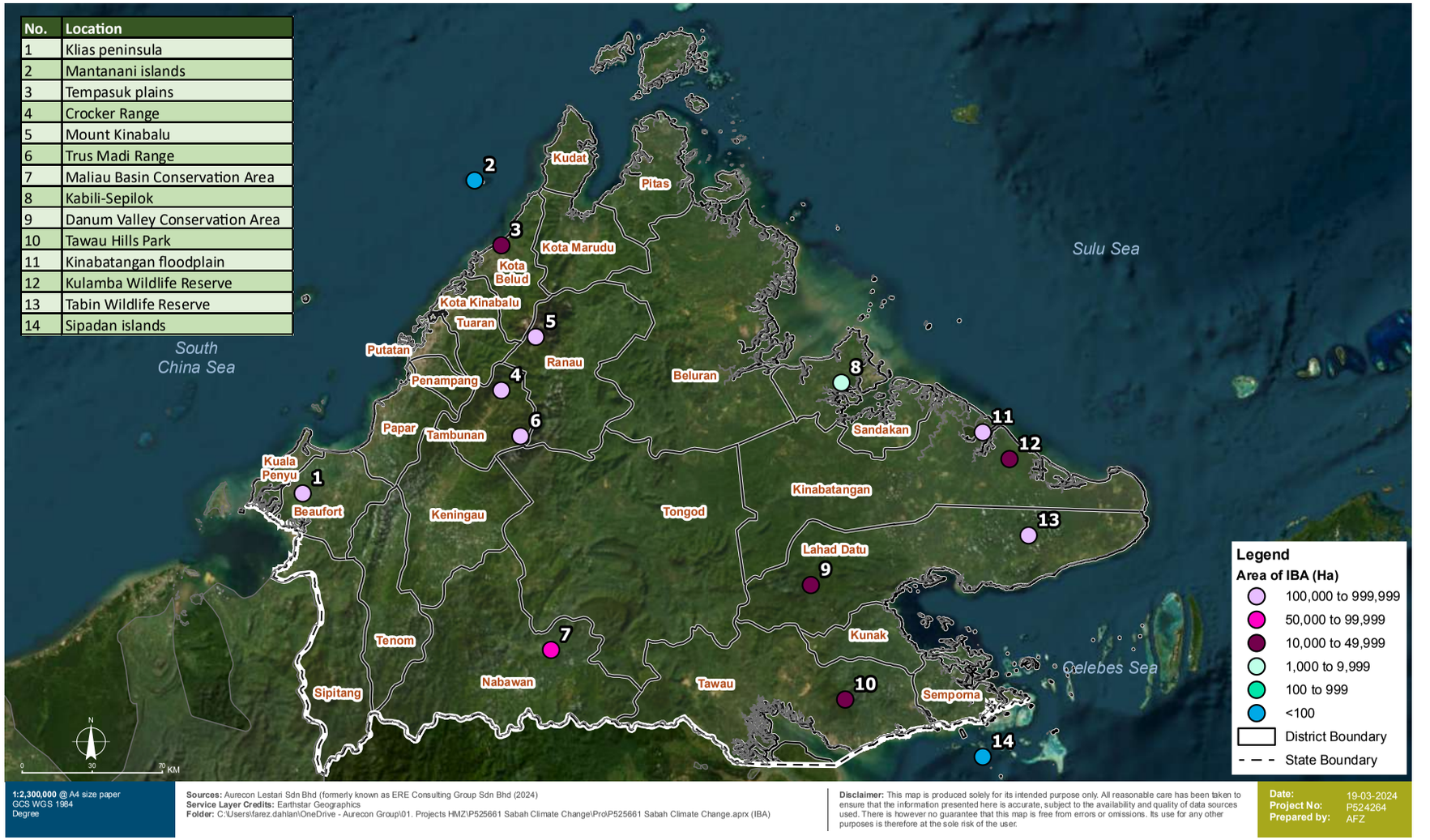
Source: Murphy Ng
Plate 1-10
Storm's stork
(*Ciconia stormi*)

Source: uhammad Alzahri
Plate 1-11
Helmeted hornbill
(*Rhinoplax vigil*)

Source: eBird (2023)
Plate 1-12
Rhinoceros hornbill
(*Buceros rhinoceros*)

Source: eBird (2023)
Plate 1-13
Straw-headed bulbul
(*Pycnonotus zeylanicus*)

Figure 1-3: Location of IBAs in Sabah



Wildlife Atlas of Sabah

The Wildlife Atlas of Sabah was officially launched in December 2023. This reference book is a comprehensive compilation of ecological information and wildlife records, authored by conservation and research scientists with extensive experience in Sabah. The Wildlife Atlas was designed for government officers overseeing wildlife management, technical advisers involved in infrastructure projects and environmental impact assessments, nature tour guides, as well as researchers and students in Sabah. The Wildlife Atlas concentrates on 31 mammals and six bird species based on extensive field data and documentation of the various conservation threates and requirements needed to secure populations in the future.

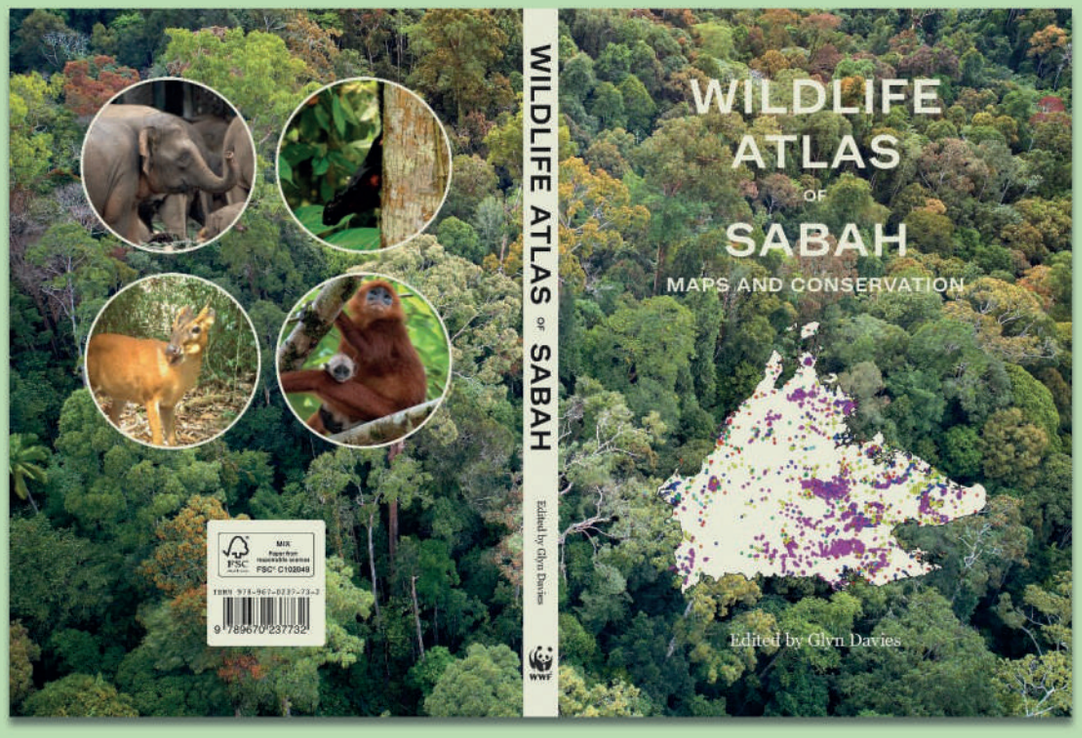


Figure 1-4: Distribution of wildlife records in the Wildlife Atlas of Sabah database

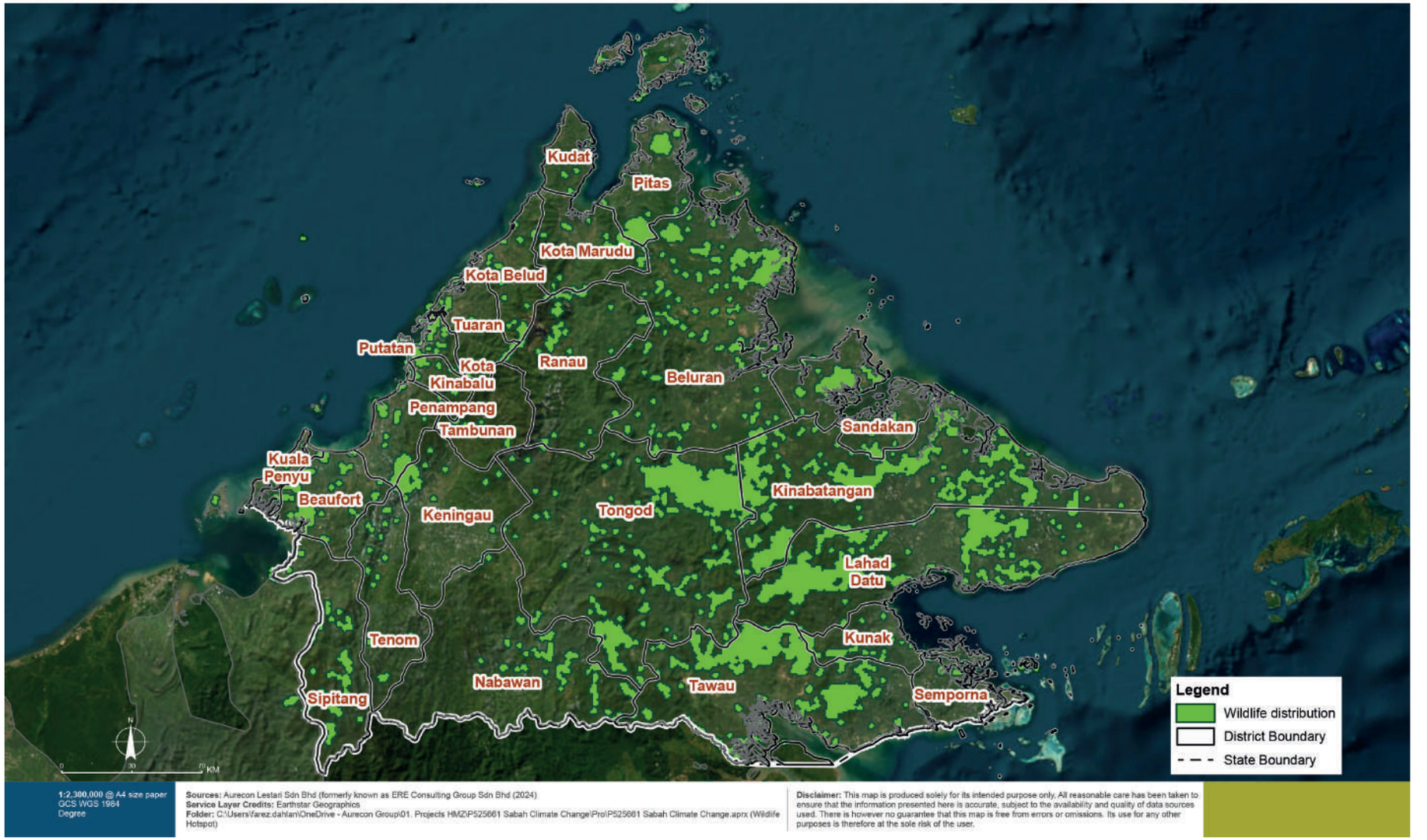


Table 1-8: Focal Wildlife under the Wildlife Atlas of Sabah and their Conservation Threats

Groups	Species	Conservation Status	Threats
Primates	Bornean Orangutan *Pongo pygmaeus*	Critically Endangered	• Habitat degradation • Habitat loss from oil palm expansion • Illegal pet trade
	North Bornean Gibbon *Hylobates funereus*	Endangered	• Generally resilient to impacts of timber extraction • Long-term impacts on populations from timber extraction required
	Red Leaf Monkey *Presbytis rubicunda*	Not Determined	• Reduced populations from logging • Potential pressures from hunting
	Sabah Leaf Monkey *Presbytis sabana*	Endangered	• Habitat loss from oil palm expansion and logging • Hunting
	Hose's Leaf Monkey *Presbytis hosei*	Endangered	• Habitat loss from oil palm expansion and logging • Hunting
	Proboscis Monkey *Nasalis larvatus*	Endangered	• Habitat loss and fragmentation • Habitat degradation • Impacts from tourism and increased visitor numbers
	Long-tailed Macaque *Macaca fascicularis*	Vulnerable	• Generally resilient to land use changes • Suspected population decline
	Southern Pig-tailed Macaque *Macaca nemestrina*	Vulnerable	• Population decline from peat land drainage, logging, landscape conversion to monoculture, habitat degradation, forest burning • Increased human wildlife-conflicts
Elephants & Ungulates	Bornean Elephant *Elephas maximus*	Endangered	• Habitat loss and fragmentation • Retaliatory killing • Poaching for ivory • Capacity contraints
	Sumatran Rhinoceros *Dicerorhinus sumatrensis*	Critically Endangered	• Hunting / trapping in the 1960s • Insufficient population size • Unsuccessful captive breeding due to reproductive pathology
	Bearded Pig *Sus barbatus*	Vulnerable	• Habitat loss and fragmentation • African Swine Outbreak • Over-hunting

Groups	Species	Conservation Status	Threats
	Bornean Banteng *Bos javanicus*	Endangered	• Habitat fragmentation and isolation of sub-populations • Hunting
	Sambar Deer *Rusa unicolor*	Vulnerable	• Impacts from logging • Conversion of forests to agriculture • Hunting
	Bornean Yellow Muntjac *Muntiacus atherodes*	Near Threatened	• Impacts from logging • Conversion of forests to agriculture • Hunting • Impacts of climate change
	Lesser Mousedeer *Tragulus kanchil*	Least Concern	• Unsustainable logging • Hunting
	Greater Mousedeer *Tragulus napu*	Least Concern	
Carnivores & Pangolin	Bornean Sun Bear *Helarctos malayanus*	Vulnerable	• Unsustainable logging • Hunting • Illegal wildlife trade • Human-widlife conflicts
	Smooth-coated otter *Lutrogale perspicillata*	Vulnerable	• Loss of riparian forests and wetland habitats • Water pollution • Hunting and illegal pet trade • Roadkill from increased road construction • Human-otter conflicts
	Asian Small-clawed Otter *Aonyx cinereus*	Vulnerable	
	Hairy-nosed Otter *Lutra sumatrana*	Endangered	
	Malay Civet *Viverra tangalunga*	Least Concern	• Land use change inc. logging • Habitat loss and fragmentation • Roadkill from new road developments • Zoonotic diseases • *Kopi luwak* industry
	Binturong *Arctictis binturong*	Vulnerable	• Impacts from new logging • Habitat loss from monoculture expansion • Hunting and pet trade

Groups	Species	Conservation Status	Threats
	Sunda Clouded Leopard *Neofelis diardi*	Vulnerable	• Low population size • Habitat loss, degradation, fragmentation • Hunting and pet trade
	Sunda Pangolin *Manis javanica*	Critically Endangered	• Overexploitation in illegal pet trade and over-hunting
Squirrels	Red Giant Flying Squirrel *Petaurista petaurista*	Least Concern	• Potential population decline from logging
	Black Flying Squirrel *Aeromys tephromelas*	Data Deficient	• Habitat loss, fragmentation
	Thomas' Flying Squirrel *Aeromys thomasi*	Least Concern	• Habitat loss, fragmentation
	Giant Squirrel *Ratufa affinis*	Near Threatened	• Habitat loss, fragmentation
	Prevost's Squirrel *Callosciurus prevostii*	Least Concern	• Habitat loss, fragmentation • Roadkill
	Tufted Ground Squirrel *Theithrosciurus macrotis*	Vulnerable	• Habitat loss • Removal of large trees • Hunting
Hornbills and other birds	Great Argus Pheasant *Argusianus argus*	Vulnerable	• Forest conversion • Hunting • Forest fires
	Storm's Stork *Ciconia stormi*	Endangered	• Small global population size • Habitat loss
	Helmeted Hornbill *Rhinoplax vigil*	Critically Endangered	• Logging and forest clearance • Hunting and illegal wildlife trade • Impacts from tourism
	Rhinoceros Hornbill *Buceros rhinoceros*	Vulnerable	• Logging and forest clearance • Hunting and illegal wildlife trade • Impacts from tourism
	Straw-headed Bulbul *Pycnonotus zeylanicus*	Critially Endangered	• Habitat loss • Trapping for cage-bird trade

Groups	Species	Conservation Status	Threats
	White-crowned Shama *Copsychus stricklandii*	Least Concern	• Unsustainable pet trade • Trapping for cage-bird trade • Isolated populations

Source: *Wildlife Atlas of Sabah*

Herpetofauna

Sabah is known for its diverse herpetofauna population where the region's tropical rainforests, mountains, and coastal areas provide a variety of habitats that support a rich array of species. A total of 327 herpetofauna species[18] has been recorded in Sabah. These comprised of 112 amphibian species (frogs and caecilians) and 215 reptile species[19] (snakes, lizards and crocodiles). For testudines (turtles, terrapins and tortoises), 14 species have been described in Sabah[19].

Inger et al. (2017) documented over 180 frogs species in Borneo. Particularly in Sabah, there are 108 species of frogs belonging to 30 genera and seven families[20]. About 96 species (57%) are endemic to Borneo. Some of reported endemic species occurring in Sabah includes giant river frog (*Limnonectes leporinus*), lowland litter frog (*Leptobrachium abbotti*), north borneo slender toad (*Ansonia fuliginea*), and whitehead's torrent frog (*Meristogenys whiteheadi*)[20].

A total of 123 snake species and 76 lizard species have also been recorded in Sabah[19]. Recorded snake species that are endemic to Borneo includes Kinabalu green pit viper (*Parias malcolmi*), Sabah green pit viper (*Popeia sabahi*), Bornean palm pit viper (*Trimeresurus borneensis*), and Kinabalu brown pit viper (*Garthius chaseni*)[21]. Large population of estuarine crocodile (*Crocodylus porosus*) can also be found in Sabah. This species mainly inhabits freshwater swamps, mangroves, river basins, oxbow lakes and up to 20km off Sabah's coast.

Invertebrates

The invertebrates of Sabah are extremely diverse. However, only a fraction of its population has been investigated and a large portion of the group remains unexplored. Fragmented research and studies were carried out in Sabah mostly focusing on charismatic insect groups such as the beetles, wasps, butterflies, moths, termites, ants and bees.

The arthropod invertebrates within Borneo's lowland forests harbour over 3,000 species[22]. Large population size with the highest number of species is mainly from the groups Hymenoptera (sawflies, wasps, bees, and ants), Coleoptera (beetles), Diptera (flies) and Hemiptera (true bugs). There are about 936 butterfly species recorded in Borneo where 94 species are endemics[14]. Some of the reported endemic species are Kinabalu birdwing (*Troides andromache*), Kinabalu bluebottle (*Graphium procles*), and Kinabalu sword tail (*Graphium stratiotes*). Kinabalu birdwing was declared as Sabah's state butterfly as of October 2023[23].

[18] Malkmus *et al.* (2002)
[19] Das & Yaakob (2007)
[20] Huaimei (2019)
[21] Das *et al.* (2015)
[22] WWF (2020)
[23] The Borneo Post (2023)

Source: Frogs of Borneo (2023)

Plate 1-14 Giant river frog (*Limnonectes leporinus*)

Source: Ismail et al. (2017)

Plate 1-15 Kinabalu brown pit viper (*Garthius chaseni*)

c. Aquatic fauna

Marine mammals

Sabah is known for its diverse marine ecosystem, and this includes various species of marine mammals. A total of 19 marine mammals species belonging to six families have been reported within Sabah waters from 1931 – 2012[24] (**Table 1-9**). Information on species occurrence were collated from historical published literatures and summarised based on Ponnampalam (2012).

The Indo-Pacific humpback dolphin (*Sousa chinensis*) and Irrawaddy dolphin (*Orcaella brevirostris*) are the two most prevalent species found Sabah in coastal waters, mostly within bays and estuaries[25]. Common species recorded in the open waters are Indo-Pacific bottlenose dolphin (*Tursiops aduncus*), spinner dolphin (*Stenella longirostris*) and pantropical spotted dolphin (*Stenella attenuata*). Dugong (*Dugong dugon*) was the most common marine mammal that are reported stranded between 1996 – 2001[25].

Table 1-9: Marine Mammal Distribution in Sabah

Family	Species	Common Name	Areas
Dugongidae	*Dugong dugon*	Dugong	• Brunei Bay inc. Labuan Island Sandakan Bay • Mantamani Island • Banggi Island
Balaenopteridae	*Balaenoptera edeni*	Bryde's whale	• Tunku Abdul Rahman Marine Protected Area
	Balaenoptera musculus	Blue whale	-
	Balaenoptera physalus	Fin whale	• Continental shelf waters of the South China Sea
Ziphiidae	*Ziphius cavirostris*	Cuvier's beaked whale	• Continental shelf waters of the South China Sea, Mapun Island
Physeteridae	*Physeter macrocephalus*	Sperm whale	• Pandanan Island • Bohey Dulang Island • Sulawesi Sea • Layang-layang Island
Delphinidae	*Sousa chinensis*	Indo-Pacific humpback dolphin	• Jambongan Island • Sipadan Island • Cowie Bay
	Orcaella brevirostris	Irrawaddy dolphin	• Sandakan Bay • Labuk Bay • Cowie Bay • Kinabatangan River • Jambongan Island • Berhala Island • Silumpat Island
	Tursiops aduncus	Indo-Pacific bottlenose dolphin	• Kota Marudu • Gulisaan Island
	Tursiops truncatus	Common bottlenose dolphin	• Layang-layang Island • Southern Sulu Sea
	Stenella attenuata	Pantropical spotted dolphin	• Layang-layang Island • Southern Sulu Sea

[24] Ponnampalam (2012)
[25] Jaaman *et al.* (2008)

Family	Species	Common Name	Areas
	Stenella longirostris	Spinner dolphin	• Nagus Bay • Teringai Beach
	Pseudorca crassidens	False killer whale	• Teringai Beach • Nagus Bay
	Feresa attenuata	Pygmy killer whale	• Tanjung Aru
	Peponocephala electra	Melon-headed whale	• Sipadan
	Steno bredanensis	Rough-toothed dolphin	• Kota Belud
	Orcinus orca	Killer whale	• Sipadan Island • Layang-layang Island
	Globicephala macrorhynchus	Short-finned pilot whale	• Likas Bay
Phocoenidae	*Neophocaena phocaenoides*	Indo-Pacific finless porpoise	-

Source: Ponnampalam (2012); The Borneo Post (2012); New Straits Times (2017); New Straits Times (2016); The Borneo Post (2015)

Marine Turtles

A total of three marine turtle species have been recorded in Sabah namely the green turtle (*Chelonia mydas*), olive ridley turtle (*Lepidochelys olivacea*), and hawksbill turtle (*Eretmochelys imbricata*). However, the olive ridley turtle nesting has been rare in the last decades. Turtles' distributions are mainly reported near Turtle Islands Park, Mantanani Island, Sipadan Island, and Brunei Bay[26].

Turtle Island Park comprises of three small islands namely Selingan, Gulisaan and Bakungan Kechil which cover a total area of 1,740 ha[27]. The park is under the management of Sabah Parks for the full protection of nesting turtles and nesting grounds. The nesting of hawksbill turtle on Gulisaan Island is reported the highest in Malaysia, and southeast Asia to some extent[28]. The nesting in the park is mostly dominated by green turtles (94%), followed by hawksbill turtles (6%) and very rarely by olive ridley turtles (0.002%)[28].

[26] Universiti Malaysia Sabah (2009)
[27] Sabah Parks (2023)
[28] Joseph (2017)

Source: The MareCet Research Organisation

Plate 1-16 Indo-Pacific humpback dolphin (*Sousa chinensis*)

Source: Roland Seitre / WWF (2023)

Plate 1-17 Irrawaddy dolphin (*Orcaella brevirostris*)

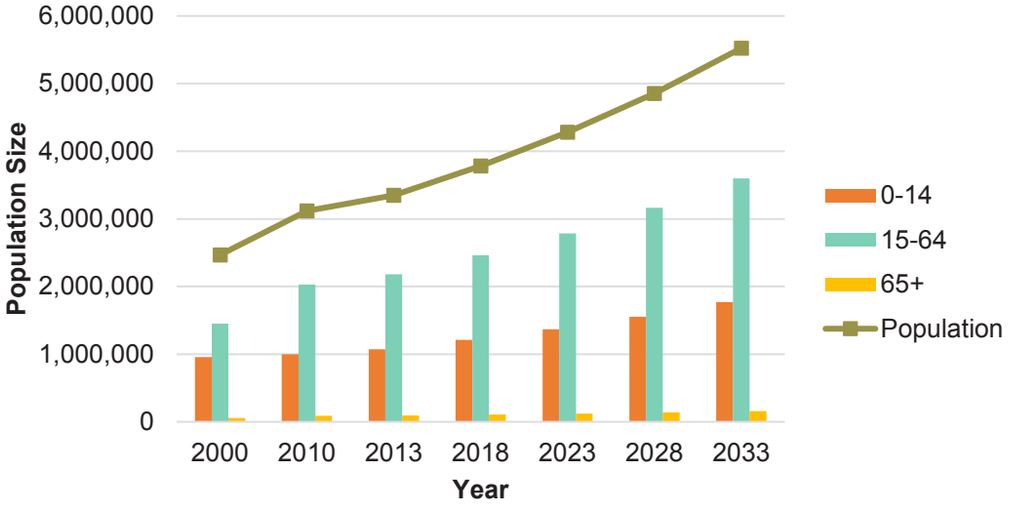
BIODIVERSITY CONSERVATION IN THE NEXT DECADE

Sabah is expected to continue its economical development well beyond 2030. The Sabah Maju Jaya Development Plan 2021-2025 and Sabah Structure Plan 2033 have charted the State's development priorities and strategies for the next decade. These development plans have also taken into consideration the need to safeguard its natural ecosystems and biodiversity resources. Nonetheless, it is still important to understand the socio-economic factors that will influence and effect Sabah's biodiversity in order to develop effective conservation strategies.

Population Growth

Sabah is the third most populous state in Malaysia after Selangor (21.6 %) and Johor (12.3 %), with population composition of 10.4 %. Sabah's population in 2022 was about 3.39 million. The population is projected to increase to 5.5 million by 2033[29] (DOSM, 2023; Sabah State Structure Plan 2033, 2016) (**Chart 1-3**). The state's population is relatively young and expected to remain as such. The largest cohort will be the work age group (15-64) that is expected to make up 65% of total population 2033.

Sabah's population is projected to increase in the future due to factors such as increased lifespan, reduced infant mortality, and labour migration. As the population grows, the demand for resources such as land, water, energy, and food will increase, leading to the exploitation of natural resources. Changes in resource demand will lead to increased pressure on natural ecosystems and resources, which will then have cascading impacts to wildlife populations.



Source: Sabah State Structure Plan 2033

Chart 1-3: Population Size of Sabah between 2000 and 2033 (Projected)

[29] DOSM (2023); Sabah State Structure Plan 2033

Impacts from Economic Growth

Sabah is a significant contributor to the national economy, accounting for 6% of the national GDP. The economy is driven by the services sector, manufacturing, and the domestic economy, with heavy reliance on the oil and gas, agro-commodities, and tourism sectors. From 2009 to 2019, the state's economy grew from MYR 56.54 billion to MYR 85.44 billion and is projected to reach MYR 124.7 billion by 2030 under a high-growth scenario [30]. Population growth in Sabah, particularly among the working-age cohort, will lead to rapid economic development and consumption patterns that may impact biodiversity and natural resources.

a. Agriculture

The agriculture sector remains essential to Sabah's economy. In 2019, the sector contributed 16.1% of Sabah's GDP and employs 26% of workforce[34]. However, the agriculture productivity remains low with a low self-sufficiency level in food crop production, leading to a negative food trade balance [31]. From 2010 to 2019, food imports to Sabah grew at a compound annual growth rate (CAGR) of 6.0%, while exports grew at a slower CAGR of 4.1% (**Chart 1-4)**. This indicates a widening gap in the state's food trade balance.

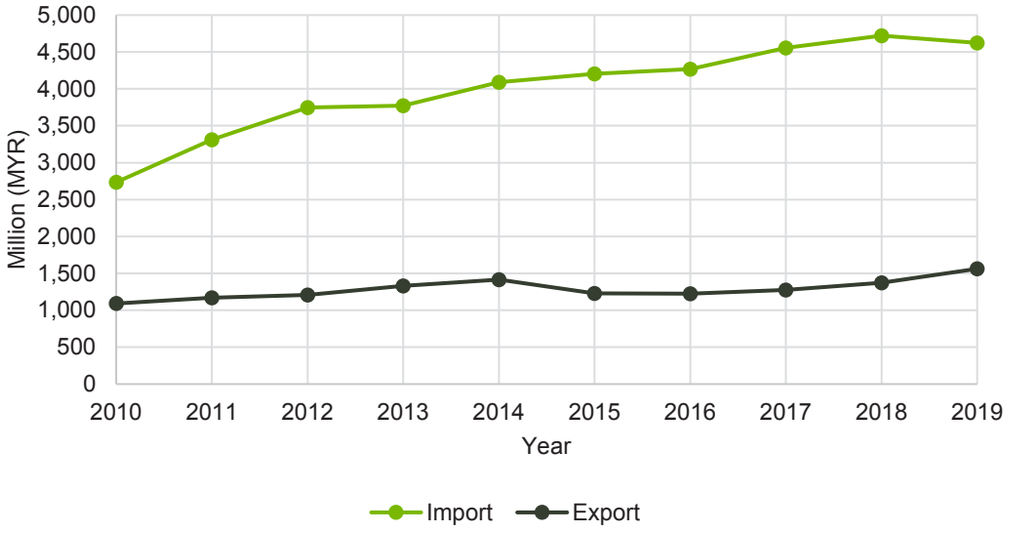


Chart 1-4 Import and Export of Food in Sabah between 2010 and 2019 (MYR Million)

Rice is the key carbohydrate source for the population and the reported SSL level for paddy is 26% which is insufficient to meet local demand [32]. Efforts to improve paddy production is hampered by issues on drainage and irrigation facilities, land use competition, lack of high-quality seeds, and traditional farming practices. The Sabah government is committed to expand the paddy plantation area and improve

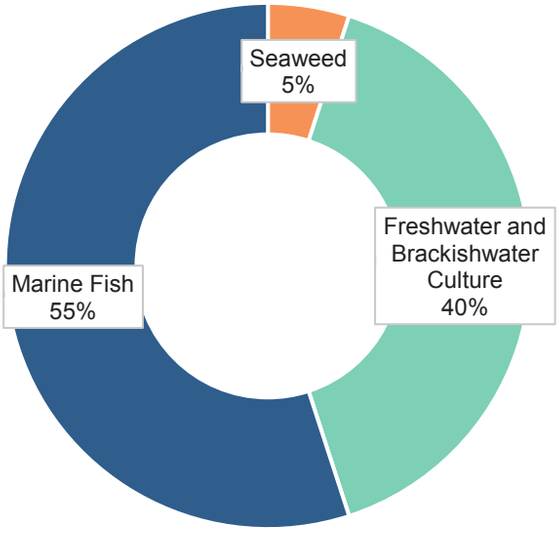
[30] SDC Blueprint 2021-2030
[31] Environmental Statistics Sabah 2022 (DOSM)
[32] Third Sabah Agricultural Policy 2015-2024 (2015)

farming technologies and practices to improve the yield. This will result in more pressures towards terrestrial landscapes and increase risks of habitat loss and fragmentation. Additionally, increased agriculture development will also increase in water usage and pollution from increased pesticide and fertiliser use, as well as contribute to greenhouse gas emissions, which will have long-term impacts on habitat and species integrity.

b. Livestock, Fisheris, and Aquaculture

Livestock cultivation in Sabah mainly consist of buffalo, cattle, goat, sheep, swine, chicken, and duck. Sabah's livestock industry is expected to continuously grow to support demand from increased population size and export activities. The Sabah Agriculture Blueprint 2030 has outlined several target towards improving self-sufficiency levels for livestock which is backed by government funding and private investments.

The fisheries industry in Sabah includes marine fish landing, freshwater and brackish water culture, and seaweed culture, with a total value of MYR 2 billion in 2019 [33] (**Chart 1-5**). Marine fish is the largest contributor to this sector, with a total fish landing of 179.7 tonnes in 2019[37]. Marine fish landings alone generated RM 1.1 billion in revenue in 2019, which represents 55% of the total revenue of the fisheries industry. Seaweed culture production in 2019 stood at 188.1 tonnes and has experienced a rapid growth rate of 11.7% between 2002 and



Source: SDC Blueprint 2021-2030 (2021)

Chart 1-5: Total Value of Capture Fisheries and Aquaculture in Sabah, 2019

[33] SDC Blueprint 2021-2030

The Sabah Maju Jaya Development Plan has targeted the fisheries industry for further development through deep-sea fishing to meet the increasing export demands from countries such as China, Korea, Taiwan, Hong Kong, Australia, and Japan.

The expansion of the livestock industry can result in habitat loss and degradation due to land expansion, leading to increased water usage and pollution levels that deplete water sources and reduce water quality. Wildlife conflicts may also increase near grazing areas. Moreover, the increased demand for fisheries resources can lead to overfishing, increased by-catch incidents, and habitat destruction from harmful fishing practices such as fish bombing, leading to declining fish stocks and biodiversity loss. These effects can be detrimental to both the fisheries industry and the environment.

c. Agri-Commodity and Forest Industries

Sabah's agri-commodity sector primarily consists of oil palm, rubber, and cocoa. Oil palm has the largest planted area, at 1.7 million ha. in 2019, making Sabah the largest palm oil producer in Malaysia with 5 million tonnes of CPO production, accounting for 25.4% of Malaysia's output[34]. On the other hand, rubber and cocoa production are comparatively smaller, with a planted area of 208,966 ha. and 5,975 ha. respectively, and production amounts of 38,000 tonnes and 533 tonnes respectively.

In 2019, the forest and timber industry contributed MYR 1.1 billion to the state's coffers[38]. In terms of log production, Sabah has witnessed a significant increase, with production volumes rising from 0.68 million m^3 in 2020 to 1.13 million m^3 in 2021, most of which are from Sabah's production forest reserves, which constitute 87% of the log sources through Sustainable Forest Management practices[35]. The increased log production in Sabah led to a rise in the production of primary timber products such as sawn timber, plywood, moulding, chips, and veneers. Additionally, Sabah has received approximately MYR 2.5 billion in investments for the wood-based industry, which is expected to boost the production output of timber products.

The production and export of forest and timber products are projected to increase in the future. This is following the partial overturn of the log export ban at the end of 2021 to allow for a limited export program for eligible parties to export unprocessed timber from natural forests starting Jan 3rd 2022. The return of log exports has raised fears that both legal and illegal logging will ramp up in the state[36].

The Sabah Forestry Action Plan 2022-2035 elaborates that the state has allocated 600,000 ha of degraded forests for the establishment of timber plantations, on which 160,000 ha of plantations have already been set up. The plan calls for an

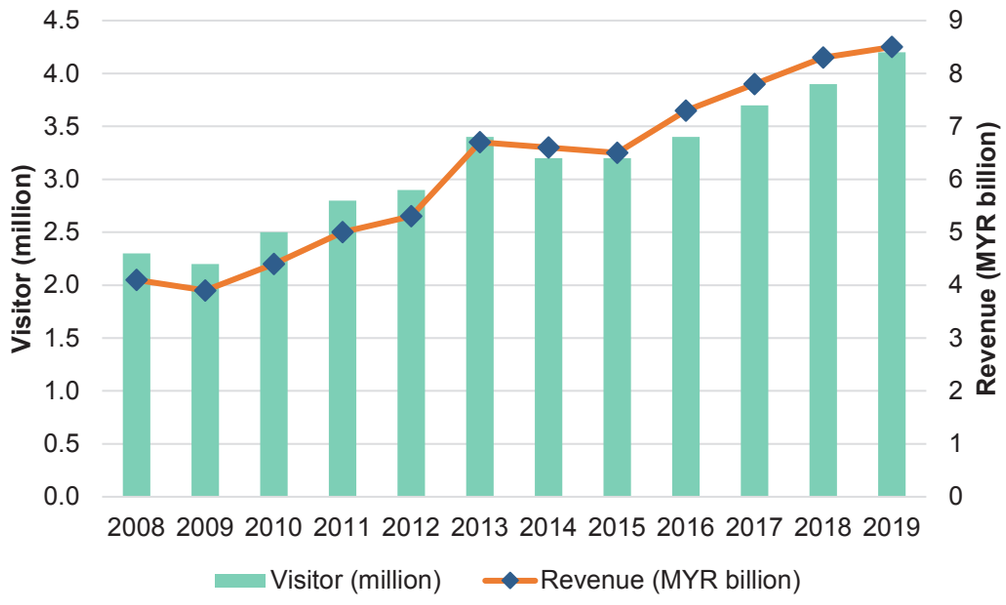
[34] SDC Blueprint 2021-2030
[35] SFD Annual Report 2021
[36] Donald, R. (2022).

additional 240,000 ha of new timber plantations to be established by 2035, which it estimates will bring the state's production capacity up to 6 million cubic meters of wood per year. While timber plantations can provide certain ecosystem services such as temperature regulation and filtering air and water, these cannot reach the extent of services that can be provided by a natural and biodiverse forest[37].

The continued growth of the agri-commodity and forest industries will continue to exert pressures towards important habitats and landscapes in Sabah. While there have been efforts to improve practices to meet sustainable standards e.g., Sustainable Forest Management, RSPO, etc., the threats of excessive habitat conversion for new plantations remain present. This then increases challenges for human-wildlife conflict management and species conservation.

d. Tourism

The tourism sector is a major economic sector of Sabah. In 2019, 4.2 million visitors were recorded with a generated revenue valued at MYR 8.5 million (**Chart 1-6**). Tourism activities are reliant on Sabah's natural ecosystems, both from the terrestrial and marine realms, as well as cultural heritage.



Source: Sabah Tourism Board (n.d.), SDC Blueprint 2021-2030 (2021)

Chart 1-6: Sabah Visitor Arrival and Revenue Generation between 2008 and 2019

The tourism sector is expected to experience continuous growth as a recovery from the COVID-19 pandemic between 2020 and 2021. The Sabah Maju Jaya Development Plan has identified the tourism sector as one of the key economic sectors that will propel Sabah's economic growth in the next five years. The

[37] Lee, S.T.T. (2022)

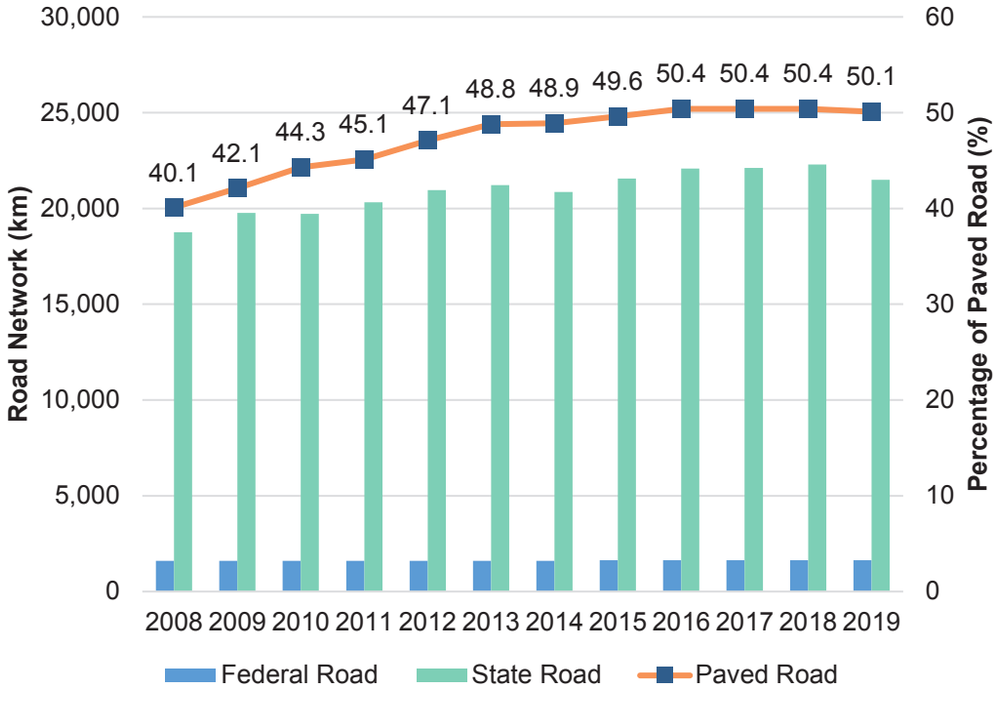
development plan aims to enhance community-based tourism (CBT) and cater to frequent independent travellers (FIT), who contribute to 59% of the revenue generated.

However, the expected growth of Sabah's tourism sector will see pressures from increased visitor usage, as well as ensuring sustainable infrastructure development. Oversusage of nature-based sites will eventually result in environmental degradation and social impacts, if not managed properly. Sabah's islands and marine biodiversity in particularly, will be extremely susceptible to increased visitor intensity for snorkelling and diving activities. The 2023 Reef Check annual report indicated the average of live coral cover (LCC) over 15 islands in Sabah was at 43.31%, ranging from 20.08% - 55.63%. This indicated that the coral health levels in Sabah fall within "poor" to "good" category. This deteriorating trend followed a noticeable improvement of LCC during the COVID-19 pandemic period, where tourism activities were restricted and the islands did not experience any major tourism activities.

Impacts from Major Infrastructure Development

a. Expanding Road Networks

Sabah's road network consists of federal and state roads. Between 2008-2019, the federal road network has grown by 2.6% while the state road network has grown by 14.7% (**Chart 1-7**). The overall road network in Sabah presently spans 23,140 km, of which 11,583 km are paved, while the remaining roads are gravel and earth type. However, the paved road network in Sabah (50.1%) is significantly lower compared to Peninsular Malaysia (78.9%) and Sarawak (66.4%)[38].



Source: SDC Blueprint 2021-2030 (2021), Department of Statistics (DOSM) (n.d.)

Chart 1-7: Road Network System in Sabah between 2008 and 2019

The road network system is projected to expand in line with the vision outlined in Sabah Maju Jaya Framework, which aims to increase the percentage of paved roads to 60% by 2025. This target entails paving an additional 14,055.57 km of roads. Furthermore, the coverage of the road network is expected to increase through the construction of the Pan-Borneo Highway and the implementation of road construction projects in urban and rural areas. These efforts aim to enhance connectivity and facilitate transportation within different regions of the state.

Although necessary to improving connectivity between rural areas and major towns, expanding road networks around Sabah will also increase habitat fragmentation risks, especially if proposed roads directly traverse through pristine forests or important landscapes. This will then increase human-wildlife conflicts, especially

[38] SDC Blueprint 2021-2030

with Bornean elephants due to disruptions to natural roaming areas, as well as potentially increasing roadkills involving other wildlife.

b. Increasing Water Supply

Sabah's water demand for potable use, animal husbandry, and agriculture activities is still relatively high and is expected to increase in tandem with population and economic growth (**Chart 1-8)**. Water demand in Sabah is expected to increase from approximately 1,400 million cubic meter (MCM) in 2020 to 1,500 MCM by 2050[39]. Fulfilling this additional demand requires more water treatment plants and other appropriate infrastructure as well as increased water abstraction from rivers and groundwater sources.

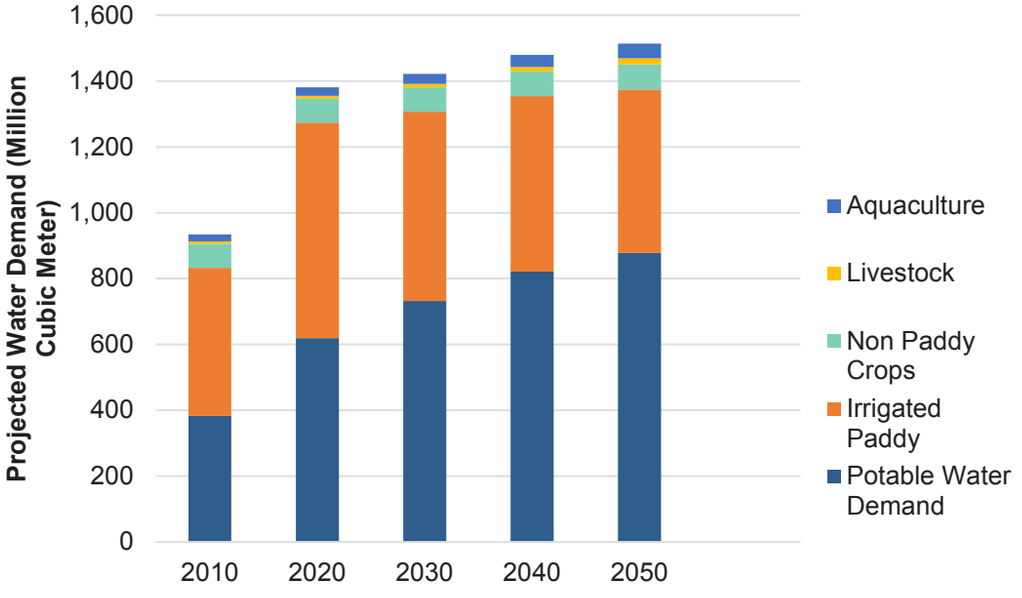


Chart 1-8 Projected Water Demand of Different Sectors in Sabah between 2000 and 2050

Under the Sabah Maju Jaya Framework, the State is aiming to increase the clean water production capacity by constructing 22 new water treatment plants (WTP) by 2025. These new WTPs will be built in Kota Kinabalu, Kundasang, Kota Marudu, Sandakan, Papar, and Semporna, where there is projected growth in water demand.

The need to increase water capacity to meet the demands may exert pressures on Sabah's freshwater ecosystem, particularly in the highland water catchment areas. The possible construction of dams, reservoirs, and water diversion projects to enhance water availability can lead to the alteration of natural river flows and the disruption of important ecological processes. Modification to freshwater ecosystem can impact the native flora and fauna that rely on the habitats, which could lead to population declines.

[39] Review of the National Water Resource Study 2000-2050 (2011)

c. Energy Use

The increased population and economic growth in Sabah will lead to higher energy consumption. Sabah's total electricity consumption between 2010 and 2021 increased from 4,050 GWh to 5,356 GWh and projected to reach 9,000 GWh in 2030[40]. The electricity generation is primarily driven by gas power plant (79.3%), diesel power plant (11.8%), and renewable energy (8.9%).

The application of conventional gas and diesel power plants will result in increased greenhouse gas emissions, which will contribute to climate change. The potential development of renewable energy is identified in small and large hydro power plants, solar plants, geothermal, and bioenergy plants[40]. The establishment of solar farms requires a significant amount of land to generate sufficient energy for sustainable production and distribution. Land clearing activities associated with this may lead to the conversion of natural habitats, impacting habitat connectivity and population distribution. The construction of hydro power plants will also lead to increased land use pressures, water flow alteration, and community displacement.

Other Conservation Challenges

a. Poaching and Illegal Wildlife Trade

Poaching and illegal wildlife trade has always been a major challenge in Sabah, due to its rich plant and wildlife diversity. Poaching usually occurs within plantations and forest reserves by people looking for plants and wildlife for consumption or trade. While Sabah has various legislations that allows hunting of certain wildlife, illegal hunting still remains rampant by people that do not have the necessary licenses and permits.

In recent years, Sabah has emerged as a route used for wildlife trafficking, which has made wildlife in Sabah more vulnerable to the pressures of poaching and illegal wildlife trade. The growth of organised crime specialised in illegal wildlife trade, the increase in cybercrime activities as well as the expansion of courier and postal services have collectively amplified the threat of the state being used as a pitstop for these illegal activities.

Sabah currently has five species action plans that have been endorsed for some of its most threatened wildlife including the Bornean elephant, the Bornean orangutan, the Bornean banteng, the Sunda clouded leopard, the proboscis monkey and sea turtles. However, it does not yet have plans for other species including the Sunda pangolin and Malayan sun bear, which have emerged as priority targets for illegal wildlife trade. Moving forward, the Sabah Wildlife Department has partnered WWF-Malaysia and other government agencies including the Royal Malaysian Police and

[40] Sabah Energy Roadmap and Master Plan 2040 (SE-RAMP 2040).

General Operations Force, as well as private corporations, to develop a 10-year action plan to combat illegal wildlife trade in Sabah[41].

b. Marine Pollution

Sabah has an extensive coastline which also makes its marine ecosystems particularly susceptible to marine pollution. Various studies have been conducted to explore the level of marine pollution around Sabah's coastal areas, including Darvel Bay and selected islands in the Tunku Abdul Rahman Park[42] which have indicated concerning levels of pollution. More recently, the Kota Kinabalu City Hall has entered into a partnership with Kure Daiya, a Japanese vessel manufacturer specialising in equipment for waste collection in waterways and oceans. A seven-day feasibility trial around Kota Kinabalu's coastal areas collected a staggering 2,230kg of waste, which is a 150kg average of waste generated per day[43].

Plastics (plastic bags, plastic bottles, plastic straws, polystyrene, and other general plastics) still make up the bulk of marine pollution around Sabah, which have both direct and indirect impacts to marine ecosystems, especially coral reefs which are abundant throughout Sabah's waters. Direct impacts include physical damage, substrate covering and entanglement, and gut blockage if items are ingested by marine fauna. Litter can also act as an artificial substrate for the colonisation of corals. When litter is transported over long distances it can facilitate the spread of invasive coral species, such as the crown of thorns. In addition, large pieces of litter clearly damage the aesthetic value of coral reefs[44].

Indirect impacts of plastics include the introduction of pathogenic agents 'hitch-hiking' on the surface and increasing the appearance of diseases in corals. In the long term, macroplastics decompose into micro- and nanoplastics that can be unintentionally ingested by corals. They may also become vectors of bacteria and chemicals that are toxic to corals, and may enter and contaminate the marine food webs. These adverse indirect effects are not exclusive to plastics, but most can be extended to a diverse variety of marine litter that also break into microplastics and nanoparticles that end up accumulating in reef ecosystems[49].

[41] The Borneo Post (2023)
[42] Santodomingo et al. (2021); Zahari et al. (2021)
[43] Anjumin, E. (2023)
[44] Santodomingo et al. (2021)

Emerging Challenges

a. Climate Change

Climate change is expected to continually influence Sabah's seasonal changes, extreme weather events, and oceanic conditions. This will impact the Sabah's biodiversity resource, population, and economic activities. Impact of climate change is being noted in changes of annual temperature trends, rainfall trends, sea level rise, sea surface temperature, and ocean acidification[45].

Sabah's mean surface temperature has increased by 0.18°C between 1969 and 2019 and is expected to experience an increase of between 0.8°C – 1.0°C by 2030. Rainfall is projected to in by 4-6% by the same period. In addition, sea level rise, increase in sea surface temperature, and ocean acidification will occur as a result of climate change.

Climate change may have significant impacts on biodiversity and ecosystems. Among primary effects are changes in forest cover, loss of coastal habitats due to rising sea levels, shifts in species distribution and population, and coral bleaching. Climate change can cause altered precipitation patterns, increased droughts, wildfires, and pest outbreaks, leading to changes in forest cover. Species may shift their ranges and populations as temperatures change, causing disruptions in ecological interactions. Coastal habitats like mangroves may submerge due to rising sea levels, endangering biodiversity, and communities. Coral reefs, vital for biodiversity, can experiencing mass bleaching events due to elevated sea temperatures and ocean acidification.

In addition to the impacts on ecosystems, climate change will disrupt the economic growth of Sabah and have an impact on the health of humans who rely on ecosystem services and resources. Therefore, it is urgent that climate change considerations be included in policy and legislative planning, as well as in conservation efforts.

b. Mineral and Non-Mineral Extraction

Extraction activities in Sabah comprises of both mineral and non-mineral resources which includes oil and gas, sand and stone, and precious metal (i.e., gold). Sabah is among the largest gas producing states in Malaysia with nearly 11.67 trillion cubic feet (Tcf) of natural gas reserve and 1.5 billion barrel of oil reserve. This represents 12% and 25% of its gas and oil reserves respectively. Oil and gas extraction primarily occurs in marine environment and will continue for the foreseeable future. Oil and gas extraction can pose environmental impacts such as oil spill, water contamination, habitat destruction, and noise and vibration impacts towards marine organisms.

[45] Malaysia 4th Biennial Update Report to UNFCCC

Aside from oil and gas extraction, river sand mining activities in active in Sabah where approximately 2 million MT of sand, gravel, rocks, and other riverbed deposits are extracted from rivers[46]. Gold mining activities are present in Tawau and Lahad Datu. Mining activities in terrestrial and freshwater environment may result in habitat destruction, water quality degradation, river channel modification, and land use conflicts which harms the ecosystem, its services, and its dependents.

c. Zoonotic Disease

Zoonotic diseases refer to infectious diseases that can be transmitted between animals and humans. They can be caused by various pathogens such as bacteria, viruses, parasites, or fungi. These diseases are typically transmitted through direct or indirect contact with infected animals or their bodily fluids. The emergence of zoonotic diseases is influenced by several factors, including changes in land use, agricultural practices, human-wildlife interaction, deforestation, climate change, wildlife trade, and global trade and travel. These factors create conditions that facilitate the transmission of pathogens from animals to humans.

As the population and economy of Sabah continue to grow, there is a potential increase in instances of zoonotic disease occurrence. The recent examples of zoonotic diseases like COVID-19 and SARS highlight the significant impacts they can have on human health and the economy. Sabah needs to be well-prepared to prevent and manage these diseases effectively.

d. Invasive Alien Species

Invasive Alien Species (IAS) are non-native species that are introduced and establish themselves in ecosystems outside of their native range. These species have the potential to cause significant damage to the invaded environment, economy, and social aspects. IAS can alter ecosystem processes, decrease native species abundance and richness through competition and predation, and change the community structure of flora and fauna[47]. As Sabah's participation in trade and transport activity increases, so does the potential exposure to IAS.

Sabah is already facing issues with IAS in its freshwater and terrestrial ecosystems. For example, 200 freshwater bodies in Sabah are invaded by giant weed (*Salvinia molesta*), which can harm freshwater fish species, submerged aquatic plants, and alter water quality, ultimately affecting crop production. Additionally, protected areas such as Kinabalu Park are also facing IAS invasions, which, if left unchecked, can damage the pristine biodiversity, and subsequently impact tourism activities.

[46] EIA Guidelines for River Sand and Stone Mining
[47] McGeoch *et al*. 2010

PART 2

BIODIVERSITY CONSERVATION STRATEGIES FOR THE NEXT DECADE

CONSERVATION COMMITMENT

The Sabah Biodiversity Strategy 2024-2034 represents a renewed commitment to protect and conserve Sabah's biodiversity, while also ensuring sustainable utilisation as Sabah continues to progress and develop. The revised Strategy embodies the spirit of the CBD's Kunming-Montreal Global Biodiversity Framework, and Malaysia's National Policy on Biological Diversity (NPBD) 2022-2030.

"Sabah will strive to conserve its biological diversity, promote its sustainable use and ensure the fair and equitable sharing of benefits arising from the utilisation of biological resources to its people."

PRINCIPLES

The revised Policy will be guided by the five principles of the NPBD to ensure that the goals, targets and actions support the Sabah's vision for biodiveristy conservation:

PRINCIPLE 1: HERITAGE

Biological diversity is a national heritage and it must be sustainably managed and wisely utilized today and conserved for future generations.

PRINCIPLE 2: PRECAUTIONARY

The lack of full scientific certainty should not be used as a reason to postpone measures to minimize threats of significant loss of biodiversity. At the same time, there is also a strong need to improve the information databases of Sabah's biodiversity to guide implementation and decision making of this revised strategy.

PRINCIPLE 3: SHARED RESPONSIBILITY

The conservation and sustainable utilisation of biodiversity are the shared responsibility of all sectors of society. Planning & management of biodiversity must be carried out in a participatory manner. This Strategy should be used as a platform to breakdown management silos between government departments and bridge implementation gaps in Sabah to further improve conservation action.

PRINCIPLE 4: PARTICIPATORY

The role of indigenous peoples and local communities in the conservation have to be continuously strengthened as the true conservation partners in Sabah. At the same time, the rights of indigenous peoples and local communities also have to be effectively recognized to ensure rightful share of benefits arising from utilisation of natural resources.

PRINCIPLE 5: GOOD GOVERNANCE

Good governance, including accountability and transparency in decision-making, remains crucial to biodiversity conservation in Sabah. This Strategy should be used as a tool to call for more effective and transparent governance of Sabah's natural resources in the midst of continuing development.

FRAMEWORK OF THE SABAH BIODIVERSITY STRATEGY 2024-2034

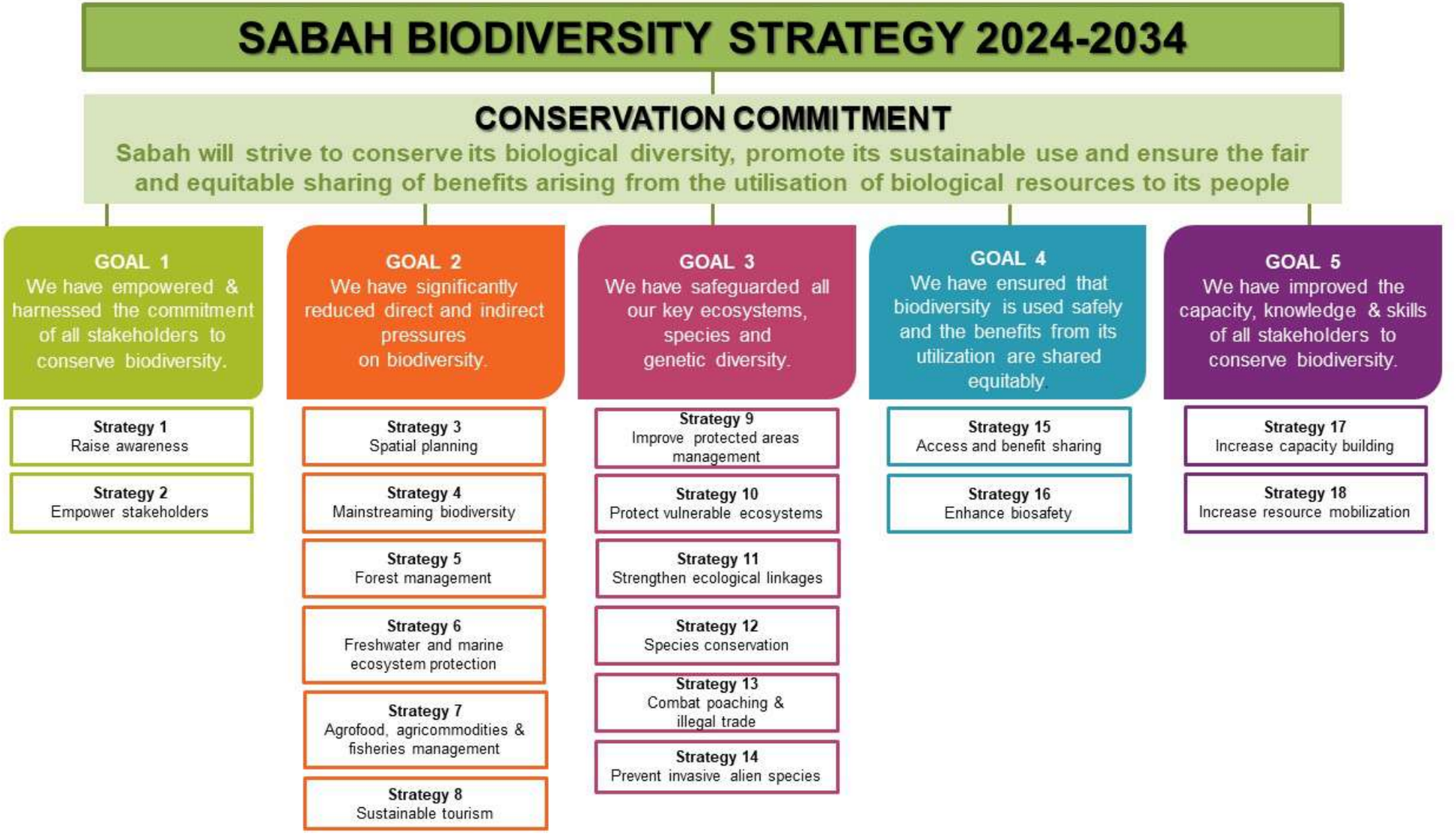
The framework of the Sabah Biodiversity Strategy has been revised to provide a more cohesive and direct approach to guide conservation efforts. The Strategy now encompasses a Goal-Strategy-Action framework that closely mirrors the NPBD 2022-2030 while also meeting Sabah's own interests.

The revised Sabah Biodiversity Strategy contains **5 Goals, 18 Strategies** and **57 Actions**. These have been revised through a review process that has assessed the progress and effectiveness of the previous Strategy and updated to take into account present and future challenges and conservation needs in Sabah.

Each goal is accompanied by strategies to provide guidance on specific thematic areas. The strategies are supported by a list of actions that outline the required activities to be undertaken and proposed time frame, as well as a main indicator to measure the effectiveness of the action. Each action also includes a list of implementing and supporting players. The roles for lead and supporting agencies are to:

- **Lead agencies**: To initiate and coordinate implementation of the activity. This includes kick-starting projects/programmes, initiating discussions and collaboration, and overall reporting on the progress of the activity. The agency may also be directly involved in the implementation through its own technical capacities, but is also encouraged to collaborate with supporting agencies to enhance implementation. SaBC will serve as the coordinator with all lead agencies to facilitate and guide implementation of the actions/activity.

- **Supporting agencies**: Assist lead agency in implementation of the activity/ action through their technical experties/capabilities. Supporting agencies may even expand beyond those listed in this Strategy, based on the direction of the lead agencies.


SABAH BIODIVERSITY STRATEGY 2024-2034
CONSERVATION COMMITMENT
Sabah will strive to conserve its biological diversity, promote its sustainable use and ensure the fair and equitable sharing of benefits arising from the utilisation of biological resources to its people
GOAL 1
We have empowered & harnessed the commitment of all stakeholders to conserve biodiversity.
Strategy 1
Raise awareness
Strategy 2
Empower stakeholders
GOAL 2
We have significantly reduced direct and indirect pressures on biodiversity.
Strategy 3
Spatial planning
Strategy 4
Mainstreaming biodiversity
Strategy 5
Forest management
Strategy 6
Freshwater and marine ecosystem protection
Strategy 7
Agrofood, agricommodities & fisheries management
Strategy 8
Sustainable tourism
GOAL 3
We have safeguarded all our key ecosystems, species and genetic diversity.
Strategy 9
Improve protected areas management
Strategy 10
Protect vulnerable ecosystems
Strategy 11
Strengthen ecological linkages
Strategy 12
Species conservation
Strategy 13
Combat poaching & illegal trade
Strategy 14
Prevent invasive alien species
GOAL 4
We have ensured that biodiversity is used safely and the benefits from its utilization are shared equitably.
Strategy 15
Access and benefit sharing
Strategy 16
Enhance biosafety
GOAL 5
We have improved the capacity, knowledge & skills of all stakeholders to conserve biodiversity.
Strategy 17
Increase capacity building
Strategy 18
Increase resource mobilization

GOAL 1
ALL STAKEHOLDER GROUPS HAVE BEEN EMPOWERED AND ARE COMMITTED TO PROTECT SABAH'S BIODIVERISTY

Empowering and harnessing the commitment of stakeholders is crucial in protecting Sabah's biodiversity. It will require the contribution of citizens across all segments of society towards conservation. These ranges from government agencies, NGOs, academic institutions, private sectors, and local communities.

The Sabah State Government will continue to oversee, lead and coordinate high-level conservation activities. The academic community will continue to serve as the main hubs for collecting, managing, and updating information on Sabah's biodiversity. Land use planning, infrastructure, transportation, agriculture, fisheries, mining, tourism, and economic development will be managed by the respective sectoral agencies, where biodiversity mainstreaming will need to be continuously engrained to ensure these sectors do not result in significant impacts that dampens biodiversity conservation.

Private sector involvement in biodiversity conservation is anticipated to increase in the next decades. Sustainable Development Goals (SDGs) and Environmental, Social, and Governance (ESG) are already being gradually adopted by the private sector as guiding principles. This shows increased awareness levels in making greater contributions towards biodiversity conservation in Sabah. Coordinated efforts with State Government need to be empowered through series of direct engagements with these private businesses.

Goal 1 has 2 strategies:

- Strategy 1: Increase the awareness of Sabahans to the values of biodiversity and the steps they can take to conserve and use it sustainably.
- Strategy 2: Strengthen the roles of indigenous peoples and local communities, civil society, the private sector, and academia in biodiversity conservation.

Strategy 1: Increase the awareness of Sabahans to the values of biodiversity and the steps they can take to conserve and use it sustainably.

WHY IS THIS STRATEGY IMPORTANT?

Efforts toward conservation are most effective when the significance of biodiversity is fully grasped and embraced. However, there is still has a notable lack of awareness about biodiversity within Sabah's society, which poses a significant challenge. Greater initiatives are required to elevate societal understanding of biodiversity. This entails fostering ongoing dialogues across different societal groups, including the youth, which play a pivotal role in fostering behavioral shifts necessary for biodiversity conservation.

PROGRESS SINCE SBS 2012-2022

The Sabah Environmental Education Network (SEEN) is one of the many successful outcomes since the implementation of the SBS. The scope of SEEN has expanded and now comprises of various members which have contributed to improving awareness on Sabah's biodiversity, especially to children and youth. Various programmes have also been established, notably the Junior Ranger programme, to provide more exposure to nature and biodiversity.

MEETING THE STRATEGY

Moving forward, different approaches are still required to improve the awareness levels of Sabah's community. Public participation still needs to be nurtured to improve the public's knowledge and awareness regarding biodiversity values. This will help guide them in playing their role to contribute towards conservation.

Strategy 1 has 2 Actions:

- Action 1.1: Enhance awareness of biodiversity across all segments of society.
- Action 1.2: Ingrain the importance of biodiversity within the children and youth.

Action 1.1: Enhance awareness of biodiversity across all segments of society.

Key Indicator: By 2034, Sabah's public awareness on biodiversity conservation has increased compared to 2024 levels.

Continuous effort is needed to enhance the awareness of biodiversity across all segments of society in Sabah. Clear communication is key to reaching out to the masses in order to mainstream and improve understanding of biodiversity conservation to inspire action. This ranges from decision makers (including politicians), private sectors, and the local community.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Conduct a baseline awareness survey to document the present extent of Sabah's public awareness on biodiversity conservation.	SaBC	SFD SWD SP EPD UMS[48] NGO
b.	Formulate the State Biodiversity Communication Plan, together with supporting materials (e.g., guidelines, training modules) as a guide towards mainstreaming and increasing biodiversity awareness across all segments of society.	SaBC	SFD SWD SP EPD UMS [48]
c.	Expand the capacities and strengthen the membership of the Sabah Environmental Education Network (SEEN) to mainstream biodiversity conservation as part of environmental education.	EPD	SaBC
d.	Increase opportunities for public participation in biodiversity research and conservation such as through citizen science programmes [49].	SaBC	NGO UMS
e.	Leverage on global, national, and state biodiversity events as platforms for building targeted awareness and participation.	MTCE	SaBC
f.	Enhance the use of digital tools including social media platforms and mobile applications, as well as current conventional methods (radio and television programmes) to communicate biodiversity conservation across all segments of society.	SaBC	SFD SWD SP EPD UMS[48]

SDG Goals Supported

[48] ITBC, BMRI, and FTF

[49] This should include the importance of scientific concepts and the roles of IPLCs in biodiversity conservation.

Action 1.2: Ingrain the importance of biodiversity within the children and youth.

Key Indicator: By 2034, the participation of Sabah's children and youth in biodiversity conservation activities has significantly increased compared to 2024 levels.

The future generation of Sabah remains a key component for biodiversity conservation in the future. These groups need to be well educated and nurtured in terms of the various aspects of biodiversity. There is also the need to improve the educator's capacity towards developing further interests in biodiversity conservation.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Strengthen collaborations with SEEN members in enhancing biodiversity-related topics and activities within the state environmental education co-curriculum across all levels of education (pre-school, primary, secondary).	Sabah Education Dept.	SaBC EPD Yayasan Sabah
b.	Expand and strengthen nature centres and research sites[50] as focal points for increasing biodiversity awareness among the children and youths through hands-on approaches such as fieldwork exposure and experiments.	SaBC	SFD SWD SP Yayasan Sabah
c.	Expand programmes[51] that enable youths to be exposed and involved in biodiversity conservation. This can include establishing nature clubs under partner organisations as well as organising regular forums/ conferences that targets youths of different age groups.	Sabah Education Dept. Yayasan Sabah	SaBC EPD NGO
d.	Establish a youth environment network for Sabah.	SaBC Sabah Education Dept.	SFD SWD SP Yayasan Sabah NGO

SDG Goals Supported

[50] Notably Danum Valley, Maliau Basin, and Imbak Canyon conservation areas

[51] The primary environmental youth programme in all schools in Sabah is the Kelab Pencinta Alam. Other programmes that can be implemented, expanded, or adopted include Global Youth Biodiversity Network, Rakan Muda, and other voluntourism programmes.

No.	No.	PHASE 1				PHASE 1				PHASE 1		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 1: Increase the awareness of Sabahans to the values of biodiversity and the steps they can take to conserve and use it sustainably												
Action 1.1: Enhance awareness of biodiversity across all segments of society												
a.	Conduct a baseline awareness survey to document the present extent of Sabah's public awareness on biodiversity conservation.											
b.	Formulate the State Biodiversity Communication Plan, together with supporting materials (e.g., guidelines, training modules) as a guide towards mainstreaming and increasing biodiversity awareness across all segments of society.											
c.	Expand the capacities and strengthen the membership of the Sabah Environmental Education Network (SEEN) to mainstream biodiversity conservation as part of environmental education.											
d.	Increase opportunities for public participation in biodiversity research and conservation such as through citizen science programmes.											
e.	Leverage on global, national, and state biodiversity events as platforms for building targeted awareness and participation.											
f.	Enhance the use of digital tools including social media platforms and mobile applications, as well as current conventional methods (radio and television programmes) to communicate biodiversity conservation across all segments of society.											
Action 1.2: Enhance awareness of biodiversity across all segments of society												
a.	Strengthen collaborations with SEEN members in enhancing biodiversity-related topics and activities within the State environmental education co-curriculum across all levels of education (pre-school, primary, secondary).											
b.	Expand and strengthen nature centres and research sites as focal points for increasing biodiversity awareness among the children and youths through hands-on approaches such as fieldwork exposure and experiments.											
c.	Expand programmes that enable youths to be exposed and involved in biodiversity conservation. This can include establishing nature clubs under partner organisations as well as organising regular forums/conferences that targets youths of different age groups.											
d.	Establish a youth environment network for Sabah											

Strategy 2: Strengthen the roles of indigenous peoples and local communities, civil society, the private sector, and academia in biodiversity conservation.

WHY IS THIS STRATEGY IMPORTANT?

The engagement of diverse community groups, including Indigenous Peoples and Local Communities (IPLCs), plays a pivotal role in fostering a comprehensive approach to biodiversity conservation in Sabah. IPLCs bring invaluable traditional knowledge and sustainable practices that directly contribute to conservation efforts. Their intimate connection with the land and ecosystems offers insights that are often overlooked but are essential for effective conservation strategies.

Civil societies complement these efforts by advocating for conservation and raising awareness, thereby mobilizing public support for conservation initiatives. Moreover, the private sector's involvement is crucial, as responsible practices and financial resources from businesses are instrumental in implementing sustainable conservation measures.

Additionally, academia's contribution cannot be overstated, as research and innovation provide the foundation for evidence-based policies and strategies, further enhancing the effectiveness of biodiversity conservation efforts in Sabah.

PROGRESS SINCE SBS 2012-2022

The SBS 2012-2022 elaboraded various activities to harness the involvement of IPLCs in conservation, notably through community-use zones, the Honorary Wildlife Warden programme, and local community forest rehabilitation programmes. These have had various implementation success but has been effective enough to improve awareness to some levels. However, the roles of the civil society, private sector, and academia need to be strengthened further moving into the next decade in order to maximise and fully realise the “Whole of Society” approach.

MEETING THE STRATEGY

This revised Strategy elaborates on ways to foster long-term partnerships between the various society groups as implementing partners for biodiversity conservation in Sabah. The existing conservation initiatives involving IPLCs need to be sustained to continuously empower and nurture local champions for biodiversity conservation works on the ground. Long term partnerships with civil society must be strengthened to ensure that their conservation efforts are sustained. The private sector also needs more recognition in their roles for conservation by providing necessary avenues for them to contribute.

Strategy 2 has 5 Actions:

- Action 2.1: Empower indigenous peoples and local communities.
- Action 2.2: Develop long-term partnerships with civil society.
- Action 2.3: Harness the strength of private sector.
- Action 2.4: Enhance stakeholder participation in decision-making process.
- Action 2.5: Strengthen collaborations with the academic community.

Source: Reef Check Malaysia

Plate 2-1: Marine conservation activities being conducted with stateless youths in Semporna

Action 2.1: Empower indigenous peoples and local communities.

Key Indicator: By 2034, the participation of Sabah's indigenous peoples and local communities in biodiversity conservation have significantly increased compared to 2024 levels.

The indigenous peoples and local communities of Sabah remain a vital player in biodiversity conservation due to their deep and intricate relationship with nature as a whole. It is essential that the sense of responsibility and stewardship continues to be instilled among them to contribute towards biodiversity conservation within their areas.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Develop and expand partnerships and programmes [52] that facilitate the involvement of indigenous peoples and local communities in biodiversity conservation.	SFD SWD SP	JHEANS NGO
b.	Strengthen support [53] to continuously enable indigenous peoples and local communities to have more effective roles in biodiversity conservation.	SFD SWD SP	DOF JHEANS NGO
c.	Continue to identify, nurture, and honour local conservation champions by showcasing effective conservation outcomes at state, national and international platforms.	SFD SWD SP	JHEANS NGO

SDG Goals: Supported

[52] Examples: Strategic Support to Territories and Areas Conserved by Indigenous Peoples and Local Communities (ICCAS), Tagal Project, Community-based Orangutan Conservation Programme (KOCP), and Social Forestry and Community Development Projects.

[53] This can include capacity building, awareness raising and community workshops

Action 2.2: Develop long term partnerships with civil society.

Key Indicator: By 2034, collaborative projects with civil society have significantly increased compared to 2024 levels.

Civil society organisations are also key partners in conservation. Their unrelenting and continued involvement in long-term programmes and projects have helped increase awareness, support, and action towards biodiversity conservation. However, there is also a need to provide avenues for civil society organisations to partner and collaborate with other stakeholders in conservation (both the government and private sector), as well as protecting their rights as environmental defenders.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Establish a state platform for mandatory reporting of conservation projects by NGOs and CSOs, particularly those that support the Strategy [54].	SaBC	NGO CSO
b.	Identify on-going or necessary research / projects that are in line with the Strategy to develop smart partnership agreements with the State Government for continuous support.	SaBC SFD SWD SP	NGO CSO

SDG Goals: Supported

[54] This should also serve as a platform to also report on SDGs implementation for Sabah, especially those related to biodiversity conservation

Action 2.3: Harness the strength of private sector.

Key Indicator: By 2034, public-listed companies operating in Sabah are mandatorily reporting on their biodiversity conservation initiatives and outcomes.

The involvement of the private sector in biodiversity conservation has steadily increased in recent years, especially on the onset of sustainability responsibilities and the recognition of ESG principles. The private sector needs to be continuously engaged as strategic partners in achieving Sabah's goals in biodiversity conservation.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Establish the Sabah Business and Biodiversity Network / Council as a platform to harness private sector participation in biodiversity conservation [55].	MIDE [56] SaBC	SMJ MTCE UPEN SFD
b.	Develop a state Business and Biodiversity Action Plan in line with the Business and Biodiversity Strategic Roadmap to align the roles and responsibilities of the private sector towards biodiversity conservation.	MIDE SaBC	SEDIA MTCE SMJ UPEN
c.	Scale up Corporate Social Responsibility (CSR) and Environment, Social and Governance (ESG) commitments and strategies on biodiversity conservation at the state level by the private sector.	MIDE SEDIA SaBC	MTCE
d.	Develop smart partnership arrangements between the private and public sector in implementing programmes / projects that are in line with the Strategy.	MIDE SaBC	SMJ MTCE UPEN SEDIA

SDG Goals: Supported

[55] This also includes discussing avenues for private sector financing for Sabah's conservation activities.
[56] To also include the Sabah State Economic Advisory Council

Action 2.4: Enhance stakeholder participation in decision-making process.

Key Indicator: By 2034, avenues for stakeholder participation in public consultation processes have been strengthened and has led to positive outcomes towards biodiversity conservation.

The conservation of Sabah's biological resources is a shared responsibility across society. Each individual and organisation needs to be given equal opportunities to contribute and participate in decision-making processes. It is important to ensure that future development plans and actions are properly represented by our shared vision for biodiversity.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Strengthen the public consultation process to ensure feedback pertaining to impacts on biodiversity have been included in decision-making outcomes during the formulation of state policies, plans, and projects [57].	UPEN SMJ SEDIA	SFD SWD SP DOF JKR ECOS MIDE
b.	Ensure the continuity of the public consultation process in the gazettement, management and excision of areas that are important for biodiversity and that stakeholder feedback have been taken into consideration in decision-making outcomes.	NRO District Offices	SFD SWD SP NGO CBO
c.	Strengthen the public consultation process during planning approvals and impact assessments of development projects that have impacts on biodiversity to ensure that feedback have been taken into consideration in decision-making outcomes.	EPD NRO	SWD SFD
d.	Adopt and implement the Free, Prior, and Informed Consent (FPIC) / Prior and Informed Consent (PIC) process for projects that affect indigenous peoples and local communities [58].	JHEANS Local Councils	SWD SFD SaBC

SDG Goals: Supported

[57] This needs to be emphasised for policies, plans and projects for the energy, linear infrastructure (roads and highways), and industrial sectors.

[58] This may involve conducting awareness programmes pertaining to laws and customs of indigenous peoples and local communities. The District Officer is also envisaged to play an important role as Head of the District Native Court (Mahkamah Anak Negeri Daerah) as stipulated under the Native Courts Enactment 1992, Section 4(2).

Action 2.5: Strengthen collaborations with the academic community.

Key Indicator: By 2034, at least 30% of research is directly related to biodiversity conservation and management.

The academic community plays an important role in biodiversity conservation. Ongoing research efforts are crucial in bridging knowledge gaps. The findings need to be properly communicated with other stakeholders to improve awareness and understanding. The involvement of the academic community is also important to facilitate policy making as well as other aspects of biodiversity conservation.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Establish research collaborations to address knowledge gaps in critical areas to improve conservation interventions, as well as efforts to socialise findings to the general public.	SaBC	Sabah Academia
b.	Strengthen the functions and promote the utilisation of the Sabah Biodiversity Information Integrated System (SaBIIS) as a reliable state biodiversity information system and as a platform for collaboration between researchers, protected area and resource managers, and other relevant stakeholders.	SaBC	ITBC
c.	Monitor specimen depositories and records, taking into account current and future trends, to safeguard Sabah's biodiversity collections.	SaBC	SFD SWD SP UMS [59] Sabah Museum Sabah Cultural Board

SDG Goals: Supported

[59] All research institutions and faculties

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 2: Strengthen the roles of indigenous peoples and local communities, civil society, the private sector, and academia in biodiversity conservation												
Action 2.1: Empower indigenous peoples and local communities												
a.	Develop and expand partnerships and programmes that facilitate the involvement of indigenous peoples and local communities in biodiversity conservation.											
b.	Strengthen support to continuously enable indigenous peoples and local communities to have more effective roles in biodiversity conservation.											
c.	Continue to identify, nurture, and honour local conservation champions by showcasing effective conservation outcomes at state, national and international platforms.											
Action 2.2: Develop long-term partnerships with civil society												
a.	Establish a state platform for mandatory reporting of conservation projects by NGOs and CSOs, particularly those that support the Strategy.											
b.	Identify on-going or necessary research / projects that are in line with the Strategy to develop smart partnership agreements with the State Government for continuous support.											
Action 2.3: Harness the strength of private sector												
a.	Establish the Sabah Business and Biodiversity Network / Council as a platform to harness private sector participation in biodiversity conservation.											
b.	Develop a state Business and Biodiversity Action Plan in line with the Business and Biodiversity Strategic Roadmap to align the roles and responsibilities of the private sector towards biodiversity conservation.											
c.	Scale up Corporate Social Responsibility (CSR) and Environment, Social and Governance (ESG) commitments and strategies on biodiversity conservation at the state level by the private sector.											
d.	Develop smart partnership arrangements between the private and public sector in implementing programmes / projects that are in line with the Strategy.											
Action 2.4: Enhance stakeholder participation in decision-making process												
a.	Strengthen the public consultation process to ensure feedback pertaining to impacts on biodiversity have been included in decision-making outcomes during the formulation of state policies, plans, and projects.											

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
b.	Ensure the continuity of the public consultation process in the gazettement, management and excision of areas that are important for biodiversity and that stakeholder feedback have been taken into consideration in decision-making outcomes.											
c.	Strengthen the public consultation process during planning approvals and impact assessments of development projects that have impacts on biodiversity to ensure that feedback have been taken into consideration in decision-making outcomes.											
d.	Adopt and implement the Free, Prior, and Informed Consent (FPIC) process for projects that affect indigenous peoples and local communities.											
Action 2.5: Strengthen collaborations with the academic community												
a.	Establish research collaborations to address knowledge gaps in critical areas to improve conservation interventions, as well as efforts to socialise findings to the general public.											
b.	Strengthen the functions and promote the utilisation of the Sabah Biodiversity Information Integrated System (SaBIIS) as a reliable state biodiversity information system and as a platform for collaboration between researchers, protected area and resource managers, and other relevant stakeholders.											
c.	Monitor specimen depositories and records, taking into account current and future trends, to safeguard Sabah's biodiversity collections.											

GOAL 2
ALL DIRECT AND INDIRECT PRESSURES ON SABAH'S BIODIVERSITY HAVE BEEN SIGNIFICANTLY REDUCED

Sabah is expected to continue to develop and grow economically. As such, direct and indirect pressures towards biodiversity will also continue to persist. Timber harvesting, agriculture and commodity expansion, fisheries extraction, and infrastructure development have long been the common causes of biodiversity loss and ecosystem degradation. Renewed interest in mining, as well as expanding tourism, will add on more pressures towards Sabah's biodiversity and natural habitats.

Mainstreaming among all economic sectors remains an utmost priority to ensure that these sectors are planned and managed sustainably and takes the necessary measures to minimise pressure on Sabah's biodiversity. While each sector has its own mandate and aspirations, continuous corporation is needed to harmonise biodiversity conservation and sector-specific development, thus working towards actual sustainable development.

Goal 2 has 6 strategies:

- Strategy 3: Incorporate biodiversity conservation into terrestrial and marine spatial planning in Sabah.
- Strategy 4: Mainstream biodiversity conservation into Sabah's public and private development frameworks.
- Strategy 5: Strengthen Sabah's forest governance and management to support biodiversity conservation.
- Strategy 6: Strengthen safeguards of Sabah's freshwater and marine ecosystem.
- Strategy 7: Strengthen management and utilisation of Sabah's agrifood, agricommodity, and fisheries resources.
- Strategy 8: Enhance the synergies between Sabah's tourism and biodiversity conservation.

Strategy 3: Incorporate biodiversity conservation into terrestrial and marine spatial planning in Sabah.

WHY IS THIS STRATEGY IMPORTANT?

Biodiversity conservation has historically been ecosystem-centric and focused on areas that are rich with flora and fauna. However, biodiversity also depends on various interrelated ecological services across different areas to thrive. This necessitates conservation efforts to also be undertaken at the landscape level. There is a need to change the spatial planning and management processes at the state level. An initial step is to ensure that spatial plans are properly integrating biodiversity conservation that will facilitate ecosystem resilience.

PROGRESS SINCE SBS 2012-2022

The Sabah Structure Plan 2033, Sabah Development Corridor Blueprint 2.0, and Sabah Maju Jaya Development Plan are some of the major state development plans that have been launced since the SBS 2012-2022. Biodiversity conservation elements have been embedded to some extent in this documents, which indicates a heightened awareness towards the need to protect Sabah's biodiversity. However, there remains a need to constantly ensure that Sabah's important landscapes (and seascapes) are continuously emphasised to be conserved in the midst of the state's development, especially during the planning of new development projects.

MEETING THE STRATEGY

This strategy focuses on further mainstreaming biodiversity principles and conservation into state planning documents. This calls for sustainable spatial planning and land management for future development activities in Sabah. New townships need to enhance or incorporate natural areas as part of the overall design to strengthen biodiversity conservation in urban areas. Besides leveraging on its aesthetical and recreational values, these urban natural areas can also serve as wildlife refuges, pollinators and seed dispersers.

Strategy 3 has 2 Actions:

- Action 3.1: Strengthen biodiversity conservation elements in the state development plans.
- Action 3.2: Enhance biodiversity conservation in urban and rural areas.

Action 3.1: Strengthen biodiversity conservation elements in the state development plans.

Key Indicator: By 2034, important landscapes and seascapes have been integrated into relevant state development plans with implementable management actions / conditions.

Biodiversity conservation principles must be progressively integrated into all spatial plans in Sabah. This is to ensure that future developments are sustainably planned and managed and do not result in detrimental impacts in the future. Recognition of Sabah's important biodiversity areas also needs to be increased to ensure future development projects do not encroach into these areas at the planning level, thereby reducing further and unwanted conservation pressures.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Mainstream the ecosystem-based approach to ensure that state and district-level development plans [60] integrate Environmentally Sensitive Areas and important biodiversity areas, ensuring that development in these areas are avoided.	TRPD EPD	SFD SWD SP
b.	Conduct an integrated mapping exercise to expand spatial planning to include all marine areas beyond Sabah's EEZ up to international marine borders within the relevant planning documents.	TRPD	BMRI DOF Sabah Maritime Dept.

SDG Goals: Supported

[60] This includes reviewing the Sabah Structure Plan 2034 and relevant district plans to include updated integrated ESA / HCV maps.

Action 3.2: Enhance biodiversity conservation in urban and rural areas.

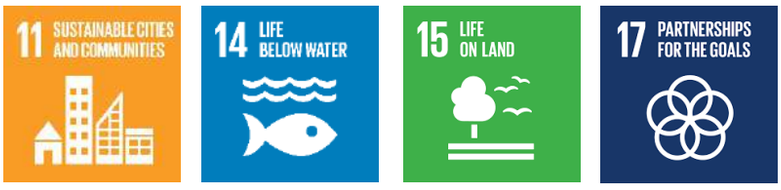
Key Indicator: By 2034, district local plans have integrated green and blue spaces and corridors as part of local biodiversity conservation initiatives.

Urban and rural areas have great potential to contribute towards biodiversity conservation. Green space and remnant forest patches can still serve as viable habitats for a wide range of wildlife, including migratory birds and pollinating insects. Rivers also can serve as viable corridors connecting forest patches. These areas can also serve as potential rehabilitation and ex-situ conservation areas. In turn, these provide multiple benefits to the community and the environment, through increased recreational and aesthetical values and improved ecological connectivity within the urban environment.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Improve urban and rural area planning and design to adopt low carbon approaches such as conserving/establishing urban forests, green lungs, and blue spaces as part of climate adaption strategies while also maintaining and enhancing ecosystem services.	MLGH TRPD	Local Councils SFD DOF NGO CBO
b.	Develop local council capacities through targeted training / personnel exchange programmes to improve biodiversity conservation planning in urban and rural landscapes.	MLGH TRPD	SFD SWD SP DID
c.	Establish community-based programs as part of the key initiatives in the protection and maintenance of urban rivers, especially severely polluted rivers [61].	DID	Local councils
d.	Review and update the Town and Country Planning Ordinance to promote urban and rural biodiversity conservation for new townships through effective utilisation and management of vacant land [62].	MLGH TRPD	Local Councils

SDG Goals: Supported



[61] This can be implemented under Section 12(2) of the Sabah Water Resources Enactment 1998.

[62] The revision should include provisions and guidelines on the function of open spaces in Part IV (Amenities) of the Ordinance. This can include planting of native trees that will attract indigenous fauna to enhance biodiversity values in townships and rural settlements.

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 3: Incorporate biodiversity conservation into terrestrial and marine spatial planning in Sabah												
Action 3.1: Strengthen biodiversity conservation elements in the state development plans												
a.	Mainstream the ecosystem-based approach to ensure that state and district-level development plans integrate Environmentally Sensitive Areas and important biodiversity areas, ensuring that development in these areas are avoided.											
b.	Conduct an integrated mapping exercise to expand spatial planning to include all marine areas beyond Sabah's EEZ up to international marine borders within the relevant planning documents.											
Action 3.2: Enhance biodiversity conservation in urban and rural areas												
a.	Improve urban and rural area planning and design to adopt low carbon approaches such as conserving/establishing urban forests, green lungs, and blue spaces as part of climate adaption strategies while also maintaining and enhancing ecosystem services.											
b.	Develop local council capacities through targeted training / personnel exchange programmes to improve biodiversity conservation planning in urban and rural landscapes.											
c.	Establish community-based programs as part of the key initiatives in the protection and maintenance of urban rivers, especially severely polluted rivers.											
d.	Review and update the Town and Country Planning Ordinance to promote urban and rural biodiversity conservation for new townships through effective utilisation and management of vacant land.											

Strategy 4: Mainstream biodiversity conservation into Sabah's public and private development frameworks.

WHY IS THIS STRATEGY IMPORTANT?

Economic development remains a top priority for the State Government. However, the state economic aspiration must harmonise and recognise the importance of biodiversity conservation to ensure efficient and sustainable use of its natural resources. A vital component to reduce direct and indirect pressures on biodiversity is to continuously mainstream biodiversity conservation into the various sectors and development frameworks of Sabah.

PROGRESS SINCE SBS 2012-2022

The SBS 2012-2022 did not have specific activities on biodiversity mainstreaming into Sabah's development frameworks. In spite of this, the last decade has seen the emergence of various biodiversity conservation safeguards in various sectors, all with the intent of minimising impacts at the planning levels. This is highly important in view of Sabah continuously expanding its economic sectors, including plans for mining in marine and coastal areas.

MEETING THE STRATEGY

This Strategy emphasises on the need to continuously improve efforts to mainstream biodiversity conservation across major economic sectors in Sabah. Conservation principles and measures need to be considered and reflected during the formulation of new development policies, as well as during the revision of current development plans. At the same time, environmental monitoring processes also need to be strengthened to ensure development is pursued and conducted sustainably without imposing more pressures towards biodiversity. The state's valuation of biodiversity also needs to be strengthened and further incorporated into planning frameworks to better reflect the state's economic growth.

Strategy 4 has 4 Actions:

- Action 4.1: Strengthen safeguards for biodiversity conservation in Sabah's financial sector.
- Action 4.2: Incorporate biodiversity conservation principles into the infrastructure, industrial, energy, and health sectors.
- Action 4.3: Strengthen the biodiversity assessment and monitoring process during project development planning.
- Action 4.4: Strengthen safeguards to minimise pressures from mining / quarrying developments.

Action 4.1: Strengthen safeguards for biodiversity conservation in Sabah's financial sector.

Key Indicator: By 2034, biodiversity conservation has been embedded into the state's investment and financing frameworks.

Biodiversity serves as the foundation of almost all economic ventures. However, it remains unaccounted and not fully included into the state's GDP. Alternative methods need to be established in measuring the state's economic, social, and environmental health. It is important to facilitate in making well-informed decisions on land-use planning and development.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Commission a study to explore the feasibility of establishing a state-level System of Environmental and Economic Accounting (SEEA) framework that acknowledges biodiversity and ecosystem service values in the state's economy.	UPEN SaBC	MOF EPD
b.	Mainstream the Sustainable and Responsible Taxonomy for Biodiversity to guide sustainable and responsible investment and financing that avoids / minimises impacts towards biodiversity and supports conservation.	SaBC	UPEN MOF
c.	Develop a state framework for biodiversity-related financial disclosure to regulate and support biodiversity reporting and risk assessments by private companies.	SaBC	UPEN MOF

SDG Goals: Supported

Action 4.2: Incorporate biodiversity conservation principles into the infrastructure, industrial, energy, and health sectors.

Key Indicator: By 2034, biodiversity regulatory frameworks are in place and implemented within project development frameworks.

All sectoral policies need to consistently mainstream biodiversity principles within its framework. By addressing biodiversity conservation at the policy level, direct pressures can be reduced which avoid the need for much costly rehabilitation works. This also requires cooperation between sectors and agencies to ensure biodiversity is sustainably managed without jeopardising development aspirations.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Enforce the need for new linear infrastructure developments [63] proposed in the Sabah Structure Plan to include and implement measures to avoid, minimize, and mitigate habitat fragmentation [64].	JKR	SFD DOF
b.	Encourage development of large-scale renewable energy production facilities that do not incur clearing of terrestrial habitats or deter/disrupt hydrological and coastal ecological process (especially for micro-, small-hydropower, and biogas projects) through government incentives and tax breaks.	ECOS Sabah Energy Corp	SEDIA SMJ
c.	Mainstream the need for Marine Wildlife Observers [65] onboard seismic exploration vessels and other oil and gas exploration within Sabah's EEZ waters to minimise impacts on marine wildlife [66].	SPA	DOF BMRI NGO

SDG Goals: Supported

[63] Roads, highways and railways

[64] Impacts towards the forest edge such as increased fire risks and invasive alien species should also be identified and mitigated.

[65] These are usually Marine Mammal Observers (MMOs) specifically focusing on dolphins and whales, but can be expanded to cover other marine wildlife.

[66] This can leverage on actions prescribed under the National Plan of Action (NPOA) for Sharks and Rays, as well as the upcoming NPOA for dugongs and turtles by Deparment of Fisheries HQ.

Action 4.3: Strengthen the biodiversity assessment and monitoring process during project development planning.

Key Indicator: By 2034, biodiversity regulatory frameworks are in place and implemented within project development frameworks.

Despite various existing laws and regulations, development impacts towards biodiversity and the environment remains sorely overlooked. The current impact assessment methodologies and monitoring frameworks needs to be strengthened to ensure these impacts are properly addressed and avoided as early as possible. Biodiversity principles needs to be included as crucial component not only in major development projects, but also at the smaller scales.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Embed biodiversity conservation principles as part of efforts to mainstream environmental protection during the early stages of development in line with the 3rd edition of the Sabah EIA handbook.	EPD TRPD	SaBC SFD SWD SP
b.	Develop a biodiversity assessment toolkit as a guide for project proponents to conduct proper assessments during development planning in accordance with the mitigation hierarchy for Importance Biodiversity Areas and Environmentally Sensitive Areas.	EPD	SaBC
c.	Increase post-EIA monitoring and implement compensatory mitigation programmes to ensure environmental mitigation measures are effective.	EPD	SaBC SFD SWD SP
d.	Review the findings from the Sabah Biodiversity Conservation in Multiple-Use Forest Landscapes study to determine the steps needed in establishing Nature Positive approaches [67] in the state, especially for proposed projects that are likely to result in significant impacts towards biodiversity.	SFD	UPEN SaBC EPD JTU
e.	Incorporate biodiversity risk evaluation and assessments into feasibility studies and preliminary screening processes during the early states of development planning to identify potential threats towards biodiversity and guide decision-making to avoid and minimise impacts as early as possible.	EPD JKR TRPD	UPEN SFD SWD SP

SDG Goals: Supported

[67] Including feasibility of establishing No Net Loss policy for Sabah

Action 4.4: Strengthen safeguards to minimise pressures from mining / quarrying developments.

Key Indicator: By 2034, biodiversity conservation principles have been translated into implementable actions within mining projects.

Mining and quarrying activities are expected to intensify in the next decade due to increasing demand for minerals to support industries and energy generation. Sabah is also venturing into blue economy which will see more mining exploration in seabeds, specifically for marine salt harvesting. As such, it is crucial to ensure that future mining activities are planned and executed responsibly and take into consideration remedial steps to conserve or rehabilitate natural areas and biodiversity.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Ensure that new mining projects take into account and adhere to all relevant legislations and procedures[68], as well as national and state commitments to avoid important biodiversity and environmentally sensitive areas.	JTU	NRO EPD JMG Sabah Mineral Management Sdn. Bhd.

SDG Goals: Supported

[68] This includes ensuring all mining operators to prepare a comprehensive rehabilitation plan that is approved and in accordance with the Operational Mining Scheme (OMS)

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 4: Mainstream biodiversity conservation into Sabah's public and private development frameworks												
Action 4.1: Strengthen safeguards for biodiversity conservation in Sabah's financial sector												
a.	Commission a study to explore the feasibility of establishing a state-level System of Environmental and Economic Accounting (SEEA) framework that acknowledges biodiversity and ecosystem service values in the state's economy.											
b.	Mainstream the Sustainable and Responsible Taxonomy for Biodiversity to guide sustainable and responsible investment and financing that avoids / minimises impacts towards biodiversity and supports conservation.											
c.	Develop a state framework for biodiversity-related financial disclosure to regulate and support biodiversity reporting and risk assessments by private companies.											
Action 4.2: Incorporate biodiversity conservation principles into the infrastructure, industrial, energy, and health sectors												
a.	Enforce the need for new linear infrastructure developments proposed in the Sabah Structure Plan to include and implement measures to avoid, minimize, and mitigate habitat fragmentation .											
b.	Encourage development of large-scale renewable energy production facilities that do not incur clearing of terrestrial habitats or deter/disrupt hydrological and coastal ecological process (especially for micro-, small-hydropower, and biogas projects) through government incentives and tax breaks.											
c.	Mandate the need for Marine Mammal Observers (MMOs) onboard seismic exploration vessels and other oil and gas exploration within Malaysia's EEZ waters to minimise impacts on marine wildlife.											
Action 4.3: Strengthen the biodiversity assessment and monitoring process during project development planning												
a.	Embed biodiversity conservation principles as part of efforts to mainstream environmental protection during the early stages of development in line with the 3rd edition of the Sabah EIA handbook.											
b.	Develop a biodiversity assessment toolkit as a guide for project proponents to conduct proper assessments during development planning in accordance with the mitigation hierarchy for Importance Biodiversity Areas and Environmentally Sensitive Areas.											
c.	Increase post-EIA monitoring and implement compensatory mitigation programmes to ensure environmental mitigation measures are effective.											

No.	No.	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
d.	Review the findings from the Sabah Biodiversity Conservation in Multiple-Use Forest Landscapes study to determine the steps needed in establishing Nature Positive approaches[67] in the state, especially for proposed projects that are likely to result insignificant impacts towards biodiversity.											
e.	Incorporate biodiversity risk evaluation and assessments into feasibility studies and preliminary screening processes to identify potential threats towards biodiversity from proposed developments and guide decision-making to avoid and minimise impacts of early as possible.											
Action 4.4: Strengthen safeguards to minimise pressures from mining / quarrying developments												
a.	Ensure that new mining projects take into account and adhere to all relevant legislations and procedures , as well as national and state commitments to avoid important biodiversity and environmentally sensitive areas.											

Strategy 5: Strengthen Sabah's Forest governance and management to support biodiversity conservation.

WHY IS THIS STRATEGY IMPORTANT?

Sabah's forest ecosystems are home to large proportion of terrestrial biodiversity, but also play major role as carbon sinks in mitigating carbon emissions and helping address climate change. Upholding sustainable forest management is not only important for biodiversity conservation in Sabah, but crucial at the global scale. Measures to protect and conserve forest areas should be top priority at the state level.

PROGRESS SINCE SBS 2012-2022

The SBS 2012-2022 initially focused on the need for sustainable forestry certification for Sabah's Forest Management Units (FMUs). Sabah continues to lead the way in this field and continues to place emphasis on sustainable forest management practices and certification. These have been evident through recent award recognition of sustainably managed timber companies, further examplifying Sabah's commitment towards sustainable forest management.

MEETING THE STRATEGY

This Strategy builds on Sabah's good work in forest governance and generally endeavours to ensure that this high performance level continues into the next decade. At the same time, there is also a need to improve the capacities of foresters and forest rangers on monitoring and enforcement with the latest advancements in equipments.

Strategy 5 has 3 Actions:

- Action 5.1: Strengthen state forest governance and regulations.
- Action 5.2: Enhance sustainable forest management practices and capacities in the forestry sector.
- Action 5.3: Leverage on technology advancements to enhance forest monitoring and reporting.

Action 5.1: Strengthen state forest governance and regulations.

Key Indicator: By 2025, Sabah's forestry laws, regulations, and frameworks have been reviewed and updated to support biodiversity conservation.

The Sabah Forestry Policy 2018 currently provides the state direction in managing forest resources which seek to equally benefit the people and environment while also ensuring sustainable economic growth. Nevertheless, there is still a need to review and strengthen existing regulation to ensure issues pertaining forest governance can be addressed comprehensively.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Formulate an Action Plan on Forest Plantation Development to spearhead establishment and management of sufficient forest plantation areas to ensure sustainable supply of planted timber for downstream industries [69].	SFD	TAS STIA SFM licence holders
b.	Incorporate the High Conservation Value (HCV) approach within the decision-making process of allocating forest management units, industrial tree plantation (ITP) areas, and maintaining community forests.	SFD	NGO

SDG Goals: Supported

[69] The Action Plan should provide direction to ensure optimal economic and conservation outcomes from each forest management unit under the Sustainable Forest Management License Agreement (SFMLAs), as well as enforcing annual rent on all SFM licensed areas.

Action 5.2: Enhance sustainable forest management practices and capacities in the forestry sector.

Key Indicator: By 2030, all forest management units (FMUs) in Sabah have been certified under the FSC and other accredited certification programmes.

Forest reserves in Sabah are managed under the Sustainable Forest Management (SFM) approach to conserve forests while also maintaining a balance between social, economic, and environmental development. Despite the ongoing good progress of this approach in Sabah, there is always room for improvement especially in terms of biodiversity and landscape conservation.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Ensure that all forest management plans[70] are developed and reviewed through a participatory process that considers inputs of all stakeholders including NGOs and indigenous peoples and local communities.	SFD	NGO CBO
b.	Ensure all SFMLAs adopt the HCV approach to ensure that environmentally and socially sensitive areas are avoided.	SFD	NGO CBO
c.	Expand social forestry and co-management approaches to strengthen management of forest resources while also improving socio-economic levels of indigenous peoples and local communities (IPLCs)[71].	SFD	NGO CBO
d.	Strengthen the capacities of foresters and forest rangers in sustainable forest management and certification, especially at the FMU level[72].	SFD	NGO CBO

SDG Goals: Supported

[70] This includes the development of the State 25-year Forest Master Plan, as well as the 10-year Forest Management Plan by the SFM licensees.
[71] This can expand on the Social Forestry Toolkit (KIPMAPS) that is being developed by SFD.
[72] This includes forest fire management as well as health and safety training.

Action 5.3: Leverage on technology advancements to enhance forest monitoring and reporting.

Key Indicator: By 2034, technological capacities for forest monitoring in Sabah have improved.

Technology advancement provides key advantages over traditional method in addressing forest monitoring and reporting. For example, remote sensing provides data and practical means to enhance forest monitoring on encroachment, degradation and forest fires. This can greatly reduce time collecting information in the field, as well as the number of field personnel required.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Develop, strengthen, and incorporate remote sensing capacities [73] of all stakeholders related to forestry management to enhance forestry planning, monitoring and enforcement.	SFD	JTU Pej. Hal Ehwal Dalam Negeri dan Penyelidikan UMS [74]

SDG Goals: Supported

[73] This includes forest and tree cover monitoring, land-use changes, esp. forest areas outside forest reserves, and monitoring of encroachment through UAV.
[74] ITBC and FTF

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 5: Strengthen Sabah's forest governance and management to support biodiversity conservation												
Action 5.1: Strengthen state forest governance and regulations												
a.	Formulate an Action Plan on Forest Plantation Development to spearhead establishment and management of sufficient forest plantation areas to ensure sustainable supply of planted timber for downstream industries[69].											
b.	Incorporate the High Conservation Value (HCV) approach within the decision-making process of allocating forest management units, industrial tree plantation (ITP) areas, and maintaining community forests.											
Action 5.2: Enhance sustainable forest management practices and capacities in the forestry sector												
a.	Ensure that all forest management plans are developed and reviewed through a participatory process that considers inputs of all stakeholders including NGOs and IPLCs.											
b.	Ensure all SFMLAs adopt the HCV approach to ensure that environmentally and socially sensitive areas are avoided.											
c.	Expand social forestry and co-management approaches to strengthen management of forest resources while also improving socio-economic levels of IPLCs.											
d.	Strengthen the capacities of foresters and forest rangers in sustainable forest management and certification, especially at the FMU level.											
Action 5.3: Leverage on technology advancements to enhance forest monitoring and reporting												
a.	Develop, strengthen, and incorporate remote sensing capacities of all stakeholders related to forestry management to enhance forestry planning, monitoring and enforcement.											

Strategy 6: Strengthen safeguards of Sabah's freshwater and marine ecosystems.

WHY IS THIS STRATEGY IMPORTANT?

Sabah boasts a diverse and rich aquatic biodiversity, in both marine and freshwater ecosystems. However, these ecosystems are exposed to pollution that are harmful to biodiversity. These mostly stem from human anthropogenic activities which includes coastal development, agriculture, mining, and tourism.

PROGRESS SINCE SBS 2012-2022

One of the gaps in the SBS 2012-2022 was that it did not specifically address protection of freshwater and marine ecosystems in terms of pollution control. Nonetheless, the recent Malaysia Plans have recognised the need for integrated management of river basins and have allocated fundings for related studies such as Intergrated River Basin Management (IRBM) and Total Maximum Daily Loads (TMDL). The revised SBS has to take this into account to strengthen safeguards to protect these rich but vulnerable ecosystems.

MEETING THE STRATEGY

Efforts to address pollution issues on Sabah's aquatic ecosystem involve a combination of long-term monitoring as well as community engagements. These are essential to safeguard Sabah's freshwater and marine biodiversity for future generations.

Strategy 6 has 3 Actions:

- Action 6.1: Improve pollution control mechanisms to protect Sabah's freshwater ecosystems.
- Action 6.2: Reduce land-based and sea-based pollution sources to protect the marine ecosystems.
- Action 6.3: Strengthen efforts to reduce plastic pollution into freshwater and marine ecosystems.

Action 6.1: Improve pollution control mechanisms to protect Sabah's freshwater ecosystems.

Key Indicator: By 2034, freshwater pollution levels in Sabah have improved compared to 2024 levels.

Strengthening pollution control mechanisms are important to safeguard Sabah's freshwater ecosystem. Continuous monitoring and long-term research are also needed to monitor the health of freshwater ecosystems. Rehabilitation activities should focus on major river systems that have been severely polluted, while also reviewing legislations to improve protection of riparian areas.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Assess the permissible pollution loads of major river basins and severely contaminated rivers through the Total Maximum Daily Load (TMDL) approach [75] within Integrated River Basin Management (IRBM) plans in Sabah [76].	DID	EPD DOE
b.	Synchronise the yearly water resource quality monitoring programmes in major river systems within integrated databases for data collection and dissemination.	EPD DID	DOF DOE
c.	Include long-term monitoring of the effects of emerging pollutants in major rivers within the Sabah water resource study programme and revise pollution concentration standards.	EPD DID	DOF DOE
d.	Expedite gazettement of riparian corridors to minimise potential pollution from surrounding land use into rivers under the Sabah water resource study programme.	DID	EPD
e.	Conduct programs to rehabilitate degraded urban rivers under the Sabah River Development, Protection and Maintenance Program.	DID EPD	NGOs CBOs
f.	Develop an industrial guideline for wastewater treatment for effluent control to be included in the Sabah Water Resources Program.	DID EPD	DOE JPP

SDG Goals: Supported

[75] This includes inventorying all point and non-point pollution sources within major river basins.
[76] For the upcoming Papar, Tuaran, Kinabatangan, and Padas IRBMs.

Action 6.2: Reduce land-based and sea-based pollution sources to protect the marine ecosystems.

Key Indicator: By 2034, marine pollution levels in Sabah have improved compared to 2024 levels.

Sabah's marine ecosystem remains exposed towards pollution which derives from both sea and land-based sources. Regular monitoring, adaptive management and sustainable practices are crucial to ensuring the effectiveness of pollution reduction strategies over time. Commitment from all layers of society is essential for more effective marine biodiversity conservation in Sabah.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Improve waste management regulations and protocols to reduce marine litter from major contributing sectors such as shipping industries, marine capture fisheries, tourism, coastal developments, residential areas, and agriculture.	Local councils	EPD JPP DOE DOF
b.	Strengthen regulations to include conservation and rehabilitation of coastal and marine ecosystems for coastal mining and dredging activities.	NRO EPD	JTU JMG DOE
c.	Conduct a marine pollution baseline survey to identify areas that are severely polluted.	EPD DOE	DID
d.	Establish a standardised monitoring program with relevant criteria for marine debris at polluted areas from the marine pollution baseline survey.	EPD DOE	NGO

SDG Goals: Supported

Action 6.3: Strengthen efforts to reduce plastic pollution into freshwater and marine ecosystems.

Key Indicator: By 2034, plastic pollution levels in Sabah's freshwater and marine ecosystems have improved compared to 2025 levels.

Plastic pollution is a major environmental issue in Sabah which threatens its freshwater and marine biodiversity. Improper disposal and accumulation of plastic waste remains a challenge especially within coastal areas. Addressing plastic pollution in Sabah requires a multi-stakeholder approach, community awareness, legislative measures, and research advancements.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Strengthen state regulations[77] towards minimising single-use plastics as well as management of plastic waste.	MLGH MTCE	NGO CBO
b.	Strengthen advocacy for the adoption of biodegradable materials in the food and beverage sector (and other relevant commercial sectors) as a substitute to plastic.	MTCE EPD	NGO
c.	Leverage on recent research advancements[78] on bioplastics and advocate for commercial production of more biodegradable materials.	MTCE SaBC	SIRIM, UMS (FSNR)

SDG Goals: Supported

[77] This should leverage upon the National Roadmap towards Single-Use Plastics 2018-2030 and Malaysia Plastic Sustainability Roadmap 2021-2030.

[78] Example: SIRIM and USM pilot test for commercial production of bioplastic materials.

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 6: Strengthen safeguards of Sabah's freshwater and marine ecosystems												
Action 6.1: Improve pollution control mechanisms to protect Sabah's freshwater ecosystems												
a.	Assess the permissible pollution loads of major river basins and severely contaminated rivers through the Total Maximum Daily Load (TMDL) approach within Integrated River Basin Management (IRBM) plans in Sabah.											
b.	Synchronise the yearly water resource quality monitoring programmes in major river systems within integrated databases for data collection and dissemination.											
c.	Include long-term monitoring of the effects of emerging pollutants in major rivers within the Sabah water resource study programme and revise pollution concentration standards.											
d.	Expedite gazettement of riparian corridors to minimise potential pollution from surrounding land use into rivers under the Sabah water resource study programme.											
e.	Conduct programs to rehabilitate degraded urban rivers under the Sabah River Development, Protection and Maintenance Program.											
f.	Develop an industrial guideline for wastewater treatment for effluent control to be included in the Sabah Water Resources Program.											
Action 6.2: Reduce land-based and sea-based pollution sources to protect the marine ecosystems												
a.	Improve waste management regulations and protocols to reduce marine litter from major contributing sectors such as shipping industries, marine capture fisheries, tourism, coastal developments, residential areas, and agriculture.											
b.	Strengthen regulations to include conservation and rehabilitation of coastal and marine ecosystems for coastal mining and dredging activities.											
c.	Conduct a marine pollution survey to identify areas that are severely polluted.											
d.	Establish a standardised monitoring program with relevant criteria for marine debris at polluted areas from the marine pollution baseline survey.											
Action 6.3: Strengthen efforts to reduce plastic pollution into freshwater and marine ecosystems												
a.	Strengthen state regulations towards minimising or banning single-use plastics as well as management of plastic waste.											
b.	Strengthen advocacy for the adoption of biodegradable materials in the food and beverage sector (and other relevant commercial sectors) as a substitute to plastic.											
c.	Leverage on recent research advancements on bioplastics and advocate for commercial production of more biodegradable materials.											

Strategy 7: Strengthen management and utilisation of Sabah's agrifood, agricommodity, and fisheries resources.

WHY IS THIS STRATEGY IMPORTANT?

The agrifood, agricommodity, and fisheries remain as key economic sectors in Sabah contributing to the state's GDP. However, these sectors have a very high demand for resources, in terms of land for plantations, and stock species for fisheries. As such, these sectors have constantly been viewed as having direct pressures towards biodiversity. Sustainable management practices need to be mainstreamed across these sectors to minimise their potential impacts towards biodiversity. It is also vital that Sabah works to shift these sectors towards sustainability which aligns with global demand for sustainable agriculture management aiming to conserve biodiversity.

PROGRESS SINCE SBS 2012-2022

Sabah has made significant efforts to reduce the impacts from commodities and fisheries industries. Sabah is the only state in Malaysia that established a jurisdictional approach on the oil palm industry with a target of achieving full RSPO certification by 2025. The fisheries sector has also seen efforts to curb illegal, unreported and unregulated (IUU) fishing, as well as revising the 1996 Aquaculture Master Plan to improve sustainable practices.

MEETING THE STRATEGY

Moving forward, more efforts are still required to shift agrifood, agricommodity, and fisheries sectors towards sustainability. Collective awareness is crucial especially among smallholders and workers to understand their roles in contributing towards sustainable practices. At the same time, proper incentives need to be in place to facilitate sustainability initiatives which will indirectly support biodiversity conservation in Sabah.

Strategy 7 has 4 Actions:

- Action 7.1: Strengthen sustainable agrifood and agricommodity practices.
- Action 7.2: Reduce the impact of fisheries on marine and coastal biodiversity.
- Action 7.3: Strengthen aquaculture planning and management.
- Action 7.4: Strengthen genetic diversity conservation of cultivated plants, farmed and domesticated animals, and their wild relatives.

Action 7.1: Strengthen sustainable agrifood and agricommodity practices.

Key Indicator: By 2034, Sabah's agrifood and agricommodity sectors are contributing towards positive conservation outcomes.

Sabah's agrofood and agricommodity sectors are among the core economic activities and still contribute significantly to the State's economic output. Moving forward, we must ensure that plantations are planned and managed sustainably as these activities require substantial amounts of lands. The future of these sectors will depend on sustainable and effective management of land and plantation practices to reduce pressures towards biodiversity while maximising yields.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Provide incentives[79] to agrifood and agricommodity players to encourage transitioning to modern farming techniques that incorporate habitat conservation practices as well as addressing human-wildlife conflicts, and being climate resilient.	DOA	MAFFI NGO
b.	Diversify agricommodity plantations with high value crops such as cocoa, durian, avocado, pineapple, paddy, coffee, coconut, and highland vegetables.	DOA	MCB
c.	Provide incentives and technical support to agrifood and agricommodity companies and smallholders in achieving certification under relevant sustainability schemes (RSPO, MSPO, MyGAP) and supporting state targets for full sustainability certification.	DOA	MPOB
d.	Review and strengthen all relevant regulations to ensure expansion of agrifood and agricommodity plantations do not encroach into areas of high biodiversity value.	DOA	MPOB
e.	Develop a traceability system to improve transparency and accountability of Sabah's agrifood and agricommodity throughout the supply chain.	DOA	MAFFI
f.	Expand on post-harvest loss minimization programmes for smallholders, especially for targeted crops.	DOA	MPOB

SDG Goals: Supported

[79] This can be in the form of subsidies or reward recognitions for compliance with sustainably and modern farming standards.

Action 7.2 Reduce the impact of fisheries on marine and coastal biodiversity.

Key Indicator: By 2034, Sabah's dependence on capture fisheries is reduced and supported by aquaculture (60% capture fisheries; 40% aquaculture).

The fisheries industry is also another important economic sector especially for coastal communities. However, the industry is currently exposed to rapid fish stock decline due to overfishing, pollution, and illegal, unreported, and unregulated (IUU) fishing practices. There is an urgent need to shift towards more sustainable fisheries practices to mitigate these impacts, conserve fish stocks and sustaining the fisheries industry in the long-term.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Formulate the Sabah Deep Sea Fishing Masterplan[80] to provide policy direction, standards, actions, and enablers to transition the fisheries industry towards sustainability.	DOF	NGO
b.	Expand fishery conservation zones through the seascape management approach to allow for recovery of commercial and small-scale fish stocks.	DOF	NGO
c.	Develop and implement species-based [81]fisheries management plans [82]that incorporate conservation management interventions such as slow speed zones, restricted and environmentally friendly fishing gear, seasonal closures, and other management approaches.	DOF	NGO
d.	Strengthen the state enforcement and legislative framework to establish community-based enforcement on illegal, unreported, and unregulated (IUU) fishing such as fish bombing and cyanide fishing.	DOF	EPD
e.	Implement appropriate mitigation techniques and bycatch reduction devices to reduce bycatch of non-target fish species and marine megafauna.	DOF	NGO
f.	Establish suitable databases and applications[83] to enhance accuracy of fisheries catch reporting, as well as improving adaptive management capacities on seafood traceability.	DOF	BMRI NGO
g.	Strengthen incentives and technical support to fisheries operators in achieving certification under relevant sustainability schemes, especially for live reef food fish production.	DOF	NGO

SDG Goals: Supported

[80] The Masterplan needs to provide direction and actions to phase out trawlers, as well as incorporating climate adaptation strategies to enhance resilience of the fisheries industry towards climate change.
[81] Target species should include Coral trout, Yellow fin tuna, Tiger prawn, Golden snapper, Mangrove snapper, Black snapper, and White prawn.
[82] This should entail a state-wide survey of all commercially important species as well as key production areas.
[83] Examples that can be leveraged upon include OPEN ARTFISH database and web application developed by FAO Fisheries and Aquaculture Statistics and Information Branch (FIAS) and Fisheries Standard Toolbox v 1.1 by Marine Stewardship Council (MSC).

Action 7.3 Strengthen aquaculture planning and management.

Key Indicator: By 2034, Sabah's aquaculture sector is contributing towards positive conservation outcomes.

The aquaculture sector contributes significantly to meeting seafood demand both domestically and internationally. The sector indirectly reduces fishing pressures which can sustain fish stocks in the long run. However, the establishment of aquaculture farms has been known to result in the degradation of coastal and marine ecosystems such as mangroves and coral reefs. Sustainable strategies are needed in managing the aquaculture industry to conserve biodiversity especially within the coastal areas.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Review [84] and strengthen regulations for the Aquaculture Industrial Zone to ensure expansion of aquaculture farms do not encroach, convert, and degrade coastal and marine habitats.	DOF	TRPD
b.	Strengthen research advancements to increase aquaculture productivity and sustainability while maintaining ecosystem services, minimising environmental impacts, and increasing resilience to climate change.	DOF	BMRI
c.	Improve awareness, funding and technical support to aquaculture farmers in achieving certification under relevant sustainability schemes such as MyGAP and Aquaculture Stewardship Council (ASC).	DOF	DOA
d.	Strengthen human resource and technical capacities on certification compliance and enforcement.	DOF	DOA
e.	Redirect, reform, or remove perverse and harmful economic subsidies to facilitate transition towards sustainable aquaculture production.	DOF	DOA
f.	Showcase environmentally friendly aquaculture projects [85] that demonstrate sustainable aquaculture practices, as well as being climate resilient, as part of mainstreaming efforts.	DOF	DOA

SDG Goals: Supported

[84] This should include prohibiting large scale aquaculture farms in mangroves and moving towards open sea farms.

[85] To also demonstrate small-scale farming based on traditional ecological knowledge, such as in Pitas Laut.

Action 7.4 Strengthen genetic diversity conservation of cultivated plants, farmed and domesticated animals, and their wild relatives.

Key Indicator: By 2034, all gene and seed banks, as well as in-situ farms in Sabah have been optimised to safeguard genetic diversity of cultivated plants, farmed and domesticated animals and their wild relatives.

Conservation of genetic diversity such as cultivated plants, farmed and domesticated animals, and their wild relatives is an essential but overlooked component of biodiversity conservation. It serves as a genetic storage of important biological resources which support human lives. Knowledge on the importance of genetic diversity needs to be strengthened to ensure sustainable use of these resources.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Increase public awareness [86] on the importance of conserving genetic diversity of wild relatives of cultivated plants, farmed and domesticated animals, as well as cultivation of protected plants and farming of protected wildlife species.	DOA DOF DVS	SFD SWD ITBC BMRI NGO
b.	Expand active management actions for the recovery and conservation of the genetic diversity of cultivated plants, farmed and domesticated animals, and their wild relatives.	DOA DOF DVS	SFD SWD ITBC BMRI NGO
c.	Develop and implement sufficient safeguards into biodiversity prospecting to ensure biological resources in the wild are not depleted.	DOA DOF DVS	SFD SWD ITBC BMRI NGO
d.	Ensure conservation and sustainable utilisation of other agricultural biodiversity / genetic resources for food and agriculture (GRFA) including microorganisms and insects, as well as the benefits arising from it are shared equitably to all parties.	DOA	DOF
e.	Develop a state-level agricultural biodiversity management plan to ensure nutrition, food security, livelihoods, health, and well-being, particularly for vulnerable communities, are secured.	DOA	NGO

SDG Goals: Supported

[86] Through educational modules, social media and targeted programmes.

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 7: Strengthen management and utilisation of Sabah's agrifood, agricommodity, and fisheries resources.												
Action 7.1: Strengthen sustainable agrifood and agricommodity practices.												
a.	Provide incentives to agrifood and agricommodity players to encourage transitioning to modern farming techniques that incorporate habitat conservation practices as well as being climate resilient.											
b.	Diversify agricommodity plantations with high value crops such as cocoa, durian, avocado, pineapple, paddy, coffee, coconut, and highland vegetables.											
c.	Provide incentives and technical support to agrifood and agricommodity companies and smallholders in achieving certification under relevant sustainability schemes (RSPO, MSPO, MyGAP) and supporting state targets for full sustainability certification.											
d.	Review and strengthen all relevant regulations to ensure expansion of agrifood and agricommodity plantations do not encroach into areas of high biodiversity											
e.	Develop a traceability system to improve transparency and accountability of Sabah's agrifood and agricommodity throughout the supply chain,											
f.	Expand on post-harvest loss minimization programmes for smallholders, especially for targeted crops,											
Action 7.2: Reduce the impacts of fisheries on marine and coastal biodiversity												
a.	Formulate the Sabah Deep Sea Fishing Masterplan to provide policy direction, standards, actions, and enablers to transition the fisheries industry towards sustainability.											
b.	Expand fishery conservation zones through the seascape management approach to allow for recovery of commercial and small-scale fish stocks.											
c.	Develop and implement species-based fisheries management plans that incorporate conservation management interventions such as slow speed zones, restricted and environmentally friendly fishing gear, seasonal closures, and other management approaches.											
d.	Strengthen the state enforcement and legislative framework to establish community-based enforcement on illegal, unreported, and unregulated (IUU) fishing such as fish bombing and cyanide fishing.											
e.	Implement appropriate mitigation techniques and bycatch reduction devices to reduce bycatch of non-target fish species and marine megafauna.											

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
f.	Establish suitable databases and applications to enhance accuracy of fisheries catch reporting, as well as improving adaptive management capacities on seafood traceability.											
g.	Strengthen incentives and technical support to fisheries operators in achieving certification under relevant sustainability schemes, especially for live reef food fish production.											
Action 7.3: Strengthen aquaculture planning and management												
a.	Review and strengthen regulations under the Aquaculture Industrial Zone to ensure expansion of aquaculture farms do not encroach, convert, and degrade coastal and marine habitats.											
b.	Strengthen research advancements to increase aquaculture productivity and sustainability while maintaining ecosystem services, minimising environmental impacts, and increasing resilience to climate change.											
c.	Improve awareness, funding and technical support to aquaculture farmers in achieving certification under relevant sustainability schemes such as MyGAP and Aquaculture Stewardship Council (ASC).											
d.	Strengthen human resource technical capacities with regards to certification compliance and enforcement.											
e.	Redirect, reform, or remove perverse and harmful economic subsidies to facilitate transition towards sustainable aquaculture production.											
f.	Showcase environmentally friendly aquaculture projects that demonstrate sustainable aquaculture practices, as well as being climate resilient, as part of mainstreaming efforts.											
Action 7.4 Strengthen genetic diversity conservation of cultivated plants, farmed and domesticated animals, and their wild relatives												
a.	Increase public awareness on the importance of conserving genetic diversity of wild relatives of cultivated plants, farmed and domesticated animals, as well as cultivation of protected plants and farming of protected wildlife species.											
b.	Expand active management actions for the recovery and conservation of the genetic diversity of cultivated plants, farmed and domesticated animals, and their wild relatives.											
c.	Develop and implement sufficient safeguards into biodiversity prospecting to ensure biological resources in the wild are not depleted.											

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
d.	Ensure conservation and sustainable utilisation of other agricultural biodiversity / genetic resources for food and agriculture (GRFA) including microorganisms and insects, as well as the benefits arising from it are shared equitably to all parties.											
e.	Develop a state-level agricultural biodiversity management plan to ensure nutrition, food security, livelihoods, health, and well-being, particularly for vulnerable communities, are secured.											

Strategy 8: Enhance the synergies between Sabah's tourism and biodiversity conservation.

WHY IS THIS STRATEGY IMPORTANT?

Tourism is the third largest economic sector in Sabah and has become an increasingly important economic pillar in the recent years. However, improper planning, and unsustainable practices will impose more direct pressures on Sabah's biodiversity, especially on nature-based tourism which rely on biological resources and habitats as the main tourism products.

PROGRESS SINCE SBS 2012-2022

The SBS 2012-2022 emphasised on capacity-building of nature guide and expanding community-based and village home-stay programmes as a means to improve tourism development. While these activities have been implemented, there is a a greater need for more integrated planning and management of Sabah's nature tourism sites seeing as there will foreseeably be greater visitor influx in the coming years in response to recovery from the Covid-19 pandemic.

MEETING THE STRATEGY

Tourism operations and biodiversity conservation must be mutually supportive to ensure the long-term viability of the industry. By acknowledging the significance of biodiversity, tourism can be a positive force for conservation as well as economic development. The potential synergies need to be leveraged upon as a medium to effectively conserve biodiversity while also continuing the state's development.

Strategy 8 has 3 Actions:

- Action 8.1: Enhance tourism development to support biodiversity conservation.
- Action 8.2: Facilitate and strengthen sustainable tourism certification and capacities.
- Action 8.3: Promote and develop community-based tourism and voluntourism.

Action 8.1: Enhance tourism development to support biodiversity conservation.

Key Indicator: By 2034, tourism sites / resorts in Sabah have been certified under the Global Sustainable Tourism Criteria (GSTC) or similar schemes that demonstrate effective biodiversity conservation in tourism.

Sustainable tourism development refers to practices which acknowledge all impacts of tourism and work towards balancing environment, economic, and socio-cultural aspects. Proper planning and research are needed to continuously ensure that pressures from tourism practices are minimised while supporting or contributing to biodiversity conservation.

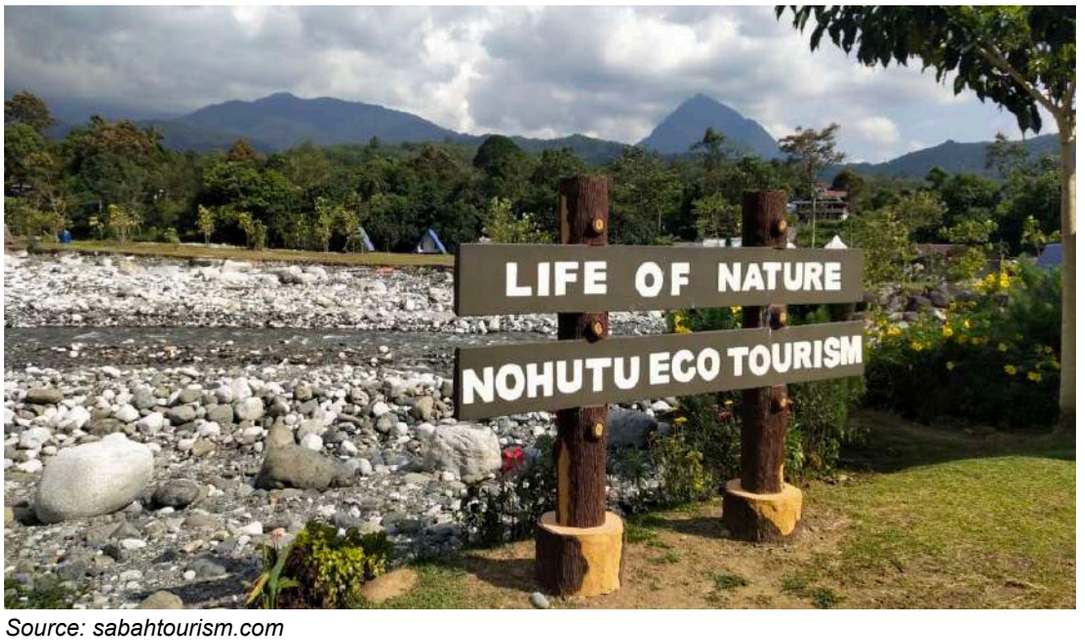
We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Revise the Sabah Tourism Master Plan to include a business development[87] element that incorporates biodiversity conservation principles and criteria within investments and concessionaire agreements.	MTCE	SEDIA STB SFD[88] SWD[88] SP[88] SCB[88]
b.	Review (or assess[89]) the current carrying capacities of major tourism and ecotourism sites in Sabah (inc. marine islands) to improve the protection of these areas from visitor impacts and identify additional supporting sites to help disperse visitor influx and minimise impacts towards natural ecosystems and biodiversity.	MTCE	STB SFD SWD SP NGO
c.	Develop and showcase model[90] ecotourism sites that display synergies between ecotourism and biodiversity conservation.	MTCE	STB SFD SWD SP NGO

[87] Business development should chart the intended business growth of Sabah's tourism sector, in terms of required infrastructure (inc. costs), human resource, and required funding. Biodiversity conservation elements should be included as part of the criteria for receiving investments or awarding concessionaires.
[88] Specifically on tourism concessions
[89] This assessment should also explore redistributing the inflow of sites that have exceeded capacities into neighboring districts and providing justifications for further investments and development of more sustainable tourist resorts to expand visitor capacities.
[90] The KOPEL model should be replicated in other areas.

No.	Activity	Lead Agency	Partner Agency
d.	Assess the feasibility[91] of implementing conservation taxes or fees on tourists (domestic and foreign) or re-channelling existing taxation / fee systems to improve maintenance of major tourism sites or to be used for conservation activities.	MTCE SEDIA	SFD SP SWD Sabah Museum

SDG Goals: Supported



Source: sabahtourism.com

Plate 2-2: Nohutu Eco-Tourism Campsite, Kota Belud

[91] Example: The Natural Resources Office is proposing a PES tax on foreign tourists, as well as the hotel tax by the Federal Government.

Action 8.2: Facilitate and strengthen sustainable tourism certification and capacities.

Key Indicator: By 2034, at least 80% of tour operators in Sabah are certified through accredited certification schemes that emphaise biodiversity conservation in sustainable tourism management.

Sabah's tourism sites need to operate with the best management practices while ingraining the importance of biodiversity conservation towards visitors. At the same time, guides need to be properly trained to provide high quality interpretation to ensure tourists gain relevant and meaningful knowledge about biodiversity conservation when visiting natural sites. Certification can be used as a means to ensure that sustainable criteria are met where tourism and biodiversity conservation are mutually upheld.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Encourage and support tourism operators to participate in sustainable tourism certification schemes, specifically those focusing on community-based tourism standards such as GSTC and ASEAN community-based indicators.	MTCE	CBO
b.	Develop and implement training programmes to upskill managers and operators to meet international tourism standards that balance tourism development and biodiversity conservation.	MTCE	UMS [92] NGO CBO

SDG Goals: Supported

[92] FBEA (Tourism Management Programme), FTF (Nature Park and Recreation Programme)

Action 8.3: Promote and develop community-based tourism and voluntourism.

Key Indicator: By 2034, the number of indigenous people and local communities actively participating in tourism development in Sabah has significantly increased.

Community-based tourism and voluntourism can play a significant role in supporting biodiversity conservation. It involves the active participation of local communities, tourists or conservationists in tourism initiatives which allows them to benefit directly from the industry while simultaneously promoting conservation efforts. This approach helps build a sustainable dynamic where both tourism and biodiversity are mutually supported.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Establish a community-based tourism network [93] to improve collaborations and knowledge sharing between site managers (inc. community leaders) and tourism operators.	STB	SFD SWD SP NGO CBO
b.	Engage and empower indigenous peoples and local communities living in and around nature tourism sites [94] as active participants in planning and implementation to improve livelihoods while strengthening protection of sites.	SFD SWD SP	STB FERTAS NGO
c.	Promote and support community-based tourism for agro-tourism, birding, caving, and diving activities while respecting local customs and minimising impacts to the natural ecosystem and biodiversity.	STB MTCE	SWD SFD SP NGO
d.	Develop volunteer placements and internships [95] at ecotourism sites that enable tourists to experience hands-on conservation work.	SFD SWD SP	NGO CBO

SDG Goals: Supported

[93] This can leverage on the Cultural Community Program that is being developed by the Sabah Cultural Board.

[94] This can be leveraged as part of OECM and biocultural diversity aspects that can be mainstreamed to enable community-based tourism.

[95] The objective of the internship has to be clearly defined by the operator/manager with proper modules, programmes, and activities that provide meaningful experiences to the volunteer/intern.

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 8: Enhance the synergies between Sabah's tourism and biodiversity conservation												
Action 8.1: Enhance tourism development to support biodiversity conservation												
a.	Revise the Sabah Tourism Master Plan to include a business development element that incorporates biodiversity conservation principles and criteria within investments and concessionaire agreements.											
b.	Review (or assess) the current carrying capacities of major tourism and ecotourism sites in Sabah (inc. marine islands) to improve the protection of these areas from visitor impacts and identify additional supporting sites to help disperse visitor influx and minimise impacts towards natural ecosystems and biodiversity.											
c.	Develop and showcase model ecotourism sites that display synergies between ecotourism and biodiversity conservation.											
d.	Assess the feasibility of implementing conservation taxes or fees on tourists (domestic and foreign) or re-channelling existing taxation / fee systems to improve maintenance of major tourism sites or to be used for conservation activities.											
Action 8.2: Facilitate and strengthen sustainable tourism certification and capacities												
a.	Encourage and support tourism operators to participate in sustainable tourism certification schemes, specifically those focusing on community-based tourism standards such as GSTC and ASEAN community-based indicators.											
b.	Develop and implement training programmes to upskill managers and operators to meet international tourism standards that balance tourism development and biodiversity conservation.											
Action 8.3: Promote and develop community-based tourism and voluntourism												
a.	Establish a community-based tourism network to improve collaborations and knowledge sharing between site managers (inc. community leaders) and tourism operators.											
b.	Engage and empower indigenous peoples and local communities living in and around nature tourism sites as active participants in planning and implementation to improve livelihoods while strengthening protection of sites.											
c.	Promote and support community-based tourism for agro-tourism, birding, caving, and diving activities while respecting local customs and minimising impacts to the natural ecosystem and biodiversity.											
d.	Develop volunteer placements and internships at ecotourism sites that enable tourists to experience hands-on conservation work.											

GOAL 3
ALL OF SABAH'S KEY ECOSYSTEMS, SPECIES AND GENETIC DIVERSITY HAVE BEEN SAFEGUARDED

Sabah possesses irreplaceable assets in the form of its ecosystem, species, and genetic diversity, which must be safeguarded. The management of protected areas, both within the landscape and seascape, should be conducted in an effective manner to ensure ecological representation. Given that Sabah comprises diverse ecosystems with varying species diversity and ecosystem functions and services, it is crucial to manage protected areas in a manner that is ecologically representative.

In addition to the management of protected areas, conservation efforts in Sabah need to be further enhanced by expanding and strengthening other effective area-based conservation approaches that are gaining traction. These approaches complement the management of protected areas and contribute to comprehensive conservation efforts.

Sabah has undergone rapid economic development over the years, resulting in significant expansion in the agriculture, agricommodity, and tourism sectors, as well as urbanization. However, this economic growth has also led to habitat degradation and fragmentation, posing threats to the natural ecosystem and disrupting ecological corridors. To address these challenges, it is crucial to prioritize the rehabilitation and protection of natural ecosystems, including the preservation of ecological corridors. By doing so, the resilience of the ecosystem can be enhanced, enabling it to withstand various environmental pressures while continuing to provide essential ecosystem services.

Both human-induced and natural disturbances, such as habitat destruction and fragmentation, illegal poaching, harvesting, and trade, have significantly threatened flora and fauna populations. Sabah is home to several endemic flora and fauna species, emphasizing the need to implement management actions that enable their conservation and recovery while maintaining genetic diversity. At the same time, the introduction and spread of invasive alien species (IAS) also pose threats to Sabah's flora, fauna, and ecosystem. As Sabah becomes more interconnected globally through trade and transportation activities, the incidences of IAS spread are becoming prevalent. Implementing measures for prevention, containment, and eradication of IAS is necessary to safeguard Sabah's ecosystem.

To successfully safeguard Sabah's key ecosystems, species, and genetic diversity, sound scientific and technical capacity, political will, and collaborative stakeholder participation must support the ongoing efforts.

Goal 3 has 6 strategies:

- Strategy 9: Conserve at least 30% of Sabah's terrestrial and inland waters, and 15% of coastal and marine areas through an effectively managed and ecologically representative system of protected areas and other effective area-based conservation measures.
- Strategy 10: Sustainably manage and restore Sabah's threatened natural ecosystems.
- Strategy 11: Secure important ecological corridors in Sabah and enhance the resilience of terrestrial, freshwater, and marine ecosystems.
- Strategy 12: Enhance management actions to enable conservation and recovery of Sabah's threatened species.
- Strategy 13: Strengthen enforcement actions to significantly reduce poaching, illegal harvesting, and illegal trade of flora and fauna.
- Strategy 14: Implement measures for the prevention, eradication, containment, and control of invasive alien species in Sabah.

Strategy 9: Conserve at least 30% of Sabah's terrestrial and inland waters, and 15% of coastal and marine areas through an effectively managed and ecologically representative system of protected areas and other effective area-based conservation measures.

WHY IS THIS STRATEGY IMPORTANT?

Protected areas are geographically designated regions managed to provide specific protection and conservation to natural and cultural resources. The establishment and effective management of protected areas are crucial for safeguarding important ecosystems, habitats, species, as well as natural resources. They also play a vital role in ensuring ecosystem services that support human health and economic security.

PROGRESS SINCE SBS 2012-2022

Sabah has a commendable track record in protecting and conserving its terrestrial and marine ecosystems. A major outcome of the SBS 2012-2022 was the gazettement of the Tun Mustapha Marine Protected Area, which is the state and country's largest marine protected area to date. Since then, there has been even more work to protect and manage important habitats to increase the protected area coverage in Sabah. The emergence of the Other Effective Conservation Measures (OECM) approach has also provided more opportunities for co-management, especially with indigenous peoples and local communities and native landscapes.

MEETING THE STRATEGY

The revised SBS needs to take into account the need for long-term management of Sabah's protected areas. Management has to be scientifically grounded while adhering to global and national standards and good governance principles. This will require long-term integrated assessments and monitoring, improving human resource and capabilities, while also identifing new sites that fit the criteria to be recognised as protected areas.

Strategy 9 has 4 Actions:

- Action 9.1: Strengthen and streamline governance of Sabah's protected areas.
- Action 9.2: Enhance management effectiveness of Sabah's protected area.
- Action 9.3: Expand the extent and representativeness of Sabah's protected area network.
- Action 9.4: Identify and recognise other effective area-based conservation measures.

Action 9.1: Strengthen and streamline governance of Sabah's protected areas.

Key Indicator: By 2025, the Sabah Protected Area working group has been operationalized.

Sabah has created multiple protected areas in both the terrestrial and marine realms. These are managed by different state agencies supported by various NGOs and indigenous peoples and local communities. The conservation efforts undertaken by these entities may be fragmented and uncoordinated resulting in weak or ineffective measures with poor resource allocation planning. As such, there is a need to streamline governance of Sabah's protected area by establishing working groups within state and with Sarawak and Federal agencies to improve coordination and resource allocation. In addition, Sabah need to strengthen existing and gazette new legislation to improve governance and management of protected areas in line with global best practice standard.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Operationalize the Sabah Protected Area working group to streamline governance and management with Federal and Sarawak regions according to the National Framework on Protected Areas.	SaBC	SFD SWD SP
b.	Strengthen and harmonize existing protected area legislation [96], and create new regulations where required [97], to meet global best practice standard.	SFD SWD SP	NGO

SDG Goals: Supported

Action 9.2: Enhance management effectiveness of Sabah's protected area.

Key Indicator: By 2034, management plans have been formulated/revised for priority protected areas in Sabah.

Management effectiveness is defined as degree to which conservation efforts achieved the desired goals and objectives [98]. The key elements of management effectives in protected area include design relating to individual sires and protected area systems, adequacy and appropriateness of system, and delivery of objectives

[96] This should also identify and review gaps in existing legislation pertaining to implementation and enforcement.
[97] This should include fully protecting Sabah's mangroves from being reclaimed or illegally encroached.
[98] Karadeniz, N. & Yenilmez Arpa, N. (2022)

and conservation values[99]. Guidelines and best management practices are being continually developed alongside tools and resources. Sabah can capitalise on those resources to enhance management effectiveness of its protected area to achieve its full potential and able to significantly contribute towards conservation.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Ensure all protected areas in Sabah have management plans[100]. This includes formulating/revising management plans for: • Kota Belud - Tempasuk Wildlife Sanctuary • Lower Kinabatangan-Segama Wetlands • Tun Sakaran Marine Protected Area • Turtle Island Parks (application for ASEAN protected status)	SFD SWD SP	SaBC NGO
b.	Conduct management[101] effectiveness assessments and consolidate the findings to identify key areas for improvement at the site and system levels[102].	SFD SWD SP	SaBC NGO
c.	Encourage Sabah's best managed protected areas to achieve international certification and recognition. This includes: • Nominating the Lower Kinabatangan as a Man and Biosphere reserve • Nominating the Maliau Basin, Danum Valley, and Imbak Canyon as UNESCO World Heritage sites • Nominating the Klias Peninsula as a Ramsar site • Candidate sites for certification as IUCN Green List sites[103]	MTCE Yayasan Sabah	SFD SP NGO

SDG Goals: Supported

[99] Evaluating Effectiveness 2nd Edition, IUCN (2006)

[100] There should also be standards/guidelines to standardize the language of all management plans to avoid misinterpretation and overlaps.

[101] The IUCN Green List Standard or Management Effectiveness Tracking Tools (METT) should be used as a guideline to improve the management plan. The scoring of assessment could help in determining level of management in terms of (planning, threats, future projection etc).

[102] This should consider habitats / areas that are linked with existing protected areas, and the current threat status, as efforts to enhance management effectiveness

[103] Danum Valley Conservation Area, Pin Supu FR, Sook Lake FR and Tun Mustapha Marine Protected Area

Action 9.3: Expand the extent and representativeness of Sabah's protected area network.

Key Indicator: By 2030, priority sites in Sabah have been identified with plans in place to be gazetted as protected area.

Sabah must expand its protected area network in both terrestrial and marine ecosystems by identifying and incorporating additional habitats, including endangered or threatened ecosystems such as peat swamp forests, oxbow lakes, and limestone hills. It is crucial to consider the inclusion of ecological corridors and migratory pathways to ensure the uninterrupted movement of wildlife. The selection of areas to be protected must be based on effective stakeholder participation, including local communities, indigenous groups, and experts in the field.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Identify priority sites for protected area expansion based on important ecological criteria [104] [105].	SFD SWD SP	SaBC NGO
b.	Include members from civil society and IPLCs into the Sabah Protected Area working group as key stakeholders to work towards the gazettal of identified priority sites.	SFD SWD SP	SaBC NGO CBO

SDG Goals: Supported

[104] Includes connectivity of Sabah's Protected Area network to the HoB transboundary landscape of Sarawak and Kalimantan and threatened coastal ecosystems and coastlines for climate change mitigation and adaptation.

[105] Potential sites include:

- Ulu Padas primary forest
- Padang Teratak water bird habitat (800 ha.)
- Tempasuk plains critical water bird habitat (1,500 ha.)
- Tg. Malubang, Pitas
- Weston Menumbok, Beluran, Paitan, & Pitas mangroves
- Segama river corridor (to connect Danum, Ulu Segama Complex, Lower Segama Conservation Area & Tabin)
- Mabul – Pom Pom seascape
- Darvel Bay
- Brunei Bay
- Mengalum and Ligitan coral reefs
- Turtle Islands expansion
- Supirak Island, Floating coral bar, The Island of Sorrow/Batu Berunsai

Action 9.4: Identify and recognise other effective area-based conservation measures (OECM).

Key Indicator: By 2030, an OECM registry has been developed and operationalised to document all OECMs established in Sabah.

Other effective area-based conservation measures (OECM) is a new alternative where areas that are outside the protected area network are managed through measures that conserve biodiversity and contribute towards conservation efforts. If done right, this can play crucial role in biodiversity conservation, ecological connectivity, and maintenance of ecosystem services. Sabah must recognise the role of OECM and develop its capacity to implement OECM concepts in scientific and technically appropriate manner.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Leverage on the national framework [106] to streamline Sabah's recognition of OECMs in line with international standards and national / state circumstances.	SaBC	SFD SWD SP NGO
b.	Identify [107] sites that qualify as OECM through scientific and technical-based criteria.	SaBC	SFD SWD SP NGO
c.	Encourage/facilitate establishment of OECM sites through appropriate recognition, governance measures, and other relevant frameworks.	SaBC	SP SFD SWD NGO
d.	Develop/strengthen appropriate policy, regulatory, and management frameworks that secure and recognize Community Conserved Areas (CCAs), Locally Managed Marine Areas (LMMAs), Conservation Units (CU), and Community Protocols (CP) across landscapes and seascapes, as part of the OECM network.	SaBC	SP SFD SWD NGO

SDG Goals: Supported

[106] The state framework will be based on the national OECM framework. The Sabah government should advocate for the framework to be bottom-up, taking into account many existing practices relevant to conservation.

[107] Site identification should also recognize tenuity and identify avenues to protect/secure this.

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 9: Conserve at least 30% of Sabah's terrestrial and inland waters, and 15% of coastal and marine areas through an effectively managed and ecologically representative system of protected areas and other effective area-based conservation measures												
Action 9.1: Strengthen and streamline governance of Sabah's protected areas												
a.	Operationalize Sabah Protected Area working group to streamline governance and management with Federal and Sarawak regions according to the National Framework on Protected Areas.											
b.	Strengthen and harmonize existing protected area legislation, and create new regulations where required, to meet global best practice standard.											
Action 9.2: Enhance management effectiveness of Sabah's protected areas												
a.	Ensure all protected areas in Sabah have management plans. This includes formulating/revising management plans for: • Kota Belud - Tempasuk Wildlife Sanctuary • Lower Kinabatangan-Segama Wetlands • Tun Sakaran Marine Protected Area • Turtle Island Parks (application for ASEAN protected status)											
b.	Conduct management effectiveness assessments and consolidate the findings to identify key areas for improvement at the site and system levels.											
c.	Encourage Sabah's best managed protected areas to achieve international certification and recognition. This includes: • Nominating the Lower Kinabatangan as a Man and Biosphere reserve • Nominating the Maliau Basin, Danum Valley, and Imbak Canyon as UNESCO World Heritage sites • Nominating the Klias Peninsula as a Ramsar site • Candidate sites for certification as IUCN Green List sites (Danum Valley Conservation Area, Pin Supu FR, Sook Lake FR and Tun Mustapha Marine Protected Area)											
Action 9.3: Expand the extent and representativeness of Sabah's protected area network												
a.	Identify priority sites for protected area expansion based on important ecological criteria. Potential sites include includes: • Ulu Padas primary forest • Padang Teratak water bird habitat (800 ha.)											

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
	• Tempasuk plains critical water bird habitat (1,500 ha.) • Tg. Malubang, Pitas • Weston Menumbok, Beluran, Paitan, Pitas mangroves • Segama river corridor (to connect Danum, Ulu Segama Complex, Lower Segama Conservation Area & Tabin) • Mabul – Pom Pom seascape • Darvel Bay • Brunei Bay • Mengalum and Ligitan coral reefs • Turtle Islands expansion • Supirak Island, Floating coral bar, The Island of Sorrow, Batu Berunsai											
b.	Include members from civil society and IPLCs into the Sabah Protected Area working group as key stakeholders to work towards the gazettal of identified priority sites.											
Action 4.4: Strengthen safeguards to minimise pressures from mining / quarrying developments												
a.	Leverage on the national framework to streamline Sabah's recognition of OECMs in line with international standards and national / state circumstances.											
b.	Identify sites that qualify as OECM through scientific and technical-based criteria.											
c.	Encourage/facilitate establishment of OECM sites through appropriate recognition, governance measures, and other relevant frameworks.											
d.	Develop/strengthen appropriate policy, regulatory, and management frameworks that secure and recognize Community Conserved Areas (CCAs), Locally Managed Marine Areas (LMMAs), Conservation Units (CU), and Community Protocols (CP) across landscapes and seascapes, as part of the OECM network.											

Strategy 10: Sustainably manage and restore Sabah's threatened natural ecosystems.

WHY IS THIS STRATEGY IMPORTANT?

Degraded ecosystems are areas that have been severely altered or damaged due to human activities. This greatly affects the structure and functionality of the ecosystem, resulting in the loss of biodiversity and ecological imbalances. It disrupts critical ecological processes and reduces the availability of ecosystem services that are essential for human well-being. Sabah's economy relies heavily on agriculture, fisheries, livestock, and urban infrastructure development. However, these activities have resulted in habitat degradation due to uncontrolled and unmonitored activities.

PROGRESS SINCE SBS 2012-2022

The SBS 2012-2022 included a general activity to rehabilitated degraded areas within protected areas. Various rehabilitation activities have been put in motion since then, but rehabilitation is a long-term process, which requires consistent monitoring, as well as resources. A more coordinated approach is needed to guide all forms of rehabilitation work in Sabah. At the same time, rehabilitation also needs to improve the resilience of habitats towards both anthropogenic disturbances and climate change impacts.

MEETING THE STRATEGY

Moving forward, severely degraded or threatened ecosystems in Sabah must be identified and mapped, with threats and management priorities clearly elaborated. At the same time, management of these ecosystems also has to be improved to strengthen resilience towards climate change while striving to prevent, halt and reverse the degradation of ecosystems from anthropogenic drivers.

Strategy 10 has 3 Actions:

- Action 10.1: Expand ecosystem mapping and vulnerability classification.
- Action 10.2: Restore degraded ecosystems.
- Action 10.3: Maintain and enhance ecosystem resilience to disturbance.

Action 10.1: Expand ecosystem mapping and vulnerability classification.

Key Indicator: By 2030, Sabah's ecosystem vulnerability map has been developed.

Ecosystem vulnerability refers to the susceptibility of an ecosystem to changes or disruptions that may negatively impact its structure, function, and ability to provide necessary services. Given the scale of Sabah's natural ecosystem and myriad of threats facing it, there is a need to expand the identification and mapping of ecosystem, particularly those that are vulnerable. These assessments can serve as valuable guidance for the development of conservation and management plans. By identifying and understanding the vulnerabilities of different ecosystems, appropriate strategies and measures can be implemented to mitigate the impacts of threats and ensure the long-term sustainability and resilience of Sabah's natural environment.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Expand mapping and documentation [108] of marine HCVAs, while updating terrestrial HCVA maps, to classify and rank threatened ecosystems [109] to aid restoration planning.	SaBC	ITBC BMRI SFD SWD SP NGO
b.	Establish and develop a Geospatial Mapping Unit at Sabah Biodiversity Centre to coordinate mapping of threatened ecosystems in Sabah.	SaBC	ITBC BMRI NGO

SDG Goals: Supported

[108] This should be conducted through a standardized method.

[109] Assessment must include limestone and karst areas, coral reefs, kerangas forest, seagrasss, and mangroves and should also leverage on citizen science inputs.

Action 10.2: Restore degraded ecosystems.

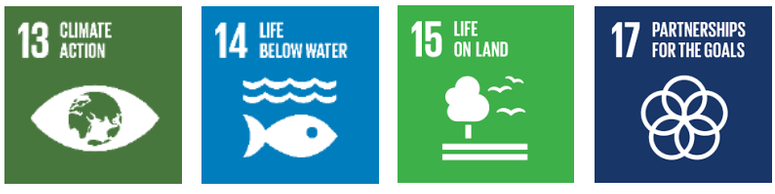
Key Indicator: By 2034, 50% of identified degraded sites in Sabah are being actively rehabilitated.

Ecosystem restoration occurs as part of nature's way of recovering, depending on the inherent condition of a degraded area as well as other contributing factors. However, efforts to accelerate ecosystem recovery will greatly help restore ecosystem services and improve adaptation to climate change. These should be grounded in science-based approaches to maximise effectiveness.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Identify and prioritize sites for restoration, including ecological corridors and natural habitats that have been degraded from anthropogenic or natural stresses, based on the Sabah Red List of Threatened Ecosystem study.	SFD SWD SP	DOF ITBC BMRI NGO
b.	Facilitate restoration [110] efforts [111] using science-based methodologies appropriate to site-specific conditions and restoration objectives. This can include: • Agroforestry or regenerative agriculture techniques to restore ecological connectivity across monoculture landscapes. • Deployment of artificial reefs to increase coral cover. • Establish well monitored coral nurseries to assist rehabilitation of degraded coral reefs. • Restoration of seagrass beds.	SFD SWD SP DOF	ITBC BMRI NGO

SDG Goals: Supported



[110] A systematic review of existing restoration efforts should be conducted to evaluate effective practices. Awareness of the importance and adoption of effectiveness monitoring protocol needs to be enhanced and minimum reporting standards for government funded restoration projects (and preferably all projects) developed.

[111] An avenue to share information on restoration practice should also be established.

Action 10.3: Maintain and enhance ecosystem resilience to disturbances.

Key Indicator: By 2030, adaptive management actions have been established and implemented to address disturbances in threatened natural ecosystems.

Ecosystem resilience refers to the capability of an ecosystem to withstand, recover, or adapt to disturbances while retains its structures and functions. Sabah needs to enhance understanding of the patterns and processes that underpin ecosystem resilience. This understanding can improve the development of effective management plans that integrate resilience concepts and enable Sabah's ecosystem to be safeguarded and enhance their ability to response and adopt to future disturbance and challenges.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Enhance research to further develop understanding of multi-scale patterns and processes that determine ecological and spatial resilience of both landscapes and seascapes, as well as species populations.	UMS [112]	SFD SWD SP NGO
b.	Incorporate spatial resilience factors into the management of protection and production landscapes.	SFD	UMS[111] NGO
c.	Strengthen efforts to monitor spatial and temporal changes towards landscapes and seascapes, as well as impacts of anthropogenic activities and climate change.	SFD SWD SP	UMS[111] NGO

SDG Goals: Supported

[112] ITBC, BMRI, FTF, & FSNR

No.	No.	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 10: Sustainably manage and restore Sabah's threatened natural ecosystems												
Action 10.1: Expand ecosystem mapping and vulnerability classification												
a.	Expand mapping and documentation of marine HCVAs, while updating terrestrial HCVA maps, to classify and rank threatened ecosystems to aid restoration planning.											
b.	Establish and develop a Geospatial Mapping Unit at Sabah Biodiversity Centre to coordinate mapping of threatened ecosystems in Sabah.											
Action 10.2: Restore degraded ecosystems												
a.	Identify and prioritize sites for restoration, including ecological corridors and natural habitats that have been degraded from anthropogenic or natural stresses, based on the Sabah Red List of Threatened Ecosystem study.											
b.	Facilitate restoration efforts using science-based methodologies appropriate to site-specific conditions and restoration objectives. This can include: • Agroforestry or regenerative agriculture techniques to restore ecological connectivity across monoculture landscapes. • Deployment of artificial reefs to increase coral cover. • Establish well monitored coral nurseries to assist rehabilitation of degraded coral reefs. • Restoration of Seagrass beds.											
Action 10.3: Maintain and enhance ecosystem resilience to disturbance												
a.	Enhance research to further develop our understanding of multi-scale patterns and processes that determine ecological and spatial resilience of both landscapes and seascapes, as well as species populations.											
b.	Incorporate spatial resilience factors into the management of protection and production landscapes.											
c.	Strengthen efforts to monitor spatial and temporal changes towards landscapes and seascapes, as well as impacts of anthropogenic activities and climate change.											

Strategy 11: Secure important ecological corridors in Sabah and enhance the resilience of terrestrial, freshwater, and marine ecosystems.

WHY IS THIS STRATEGY IMPORTANT?

Ecological connectivity refers to the movement ability of species within a landscape, considering various landscape features like habitat patches that can either aid or hinder animal movement[113]. Ecological connectivity is essential for maintaining healthy and functioning ecosystems, as it enables vital ecological processes such as gene flow, seed dispersal, and prey-predator interactions. It also improves the resilience and long-term survival of species and ecosystems. However, habitat loss and fragmentation from land use change and physical barriers like roads and dams, pollution, invasive species, and climate change to some extent, impose pressures towards maintaining proper ecological connectivity.

PROGRESS SINCE SBS 2012-2022

The Kinabalu ECOLINC and Heart of Borneo were some of the early ecological connectivity projects that were well received on its initial conception, and have managed to continue being implemented since the SBS 2012-2022. Moving forward, there needs to be more concerted efforts to improve both terrestrial and ecological connectivity throughout Sabah. This too has to be grounded in scientific data, while also involving indigenous peoples and local communities in protecting native lands and seascapes.

MEETING THE STRATEGY

Sabah need to undertake measures to secure and expand both terrestrial and marine ecological corridors to ensure existing species movement and ecological services remain undisrupted. Expansion of ecological corridors should priorities habitats of biodiversity importance. Existing initiatives namely Heart of Borneo (HoB) initiative and Coral Triangle Initiatives (CTI) need to be enhanced. Furthermore, degraded habitats that could potentially serve as vital corridors need to be identified and restored based on a solid scientific and technical approach.

Strategy 11 has 2 Actions:

- Action 11.1: Strengthen and expand Sabah's terrestrial ecological connectivity.
- Action 11.2: Strengthen and expand Sabah's marine ecological connectivity.

[113] Kirk.H *et al* (2023).

Action 11.1: Strengthen and expand Sabah's terrestrial ecological connectivity[114].

Key Indicator: By 2030, there is a 10% increase in protected areas within the Heart of Borneo in Sabah.

The Heart of Borneo Initiative is a government-led and NGO-supported programme that was initiated in 2007 through a joint declaration by the Governments of Brunei, Indonesia and Malaysia to conserve the biodiversity within central Borneo for the benefit of the people who rely upon it through a network of protected areas, sustainably managed forests and other sustainable land uses.

The Sabah Heart of Borneo Strategic Plan of Action 2021-2030 has been recently endorsed to guide conservation while also expanding and enhancing ecological connectivity. While the main forest corridors within Central Sabah have already been identified and managed, there is still room to expand terrestrial connectivity beyond the Heart of Borneo as a means to improve terrestrial biodiversity conservation.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Formulate the State Masterplan[115] for ecological linkages to identify major ecological corridors to be protected. The Masterplan should include: • Ecological corridor between Lower Kinabatangan Wildlife Sanctuary, Kulamba Wildlife Reserve, and Tabin Wildlife Reserve. • Freshwater corridor between the Lokan River and Bkt. Garam along the middle of the Kinabatangan River. • River corridor between Segama River, Kiulu Valley, Papar River. • Transboundary connectivity for the Heart of Borneo (HoB) e.g., South of Sabah linking to North Kalimantan.	SFD SWD SP	SaBC MTCE

[114] Action and activities approach shall be harmonized with Sabah Forest Policy 2018, Sabah Heart of Borneo Strategic Plan of Action 2021-2030, and upcoming Sabah Forest Masterplan.

[115] The Masterplan should also include agricultural landscapes, as well as incorporating the Mitigation Hierarchy for areas earmarked for development.

No.	Activity	Lead Agency	Partner Agency
b.	Strengthen (and expand) the representativeness of the Kinabalu ECOLINC.	SP	SFD SaBC NGO CBO
c.	Enhance and expand connectivity within and outside the HoB while also limiting activities that will degrade the HoB.	SFD	SaBC NGO CBO

SDG Goals: Supported

Source: northborneosafari.blogspot

Plate 2-3: Aerial view of the Kinabatangan River Basin

Action 11.2: Strengthen and expand Sabah's marine ecological connectivity.

Key Indicator: By 2030, marine ecological corridors in Sabah are actively protected and managed.

Marine ecological corridors refer to areas of ocean and coastal environment that facilitate movement of species between different marine habitat. Similar to terrestrial corridors, marine ecological corridors are essential for maintaining healthy and functioning ecosystem by enabling species migration, facilitation access to feeding grounds, breeding sites, and suitable habitats. In addition, the support the productivity of fisheries and promote the resilience of marine ecosystem towards climate change and pollution. There is a need to recognise and protect marine ecological corridors to safeguard the natural resources and ecosystem services.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Formulate the State masterplan for ecological linkages to identify major ecological corridors to be protected [116]. Examples include: • Darvel Bay seascape • Mabul - Pom Pom seascape	SP	DOF SaBC
b.	Strengthen management of the Tun Mustapha Marine Protected Area, specifically on the legislation framework to push for enhanced regulations [117].	SP	DOF SaBC
c.	Strengthen marine transboundary connectivity under the Coral Triangle Initiative through continuous research and collaborative actions to address transboundary issues.	SP	DOF BMRI NGO

SDG Goals: Supported

[116] This can be done using data on migration and movement patters of protected marine species such as marine turtles and whale sharks. Marine corridors should consider transboundary connectivity as well.
[117] Especially management of private islands

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 11: Secure important ecological corridors in Sabah and enhance the resilience of terrestrial, freshwater, and marine ecosystems												
Action 11.1: Strengthen and expand Sabah's terrestrial ecological connectivity												
a.	Formulate the State Masterplan for ecological linkages to identify major ecological corridors to be protected. The Masterplan should include: • Ecological corridor between Lower Kinabatangan Wildlife Sanctuary, Kulamba Wildlife Reserve, and Tabin Wildlife Reserve. • Freshwater corridor between the Lokan River and Bkt. Garam along the middle of the Kinabatangan River. • River corridor between Segama River, Kiulu Valley, Papar River. • Transboundary connectivity for the Heart of Borneo (HoB) e.g., South of Sabah linking to North Kalimantan.											
b.	Strengthen (and expand) the representativeness of the Kinabalu ECOLINC.											
c.	Enhance and expand connectivity within and outside the HoB while also limiting activities that will degrade the HoB.											
Action 11.2: Strengthen and expand Sabah's marine ecological connectivity												
a.	Formulate the State masterplan for ecological linkages to identify major ecological corridors to be protected. Examples include: • Darvel Bay seascape • Mabul - Pom Pom seascape											
b.	Strengthen management of the Tun Mustapha Marine Protected Area, specifically on the legislation framework to push for enhanced regulations.											
c.	Strengthen marine transboundary connectivity under the Coral Triangle Initiative through continuous research and collaborative actions to address transboundary issues.											

Strategy 12: Enhance management actions to enable conservation and recovery of Sabah's threatened species.

WHY IS THIS STRATEGY IMPORTANT?

Sabah is well known to be equally rich in both flora and fauna species composition across the terrestrial and marine realms. However, anthropogenic threats such as habitat and fragmentation, poaching, unsustainable resource use, and climate change, are exerting enormous pressures towards certain species and pushing them towards extinction. Sabah has some 44 species of mammals, 3,000 species of vascular plant, and 37 species of birds that are endemic to the state alone, making them more susceptible to extinction.

PROGRESS SINCE SBS 2012-2022

A major outcome from the SBS 2012-2022 was efforts to improve species management and conservation. The Sabah Wildlife Department (SWD) has developed various species management plans, particularly for threatened mammals in Sabah. Furthermore, the Wildlife Atlas of Sabah was a concerted effort to tabulate data on at least 33 species of mammals and six bird species that are facing conservation threats. Amendments have also been made to the Sabah Biodiversity Enactment 2000 to include more species within the protected and totally protected lists, further strengthening protection.

MEETING THE STRATEGY

Moving forward, the revised Strategy will need to focus on long-term conservation actions. At the same time, there is also a need to address human-wildlife conflicts to reduce retaliatory killings which may also impact population conservation.

Strategy 12 has 4 Actions:

a. Action 12.1: Strengthen and expand targeted and science-led species conservation plans.
b. Action 12.2: Enhance technical capacities for ex-situ conservation.
c. Action 12.3: Adopt scientific and co-existence approaches to address human-wildlife conflicts.
d. Action 12.4: Strengthen conservation of threatened migratory species.

Action 12.1: Strengthen and expand targeted and science-led species conservation plans.

Key Indicator: By 2030, species conservation plans have been formulated/updated and implemented.

Understanding the existing condition of several threatened flora and fauna species is critical in prioritizing conservation efforts and funding. It is important that conservation actions, plans and programmes are developed through consensus with the scientific community and based on the best available science. This would entail strategic and long-term monitoring of biodiversity, done collaboratively to share data and avoid duplication. These also need to be shared to decision-makers and general public as part of awareness raising and aligning state priorities.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Develop a biodiversity dashboard [118] to report on the status of Sabah's keystone [119] flora and fauna to identify species that require conservation interventions.	SaBC	SWD SFD SP DOF ITBC BMRI NGO
b.	Enhance collaboration to monitor and share data on threatened species population using appropriate techniques and technology [120].	SaBC	SWD SFD SP DOF ITBC BMRI NGO
c.	Formulate, update, and implement science-based conservation actions plan [121] [122] for Sabah's severely threatened species, including monitoring and evaluation of population trends [123].	SFD SWD DOF	SaBC NGO

[118] The function of the dashboard is to serve as a central repository from all relevant stakeholders to monitor and report on species conservation and how this reflects Sabah's biodiversity as a whole.

[119] Key stone species to also include lesser known or non-charismatic groups but are facing conservation and extinction threats.

[120] To leverage on existing platform such as iNaturalist to obtain readily available data on biodiversity in Sabah shared by social network of naturalists, citizen scientists, and biologists across the globe. This should also be integrated as part of the state biodiversity dashboard system.

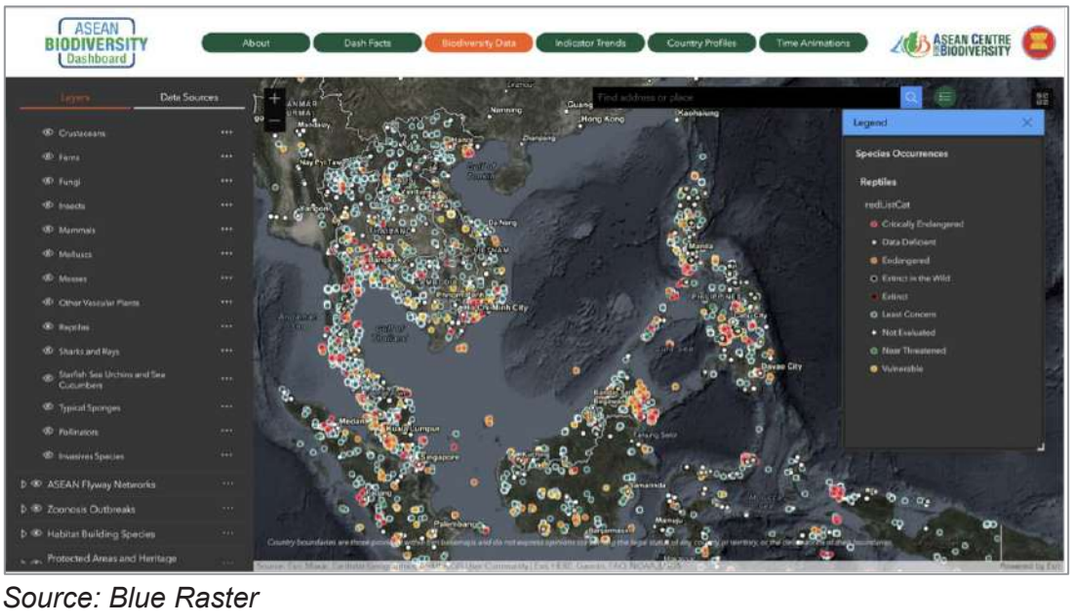
[121] This includes Banteng, Proboscis Monkey, Sunda Pangolin, Sharks, Dugongs, Sunbears, Hornbills, Sea Turtles, Bornean orangutan, Bornean elephants, and Sunda Clouded Leopard, as well as Species Conservation Plan for Endangered Plants.

[122] This should also include endorsing the Sabah Wildlife Policy 2019.

[123] This may require reviewing the role of SWD's Endangered Species Conservation Unit (ESCU) and to revive the unit where possible.

No.	Activity	Lead Agency	Partner Agency
d.	Study and monitor the impacts of climate change on threatened species and its habitat [124].	SCAC UMS [125]	SaBC SWD SFD SP DOF NGO

SDG Goals: Supported



Source: Blue Raster

Plate 2-4: Example of biodiversity dashboard for the ASEAN region

[124] This should leverage on existing work done by non-governmental players and corroborated to identify appropriate means of mitigation and adaptation both for short, medium, and long-term.
[125] All research institutes and related faculties

Action 12.2: Enhance technical capacities for ex-situ conservation.

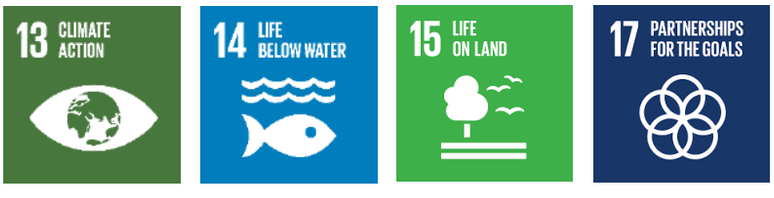
Key Indicator: By 2030, ex-situ conservation sites in Sabah have been enhanced to contribute towards ex-situ conservation efforts.

Ex-situ conservation refers to the conservation of species outside of their natural habitats, involving the establishment of dedicated facilities such as wildlife sanctuaries. The establishment of ex-situ conservation sites is particularly crucial for protecting species that face significant risks in their natural habitats. This approach can lead to population growth, the maintenance of genetic diversity, and provide an avenue for reintroducing threatened species into the wild when conditions allow. Sabah already has existing ex-situ conservation sites for flora and fauna species, and it is essential to continue and improve these efforts.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Strengthen collaborative efforts towards conservation breeding programmes using latest techniques and technology to help guide recovery of severely threatened plants and wildlife.	SWD SFD	SaBC ITBC BMRI NGO
b.	Enhance seed and germplasm gene banks for plants, animals, fungi and microorganisms.	SFD [126] DOA DVS	ITBC

SDG Goals: Supported



[126] Including the Forest Research Centre Sepilok

Action 12.3: Adopt scientific and co-existence approaches to address human-wildlife conflicts.

Key Indicator: By 2034, human-wildlife coexistence in Sabah is incentivised through collaborative partnerships.

Human-wildlife conflict occurs as a result of anthropogenic activities that lead to habitat loss, encroachment into wildlife habitats, changing land use patterns, and reduced availability of natural resources. Human-wildlife conflict impacts humans through crop damage, livestock loss, and property damage. It also poses a threat to human safety. On the other hand, wildlife suffers from population loss due to killing in response to conflicts, disruption of migratory patterns, and increased competition for food and shelter. These factors can ultimately lead to population decline for wildlife species. Sabah needs to strengthen and expand measures to mitigate conflicts and promote coexistence between humans and wildlife.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Establish collaborative partnerships [127] between commodity companies, smallholders, IPLC, and researchers to develop and implement holistic and science-based adaptive management strategies to reduce and mitigate human-wildlife conflicts and promote co-existence in agriculture landscapes and forest fringes.	SWD	Local Councils DOF ITBC Oil Palm Growers NGO
b.	Scale-up outreach and education programmes for key stakeholders including local government and local communities to reduce and mitigate human-wildlife conflicts in urban and rural areas, as well as marine areas [128].	SWD Local Councils	NGO
c.	Review the Sabah Wildlife Conservation Enactment 1997 to incorporate regulations pertaining to safe, ethical, and humane human-wildlife interaction [129].	SaBC SWD	ITBC NGO DOF Local Councils

SDG Goals: Supported

[127] Develop sustainable financing mechanisms such as financial incentives to support smallholder communities to mitigate the impact of crop damages/property damages through coexistence

[128] To address impacts of boat strikes on marine wildlife

[129] Specifically Part IV (Protection of Animals and Hunting); Section 39: Protection of land and property and self defence

Action 12.4: Strengthen conservation of threatened migratory species.

Key Indicator: By 2030, identification, establishment, and recognition of migratory sites for conservation in Sabah has increased.

Migratory species are animals that regularly move between different habitats or geographical location in response to seasonal changes, resource availability, and breeding. However, habitat loss, pollution, climate change, poaching, and infrastructure development, have disrupted the migratory patterns of these organisms. It is crucial for Sabah to initiate and strengthen measures to conserve migratory species, including international collaboration for effective conservation results.

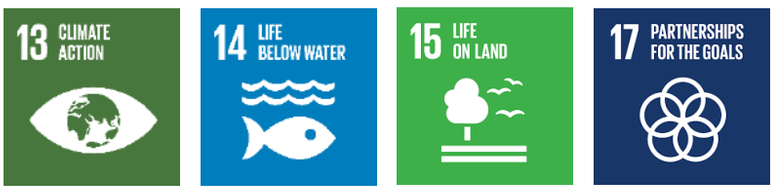
We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Scale-up research, monitoring, and reporting of migratory species (terrestrial and marine), including migratory pathways and stopover sites.	ITBC BMRI NGO	SFD SWD SP NGO
b.	Incorporate research and monitoring outputs on migratory sites and pathways into terrestrial and marine spatial planning, and area-based conservation measures.	SFD SWD SP	ITBC, BMRI NGO
c.	Review the Wildlife Conservation Enactment 1997 to ensure that rare, threatened, and endangered (RET) migratory species are legally protected [130].	SWD DOF	UMS NGO
d.	Identify and recognize more sites under relevant migratory networks. This includes: • Lower Kinabatangan-Segama RAMSAR site • Coral Triangle Initiative • Turtle Islands Heritage Protected Area • Tempasuk Plain (inc. Kuala Abai) • Lok Kak area • Kota Kinabalu Wetland • Likas lagoon • Sulu-Sulawesi Marine Ecoregion • Brunei Bay • Tun Mustapha Marine Protected Area • Darvel Bay • Libaran, Lankayan dan Mantanani islands	SFD SWD SP	ITBC BMRI NGO

[130] Specifically updating Schedule 1 (Section 2): Totally Protected Species of Animals and Plants; Part 1 (Section 25(1)): Totally Protected Animals to include migratory birds and other marine wildlife.

No.	Activity	Lead Agency	Partner Agency
e.	Develop and implement management plans for migratory sites that are under threat from anthropogenic pressures.	SFD SWD SP	ITBC BMRI NGO
f.	Enhance regional cooperation on migratory species monitoring.	SFD SWD SP	ITBC BMRI NGO

SDG Goals: Supported



Source: https://twitter.com/masidim/

Plate 2-5: Great egrets at Likas Lagoon, Kota Kinabalu

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 12: Enhance management actions to enable conservation and recovery of Sabah's threatened species												
Action 12.1: Strengthen and expand targeted and science-led species conservation plans												
a.	Develop a biodiversity dashboard to report on the status of Sabah's keystone flora and fauna to identify species that require conservation interventions.											
b.	Enhance collaboration to monitor and share data on threatened species population using appropriate techniques and technology.											
c.	Formulate, update, and implement science-based conservation actions plan for Sabah's severely threatened species, including monitoring and evaluation of population trends.											
d.	Study and monitor the impacts of climate change on threatened species and its habitat.											
Action 12.2: Enhance technical capacities for ex-situ conservation												
a.	Strengthen collaborative efforts towards conservation breeding programmes using latest techniques and technology to help guide recovery of severely threatened plants and wildlife.											
b.	Enhance seed and germplasm gene banks for plants, animals, fungi, and microorganisms.											
Action 12.3: Adopt scientific and co-existence approaches to address human-wildlife conflicts												
a.	Establish collaborative partnerships between commodity companies, smallholders, IPLC, and researchers to develop and implement holistic and science-based adaptive management strategies to reduce and mitigate human-wildlife conflicts and promote co-existence in agriculture landscapes and forest fringes.											
b.	Scale-up outreach and education programmes for key stakeholders including local government and local communities to reduce and mitigate human-wildlife conflicts in urban and rural areas, as well as marine areas.											
c.	Develop/review relevant legislations to incorporate regulations pertaining to safe, ethical, and humane human-wildlife interaction.											
Action 12.4: Strengthen conservation of threatened migratory species												
a.	Scale-up research, monitoring, and reporting of migratory species (terrestrial and marine), including migratory pathways and stopover sites.											

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
b.	Incorporate research and monitoring outputs on migratory sites and pathways into terrestrial and marine spatial planning, and area-based conservation measures.											
c.	Review the Wildlife Conservation Enactment 1997 to ensure that rare, threatened, and endangered (RET) migratory species are legally protected.											
d.	Identify and recognize more sites under relevant migratory networks. This includes: • Lower Kinabatangan-Segama RAMSAR site • Coral Triangle Initiative • Turtle Islands Heritage Protected Area • Tempasuk Plain (inc. Kuala Abai) • Lok Kak area • Kota Kinabalu Wetland • Likas lagoon • Sulu-Sulawesi Marine Ecoregion • Brunei Bay • Tun Mustapha Marine Mark • Darvel Bay • Libaran, Lankayan dan Mantanani islands											
e.	Develop and implement management plans for migratory sites that are under threat from anthropogenic pressures.											
f.	Enhance regional cooperation on migratory species monitoring.											

Strategy 13: Strengthen enforcement actions to significantly reduce poaching, illegal harvesting, and illegal trade of flora and fauna.

WHY IS THIS STRATEGY IMPORTANT?

The illegal wildlife trade encompasses the poaching, harvesting, and trade of flora and fauna that are regulated or protected by state, national, and/or international laws. This trade has become a lucrative industry, with estimated revenue in the billions of USD [131]. These activities pose a serious threat to wildlife populations, leading to population declines, ecosystem disruption, environmental degradation, and significant challenges for conservation efforts. Sabah is not spared from illegal wildlife trade activities, with threatened species such as pangolins and sun bears being affected. These activities often occur within a transboundary context, necessitating international collaboration to eradicate illegal wildlife trade.

PROGRESS SINCE SBS 2012-2022

Sabah has been undertaking successful efforts in combating wildlife harvesting and trade through its environmental and wildlife protection agencies, along with NGOs. One of the major successful outcomes was the banning on harvesting turtle eggs for local consumption. However, poaching, illegal harvesting and wildlife trade remains rampant in the state and still presents one of the greater species conservation challenges.

MEETING THE STRATEGY

Moving forward, the revised Strategy needs to focus on improving enforcement efforts to curb illegal activities. These approaches include strengthening law enforcement, raising public awareness, implementing stringent penalties for wildlife crime, and improving international cooperation [132].

Strategy 13 has 4 Actions:

- Action 13.1: Combat poaching and illegal harvesting of flora and fauna.
- Action 13.2: Combat illegal trade of flora and fauna in and from Sabah, including transboundry and regional networks.
- Action 13.3: Reduce demand through increased public awareness and behavioural change.
- Action 13.4: Strengthen state legislations and institutions arrangements to improve species protection.

[131] Mozer & Prost (2023)

[132] These should be aligned with the upcoming 10-year Sabah Action Plan in Comating Wildlife Crime to identify priority strategies and stakeholders for collaboration

Action 13.1: Combat poaching and illegal harvesting of flora and fauna.

Key Indicator: By 2030, collaborative efforts to combat poaching and illegal harvesting in Sabah have been strengthened.

Sabah needs to strengthen and expand its effort in combating poaching and illegal harvesting of flora and fauna both in terrestrial and marine environment in order to minimise potential extinction of certain species. Efforts may include improvement in patrolling and enforcement, enhancing surveillance by utilizing advanced technologies, raising public awareness and promote community engagement to minimise poaching and illegal harvesting.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Expand and strengthen collaborative ecosystems, especially Ops Khazanah and the Wildlife Crime Bureau for effective patrolling, monitoring, and enforcement throughout terrestrial and marine landscapes.	SWD SFD SP DOF	MTCE NGO
b.	Expand and strengthen programmes and incentives to hire IPLC as well as retired police, foresters, and army personnel as honorary patrollers to increase enforcement capacities.	SFD SWD SP	NGO
c.	Strengthen support [133] for all patrollers, in terms of financial compensation and protection, personal safety, as well as training and equipment.	SFD SWD SP	MOF NGO
d.	Leverage on advancing technology, including remote surveillance, monitoring, and reporting tools [134] [135] to enable data-driven and intelligence-led adaptive management of patrolling and enforcement.	SFD SWD SP	NGO

SDG Goals Supported

[133] This should encompass: -
- Providing sufficient protective insurance coverage given the high-risk levels faced during patrolling and enforcement work.
- Exploring the feasibility of a mechanism to re-channel a portion of funds received from fines to the state departments to be used as incentives/rewards to rangers.

[134] SMART framework should be adopted as the main approach for monitoring and reporting to develop a standardized database.

[135] Also applying earth observation satellite techniology in real-time monitoring of forest cover

Action 13.2: Combat illegal trade of flora and fauna in and from Sabah, including transboundary and regional networks.

Key Indicator: By 2034, illegal import and export of wild flora and fauna in and from Sabah has significantly reduced compared to 2024 levels.

Combating illegal trade requires proactive collaboration among multiple stakeholders, including government agencies, law enforcement, customs, and international organizations. It is essential to strengthen the capacity of these entities to effectively tackle every aspect of the illegal trade supply chain, from detection and investigation to prosecution and prevention.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Establish joint engagement platforms with relevant enforcement authorities to develop appropriate interventions along all points of the illegal trade chain.	SFD SWD PDRM [136]	Customs Dept. DVS DOA DOF NGO
b.	Strengthen assessments[137] of products being imported/licensed, particularly those containing or claiming to contain wildlife products.	KKM Customs Dept.	SWD NGO
c.	Improve the detection of illegal shipments through systematic and regular monitoring using enhanced equipment and techniques [138].	Customs Dept.	Marine Dept. Sabah Ports MAS Cargo NGO
d.	Revive the Transboundary Wildlife Crime taskforce to curb smuggling of wildlife across the border.	SWD Customs Dept.	NGO
e.	Improve training and capacities to ensure survivability of live confiscated wildlife[139] and facilitation of repatriation process with origin countries.	SWD Customs Dept. PDRM	NGO

SDG Goals: Supported

[136] Wildlife Crime Bureau division

[137] This can include development of rapid test kits to assist frontliners in detecting products that are based on wildlife.

[138] This should include increasing public-private partnerships with freight forwarding and courier services, including domestic transporters to report on suspicious parcels/shipments, as well as tactical operations in the maritime sector.

[139] Including upgrades to holding facilities

Action 13.3: Reduce demand through increased public awareness and behavioral change.

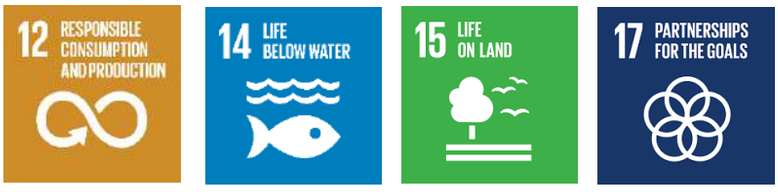
Key Indicator: By 2034, the public awareness and understanding of poaching and illegal trade has improved from 2024 levels.

Public awareness is an essential element in combating poaching and illegal trade. Education and awareness campaign play a significant role in informing the public about the negative impacts of poaching and illegal trade on wildlife, ecosystems, and local communities. By raising awareness, we can promote responsible consumer choices, discourage the demand for illegal wildlife products, and empower individuals to report suspicious activities. Improved public awareness can lead to greater support for conservation efforts and increase pressures on authorities to enhance measures against illegal trade.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Work with civil society organization and non-governmental organization to harness public participation initiatives to support law enforcement, such as through citizen science and AI machine learning for reporting suspected incidences of poaching, illegal harvesting, trafficking, and sale of protected species.	SWD	Customs Dept. NGO
b.	Collaborate with a range of businesses including restaurants, pet shops, aquarium traders and traditional medicine practices to remove RTE species and their derivatives from the supply chain.	SWD SFD	Customs Dept. PDRM Marine Police APMM Local councils NGO
c.	Conduct awareness and education programmes to the local communities and tourists to reduce demand for wild meat consumption.	SWD	Customs Dept. NGO

SDG Goals: Supported



Action 13.4: Strengthen state legislations and institutional arrangements to improve species protection.

Key Indicator: By 2034, relevant legislation and frameworks have been reviewed to improve species protection in Sabah.

Sabah has existing legislations and management plans to improve species protection that includes approach in combating illegal harvesting, poaching and trade. However, there is room for improvements to review and update laws by identifying gaps and weakness to address the shortcomings and ensure comprehensive coverage of law in creating a more robust framework and ensure effective enforcement of species protection measures.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Review current legislations [140] and institutional frameworks to effectively address the conservation and protection of marine and freshwater biodiversity.	SWD DOF DID	AGC ITBC BMRI NGO SFD
b.	Review and strengthen the regulations of industries that are directly or indirectly related to wildlife trade, including imposition of stricter penalties and fines and increasing enforcement powers of authorities.	SWD DOF	AGC SFD

SDG Goals: Supported

[140] This should include: -

- Reviewing and amending the Sabah Wildlife Conservation Enactment 1997 to enable provisions to enforce cyber-wildlife crimes, explosive snares, as well as intended introduction of invasive alien species.
- Including provisions under the UNCLOS and GBS with regards to marine biodiversity protection and conservation.
- Assessing the need for a state Wildlife Crime Action Plan.

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 13: Strengthen enforcement actions to significantly reduce poaching, illegal harvesting, and illegal trade of flora and fauna												
Action 13.1: Combat poaching and illegal harvesting of flora and fauna												
a.	Expand and strengthen collaborative ecosystems, especially Ops Khazanah and the Wildlife Crime Bureau for effective patrolling, monitoring, and enforcement throughout terrestrial and marine landscapes.											
b.	Expand and strengthen programmes and incentives to hire IPLC as well as retired police, foresters, and army personnel as honorary patrollers to increase enforcement capacities.											
c.	Strengthen support for all patrollers, in terms of financial compensation and protection, personal safety, as well as training and equipment.											
d.	Leverage on advancing technology, including remote surveillance, monitoring, and reporting tools to enable data-driven and intelligence-led adaptive management of patrolling and enforcement.											
Action 13.2: Combat illegal trade of flora and fauna in and from Sabah, including transboundary and regional networks.												
a.	Establish joint engagement platforms with relevant enforcement authorities to develop appropriate interventions along all points of the illegal trade chain.											
b.	Strengthen assessments of products being imported/licensed, particularly those containing or claiming to contain wildlife products.											
c.	Improve the detection of illegal shipments through systematic and regular monitoring using enhanced equipment and techniques.											
d.	Revive the Transboundary Wildlife Crime taskforce to curb smuggling of wildlife across the border.											
e.	Improve training and capacities to ensure survivability of live confiscated wildlife and facilitation of repatriation process with origin countries.											
Action 13.3: Reduce demand through increased public awareness and behavioural change												
a.	Work with civil society organization and non-governmental organization to harness public participation initiatives to support law enforcement, such as through citizen science and AI machine learning for reporting suspected incidences of poaching, illegal harvesting, trafficking, and sale of protected species.											
b.	Collaborate with a range of businesses including restaurants, pet shops, aquarium											

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
	traders and traditional medicine practices to remove RTE species and their derivatives from the supply chain.											
c.	Conduct awareness and education programmes to the local communities and tourists to reduce demand for wild meat consumption.											
Action 13.4 Strengthen state legislations and institutional arrangements to improve species protection.												
a.	Review current legislations and institutional frameworks to effectively address the conservation and protection of marine and freshwater biodiversity.											
b.	Review and strengthen the regulations of industries that are directly or indirectly related to wildlife trade, including imposition of stricter penalties and fines, and increasing enforcement powers of authorities.											

Strategy 14: Implement measures for the prevention, eradication, containment, and control of invasive alien species in Sabah.

WHY IS THIS STRATEGY IMPORTANT?

Invasive alien species (IAS) refer to non-native species that are introduced, intentionally or unintentionally, into ecosystems where they are not naturally present, causing negative impacts on the environment, economy, and human health. IAS, in the absence of predators, can outcompete native species for resources such as food, habitat, and space. This can lead to a decline in the native species population and alter the ecosystem by modifying habitat structure, consequently disrupting ecosystem services. Sabah is already facing issues with invasive alien species (IAS) in its freshwater and terrestrial ecosystems, threatening biodiversity and ecosystems.

PROGRESS SINCE SBS 2012-2022

The SBS 2012-2022 intially called for the formulation of a State Action Plan on invasive species, which has yet to be materialised. However, there have been efforts to mitigate the spread of invasive plants in freshwater ecosystems. Nonetheless, IAS management in Sabah still remains uncoordinated across the various agencies.

MEETING THE STRATEGY

Moving forward, Sabah needs to leverage upon the national framework on IAS management and develop its own strategies to manage and eradicate IAS. Furthermore, the awareness and understanding of the general public also needs to be improved so that society can also do its part in eradicating IAS from Sabah's ecosystems.

Strategy 14 has 3 Actions:

- Action 14.1: Improve understanding and public awareness of IAS across all segments of society.
- Action 14.2: Initiate state response plans to contain and eradicate IAS.
- Action 14.3: Strengthen control measures to prevent entry and release of IAS.

Action 14.1 Improve understanding and public awareness of IAS across all segments of society.

Key Indicator: By 2034, public awareness level regarding IAS in Sabah has increased compared to 2024 levels.

Understanding the spread of IAS is essential for effective management and prevention. In Sabah, there is a need to enhance understanding of IAS introduction pathways, ecological characteristics, and impacts. Furthermore, it is crucial to disseminate this information to the public in a clear and concise manner, covering aspects such as identification, impacts, and prevention. By ensuring that this information reaches all segments of society, from individuals to communities, businesses, and institutions, we can empower everyone to act against the spread of IAS and protect our unique and valuable ecosystems in Sabah.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Increase research [141] in all aspects of IAS management including their pathways and ecological impacts towards Sabah's landscape and continue development of technologies and interventions to contain and control IAS.	DOA DOF DVS	SaBC SWD SFD ITBC BMRI NGO
b.	Educate the public on threats [142] posed by invasive alien species and problems caused by smuggling of wild animals and plants, accidental impacts, escapes from legitimate enterprises and pet trade, and pathogen exposure.	DOA DOF DVS	SaBC SWD SFD ITBC BMRI NGO
c.	Strengthen information sharing and extension services [143] to stakeholders so that prevention, control, eradication, and mitigation efforts can be effectively implemented.	DOA DOF DVS	SaBC SWD SFD ITBC BMRI NGO

SDG Goals: Supported

[141] This should include: -
- Determining the threat extent of IAS towards various categories of biodiversity and ecosystem services inc. impacts on agrobiodiversity, food and water security, human health, and livelihoods.
- Interventions should also include elements of mitigating impacts towards land use as well as climate change.

[142] This should include the role and function of CITES in Sabah (and Malaysia).

[143] This should include an assessment of the effectiveness of current international, region, and national control measures and associated policy options that could be employed to prevent, eradicate, and control IAS with an emphasis on mitigation options.

Action 14.2: Initiate state response plans to contain and eradicate IAS.

Key Indicator: By 2030, state response / action plans have been established to guide IAS containment and eradication procedures.

Response plans to contain and eradicate IAS is an essential step in enhancing IAS management. At the Federal level, the National Action Plan on Invasive Alien Species (NAP IAS) 2021-2025 has been established to address IAS management on a national scale. To enhance and tailor the management approach to fit local requirements, it is crucial for Sabah to co-opt this plan and localize it to the state level. In addition, Sabah needs to consolidate and streamline IAS management efforts. This involves identifying IAS-affected ecosystems and developing management strategies in a collaborative manner.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Leverage on the National Action Plan on Invasive Alien Species to formulate and implement state level actions and interventions.	DOA DOF DVS	SaBC SWD SFD ITBC BMRI NGO
b.	Establish interagency platform [144] to streamline management of invasive alien species at state level.	DOA DOF DVS	SaBC SWD SFD ITBC BMRI NGO
c.	Identify natural ecosystem affected by IAS and develop collaborative programmes to prevent or reduce [145] the impacts of IAS in these ecosystems [146].	DOA DOF DVS	SaBC SWD SFD UMS ITBC BMRI NGO

SDG Goals: Supported

[144] The interagency platform should focus on harmonizing species that are being promoted by different departments that may be invasive to ensure proper actions are in place.
[145] While eradication should be the long-term goal, full eradication is extremely difficult. As such, short to medium-term goals should focus on prevention and damage reduction.
[146] Immediate priority on invasive aquatic plants in rivers and ox-bow lakes.

Action 14.3: Strengthen control measures to prevent entry and release of IAS.

Key Indicator: By 2030, control measures are in place to minimize IAS spreading in Sabah.

Sabah's logistics and transport sectors play an essential role in supporting economic activities such as tourism, agriculture, commodities, and energy. However, these create avenues for the introduction of IAS. Therefore, strengthening control measures to prevent the entry and release of IAS is crucial in preventing their spread. This necessitates various approaches, including enhancing border control, improving, and implementing regulations and policies, and fostering collaboration and cooperation among relevant stakeholders.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Enhance enforcement of legislations on the importing, trading, keeping and release of wild animals, fishes, and plants, and strengthen legislation where necessary [147].	Customs Dept.	SWD SFD DOF DOA Marine Dept.
b.	Adopt relevant provisions of international conventions [148] that Malaysia is party to in relation to management and control of IAS at the state level.	DOF DOA	SaBC SWD SFD Marine Dept. ITBC BMRI
c.	Enhance quarantine facilities and improve the skills and capabilities [149] of quarantine, customs, and other border officials.	DOA DVS	DOF SWD SFD DOA Marine Dept.

SDG Goals: Supported

[147] This also covers regulations on ballast water control and monitoring, as well as attachments on shipping vessels, where aquatic invasive species may also be introduced.
[148] This includes provisions under the International Maritime Organization (IMO) and the International Plant Protection Convention (IPPC).
[149] This needs to include training on the identification of IAS, especially aquatic species that may appear in larval forms.

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 14: Implement measures for the prevention, eradication, containment, and control of invasive alien species in Sabah												
Action 14.1: Improve understanding and public awareness of IAS across all segments of society												
a.	Increase research in all aspects of IAS management including their pathways and ecological impacts towards Sabah's landscape and continue development of technologies and interventions to contain and control IAS.											
b.	Educate the public on threats posed by invasive alien species and problems caused by smuggling of wild animals and plants, accidental impacts, escapes from legitimate enterprises and pet trade, and pathogen exposure.											
c.	Strengthen information sharing and extension services to stakeholders so that prevention, control, eradication, and mitigation efforts can be effectively implemented.											
Action 14.2: Initiate state response plans to contain and eradicate IAS												
a.	Leverage on the National Action Plan on Invasive Alien Species to formulate and implement state level actions and interventions.											
b.	Establish interagency platform to streamline management of invasive alien species at state level.											
c.	Identify natural ecosystem affected by IAS and develop collaborative programmes to prevent or reduce the impacts of IAS in these ecosystems.											
Action 14.3: Strengthen control measures to prevent entry and release of IAS												
a.	Enhance enforcement of legislations on the importing, trading, keeping and release of wild animals, fishes, and plants, and strengthen legislation where necessary.											
b.	Adopt relevant provisions of international conventions that Malaysia is party to in relation to management and control of IAS at the state level.											
c.	Enhance quarantine facilities and improve the skills and capabilities of quarantine, customs, and other border officials.											

GOAL 4
SABAH'S BIOIVERSITY IS USED SAFELY AND THE BENEFITS FROM ITS UTILISATION ARE SHARED EQUITABLY

There is a need to ensure that benefits arising from biological resource utilisation is shared in fair and equitable manner. Malaysia is a signatory to The Nagoya Protocol on Access to Genetic Resources and The Fair and Equitable Sharing of Benefits Arising from Their Utilization and also has enacted Access to Biological Resources and Benefit Sharing Act 2017. Malaysia has also established a framework on Access and Benefit Sharing, which Sabah also has to adhere to within the state circumstances.

Sabah needs to continue working together with the indigenous people and local communities to effectively protect knowledge, innovations and practices that arise from sustainable use of biological resources. While documentation of this body of knowledge is equally important, customary laws, community protocols and other similar systems have to be strengthened to ensure proper benefit sharing between custodians and users of biological resources.

Biosafety is another emerging issue related to biodiversity conservation and utilisation. As a party to Convention on Biological Diversity and Cartagena Protocol on Biosafety, Sabah needs to implements required measures to safely conduct transboundary movement of living modified organisms (LMOs) to prevent any adverse effect on ecosystem. Malaysia has already implemented the Biosafety Act 2007 to regulate the release, importation, exportation and contained use of LMOs to safeguards human and environmental health. Sabah thus needs to implement a comprehensive biosafety system by leveraging upon existing framework and guideline to safely utilise LMOs.

Goal 4 has 2 strategies:

- Strategy 15: Enhance capacities to implement Access-Benefit Sharing (ABS) framework in Sabah to realize Fair and Equitable Sharing of Benefits Arising from Biodiversity Utilisation.
- Strategy 16: Establish and operationalise comprehensive biosafety system to manage potential and adverse impacts of modern biotechnology on biodiversity and human health.

Strategy 15: Enhance capacities to implement Access-Benefit Sharing (ABS) framework in Sabah to realize Fair and Equitable Sharing of Benefits Arising from Biodiversity Utilisation.

WHY IS THIS STRATEGY IMPORTANT?

Access and Benefit Sharing (ABS) refers to the fair and equitable sharing of benefits derived from the utilisation of genetic resources and associated traditional knowledge. The ABS framework provides a legal and policy framework that ensures biodiversity-rich countries and communities benefit from this utilisation. This plays an essential role in biodiversity conservation as it incentivizes the conservation of biodiversity and ecosystems, values traditional knowledge, promotes sustainable development, and empowers indigenous and local communities to participate in biodiversity conservation.

PROGRESS SINCE SBS 2012-2022

A key outcome from the SBS 2012-2022 was the development of Sabah's own ABS framework, including relevant regulations. Under the leadership of SaBC, traditional ecological knowledge is also in progress to fully document all known practices among the indigenous communities.

MEETING THE STRATEGY

The revised Strategy now needs to focus on fully implementing Sabah's ABS framework. Beside documentation, partnerships and agreements need to be developed through informed consent to truly realise the benefit-sharing aspects of ABS among the local communities.

Strategy 15 has 2 Actions:

- Action 15.1: Enhance awareness and capacities to implement the ABS framework in Sabah.
- Action 15.2: Document and protect traditional knowledge, innovations, and practices of indigenous and local communities.

Action 15.1: Enhance awareness and capacities to implement the ABS framework in Sabah.

Key Indicator: By 2030, the public awareness regarding ABS in Sabah has increased compared to 2024 levels.

The general awareness of ABS in Sabah is still generally low. In order for ABS to be effective, all stakeholders have to be familiarised with the principles of ABS. This includes politicians and decision-makers, government officials, public institutions, indigenous peoples and local communities.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Strengthen institutional and legal capacities to enforce and operationalize the ABS framework at the state level.	SaBC	ITBC NGO
b.	Increase awareness and knowledge of ABS to users and providers of biological resources through targeted outreach programmes, training modules, and digital tools.	SaBC	ITBC NGO
c.	Strengthen the literacy of indigenous peoples and local communities on their rights to traditional knowledge to facilitate ABS implementation.	SaBC	ITBC NGO
d.	Establish effective communication channels between regulating agencies and rights-holders in implementing ABS protocols.	SaBC	ITBC NGO

SDG Goals Supported

Action 15.2: Document and protect traditional knowledge, innovations, and practices of indigenous and local communities.

Key Indicator: By 2030, registries on traditional knowledge, innovation, and practices in Sabah have been enriched.

Sabah needs to enhance the documentation and protection of traditional knowledge and practices of indigenous people and local communities. This is essential for the preservation of cultural heritage, intellectual property protection, scientific advancement, biodiversity conservation, and providing insights for sustainable resource utilization. The documentation process also empowers indigenous people and local communities by recognizing their contributions and allows for their involvement in decision-making and the right to equitable benefit sharing.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Enhance documentation of traditional knowledge, innovations, and practices of indigenous peoples and local communities and establish MOUs that acknowledge them as rightful custodians and shared benefits from their usage.	SaBC	ITBC NGO Sabah Museum
b.	Recognize, support, and legislate where possible, customary laws, community protocols, procedures, and other similar systems that supports traditional knowledge associated with biological resources that are used by indigenous peoples and local communities [150].	SaBC MHEANS	JHEANS ITBC NGO
c.	Integrate all documented traditional knowledge associated with the utilisation of biological resources of indigenous peoples and local communities into the Sabah Biodiversity Information Integrated System (SaBIIS).	SaBC	SFD SP ITBC Sabah Museum

SDG Goals: Supported

[150] This can be done through Section 4 of the Majlis Hal Ehwal Anak Negeri Enactment 1998.

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 15: Enhance capacities to implement Access-Benefit Sharing (ABS) framework in Sabah to realise Fair and Equitable Sharing of Benefits Arising from Biodiversity Utilisation												
Action 15.1: Enhance awareness and capacities to implement the ABS framework in Sabah												
a.	Strengthen institutional and legal capacities to enforce and operationalize the ABS framework at the state level.											
b.	Increase awareness and knowledge of ABS to users and providers of biological resources through targeted outreach programmes, training modules, and digital tools.											
c.	Strengthen the literacy of indigenous peoples and local communities on their rights to traditional knowledge to facilitate ABS implementation.											
d.	Establish effective communication channels between regulating agencies and rights-holders in implementing ABS protocols.											
Action 15.2: Document and protect traditional knowledge, innovations and practices of indigenous and local communities												
a.	Enhance documentation of traditional knowledge, innovations, and practices of indigenous peoples and local communities and establish MOUs that acknowledge them as rightful custodians and shared benefits from their usage.											
b.	Recognize, support, and legislate where possible, customary laws, community protocols, procedures, and other similar systems that are used by indigenous peoples and local communities.											
c.	Integrate all documented traditional knowledge associated with the utilisation of biological resources of indigenous peoples and local communities into the Sabah Biodiversity Information Integrated System (SaBIIS).											

Strategy 16: Establish and operationalise comprehensive biosafety system to manage potential and adverse impacts of modern biotechnology on biodiversity and human health.

WHY IS THIS STRATEGY IMPORTANT?

Biosafety refers to the measures and practices implemented to ensure the safe handling and use of biological materials and organisms, in order to avoid unintentional release or exposure that can have an impact on the environment and human health. Biosafety is an essential component of the agriculture, aquaculture, and health sectors. It plays a crucial role in preventing disease, controlling the spread of alien organisms, and maintaining the environment and public health in the midst of technological advancements in biotechnology.

PROGRESS SINCE SBS 2012-2022

There has not been much progress on the biosafety aspects in Sabah, besides the revision of the State Biotechnology Blueprint and state level biotechnology committee. The awareness on the importance of biosafety in Sabah is still generally low, highlighting the need for greater awareness to the general society.

MEETING THE STRATEGY

The focus of the Strategy is to establish a state biosafety system to be operationalised. The biosafety system should include components such as a regulatory framework, scientific expertise, monitoring and surveillance, containment, public participation, emergency response, capacity building, and international cooperation.

Strategy 16 has 3 Actions:

- Action 16.1: Enhance inspection and biosafety compliance in Sabah.
- Action 16.2: Assess the impacts of Living Modified Organisms (LMOs) on Sabah's biodiversity and human health.
- Action 16.3: Develop state response plans to biosafety emergencies.

Action 16.1: Enhance inspection and biosafety compliance in Sabah.

Key Indicator: By 2030, a systematic procedure for handling LMOs and its products are in place for Sabah.

Malaysia has a well-developed regulatory and enforcement system with various guidelines and protocols in place to ensure compliance with biosafety regulations. Sabah can take advantage of this existing framework to enhance its mechanisms and procedural guidelines for managing Living Modified Organisms (LMOs). Moreover, to ensure ongoing compliance with biosafety measures, state policies and plans should be integrated with biosafety considerations.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Strengthen cooperation and coordination in relation to enforcement and regulatory functions of various agencies related to living-modified organisms (LMOs).	SaBC	DOA DOF DVS UMS [151]
b.	Leverage on national tools and guidance to strengthen the implementation of the CPB provision on transit, contained use, and unintentional or illegal transboundary movements of LMOs at the state level.	SaBC	DOA DOF DVS UMS[139]
c.	Leverage on the national codes of best practices and procedural guidelines for handling, transport, packaging, and identification of LMOs for implementation at the state level.	SaBC	DOA DOF DVS UMS[139]
d.	Strengthen mechanisms and capacities to regulate the importation, management, and use of LMOs and regulate production of LMOs arising from domestic research and development.	SaBC	DOA DOF DVS UMS[139]
e.	Ensure that biosafety considerations are fully embedded into relevant state policies, plans, and programmes, especially for the agriculture, aquaculture, marine and health sectors.	SaBC	DOA DOF DVS UMS[139]

SDG Goals: Supported

[151] ITBC and FSNR

Action 16.2: Assess the impacts of Living-Modified Organisms (LMOs) on Sabah's biodiversity and human health.

Key Indicator: By 2030, a comprehensive analytical framework has been established to guide decision-making process on applications for release of LMOs and its products in Sabah.

Living Modified Organisms (LMOs) can have impacts on both biodiversity and human health. These impacts include genetic contamination, ecosystem disruption (where modified crops outcompete or reduce indigenous plant species populations), potential toxicity effects on humans, and the potential proliferation of antibiotic-resistant bacteria. Therefore, risk assessments on the impacts of LMOs is crucial. This information can then be incorporated into the regulatory framework to ensure the safe and responsible use of LMOs.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Enhance capacities and guidance for risk assessment, management, communication, together with pre-and post-approval monitoring of new LMOs based on the national guidance.	SaBC	DOA DOF UMS [152]
b.	Integrate socio-economic impact issues and analytical frameworks into decision-making on applications for release of LMOs at the state level [153].	SaBC	DOA DOF UMS[140]
c.	Increase research on biosafety, including environmental impacts and safety studies for field trials of new and locally developed LMOs and its products including those developed from new technologies.	SaBC	DOA DOF UMS[140]
d.	Develop biology documents for primary commodities that can be used as a reference document for risk assessments.	SaBC	DOA DOF UMS[140]

SDG Goals: Supported

[152] ITBC and FSNR
[153] This would need to be based on the national framework and adapted at the state level.

Action 16.3: Develop state response plans to biosafety emergencies.

Key Indicator: By 2030, state response plans have been established to address biosafety emergencies.

State response plans need to be established to outline the procedures and strategies that will be implemented in the event of a biosafety emergency. These plans should include elements such as early detection and rapid response, containment and control, risk assessment and remediation, communication and coordination, and capacity building requirements. Sabah needs to establish a state response plan, and it can leverage the existing framework and guidelines at the international and national levels for the development of this plan.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Establish state emergency response plans and emergency response teams [154] to alert, contain and eradicate any harm or damage caused directly or indirectly by LMOs or its products.	SaBC	DOA DOF UMS [155]
b.	Leverage on the national biosafety framework to strengthen state legislations for the inclusion of essential elements of liability and redress for damages resulting from the transfer, handling, release, or use of LMOs or its products in Sabah, as well as any adverse effects towards the conservation and sustainable use of biological diversity and human health.	SaBC	DOA DOF UMS[143]
c.	Strengthen cooperation and coordination among state agencies involved in the implementation of liability and redress related to LMOs.	SaBC	DOA DOF UMS[143]

SDG Goals Supported

[144] 154 This will leverage upon the national emergency response plans and SOPs for establishing emergency response teams.
[155] ITBC and FSNR

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 16: Establish and operationalise comprehensive biosafety system to manage potential and adverse impacts of modern biotechnology on biodiversity and human health												
Action 16.1: Enhance inspection and biosafety compliance in Sabah												
a.	Strengthen cooperation and coordination in relation to enforcement and regulatory functions of various agencies related to living-modified organisms (LMOs).											
b.	Leverage on national tools and guidance to strengthen the implementation of the CPB provision on transit, contained use, and unintentional or illegal transboundary movements of LMOs at the state level.											
c.	Leverage on the national codes of best practices and procedural guidelines for handling, transport, packaging, and identification of LMOs for implementation at the state level.											
d.	Strengthen mechanisms and capacities to regulate the importation, management, and use of LMOs and regulate production of LMOs arising from domestic research and development.											
e.	Ensure that biosafety considerations are fully embedded into relevant state policies, plans, and programmes, especially for the agriculture, aquaculture, marine and health sectors.											
Action 16.2: Assess the impacts of Living-Modified Organisms (LMOs) on Sabah's biodiversity and human health												
a.	Enhance capacities and guidance for risk assessment, management, communication, together with pre-and post-approval monitoring of new LMOs based on the national guidance.											
b.	Integrate socio-economic impact issues and analytical frameworks into decision-making on applications for release of LMOs at the state level.											
c.	Increase research on biosafety, including environmental impacts and safety studies for field trials of new and locally developed LMOs and its products including those developed from new technologies.											
d.	Develop biology documents for primary commodities that can be used as a reference document for risk assessments.											

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Action 16.3: Develop state response plans to biosafety emergencies												
a.	Establish state emergency response plans and emergency response teams [156] to alert, contain and eradicate any harm or damage caused directly or indirectly by LMOs or its products.											
b.	Leverage on the national biosafety framework to strengthen state legislations for the inclusion of essential elements of liability and redress for damages resulting from the transfer, handling, release, or use of LMOs or its products in Sabah, as well as any adverse effects towards the conservation and sustainable use of biological diversity and human health.											
c.	Strengthen cooperation and coordination among state agencies involved in the implementation of liability and redress related to LMOs.											

[156] This will leverage upon the national emergency response plans and SOPs for establishing emergency response teams.

GOAL 5
THE CAPACITIES, KNOWLEDGE, AND SKILLS OF ALL STAKEHOLDERS TO CONSERVE BIODIVERSITY IN SABAH HAS BEEN IMPROVED

Biodiversity conservation requires the combined efforts of all stakeholders and transcends across the government, civil society, indigenous peoples and local communities, and the private sector. We must ensure that everyone in Sabah has adequate capabilities, knowledge, access to information, tools, and networks to effectively plan, manage and monitor biodiversity conservation.

In view of the growing challenges in conserving biodiversity amidst economic development Sabah, strengthening the capacities of the government agencies remain crucial. Cross-agency and cross-sectoral capacity building, mainstreaming, as well as interfacing science and policy all need to be strengthened so that this Strategy will truly be an effective guidance document in steering biodiversity conservation in the country.

Avenues for sustainable financing and funding for biodiversity conservation across all levels also remains a priority. The State Government need to find a common ground to set aside budget allocations for conservation, regardless of growing competition for land and land conversion. We also need to find new financing mechanisms to lessen the burdens from the Federal and State Governments. This will require leveraging on the private and financial sector through incentives and sustainable partnerships.

Goal 5 has 2 strategies:

- Strategy 17: Strengthen Sabah's capabilities to implement the Strategy.
- Strategy 18: Strengthen funding allocations for biodiversity conservation from both government and non-government sources.

Strategy 17: Strengthen Sabah's capabilities to implement the Strategy.

WHY IS THIS STRATEGY IMPORTANT?

Effective management of Sabah's biodiversity requires a significant long-term investment of human and financial resources. Enhancing human resources requires an investment in training and capacity-building programs to prepare personnel with the necessary skills and knowledge to effectively implement the Strategy. Adequate financial resources allocation is essential to support the long-term implementation of the Strategy. Additionally, measures to improve coordination and collaboration among various stakeholders are essential to strengthen Sabah's capabilities to implement the Strategy.

PROGRESS SINCE SBS 2012-2022

A noticeable gap in the SBS 2012-2022 was the lack of actions and activities pertaining to capacity improvements. Human resource capacities were among the major challenges that hindered effective implementation of the SBS 2012-2022. As such, there needs to be more concerted efforts to improve the capacities of all implementing agencies of the revise Startegy

MEETING THE STRATEGY

The revised Stratategy emphasises on the need to evaluate the existing capacity of government agencies to implement the Strategy and identify weaknesses and gaps that need to be addressed. Additionally, Sabah needs to strengthen the role of the legislative and judicial components and invest in the development of local talent to ensure the long-term feasibility of Strategy implementation.

Strategy 11 has 3 Actions:

- Action 17.1: Improve the capacities of the Sabah government to conserve biodiversity.
- Action 17.2: Strengthen the role of the state legislature and judiciary in biodiversity conservation.
- Action 17.3: Develop local biodiversity related human resource capabilities.

Action 17.1: Improve the capacities of the Sabah government to conserve biodiversity.

Key Indicator: By 2030, state capacity needs for biodiversity conservation have been enhanced.

The Sabah state agencies are expected to play a key role in implementing the Strategy as part of their responsibility in conserving biodiversity. Sabah needs to ensure that the relevant government agencies are well-equipped to address biodiversity conservation and implement the Strategy. To achieve this, there is a need to review existing gaps in manpower and technical capacities and implement appropriate improvement measures where needed.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Strengthen the technical capacities of the Sabah Economic Planning Unit with regards to biodiversity conservation and management to improve state level decision-making.	UPEN SaBC	EPD SFD SWD SP DOF
b.	Incorporate a biodiversity conservation module [157] within the state civil service training programme to improve biodiversity awareness, especially for new civil servants.	EPD SaBC	JPAN SFD SWD SP DOF

SDG Goals: Supported

[157] This training module should leverage from the national level (as recommended under the National Policy for Biological Diversity 2022-2030) but can be updated for Sabah.

Action 17.2: Strengthen the role of the state legislature and judiciary in biodiversity conservation.

Key Indicator: By 2030, Sabah's laws on biodiversity have been reviewed and strengthened to enable effective conservation and enforcement.

The state legislature and judiciary play a critical role in biodiversity conservation, where their roles include enacting and enforcing biodiversity laws, regulating activities impacting ecosystems, strengthening law enforcement and compliance, and facilitating stakeholder engagement and public participation. In order for these bodies to execute their roles effectively, adequate knowledge transfer and advisory capacity need to be established.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Review the present state legislations on biodiversity to identify gaps, and create synergies with Federal laws while also strengthening state needs.	SWD DOF	SaBC
b.	Conduct targeted training programmes to improve the technical knowledge and awareness of the state judiciary and public prosecutors on biodiversity-related offences.	SaBC	AGC

SDG Goals Supported

Action 17.3: Develop local biodiversity-related human resource capabilities.

Key Indicator: By 2034, significant progress has been made to enhance biodiversity-related capacities and skillsets required by the civil service and related industries in Sabah.

Developing local biodiversity-related human resource capabilities particularly among populace of Sabah is key for successful biodiversity conservation. This step is essential for effective conservation efforts, inclusion of local knowledge and context in conservation approach, enable community participation, enhance ownership in conservation efforts. Additionally, developing and including local human resource capabilities enables economic development and job creation.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Identify specific technical capacities [158] that are needed for biodiversity research and conservation in Sabah and position prominent research institutes and centers as focal points for developing these capacities to the next generation of Sabahans	UMS [159] SFD SWD SP	NGO
b.	Strengthen existing, while also developing new collaborations [160] with local and international organizations for continuous technical capacity building in biodiversity research and conservation.	SFD SWD SP	UMS[158] NGO CSO
c.	Strengthen and promote biodiversity-related jobs in the State as a viable career pathway across all genders [161].	SFD SWD SP DOF UMS[158] NGO	JPAN
d.	Certify biodiversity conservation related jobs as recognized professions under the Malaysian Qualification Statement [162].	SaBC JPAN	-
e.	Establish mentorship programmes that connect academicians and conservation professionals with graduates to pursue biodiversity conservated related careers in Sabah	SaBC	UMS[158] NGO

SDG Goals: Supported

[158] This can include taxonomy, genetics, climate modelling, and other new emerging skills besides other core research skills

[159] All research institutes and relevant faculties

[160] This can include new research methodologies, monitoring and enforcement tools and programmes, new landscape and seascape rehabilitation methodologies, and new approaches in species conservation.

[161] This applies towards both fresh graduates and IPLCs.

[162] This includes honorary ranger professions for the IPLCs, besides official state forest and wildlife rangers and should ensure that these professions include basic EPF and SOCSO provisions.

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 17: Strengthen Sabah's capabilities to implement the Strategy												
Action 17.1: Improve the capacities of the Sabah government to conserve biodiversity												
a.	Strengthen the technical capacities of the Sabah Economic Planning Unit with regards to biodiversity conservation and management to improve state level decision-making.											
b.	Incorporate a biodiversity conservation module within the state civil service training programme to improve biodiversity awareness, especially for new civil servants.											
Action 17.2: Strengthen the role of the state legislature and judiciary in biodiversity conservation												
a.	Review the present state legislations on biodiversity to identify gaps, and create synergies with Federal laws while also strengthening state needs.											
b.	Conduct targeted training programmes to improve the technical knowledge and awareness of the state judiciary and public prosecutors on biodiversity-related offences.											
Action 17.3: Develop local biodiversity-related human resource capabilities												
a.	Identify specific technical capacities that are needed for biodiversity research and conservation in Sabah and position prominent research institutes and centers as focal points for developing these capacities to the next generation of Sabahans.											
b.	Strengthen existing, while also developing new collaborations with local and international organizations for continuous technical capacity building in biodiversity research and conservation.											
c.	Strengthen and promote biodiversity-related jobs in the State as a viable career pathway across all genders.											
d.	Certify biodiversity conservation related jobs as recognized professions under the Malaysian Qualification Statement.											
e.	Establish mentorship programmes that connect academicians and conservation professionals with graduates to pursue biodiversity conservated related careers in Sabah.											

Strategy 18: Strengthen funding allocations for biodiversity conservation from both government and non-government sources.

WHY IS THIS STRATEGY IMPORTANT?

The implementation of this Strategy requires a substantial amount of long-term capital and operational expenditure. Currently, the bulk of funding is derived from State and Federal Government allocations, supported by multilateral technical assistance and grants from private foundations. However, these may still be insufficient to sustain long-term conservation. Performance-based green financing mechanisms have to be leveraged upon to provide more sustainable financing for conservation in Sabah.

PROGRESS SINCE SBS 2012-2022

The SBS 2012-2022 also lacked of actions and activities pertaining to financing capacities and instruments for implementation. The establishment of the Ecological Fiscal Transfer (EFT) incentive by the Federal Government sheds renewed hope and understanding that biodiversity conservation is costly and requires long-term financing. At the same time, the involvement of the private sector in terms of co-financing also presents more opportunities that can and should be leveraged upon to help finance the implementation of the revised Strategy.

MEETING THE STRATEGY

Besides increasing government budget allocations and conventional sources of funding, there is a need to develop green financing mechanisms and facilitate greater private sector participation, in order to reduce the present shortfalls in conservation financing. In addition, greater incentives and compensation mechanisms need to be developed, to enable the Sabah State Government to decouple their economies from activities related to the exploitation of natural resources and offset the opportunity costs associated with area-based conservation.

Strategy 18 has 3 Actions:

- Action 18.1: Increase public funds available for biodiversity conservation.
- Action 18.2: Mobilise sustainable conservation funding from the private sector.
- Action 18.3: Diversify the revenue streams of the Sabah Government.

Action 18.1: Increase public funds available for biodiversity conservation.

Key Indicator: By 2034, at least RM500 million has been mobilized for biodiversity conservation in Sabah through public funds.

Sabah needs to increase public allocations for biodiversity conservation, which can be achieved by optimizing state financial allocation. In the Budget 2023, Sabah is entitled to receive a share of MYR 150 million disbursement from the Ecological Fiscal Transfer that will be used for biodiversity conservation. The funding needs to be utilized appropriately to ensure effective biodiversity conservation efforts.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Improve state financial resource allocation [163] for biodiversity conservation in terms of human resource, materials, and capacity development.	SaBC	MOF JPAN SFD SWD SP DOF
b.	Strengthen disbursement of the state Ecological Fiscal Transfer (EFT) allocations to ensure fair and equitable funding to support the Strategy.	MOF	SaBC MTCE SFD SWD SP DOF

SDG Goals Supported

[163] This should also cover financial allocation is to increase employment of local technical specialists and fresh graduates.

Action 18.2: Mobilise sustainable conservation funding from the private sector.

Key Indicator: By 2030, private financing contributions into state conservation trust funds have increased.

The private sector can contribute financially towards conservation efforts, supplementing gaps in state conservation initiatives. However, Sabah needs to establish a framework for private sectors to channel funding, which can be achieved by facilitating green financing mechanisms such as carbon markets, green bonds, and incentive programs. This measure should be supported by cultivating partnerships with private sector stakeholders.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Establish a state policy and mechanism [164], while also reviewing present legislations [165], to operationalize the Sabah carbon market.	SCAC	MOF SaBC UPEN
b.	Regulate future carbon projects [166] to ensure that financial returns are channeled into conservation initiatives that support the Strategy.	SCAC	MOF SaBC UPEN
c.	Re-explore the feasibility of generating biodiversity credits from major ecosystems in Sabah.	SFD Yayasan Sabah	SFD SP ITBC BMRI NGO

SDG Goals Supported

[164] This should cover procedures for Carbon Storage License, Carbon Storage Permit, Carbon Study Permit, and development of carbon credit plans when developing carbon project.

[165] This may require further amendments to Sabah's Land Ordinance and Rules for carbon storage, and Forest Rules for conducting forest carbon activity.

[166] This is expected to be done under the Voluntary Carbon Market under the Bursa Exchange, but still requires oversight at the state level.

Action 18.3: Diversify the revenue streams of the Sabah government.

Key Indicator: By 2034, Sabah is actively leveraging on sustainable financing approaches for biodiversity conservation.

The Sabah Government needs to diversify its revenue streams to reduce dependence on limited funding sources, increase financial resilience, and establish long-term stability. Additionally, a diverse revenue stream allows the state to be flexible in addressing dynamic conservation issues and implementing adaptive measures. Therefore, Sabah needs to explore opportunities to leverage market-based mechanisms and diversify its revenue stream while also re-evaluating the current state fiscal system.

We need to:

No.	Activity	Lead Agency	Partner Agency
a.	Re-align the state fiscal system [167] to entrench biodiversity conservation as part of the annual budget requirements / allocation.	UPEN MOF	SaBC
b.	Assess the feasibility of establishing a debt-for-nature swap programme to incentivize conservation actions.	SaBC SFD	UPEN MOF
c.	Establish a dedicated state task force [168] to study and pursue sustainable financing opportunities to support biodiversity conservation in Sabah.	SaBC SFD	UPEN MOF

SDG Goals Supported

[167] The fiscal system should also focus on meeting the basic needs of IPLCs as support for community-based conservation to incentive them further to participate in biodiversity conservation initiatives.

[168] The task force should ideally be under the Sabah UPEN or MOF to focus on obtaining grants and funding from various programmes such as UNDP-GEF and Asian Green Fund.

No.	Activities	PHASE I				PHASE II				PHASE III		
		2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Strategy 18: Strengthen funding allocations for biodiversity conservation from both government and non-government sources												
Action 18.1: Increase public funds available for biodiversity conservation												
a.	Improve state financial resource allocation for biodiversity conservation in terms of human resource, materials, and capacity development.											
b.	Strengthen disbursement of the state Ecological Fiscal Transfer (EFT) allocations to ensure fair and equitable funding to support the Strategy.											
Action 18.2: Mobilise sustainable conservation funding from the private sector												
a.	Establish a state policy and mechanism, while also reviewing present legislations, to operationalize the Sabah carbon market.											
b.	Regulate carbon projects to ensure that financial returns that are channelled into conservation initiatives that support the Strategy											
c.	Re-explore the feasibility of generating biodiversity credits from major ecosystems in Sabah.											
Action 18.3: Diversify the revenue streams of the Sabah government												
a.	Re-align the state fiscal system to entrench biodiversity conservation as part of the annual budget requirements / allocation											
b.	Assess the feasibility of establishing a debt-for-nature swap programme to incentivize conservation actions.											
c.	Establish a dedicated state task force to study and pursue sustainable financing opportunities to support biodiversity conservation in Sabah.											

PART 3

IMPLEMENTATION FRAMEWORK

A RENEWED CALL FOR ACTION

The revised Sabah Biodiversity Strategy 2024-2034 is a renewed call to action for biodiversity conservation in Sabah. In line with the National Policy on Biological Diversity 2022-2030, the “Whole of Government” and “Whole of Society” approach is still necessary to effectively protect and manage Sabah’s biodiversity. Political will and continuous engagement between all government levels and segments of society to be involved in biodiversity conservation remains essential to fully realise effective implementation of the Strategy.

The Sabah government will continue to play a leading role in the Strategy’s implementation, with support from various non-governmental stakeholders and Federal government where applicable. However, wider and stronger partnerships amongst civil society, private sector, indigenous people and local communities, academia, and the general public remains crucial to ensure the Strategy’s success in managing and conserving Sabah’s biodiversity.

ROLES AND RESPONSIBILITIES FOR IMPLEMENTATION

The Sabah Biodiversity Strategy will continue to provide an implementable framework for stakeholders at all levels. It will continue to inform, guide, empower, and support stakeholders to participate in biodiversity conservation. The Strategy will also assist stakeholders in setting out subsequent goals and targets to be achieved. The Strategy will also be the basis in the identification and formation of partnerships between various stakeholder groups according to their capabilities and circumstances.

As with the previous version of the Strategy and in line with the “Whole of Society” approach, effective implementation will involve various stakeholder groups which have different roles and responsibilities. These roles and responsibilities have been reviewed and redefined for the revised Strategy based on the ongoing implementation challenges and lessons learnt in the last decade years.

a. Sabah State Government

The Sabah State Government, through the respective ministries and agencies, will continue to function as the leading agencies in the implementation of the Strategy. **Part 2 of the Strategy** has already listed the lead agencies, as well as implementation partners, to realise each action of the revised Strategy. As such, the onus is on each lead agency to coordinate implementation of each action based on the proposed timeframes in this Strategy.

The implementation of the Strategy will also require strengthening of human resources. This Strategy should also be used by the respective ministries and agencies as a basis to improve staffing capacities, especially for agencies that require more manpower for monitoring and enforcement. The State Public Services Department (*Jabatan Perkhidmatan Awam Negeri*), together with the Sabah Ministry of Finance will play key roles to improve the State's human resources to ensure effective conservation efforts.

The Sabah Biodiversity Centre (SaBC) will continue to serve as the main coordinator of the Strategy and to provide implementation assistance and direction to each State agency (**also see the revised Coordinating Mechanism**).

b. Federal Government

The Federal Government will play a supporting role in the implementation of the revised Strategy, mainly through strategic direction and allocating financial resources. The Ministry of Natural Resources, Environment, and Sustainability (NRES) and Ministry of Finance (MOF) will be the main ministries that will determine the yearly Ecological Fiscal Transfer (EFT) allocations to Sabah. As such, the reporting of the implementation of the Sabah Biodiversity Strategy 2024-2034 will be crucial to secure fair and sufficient allocations from the Federal Government (**also see the Part 4 on the major financial instruments that can be leveraged upon for the implementation of the Strategy)**.

c. Private Sector

The contributions from the private sector towards biodiversity conservation have greatly increased within the last decade due to increased awareness and responsibilities within the corporate sustainability sectors. As such, the private sector is a key stakeholder group that needs to be engaged and partnered with in the implementation of the revised Strategy.

Action 2.3 elaborates on ways to harness the strengths of the private sector through stronger partnerships and more engaging platforms. The proposed State Business and Biodiversity Network/Council can be a crucial collaborative platform that can unite the private sector together with the State Government in achieving the outcomes of the revised Strategy. Besides this, the private sector should also be included as members in the revised Thematic Working Groups too maximise on the collaborative potentials.

d. Civil Society

Civil society involvement remains vital to ensure successful and effective implementation of the revised Strategy. The work by environmental and conservation organizations are still essential in realizing the Strategy's actions and activities, while community-based organizations are well-positioned to facilitate better collaborations with the indigenous people and local communities to be more engaged in biodiversity conservation.

This is in line with **Action 2.2**, which calls for more recognition and support of civil society efforts that are in line with the Strategy, as well as the need for working platforms to coordinate efforts and identify implementation gaps and needs. The revised Thematic Working Groups is envisioned to function as working platforms for civil society to participate in as part of the Strategy's overall implementation.

e. Indigenous Peoples and Local Communities

Sabah's indigenous peoples and local communities have long been considered to be model champions of biodiversity conservation in Malaysia through their long history of natural resource management and rich traditional ecological knowledge in fulfilment of their cultural practices. This has led to many areas outside the formal protected area network to be effectively managed by communities and these have helped to conserve and protect valuable conservation and ecological functions.

The revised Strategy continues to recognize these efforts and reinforce the need to continue empowering and supporting indigenous peoples and local communities (**Action 2.1**). This will require more partnerships and platforms, as well as continuous recognition and nurturing of local champions to be involved in biodiversity conservation and support the implementation of this Strategy. Communities leaders are also recommended to be included in relevant Thematic Working Groups, especially on OECMs and local and indigenous community envolvement to fully realise the "Whole of Society" approach in the implementation of the Strategy.

f. Research and Education

The research community will continue to provide scientific and technical inputs in the implementation of this Strategy. This is to ensure that conservation initiatives and actions are guided by sound justifications which are evidence-based. The revised Thematic Working Groups need to include prominent biodiversity researchers and scientists to facilitate the science-policy interface.

Universiti Malaysia Sabah (UMS), along with the respective research institutes and faculties, notably the Institute for Tropical Biology and Conservation, and Borneo Marine Research Institute, will continue to serve as the core research bodies in Sabah in bridging knowledge gaps, while also helping to update species databases. At the same time, other public and private academic institutions will also contribute towards conservation research and development.

At the same time, the involvement of educators needs to be strengthened. Educators i.e., teachers and lecturers, are still vital assets to increase the general public's awareness of Sabah's biodiversity through curriculum and experiential learning. A Thematic Working Group specifically on the involvement of children and youth is essential in nurturing the future generation to be involved in biodiversity conservation.

g. General Public

The people of Sabah remain an important component in ensuring the effectiveness of this revised Strategy, as well as contributing towards biodiversity conservation as a whole. Communication, education, and awareness raising are still important to enlighten and empower Sabahans on how to live sustainably, reduce ecological footprint, as well as supporting conservation efforts through volunteerism or even as becoming local champions of conservation.

COORDINATING MECHANISM

To improve the implementation effectiveness of the revised Sabah Biodiversity Strategy, the coordinating mechanism has been revised to provide a sense of stability, especially in the event of restructuring within the Sabah State Government. The heart of the revised coordinating mechanism is a **central coordinating framework**:

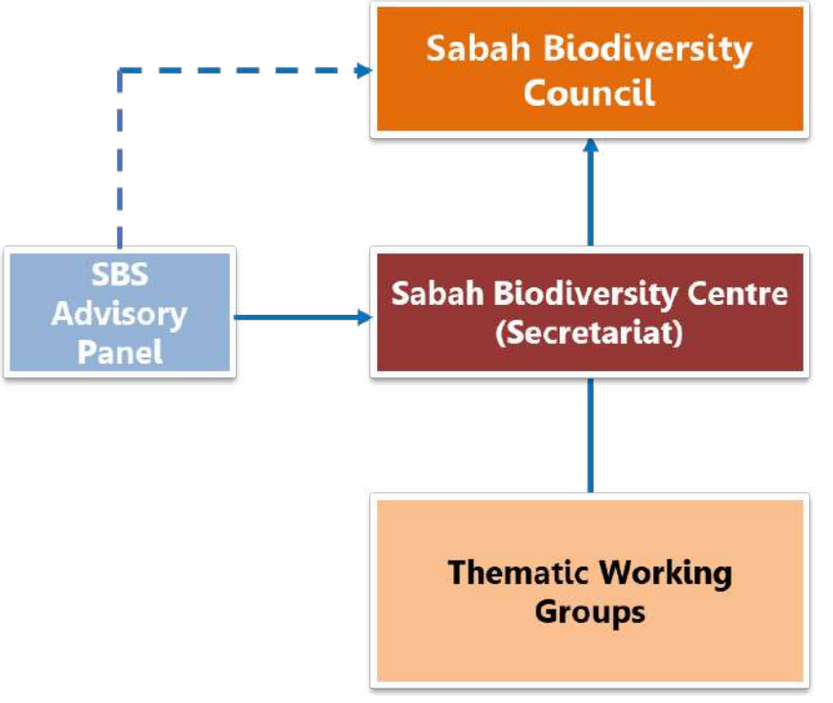


Chart 3-1: Proposed Central Coordination Framework for the Revised Sabah Biodiversity Strategy

i. The **Sabah Biodiversity Council** will remain as the central platform that oversees the implementation of the revised Strategy and facilitation strategic discussions on biodiversity conservation in Sabah. The Council is chaired by the Sabah State Secretary and the members comprising of selected representatives from relevant agencies as well as prominent experts.

ii. The **Sabah Biodiversity Centre (SaBC)** will serve as the Secretariat of the Sabah Biodiversity Council and the main coordinator of the Sabah Biodiversity Strategy. SaBC will function to coordinate with all the lead implementing partners of the Strategy with regards to progress reporting, as well as facilitating the Thematic Working Groups.

    SaBC will also serve as the State Focal Point to the National Steering Committee for the National Policy on Biological Diversity and reporting on the State's contribution to the national goals and targets.

iii. The **Sabah Biodiversity Strategy (SBS) Advisory Panel** will be re-purposed as a collaborative panel between major stakeholders to provide technical advisory input to the SBC and SaBC with regards to the implementation of the Strategy. The membership of the SBS Advisory Panel should comprise mainly of representatives from the civil society and private sector.

iv. The **Thematic Working Groups** will function as the root platforms in coordinating and monitoring the key actions of the Strategy. The Thematic Working Groups are envisaged to cover various aspects of the Strategy, such as terrestrial and marine species conservation, protected area management, habitat rehabilitation, carbon financing, and human resource capacities and improvement on biodiversity conservation jobs.

    The Working Groups are envisioned to comprise of representatives from all sectors i.e., government, private, academia, NGOs and CBOs that are involved in the specific thematic area. SaBC will identify and set-up the necessary Working Groups, as well as co-chairing the meetings. The Working Groups should meet regularly to discuss progress and coordinate future efforts that are in line with the Strategy (ideally at least every quarter of the year, or bi-monthly where needed).

MONITORING PROGRESS

Monitoring the implementation progress of the Strategy remains crucial to assess effectiveness and identify challenges that hinder successful implementation of the strategy. The identification of challenges provides an opportunity to address them through necessary revisions or modifications, if needed. Progress monitoring allows organizations to assess resource allocation and identify gaps in allocation that require corrective measures.

Progress monitoring should be done on an annual basis to track implementation progress based on the proposed timeframes for each activity. SaBC will continue to conduct this exercise and report on the yearly progress through an Annual Report. This Annual Report should ideally present an overview of the Sabah Biodiversity Strategy's implementation, together with notable achievements and outcomes, future endeavours, as well as implementation challenges and solutions moving forward.

Progress updates should be submitted by each lead agency every six months to SaBC for compilation. The mid-year findings should at least be deliberated with the SBS Advisory Panel to provide further strategic direction and support for the rest of the year, and also updated on SaBC's website for public knowledge. The mid-year findings and way forward should also be communicated to the Thematic Working Group heads so that each implementing partner is aware on what needs to be done subsequently.

The implementation outcomes of the previous year should be discussed at the first Sabah Biodiversity Council meeting of the subsequent year (ideally within the 1st quarter). This should be done together with the SBS Advisory Panel to discuss successes and setbacks of the previous year and to set implementation targets for the subsequent years.

The monitoring reports should also be submitted to the Biodiversity Management Section of the Ministry of Natural Resources, Environment, and Sustainability (NRES). This would ease and facilitate clearer reporting of Sabah's contribution to Malaysia's biodiversity conservation efforts, as well as supporting implementation of the National Policy on Biological Diversity 2022-2030.

REVIEWING THE STRATEGY

A mid-term review will continue to be conducted after the first five years of implementation i.e., in 2029. This review exercise is to account for changing priorities and emerging issues at the international, national, and state levels, as well as to learn from yearly implementation successes and challenges. This exercise remains essential to ensure that the overall aim of the Sabah Biodiversity Strategy remains aligned with the evolving needs and demands of the time.for Sabah.

IMPLEMENTATION SUPPORT AND OUTREACH

Coordinating the implementation of the Strategy is a long-term and continuous process, which requires substantial time and human resource. Besides overseeing the implementation of the Strategy, SaBC also oversees biodiversity mainstreaming into other sectoral policies in Sabah, as well as representing Malaysia to the Convention on Biological Diversity.

Given the immense task of coordinating and monitoring the Strategy, it is recommended that a specialized team be established under the SaBC specifically to monitor implementation of the Strategy, coordinate actions and initiatives, and report on its progress. This team will require qualified personnel with a strong understanding of the technical aspects of biodiversity conservation, Federal-State jurisdictions, and the collaborative networks between the government, civil society, academia, and private sector.

PART 4

FINANCING THE STRATEGY

FINANCIAL REQUIREMENTS

The implementation of the revised Sabah Biodiversity Strategy (SBS) 2024-2034 requires both stable and sufficient funding. A major implementation challenge of the SBS 2012-2022 was the limited financial resources. At least 48 actions could not be fully implemented due to insufficent funding from the various implementing agencies [169].

The revised Strategy entails both capital and operational expenditures. Capitalexpenditures are required to conduct new studies and programmes, as well as for capacity building. The revised Strategy also calls for increased staffing requirements, which increases operational expeditures.

The estimated costs for each action (and activity) are summaried in at the end of this Chapter. The estimates are based on the expected costs that will be incured to conduct the action (and activity), as well as the potential source of funding that can be leveraged upon for implementation.

FUNDING SOURCES

Federal Government Financing

i. Malaysia Plan (*Rancangan Malaysia, RMK*)

The Malaysia Plan (RMK) is a comprehensive action framework that provides clear strategic direction in the national budget allocation all economic sectors in Malaysia within a five year period. The Twelfth Malaysia Plan (RMK-12) outlines strategic principles based on shared prosperity initiatives that encompass three dimensions: (i) rebuilding the economy, (ii) implementing an inclusive social system, and (iii) emphasizing sustainable development, which also includes the protection and conservation of natural habitats.

The RMK-12 currently provides strategic directions for financing from 2021 until 2025. However, financing provisions can still be made for the initial implementation of the SBS 2024-2034. Financing applications for capital expenditure programs/projects can be carried out through the Rolling Plan (RP) method,

[169] Feedback from stakeholders during the review process

especially for RP4 (2024) and RP5 (2025). The respective implementing agencies will have to ensure that the programs/projects are prioritised and have a significant impact on Sabah's sustainable development.

The total ceiling and allocation to be approved are subject to the current Government's position. The estimated shadow ceiling set should serve as a guide for the respective lead implementing agencies to prepare program/project proposals so that the department does not submit excessive requests.

ii. National Conservation Trust Fund

The National Conservation Trust Fund (NCTF) is a trust fund established to finance research, development, management, protection, awareness, and other conservation efforts within the country. Among the main functions of the National Conservation Trust Fund include:

1. Supporting the implementation of long-term conservation plans to sustainably manage natural resources;
2. Supporting Sustainable Forest Management;
3. Implementing research and development activities in the field of natural resource management and conservation;
4. Supporting capacity development to fulfill the country's obligations and commitments under Multilateral Environmental Agreements;
5. Providing mechanisms for receiving and disbursing funds to support natural resource management and biodiversity conservation.

Applications to the NCTF will have to be based on four focus areas:

Focus Area	Jenis Projek dan Aktiviti
Focus Area 1: Natural Resource Management	• Managing, monitoring, and protecting areas of biodiversity significance and sensitive environmental areas. • Managing, monitoring, and protecting biodiversity *in-situ*, including ecosystems and species. • Managing, monitoring, and protecting biodiversity *ex-situ*, including local species and genetics. • Mitigating climate change to prioritize biodiversity conservation and sustainable natural resource management.
Focus Area 2: Research and Development	• Funding for research and development (R&D) activities in the fields of scientific, technological, and socio-economic aspects related to biodiversity conservation and sustainable natural resource management aligns with conservation-related policies and the country's commitments under multilateral environmental forums and agreements.
Focus Area 3: Capacity Building	• Developing human capital and training in the field of biodiversity conservation and sustainable natural resource management, including strengthening understanding of policies, laws, regulations, guidelines, and national obligations in multilateral environmental forums and agreements.

Focus Area	Jenis Projek dan Aktiviti
	• Enhancing public awareness through education, training, and capacity-building, including supporting campaigns for protection and conservation. • Fostering understanding in the implementation, enforcement, and improvement of policies, acts, regulations, and guidelines in the field of conservation. • Organizing seminars, courses, workshops, conferences, and colloquiums.
Focus Area 4: Sustainable Financing Mechanisms	• To implement sustainable financing mechanisms and share financial benefits and other resources between the federal and State Governments.

iii. Ecological Fiscal Transfer

The Ecological Fiscal Transfer (EFT) is a new financing mechanism established by the Federal Government under the Twelfth Malaysia Plan (RMK-12) as a strategy to enhance financial allocations to fund management and conservation aspects for protected areas at the state level. Additional funding can be applied for through the EFT to support the implementation of the SBS 2024-2034.

The EFT allocations is to the State Government, which is determined by the Ministry of Natural Resources, Environment, and Sustainability (NRES). The allocation is based on specific criteria, including performance indicators for managing these protected areas. The SBS 2024-2034 can thus be used as a performance indicator with the intent on securing more allocations to support long-term conservation for the next decade. The allocations to the State can indeed be used as a supportinig source to fund special conservation projects/ studies, but should not be wholly reliant from this.

iv. Malaysia Forest Fund

The Malaysia Forest Fund (MFF) was established on 30 June 2021 to implement the REDD Plus Finance Framework (RFF) in Malaysia. It was formed as a financing initiative by the Ministry of Natural Resources, Environment, and Sustainability (NRES). The fund specifically aims to develop and implement solutions for forest conservation throughout the implementation of the National REDD Plus Strategy. The RFF was developed as a finance mechanism to incentivise activities that help protect and conserve forests. The framework is designed to use funds for non-carbon benefits as well as for carbon credits. This will then aim to help deliver other socio-economic benefits in addition to climate benefits.

The MFF can be used as a platform to raise funds for potential sites that require funding for habitat rehabilitation. To date, the MFF has raised RM80,000 for the protection of the Sg. Besi Forest Reserve (Extension). The Forest Reserve was gazetted in 2021, covering an area of 23.83 ha., which was long degraded due to past mining activities and currently covered with invasive ferns. The MFF is currently funding efforts to rehabilitate the forest through silvicultural treatment,

improving enforcement to protect the forest as well as working with local communities to participate in conservation efforts.

State Government Financing

i. Allocations from Respective Ministries and Departments

Allocations from other relevant ministries can also be leveraged upon as a to cover specific development costs. For example, fisheries management related actions can utilise funding allocations to the Fisheries Department or Ministry of Agriculture, Fisheries and Food Industries (MAFFI). Likewise, actions related to ecotourism development and management can also be co-financed with the Ministry of Tourism, Culture and Environment (MTCE) Sabah.

It is crucial that the SBS 2024-2034 is circulated and mainstreamed to all lead agencies. This is so that everyone is aware on their roles and responsibility in the implementation of the Strategy, as well as to use this document as the basis in preparing budgetory proposals and financial management, especially through the RMK yearly allocations.

ii. Sabah Biodiversity Centre Fund

The Biodiversity Centre Fund is established under Section 14 of the Sabah Biodiversity Enactment 2000. Under the Enactment [Section 14(2)], the Fund shall consists of:

a) Funds provided by the State Legislative Assembly periodically
b) Grants from the Federal Government
c) Donations and contributions paid into the Fund by any statutory body, corporate body, associated or individual person
d) Collections from the public

Under Section 14(4), the function of the Fund is initially for (Section 14(4)):

a) the payment of the expenses of, or connected with, the administration of the Council;
b) the administration, management and operation of the Biodiversity Centre; and
c) the payment of all expenses necessary for carrying out the purpose of this Enactment.

As such, the Sabah Biodiversity Centre Fund can be leveraged as a central platform to coordinate expenditure for the implementation of the SBS 2024-3034. Fund allocations should ideally be for actions and activities under the direct leadership of SaBC, but can also be used to support other lead implementing agencies where needed. The fund can also used to provide matching grants to research bodies, especially for UMS and the respective research institutions.

However, it is important that the Fund also is constantly replenished and not depleted. As such, SaBC will have to further mainstream the existence and functions of the fund with key stakeholders, especially statutory bodies and private corporations to ensure continuous and sustainable funds to be used for the implementation of the Strategy.

iii. External Grants

External grants have the potential to be utilized as the primary source to finance conservation activities. There are various types of international and local grants and donation funds that can be explored, particularly for conservation, restoration, research, and long-term monitoring. Most grants are tailored for specific objectives and types of activities that can be funded. Therefore, a variety of grants may be required to support activities beyond operations such as capacity building, research, conservation, and awareness-raising and educational activities.

The Global Environment Facility (GEF) Small Grants Programme (SGP) remains one of the major external grants that Malaysia generally leverages upon to finance conservation programmes and projects (both research and community-based). Other local external grants that can be leveraged upon include:

Grant	Details
Habitat Foundation Conservation Grant	• Financing to provide opportunities for individuals to encourage conservation efforts. • Focus on five main elements: conservation, research, education, sustainability, and training. • Applications are open to academics, students, researchers, community members, and environmental professionals. • Grant amount ranges from approximately RM15,000 to RM50,000.
Malaysia Palm Oil Wildlife Conservation Fund (MPOWCF)	• Launched with an initial seed fund of RM20 million, a combination of Malaysian government and palm oil industry contributions. • Managed by the Malaysian Palm Oil Council (MPOC). • To fund projects for wildlife conservation, biodiversity, and environmental studies related to the impacts of the palm oil industry.
Rufford Foundation Small Grants	• Funding for small-scale natural conservation projects in developing countries. • Focuses on funding for individuals in the early stages of their conservation careers, such as graduate students or doctoral candidates.

Grant	Details
The Mohamed bin Zayed Species Conservation Fund	• Provides financial support in the form of small grants for conservation projects worldwide. • Focuses on efforts and initiatives to conserve individual species of all plant, animal, and fungal species without discrimination.

While external grants provide avenues to eleviate dependencies on Federal and State budgets, matching grants should still be provided especially to research institutions. This is to expand project budgets for more long-term sustainability and to provide additional financing buffers to research insitutions in conducting related projects/programmes.

The responsibility thus falls to the respective implementing agencies and supporting partners to develop sound technical and financial proposals that would secure sufficient funding to implement the various actions in this Strategy.

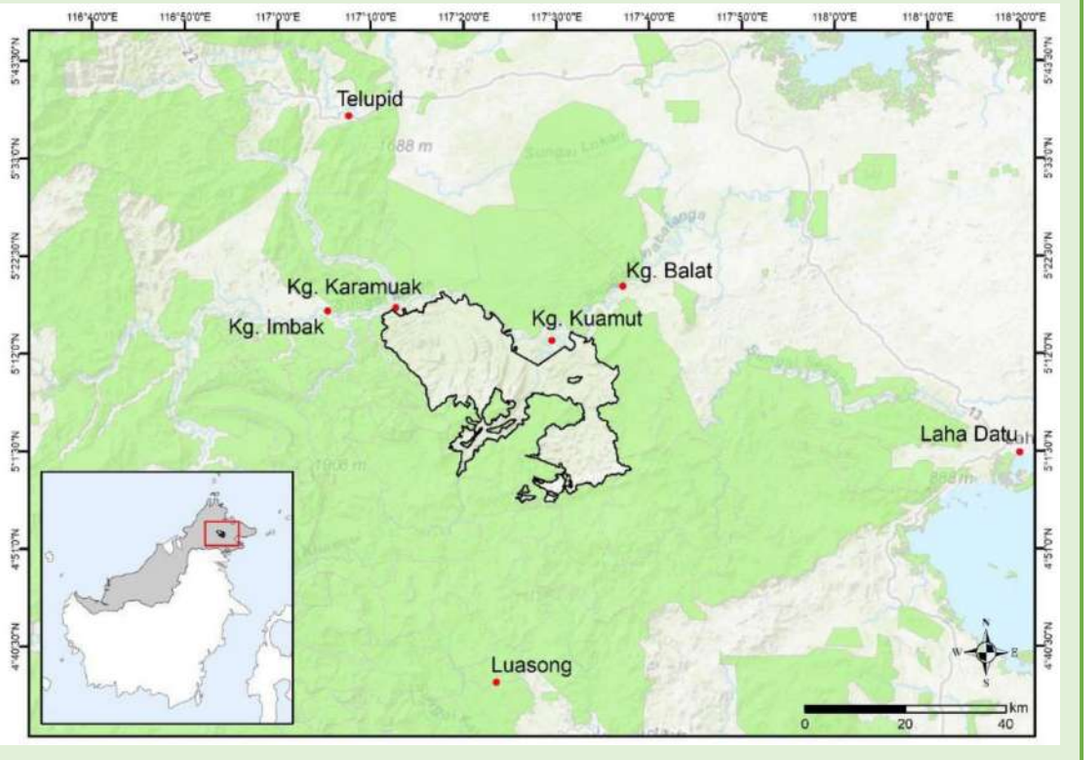
iv. Carbon Financing

Sabah has huge potentials to establish and develop nature-based solution (NBS) projects, and to participate in the Voluntary Carbon Market (VCM) as a means to garner more investments into landscape and ecosystem conservation. Based on the Verra Carbon Standards (VCS), Sabah has the opportunity to develop various AFOLU (Agriculture, Forestry and Other Land Use) projects with the intent of mitigating/offsetting GHG emissions through improved forest management (IFM). This may attract more private investors to participate and finance landscape and habitat conservation, which is line with the SBS 2024-2034. At present, the only NBS project under the National VCM framework is the Kuamut Forest Conservation Project.

Case Study 1: Kuamut Rainforest Conservation Project

This project is the first Nature-based Solution (NBS) initiative in Malaysia and was registered in the Voluntary Carbon Market (VCM) on April 13, 2023. The project's objective is to conserve an area of 83,381 hectares of forest in the Tongod and Kinabatangan districts of Sabah.

This forest area holds high biodiversity value, with the presence of 82 mammal species including Borneo elephants, banteng, and orangutans, as well as 245 bird species, including 12 endangered species. Surrounding the project area are two main communities, the Kuamut and Karamuak communities, comprising eight villages with a total population of 3,000 inhabitants.



The main objectives of this project are to:

- Protect and restore forests as carbon sink areas;
- Improve the socio-economic status and quality of life of the communities residing around the forest area;
- Enhance biodiversity integrity

This project was developed through a public-private partnership between the Sabah Forestry Department, Sabah Foundation, Rakyat Berjaya, and the project developer, Permian Global. The project also received technical support from the South East Asia Rainforest Research Partnership (SEARRP) and PACOS Trust.

The project's assessment is based on the international standards of the Verra Verified Carbon Standard (VCS) and Verra Climate, Community, and Biodiversity (CCB) to demonstrate the project's accuracy ability to generate income from carbon credits, or Verified Carbon Units (VCU) through a scientific manner. For validation purposes, the project is assessed by independent auditors based on VCS and CCB standards and will undergo periodic assessments to ensure ongoing compliance with VCS and CCB standards and to evaluate progress towards achieving project objectives.

This project is classified as an Avoided Planned Deforestation (APD) project because the land was identified for commercial development before the project was developed. The project area has been reclassified as Class 1 Forest: Protection Forest for climate financing purposes. APD projects typically do not generate much controversy and must provide an accurate assessment of the amount of GHG emissions that can be avoided.

Based on the project assessment, the estimated reduction/avoidance of GHG emissions is 16.3 million tCO2e for the term of credits from 2015 to 2045, averaging over 500,000 tCO2e of GHG emission reduction/avoidance annually. The project has already achieved "Triple Gold" status under the CCB standard.

v. Other Conservation Financing

Conservation financing is an evolving field that entails different approaches that is driven by a shared goal of reallocating financing capital to support land, water, and resource conservation. Conservation financing options vary in terms of sources (public, private, and nonprofit funders), type of loans (grants, tax incentives, market mechanisms), and scale (federal, state, national, and local).

Conservation have traditionally relied upon private, philanthropic capital in the form of solicited donations, foundation grants, as well as public and governmental funds in the form of tax incentives to fund conservation projects and initiatives. The last decade has seen a variety of strategies that are being used. This includes building markets for nature (for example, trading carbon or biodiversity credits), creating novel financial instruments such as green bonds or debt-for-nature swaps, mainstreaming nature in monetary policy and taxation, and informing investors about the impacts of their portfolios on the natural world (as in the growing use of Environmental, Social and Governance [ESG] metrics to guide investment decisions).

Given the immense financial requirements needed to implement the SBS 2024-2034, Sabah should also start to leverage upon various means of conservation financing to eleviate dependancies on both Federal and State government funds. Besides carbon financing, the State can also being to explore the feasibilities of establishing debt-for-nature swaps. This mechanism is becoming for frequently used in countries that need to invest in climate and natural environment but are not able to as their budgets are burdened by debts.

Traditional debt swaps are a financial mechanism that allow a government to agree with its creditors to change the terms of a loan obligation to make it more manageable. By negotiating more favourable conditions, such as lower interest rates or longer repayment terms, debt swaps can help governments avoid default and to redeploy part of their debt service costs to invest into policy priorities. Creditors are also likely to support a proposal that reduces default risk and ensures that at least part of the loan is eventually repaid.

In the case of debt-for-nature swaps, debt restructuring comes with a commitment from the debtor government to ensure actions on climate, biodiversity or environmental protection. Part of the scheduled repayments can then be reallocated for investments to support these targets (see **Case Study 2**).

Case Study 2: Debt-For-Nature Swaps Around the World

The first debt for nature swap was carried out in Bolivia in 1987. Since then, nearly 150 transactions have been completed around the world, but most of the deals have tended to be relatively small.

In 2021, the Belize Government reached an agreement with The Nature Conservancy where its external debt would be reduced by $553 million (10% of national GDP). The government was able to buy back part of its existing debt at a discount and replace it by issuing $364m of blue bonds. In return, the Belize Government agreed to spend around $4m every year on marine conservation until 2041. It will increase the area of its marine protection parks – containing coral reefs, mangroves and sea grasses, which are habitats for some 1,400 species – from almost 16% of its oceans to 30% by 2026. In addition, an endowment fund of $23.5m will finance conservation after 2040.

In Southeast Asia, the Government of Laos, where nearly 100% of GDP is funded by debt, has also begun the process of exploring a potential debt-for-nature swap in order to reduce its debt burden and increase resources available for protecting its forest coverage, which is currently among the highest in the region. The United Nations Development Programme (UNDP) is supporting a cross ministry Debt for Nature Technical Working Group in the design of a potential programme.

Table 4-1: Estimated Implementation Costs and Potential Funding Sources for Implementation of Sabah Biodiversity Strategy 2024-2034

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
GOAL 1: ALL STAKEHOLDER GROUPS HAVE BEEN EMPOWERED AND ARE COMMITTED TO PROTECT SABAH'S BIODIVERISTY						
Strategy 1: Increase the awareness of Sabahans to the values of biodiversity and the steps they can take to conserve and use it sustainably						
Action 1.1 Enhance awareness of biodiversity across all segments of society.						
a.	Conduct a baseline awareness survey to document the present extent of Sabah's public awareness on biodiversity conservation.	✓		500,000	• Consultancy costs	• RMK applications
b.	Formulate the State Biodiversity Communication Plan, together with supporting materials (e.g., guidelines, training modules) as a guide towards mainstreaming and increasing biodiversity awareness across all segments of society.	✓	-	800,000	• Consultancy costs • Materials publication	• RMK applications • State allocations • External grants
c.	Expand the capacities and strengthen the membership of the Sabah Environmental Education Network (SEEN) to mainstream biodiversity conservation as part of environmental education.	-	✓	100,000	• Yearly	• Agency allocations
d.	Increase opportunities for public participation in biodiversity research and conservation such as through citizen science programmes.	✓	-	500,000	• For each programme (materials, supplies etc.)	• RMK applications • State allocations • External grants
e.	Leverage on global, national, and state biodiversity events as platforms for building targeted awareness and participation.	-	✓	500,000	• Annual events	• State allocations • Sabah Biodiversity Fund

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
f.	Enhance the use of digital tools including social media platforms and mobile applications, as well as current conventional methods (radio and television programmes) to communicate biodiversity conservation across all segments of society.	✓	-	200,000	• Occasional broadcasting costs	• Agency allocations
Action 1.2: Ingrain the importance of biodiversity within the children and youth.						
a.	Strengthen collaborations with SEEN members in enhancing biodiversity-related topics and activities within the State environmental education co-curriculum across all levels of education (pre-school, primary, secondary)	✓	✓	500,000	• Programme costs (materials, supplies, etc.)	• State allocations • Agency allocations
b.	Expand and strengthen nature centres and research sites as focal points for increasing biodiversity awareness among the children and youths through hands-on approaches such as fieldwork exposure and experiments.	✓	✓	1,000,000 500,000	• Infrastructure upgrading • Programme costs	• RMK applications • State allocations • External grants
c.	Expand programmes that enable youths to be exposed and involved in biodiversity conservation. This can include establishing nature clubs under partner organisations.	✓		200,000	• Yearly	• State allocations • Agency allocations

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Strategy 2: Strengthen the roles of indigenous peoples and local communities, civil society, the private sector, and academia in biodiversity conservation.						
Action 2.1: Empower indigenous peoples and local communities.						
a.	Develop and expand partnerships and programmes that facilitate the involvement of indigenous peoples and local communities in biodiversity conservation.	✓		700,000	• Programme costs (workshops, materials, supplies etc.)	• State allocations • Agency allocations • External grants
b.	Strengthen support to continuously enable indigenous peoples and local communities to have more effective roles in biodiversity conservation.	✓		500,000	• Capacity building workshops • Can be parked under 2.1 (a)	• State allocations • Agency allocations • External grants
c.	Continue to identify, nurture, and honour local conservation champions by showcasing effective conservation outcomes at state, national and international platforms.	✓		500,000	• Annual award ceremonies	• State allocations • Agency allocations • External grants
Action 2.2: Develop long term partnerships with civil society.						
a.	Establish a state platform for mandatory reporting of conservation projects by NGOs and CSOs, particularly those that support the Strategy.	✓		200,000	• Initial setups and meeting costs	• State allocations • Agency allocations
b.	Identify on-going or necessary research / projects that are in line with the Strategy to develop smart partnership agreements with the State Government for continuous support.		✓	-	• Internal costs	-

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Action 2.3: Harness the strength of private sector.						
a.	Establish the Sabah Business and Biodiversity Network / Council as a platform to harness private sector participation in biodiversity conservation.	✓		500,000	• Initial setups and meeting costs	• State allocations • Private sector co-financing
b.	Develop a state Business and Biodiversity Action Plan in line with the Business and Biodiversity Strategic Roadmap to align the roles and responsibilities of the private sector towards biodiversity conservation.	✓		700,000	• Consultancy costs	• RMK applications • State allocations
c.	Scale up Corporate Social Responsibility (CSR) and Environment, Social and Governance (ESG) commitments and strategies on biodiversity conservation at the state level by the private sector.	✓		200,000	• Periodic meetings and annual stakeholder workshops	• State allocations • Agency allocations
d.	Develop smart partnership arrangements between the private and public sector in implementing programmes / projects that are in line with the Strategy.	-	-	-	• Internal costs	-
Action 2.4: Enhance stakeholder participation in decision-making process.						
a.	Strengthen the public consultation process to ensure feedback pertaining to impacts on biodiversity have been included in decision-making outcomes during the formulation of state policies, plans, and projects.	-	-	-	• Internal costs	-
b.	Ensure the continuity of the public consultation process in the gazettement, management and excision of areas that are important for biodiversity and that stakeholder feedback have been taken into consideration in decision-making outcomes.	-	-	-	• Internal costs	-

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
c.	Strengthen the public consultation process during planning approvals and impact assessments of development projects that have impacts on biodiversity to ensure that feedback have been taken into consideration in decision-making outcomes.	-	-	-	• Internal costs	-
d.	Adopt and implement the Free, Prior, and Informed Consent (FPIC) / Prior and Informed Consent (PIC) process for projects that affect indigenous peoples and local communities.	-	-	-	• Internal costs	-
Action 2.5: Strengthen collaborations with the academic community.						
a.	Establish research collaborations to address knowledge gaps in critical areas to improve conservation interventions, as well as efforts to socialise findings to the general public.	✓		500,000	• Periodic events	• State allocations • Agency allocations
b.	Strengthen the functions and promote the utilisation of the Sabah Biodiversity Information Integrated System (SaBIIS) as a reliable state biodiversity information system and as a platform for collaboration between researchers, protected area and resource managers, and other relevant stakeholders.	✓	✓	500,000 400,000	• Promotion events • Yearly system maintenance	• State allocations • Agency allocations
c.	Monitor specimen depositories and records, taking into account current and future trends, to safeguard Sabah's biodiversity collections.	-	-	-	• Existing operating costs	-
GOAL 2: ALL DIRECT AND INDIRECT PRESSURES ON SABAH'S BIODIVERSITY HAVE BEEN SIGNIFICANTLY REDUCED						
Strategy 3: Incorporate biodiversity conservation into terrestrial and marine spatial planning in Sabah.						
Action 3.1: Strengthen biodiversity conservation elements in the state development plans.						
a.	Mainstream the ecosystem-based approach to ensure that state and district-level development plans integrate Environmentally Sensitive Areas and important biodiversity areas, ensuring that development in these areas are avoided.	✓		1,000,000	• Review of Sabah Structure Plan • Development of district plans	• RMK allocations • State allocations • Agency allocations

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
b.	Conduct an integrated mapping exercise to expand spatial planning to include all marine areas beyond Sabah's EEZ up to international marine borders within the relevant planning documents.	✓		1,000,000	• Consultancy costs	• State allocations • Agency allocations • External grants
Action 3.2: Enhance biodiversity conservation in urban and rural areas.						
a.	Improve urban and rural area planning and design to adopt low carbon approaches such as conserving/establishing urban forests, green lungs, and blue spaces as part of climate adaption strategies while also maintaining and enhancing ecosystem services.	✓		800,000	• Periodic internal / external training	• State allocations • Agency allocations • External grants
b.	Develop local council capacities through targeted training / personnel exchange programmes to improve biodiversity conservation planning in urban and rural landscapes.	✓		800,000	• Periodic internal / external training	• State allocations • Agency allocations • External grants
c.	Establish community-based programs as part of the key initiatives in the protection and maintenance of urban rivers, especially severely polluted rivers.	✓		1,000,000	• Consultancy and PR costs • Materials, equipments • Events costs	• State allocations • Agency allocations • External grants
d.	Review and update the Town and Country Planning Ordinance to promote urban and rural biodiversity conservation for new townships through effective utilisation and management of vacant land.	✓		500,000	• Consultancy costs	• State allocations • Agency allocations

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Strategy 4: Mainstream biodiversity conservation into Sabah's public and private development frameworks						
Action 4.1: Strengthen safeguards for biodiversity conservation in Sabah's financial sector.						
a.	Commission a study to explore the feasibility of establishing a state-level System of Environmental and Economic Accounting (SEEA) framework that acknowledges biodiversity and ecosystem service values in the state's economy.	✓		800,000	• Consultancy costs inc. stakeholder engagements	• State allocations • Agency allocations • External grants
b.	Mainstream the Sustainable and Responsible Taxonomy for Biodiversity to guide sustainable and responsible investment and financing that avoids / minimises impacts towards biodiversity and supports conservation.	✓		800,000	• Stakeholder workshops and events • Training costs (materials, printing)	• State allocations • Agency allocations
c.	Develop a state framework for biodiversity-related financial disclosure to regulate and support biodiversity reporting and risk assessments by private companies.	✓		500,000	• Consultancy costs • Stakeholder engagements	• State allocations • Agency allocations
Action 4.2: Incorporate biodiversity conservation principles into the infrastructure, industrial, energy, and health sectors.						
a.	Enforce the need for new linear infrastructure developments proposed in the Sabah Structure Plan to include and implement measures to avoid, minimize, and mitigate habitat fragmentation.	-	-	-	• Internal costs	-
b.	Encourage development of large-scale renewable energy production facilities that do not incur clearing of terrestrial habitats or deter/disrupt hydrological and coastal ecological process (especially for micro-, small-hydropower, and biogas projects) through government incentives and tax breaks.	-	-	-	• Internal costs	-

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
c.	Mainstream the need for Marine Wildlife Observers onboard seismic exploration vessels and other oil and gas exploration within Sabah's EEZ waters to minimise impacts on marine wildlife.	✓		500,000	• Periodic awareness / training events	• Agency allocations • Private sector co-financing
Action 4.3: Strengthen the biodiversity assessment and monitoring process during project development planning.						
a.	Embed biodiversity conservation principles as part of efforts to mainstream environmental protection during the early stages of development in line with the 3rd edition of the Sabah EIA handbook.	✓		500,000	• Consultancy costs	• State allocations • Agency allocations
b.	Develop a biodiversity assessment toolkit as a guide for project proponents to conduct proper assessments during development planning in accordance with the mitigation hierarchy for Importance Biodiversity Areas and Environmentally Sensitive Areas.	✓		500,000	• Consultancy costs inc training	• State allocations • Agency allocations
Action 4.4: Strengthen safeguards to minimise pressures from mining / quarrying developments.						
a.	Ensure that new mining projects take into account and adhere to all relevant legislations and procedures, as well as national and state commitments to avoid important biodiversity and environmentally sensitive areas.	-	-	-	• Internal costs	-
Strategy 5: Sabah's forest governance and management has been strengthened to support biodiversity conservation						
Action 5.1: Strengthen state forest governance and regulations.						
a.	Review and strengthen the regulations under the Sustainable Forest Management License Agreement (SFMLAs) to ensure optimal economic and conservation outcomes from each forest management unit.	✓	-	300,000	• Stakeholder workshops	• Agency allocations
b.	Incorporate the High Conservation Value (HCV) approach within the decision-making process of allocating forest management units, industrial tree plantation (ITP) areas, and maintaining community forests.	✓	-	300,000	• Stakeholder workshops	• Agency allocations

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Action 5.2: Enhance sustainable forest management practices and capacities in the forestry sector.						
a.	Ensure that all forest management plans are developed and reviewed through a participatory process that considers inputs of all stakeholders including NGOs and IPLCs.	✓	-	500,000	• Per management plan (inc. stakeholder engagements and consultancy costs)	• State allocations • Agency allocations
b.	Ensure all SFMLAs adopt the HCV approach to ensure that environmentally and socially sensitive areas are avoided.	-	-	-	• Internal costs	-
c.	Expand social forestry and co-management approaches to strengthen management of forest resources while also improving socio-economic levels of IPLCs.	✓	✓	800,000	• Consultancy costs • Stakeholder engagements and training • Monitoring	• State allocations • Agency allocations • NCTF • Sabah Biodiversity Fund
d.	Strengthen the capacities of foresters and forest rangers in sustainable forest management and certification, especially at the FMU level.	✓	-	500,000	• Depending on number of foresters and rangers to be trained • Can be parked as annual / bi-annual training plan	• State allocations • Agency allocations • NCTF • Sabah Biodiversity Fund

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Action 5.3: Leverage on technology advancements to enhance forest monitoring and reporting.						
a.	Develop, strengthen, and incorporate remote sensing capacities of all stakeholders related to forestry management to enhance forestry planning, monitoring and enforcement.	✓	-	800,000	• Depending on number of foresters and rangers to be trained • Can be parked as annual / bi-annual training plan	• State allocations • Agency allocations • NCTF • Sabah Biodiversity Fund
Strategy 6: Strengthen safeguards of Sabah's freshwater and marine ecosystems.						
Action 6.1: Improve pollution control mechanisms to protect Sabah's freshwater ecosystems.						
a.	Assess the permissible pollution loads of major river basins and severely contaminated rivers through the Total Maximum Daily Load (TMDL) approach within Integrated River Basin Management (IRBM) plans in Sabah.	✓		1,200,000	• For each IRBM study	• RMK allocations • State allocations • Agency allocations
b.	Synchronize the yearly water resource quality monitoring programmes in major river systems within integrated databases for data collection and dissemination.	-	✓	300,000	• Periodic synchronization meetings / workshops	• Agency allocations
c.	Include long-term monitoring of the effects of emerging pollutants in major rivers within the Sabah water resource study programme and revise pollution concentration standards	✓	-	1,000,000	• Consultancy costs	• RMK allocations • State allocations • Agency allocations

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
d.	Expedite gazettement of riparian corridors to minimise potential pollution from surrounding land use into rivers under the Sabah water resource study programme.	✓		500,000	• Ground-truthing costs	• State allocations • Agency allocations
e.	Conduct programs to rehabilitate degraded urban rivers under the Sabah River Development, Protection and Maintenance Program.	✓		1,000,000	• Consultancy and PR costs • Materials, equipments • Events costs	• RMK allocations • State allocations • Agency allocations
f.	Develop an industrial guideline for wastewater treatment for effluent control to be included in the Sabah Water Resources Program.	✓		500,000	• Consultancy costs	• State allocations • Agency allocations
Action 6.2: Reduce land-based and sea-based pollution sources to protect the marine ecosystems.						
a.	Improve waste management regulations and protocols to reduce marine litter from major contributing sectors such as shipping industries, marine capture fisheries, tourism, coastal developments, residential areas, and agriculture.	✓	-	1,000,000	• Consultancy costs inc. stakeholder workshops • Materials printing	• State allocations • Agency allocations
b.	Strengthen regulations to include conservation and rehabilitation of coastal and marine ecosystems for coastal mining and dredging activities	✓	-	200,000	• Stakeholder workshops	• State allocations • Agency allocations

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
c.	Conduct a marine pollution baseline survey to identify areas that are severely polluted.	✓	-	1,000,000	• Consultancy costs inc. equipment and sampling	• State allocations • Agency allocations • NCTF • Sabah Biodiversity Fund
d.	Establish a standardised monitoring program with relevant criteria for marine debris at polluted areas from the marine pollution baseline survey.	✓	-	500,000	• Consultancy costs inc. stakeholder workshops	• State allocations • Agency allocations
Action 6.3: Strengthen efforts to reduce plastic pollution into freshwater and marine ecosystems.						
a.	Strengthen state regulations towards minimising single-use plastics as well as management of plastic waste.	✓	-	300,000	• Stakeholder workshops • Awareness events	• State allocations • Agency allocations
b.	Strengthen advocacy for the adoption of biodegradable materials in the food and beverage sector (and other relevant commercial sectors) as a substitute to plastic.	✓	-	300,000	• Stakeholder workshops • Awareness events	• State allocations • Agency allocations
c.	Leverage on recent research advancements on bioplastics and advocate for commercial production of more biodegradable materials.	✓	-	300,000	• Stakeholder workshops • Awareness events	• State allocations • Agency allocations

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Strategy 7: Strengthen management and utilisation of Sabah's agrifood, agricommodity, and fisheries resources.						
Action 7.1: Strengthen sustainable agrifood and agricommodity practices.						
a.	Provide incentives to agrifood and agricommodity players to encourage transitioning to modern farming techniques that incorporate habitat conservation practices as well as addressing human-wildlife conflicts, and being climate resilient.	✓	-	500,000	• Stakeholder workshops • Awareness events	• State allocations • Agency allocations • Private sector
b.	Diversify agricommodity plantations with high value crops such as cocoa, durian, avocado, pineapple, paddy, coffee, coconut, and highland vegetables	✓	-	Based on national budget allocations	• Supplies • Capacity building	• RMK allocations • State allocations
c.	Provide incentives and technical support to agrifood and agricommodity companies and smallholders in achieving certification under relevant sustainability schemes (RSPO, MSPO, MyGAP) and supporting state targets for full sustainability certification	✓	-	500,000	• Stakeholder workshops • Awareness events	• State allocations • Agency allocations • Private sector
d.	Review and strengthen all relevant regulations to ensure expansion of agrifood and agricommodity plantations do not encroach into areas of high biodiversity value	✓	-	300,000	• Stakeholder workshops • Awareness events	• State allocations • Agency allocations
e.	Develop a traceability system to improve transparency and accountability of Sabah's agrifood and agricommodity throughout the supply chain	✓	✓	1,000,000 200,000	• Consultancy costs + system set-up • System maintenance (annually)	• State allocations • Agency allocations

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
f.	Expand on post-harvest loss minimization programmes for smallholders, especially for targeted crops	✓	-	500,000	• Awareness events • Training / capacity building	• State allocations • Agency allocations • Private sector
Action 7.2: Reduce the impact of fisheries on marine and coastal biodiversity.						
a.	Formulate the Sabah Deep Sea Fishing Masterplan to provide policy direction, standards, actions, and enablers to transition the fisheries industry towards sustainability.	✓	-	1,000,000	• Consultancy costs inc. stakeholder engagements	• State allocations • Agency allocations • EFT • Extrnal grants
b.	Expand fishery conservation zones through the seascape management approach to allow for recovery of commercial and small-scale fish stocks.	✓	-	500,000	• Stakeholder workshops • Awareness events	• State allocations • Agency allocations • EFT • External grants
c.	Develop and implement species-based fisheries management plans that incorporate conservation management interventions such as slow speed zones, restricted and environmentally friendly fishing gear, seasonal closures, and other management approaches.	✓	-	500,000	• Per management plan (inc. stakeholder engagements and consultancy costs)	• State allocations • Agency allocations • EFT

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
d.	Strengthen the state enforcement and legislative framework to establish community-based enforcement on illegal, unreported, and unregulated (IUU) fishing such as fish bombing and cyanide fishing.	✓	✓	2,000,000	• Stakeholder workshops + capacity building • Enforcement funding inc. equipment + human resources	• State allocations • Agency allocations • External grants
e.	Implement appropriate mitigation techniques and bycatch reduction devices to reduce bycatch of non-target fish species and marine megafauna.	✓	✓	1,000,000	• Stakeholder workshops + capacity building / training	• State allocations • Agency allocations • External grants • Private sector
f.	Establish suitable databases and applications to enhance accuracy of fisheries catch reporting, as well as improving adaptive management capacities on seafood traceability	✓	✓	1,000,000 200,000	• Consultancy costs + system set-up • System maintenance (annually)	• State allocations • Agency allocations • Private sector
g.	Strengthen incentives and technical support to fisheries operators in achieving certification under relevant sustainability schemes, especially for live reef food fish production.	✓	-	500,000	• Stakeholder workshops • Awareness events	• State allocations • Agency allocations • Private sector

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Action 7.3 Strengthen aquaculture planning and management.						
a.	Review and strengthen regulations for the Aquaculture Industrial Zone to ensure expansion of aquaculture farms do not encroach, convert, and degrade coastal and marine habitats.	✓	-	300,000	• Stakeholder workshops (periodic) • Awareness events (periodic)	• State allocations • Agency allocations
b.	Strengthen research advancements to increase aquaculture productivity and sustainability while maintaining ecosystem services, minimising environmental impacts, and increasing resilience to climate change.	✓	-	500,000	• Periodic research financing	• NCTF • Sabah Biodiversity Fund • External Grants
c.	Improve awareness, funding and technical support to aquaculture farmers in achieving certification under relevant sustainability schemes such as MyGAP and Aquaculture Stewardship Council (ASC).	✓	-	500,000	• Stakeholder workshops (periodic) • Awareness events (periodic)	• Agency allocations • External grants
d.	Strengthen human resource and technical capacities on certification compliance and enforcement.	✓	✓	500,000	• Capacity building and training costs	• State allocations • Agency allocations
e.	Redirect, reform, or remove perverse and harmful economic subsidies to facilitate transition towards sustainable aquaculture production.	✓	-	300,000	• Stakeholder workshops	• Agency allocations
f.	Showcase environmentally friendly aquaculture projects that demonstrate sustainable aquaculture practices, as well as being climate resilient, as part of mainstreaming efforts.	✓	-	500,000	• Publicity events	• Agency allocations • External grants

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Action 7.4 Strengthen genetic diversity conservation of cultivated plants, farmed and domesticated animals, and their wild relatives.						
a.	Increase public awareness on the importance of conserving genetic diversity of wild relatives of cultivated plants, farmed and domesticated animals, as well as cultivation of protected plants and farming of protected wildlife species.	✓	-	500,000	• Awareness events (periodic)	• Agency allocations • External grants
b.	Expand active management actions for the recovery and conservation of the genetic diversity of cultivated plants, farmed and domesticated animals, and their wild relatives.	✓	✓	1,500,000	• Materials & equipment costs • Human resources	• Agency allocations • External grants • NCTF • Sabah Biodiversity Fund
c.	Develop and implement sufficient safeguards into biodiversity prospecting to ensure biological resources in the wild are not depleted.	✓	✓	300,000 800,000	• Consultancy costs (safeguard development) • Implementation	• Agency allocations • External grants
d.	Ensure conservation and sustainable utilisation of other agricultural biodiversity / genetic resources for food and agriculture (GRFA) including microorganisms and insects, as well as the benefits arising from it are shared equitably to all parties.	-	✓	300,000	• Stakeholder workshops	• Agency allocations
e.	Develop a state-level agricultural biodiversity management plan to ensure nutrition, food security, livelihoods, health, and well-being, particularly for vulnerable communities, are secured.	✓	-	500,000	• Consultancy costs	• State allocations • Agency allocations

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Strategy 8: Enhance the synergies between Sabah's tourism and biodiversity conservation.						
Action 8.1: Enhance tourism development to support biodiversity conservation.						
a.	Revise the Sabah Tourism Master Plan to include a business development element that incorporates biodiversity conservation principles and criteria within investments and concessionaire agreements.	✓	-	1,000,000	• Consultancy costs	• RMK allocations • State allocations • Agency allocations
b.	Review (or assess) the current carrying capacities of major tourism and ecotourism sites in Sabah (inc. marine islands) to improve the protection of these areas from visitor impacts and identify additional supporting sites to help disperse visitor influx and minimise impacts towards natural ecosystems and biodiversity.	✓	-	800,000	• Consultancy costs	• State allocations • Agency allocations • External grants
c.	Develop and showcase model ecotourism sites that display synergies between ecotourism and biodiversity conservation.	✓	-	800,000	• Per site • Awareness and publicity events • Site development & capacity building	• State allocations • Agency allocations • External grants • NCTF • Sabah Biodiversity Fund

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
d.	Assess the feasibility of implementing conservation taxes or fees on tourists (domestic and foreign) or re-channelling existing taxation / fee systems to improve maintenance of major tourism sites or to be used for conservation activities.	✓	-	500,000	• Consultancy costs	• State allocations • Agency allocations • External grants
Action 8.2: Facilitate and strengthen sustainable tourism certification and capacities.						
a.	Encourage and support tourism operators to participate in sustainable tourism certification schemes, specifically those focusing on community-based tourism standards such as GSTC and ASEAN community-based indicators	✓	-	500,000	• Annual training / capacity building programmes	• Agency allocations • External grants • Private sector
b.	Develop and implement training programmes to upskill managers and operators to meet international tourism standards that balance tourism development and biodiversity conservation	✓	-	500,000	• Annual training / capacity building programmes	• Agency allocations • External grants • Private sector
Action 8.3: Promote and develop community-based tourism and voluntourism						
a.	Establish a community-based tourism network to improve collaborations and knowledge sharing between site managers (inc. community leaders) and tourism operators.	✓	-	300,000	• Initial establishment costs (meetings/workshops)	• Agency allocations

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
b.	Engage and empower indigenous peoples and local communities living in and around nature tourism sites as active participants in planning and implementation to improve livelihoods while strengthening protection of sites.	✓	-	500,000	• Annual training / capacity building programmes	• Agency allocations • External grants • Private sector
c.	Promote and support community-based tourism for agro-tourism, birding, caving, and diving activities while respecting local customs and minimising impacts to the natural ecosystem and biodiversity.	✓	-	500,000	• Awareness events (periodic)	• Agency allocations • External grants • Private sector
d.	Develop volunteer placements and internships at ecotourism sites that enable tourists to experience hands-on conservation work.	-	-	-	• Internal costs	-
GOAL 3: ALL OF SABAH'S KEY ECOSYSTEMS, SPECIES AND GENETIC DIVERSITY HAVE BEEN SAFEGUARDED.						
Strategy 9: Conserve at least 30% of Sabah's terrestrial and inland waters, and 15% of coastal and marine areas through an effectively managed and ecologically representative system of protected areas and other effective area-based conservation measures.						
Action 9.1: Strengthen and streamline governance of Sabah's protected areas.						
a.	Operationalize the Sabah Protected Area working group to streamline governance and management with Federal and Sarawak regions according to the National Framework on Protected Areas.	✓	-	200,000	• Initial establishment costs (meetings/workshops)	• Agency allocations • Sabah Biodiversity Fund

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
b.	Strengthen and harmonize existing protected area legislation, and create new regulations where required, to meet global best practice standard.	-	✓	200,000	• Stakeholder workshops	• Agency allocations • Sabah Biodiversity Fund
Action 9.2: Enhance management effectiveness of Sabah's protected area						
a.	Ensure all protected areas in Sabah have management plans. This includes formulating/revising management plans for: • Kota Belud - Tempasuk Wildlife Sanctuary • Lower Kinabatangan-Segama Wetlands • Tun Sakaran Marine Protected Area • Turtle Island Parks (application for ASEAN protected status)	✓	-	500,000	• Per management plan (inc. stakeholder engagements and consultancy costs)	• Agency allocations • Sabah Biodiversity Fund • EFT • NCTF
b.	Conduct management effectiveness assessments and consolidate the findings to identify key areas for improvement at the site and system levels.	✓	-	500,000	• Per site (inc. stakeholder engagements and consultancy costs)	• Agency allocations • Sabah Biodiversity Fund • EFT • NCTF

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
c.	Encourage Sabah's best managed protected areas to achieve international certification and recognition. This includes: • Nominating the Lower Kinabatangan as a Man and Biosphere reserve • Nominating the Maliau Basin, Danum Valley, and Imbak Canyon as UNESCO World Heritage sites • Nominating the Klias Peninsula as a Ramsar site • Candidate sites for certification as IUCN Green List sites (Danum Valley Conservation Area, Pin Supu FR, Sook Lake FR and Tun Mustapha Marine Protected Area)	✓	-	500,000	• Documentation costs (inc. stakeholder engagements and consultancy costs)	• Agency allocations • Sabah Biodiversity Fund • EFT
Action 9.3: Expand the extent and representativeness of Sabah's protected area network.						
a.	Identify priority sites for protected area expansion based on important ecological criteria. Potential sites include includes: • Ulu Padas primary forest • Padang Teratak water bird habitat (800 ha.) • Tempasuk plains critical water bird habitat (1,500 ha.) • Weston Menumbok, Beluran, Paitan, Pitas mangroves • Segama river corridor (to connect Danum, Ulu Segama Complex, Lower Segama Conservation Area & Tabin) • Mabul – Pom Pom seascape • Darvel Bay • Brunei Bay • Mengalum and Ligitan coral reefs • Turtle Islands expansion	✓	-	500,000	• Documentation costs (inc. stakeholder engagements and consultancy costs)	• Agency allocations • Sabah Biodiversity Fund • EFT
b.	Include members from civil society and IPLCs into the Sabah Protected Area working group as key stakeholders to work towards the gazettal of identified priority sites.	-	✓	100,000	• Initial meeting costs (workshop / awareness / training)	• Agency allocations • Sabah Biodiversity Fund

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Action 9.4: Identify and recognise other effective area-based conservation measures (OECM).						
a.	Leverage on the national framework to streamline Sabah's recognition of OECMs in line with international standards and national/state circumstances.	-	✓	200,000	• Stakeholder consultation costs (workshops, forums)	• Agency allocations • Sabah Biodiversity Fund
b.	Identify sites that qualify as OECM through scientific and technical-based criteria.	✓	-	500,000	• Fieldwork • Documentation & consultancy costs • Stakeholder workshops	• Agency allocations • Sabah Biodiversity Fund • External grants
c.	Encourage/facilitate establishment of OECM sites through appropriate recognition, governance measures, and other relevant frameworks.	-	✓	200,000	• Stakeholder consultation costs (workshops, forums)	• Agency allocations • Sabah Biodiversity Fund
d.	Develop/strengthen appropriate policy, regulatory, and management frameworks that secure and recognize Community Conserved Areas (CCAs), Locally Managed Marine Areas (LMMAs), Conservation Units (CU), and Community Protocols (CP) across landscapes and seascapes, as part of the OECM network.	-	✓	200,000	• Stakeholder consultation costs (workshops, forums)	• Agency allocations • Sabah Biodiversity Fund

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Strategy 10: Sustainably manage and restore Sabah's threatened natural ecosystems.						
Action 10.1: Expand ecosystem mapping and vulnerability assessment.						
a.	Expand mapping and documentation of marine HCVAs, while updating terrestrial HCVA maps, to classify and rank threatened ecosystems to aid restoration planning.	✓	-	500,000	• Fieldwork • Documentation & consultancy costs • Stakeholder workshops	• EFT • Agency allocations • Sabah Biodiversity Fund • External grants
b.	Establish and develop a Geospatial Mapping Unit at Sabah Biodiversity Centre to coordinate mapping of threatened ecosystems in Sabah.	✓	✓	500,000 300,000	• Capacity building / training • Annual software license renewals	• State allocations • Agency allocations
Action 10.2: Restore degraded ecosystems.						
a.	Identify and prioritize sites for restoration, including ecological corridors and natural habitats that have been degraded from anthropogenic or natural stresses, based on the Sabah Red List of Threatened Ecosystem study.	✓	-	500,000	• Fieldwork • Documentation & consultancy costs • Stakeholder workshops	• EFT • Agency allocations • NCTF • MFF • Sabah Biodiversity Fund • External grants

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
b.	Facilitate restoration efforts using science-based methodologies appropriate to site-specific conditions and restoration objectives. This can include: • Agroforestry or regenerative agriculture techniques to restore ecological connectivity across monoculture landscapes. • Deployment of artificial reefs to increase coral cover. • Establish well monitored coral nurseries to assist rehabilitation of degraded coral reefs. • Restoration of sea grass beds.	✓	-	2,000,000	• Fieldwork + materials & equipments • Consultancy costs • Stakeholder workshops	• Agency allocations • NCTF • Sabah Biodiversity Fund • MFF • External grants • Private sector
Action 10.3: Maintain and enhance ecosystem resilience to disturbances.						
a.	Enhance research to further develop understanding of multi-scale patterns and processes that determine ecological and spatial resilience of both landscapes and seascapes, as well as species populations.	✓	-	2,000,000	• Fieldwork + materials & equipments • Consultancy costs • Stakeholder workshops	• RMK allocations • Agency allocations • NCTF • Sabah Biodiversity Fund • External grants • Private sector
b.	Incorporate spatial resilience factors into the management of protection and production landscapes.	✓	-	500,000	• Consultancy costs • Stakeholder workshops	• Agency allocations • External grants

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
c.	Strengthen efforts to monitor spatial and temporal changes towards landscapes and seascapes, as well as impacts of anthropogenic activities and climate change	✓	-	2,000,000	• Fieldwork + materials & equipments • Consultancy costs • Stakeholder workshops	• RMK allocations • Agency allocations • NCTF • Sabah Biodiversity Fund • External grants • Private sector
Strategy 11: Secure important ecological corridors in Sabah and enhance the resilience of terrestrial, freshwater, and marine ecosystems.						
Action 11.1: Strengthen and expand Sabah's terrestrial ecological connectivity						
a.	Formulate the State Masterplan for ecological linkages to identify major ecological corridors to be protected. The Masterplan should include: • Ecological corridor between Lower Kinabatangan Wildlife Sanctuary, Kulamba Wildlife Reserve, and Tabin Wildlife Reserve. • Freshwater corridor between the Lokan River and Bkt. Garam along the middle of the Kinabatangan River. • River corridor between Segama River, Kiulu Valley, Papar River. • Transboundary connectivity for the Heart of Borneo (HoB) e.g., South of Sabah linking to North Kalimantan.	✓	-	1,500,000	• Consultancy costs • Stakeholder workshops	• RMK allocations • Agency allocations • NCTF • Sabah Biodiversity Fund • External grants

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
b.	Strengthen (and expand) the representativeness of the Kinabalu ECOLINC.	✓	-	1,000,000	• Consultancy costs • Capicity building / training • Stakeholder workshops	• Agency allocations • EFT • NCTF • External grants
c.	Enhance and expand connectivity within and outside the HoB while also limiting activities that will degrade the HoB.	✓	-	1,000,000	• Consultancy costs • Stakeholder workshops	• Agency allocations • EFT • NCTF • External grants • Private sector
Action 11.2: Strengthen and expand Sabah's marine ecological connectivity						
a.	Formulate the State masterplan for ecological linkages to identify major ecological corridors to be protected. Examples include: • Darvel Bay seascape • Mabul - Pom Pom seascape	✓	-	1,500,000	• Consultancy costs • Stakeholder workshops • Similar with 11.1 (a)	• RMK allocations • Agency allocations • NCTF • Sabah Biodiversity Fund • External grants

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
b.	Strengthen management of the Tun Mustapha Marine Protected Area, specifically on the legislation framework to push for enhanced regulations.	✓	-	1,000,000	• Consultancy costs • Stakeholder workshops	• Agency allocations • EFT • NCTF • Sabah Biodiversity Fund • External grants
c.	Strengthen marine transboundary connectivity under the Coral Triangle Initiative through continuous research and collaborative actions to address transboundary issues.	✓	-	1,000,000	• Consultancy costs • Stakeholder workshops	• Agency allocations • EFT • NCTF • Sabah Biodiversity Fund • External grants
Strategy 12: Enhance management actions to enable conservation and recovery of Sabah's threatened species.						
Action 12.1: Strengthen and expand targeted and science-led species conservation plans.						
a.	Develop a biodiversity dashboard to report on the status of Sabah's keystone flora and fauna to identify species that require conservation interventions.	✓	-	800,000	• Consultancy costs • Stakeholder workshops	• Agency allocations • NCTF • Sabah Biodiversity Fund • External grants

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
b.	Enhance collaboration to monitor and share data on threatened species population using appropriate techniques and technology.	✓	-	500,000	• Stakeholder workshops • Capacity building / training	• Agency allocations • NCTF • Sabah Biodiversity Fund • External grants
c.	Formulate, update, and implement science-based conservation actions plan for Sabah's severely threatened species, including monitoring and evaluation of population trends.	✓	✓	1,000,000	• Per conservation plan (inc. stakeholder engagements and consultancy costs)	• Agency allocations • NCTF • Sabah Biodiversity Fund • External grants
d.	Study and monitor the impacts of climate change on threatened species and its habitat.	✓	✓	1,000,000	• Stakeholder workshops • Consultancy osts	• Agency allocations • NCTF • Sabah Biodiversity Fund • External grants
Action 12.2: Enhance technical capacities for ex-situ conservation.						
a.	Strengthen collaborative efforts towards conservation breeding programmes using latest techniques and technology to help guide recovery of severely threatened plants and wildlife.	✓	✓	1,000,000	• Materials & equipment • Other operational expenditures	• NCTF • External grants

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
b.	Enhance seed and germplasm gene banks for plants, animals, fungi, and microorganisms.	-	✓	1,000,000	• Operational costs	• NCTF • External grants
Action 12.3: Adopt scientific and co-existence approaches to address human-wildlife conflicts.						
a.	Establish collaborative partnerships between commodity companies, smallholders, IPLC, and researchers to develop and implement holistic and science-based adaptive management strategies to reduce and mitigate human-wildlife conflicts and promote co-existence in agriculture landscapes and forest fringes.	✓	-	800,000	• Stakeholder workshops • Capacity building / training	• Agency allocations • Sabah Biodiversity Fund • External grants • Private sector
b.	Scale-up outreach and education programmes for key stakeholders including local government and local communities to reduce and mitigate human-wildlife conflicts in urban and rural areas, as well as marine areas.	✓	-	800,000	• Stakeholder workshops • Capacity building / training	• Agency allocations • Sabah Biodiversity Fund • External grants • Private sector
c.	Review the Sabah Wildlife Conservation Enactment 1997 to incorporate regulations pertaining to safe, ethical, and humane human-wildlife interaction.	-	✓	200,000	• Stakeholder consultation costs (workshops, forums)	• Agency allocations • Sabah Biodiversity Fund

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Action 12.4: Strengthen conservation of threatened migratory species.						
a.	Scale-up research, monitoring, and reporting of migratory species (terrestrial and marine), including migratory pathways and stopover sites.	✓	-	1,000,000	• Stakeholder workshops • Fieldwork + equipment and materials	• Agency allocations • NCTF • Sabah Biodiversity Fund • External grants
b.	Incorporate research and monitoring outputs on migratory sites and pathways into terrestrial and marine spatial planning, and area-based conservation measures.	✓	-	500,000	• Stakeholder workshops • Capacity building / training	• Agency allocations
c.	Review the Wildlife Conservation Enactment 1997 to ensure that rare, threatened, and endangered (RET) migratory species are legally protected.	-	✓	200,000	• Stakeholder consultation costs (workshops, forums)	• Agency allocations • Sabah Biodiversity Fund

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
d.	Identify and recognize more sites under relevant migratory networks. This includes: • Lower Kinabatangan-Segama RAMSAR site • Coral Triangle Initiative • Turtle Islands Heritage Protected Area • Tempasuk Plain (inc. Kuala Abai) • Lok Kak area • Kota Kinabalu Wetland • Likas lagoon • Sulu-Sulawesi Marine Ecoregion • Brunei Bay • Tun Mustapha Marine Mark • Darvel Bay • Libaran, Lankayan dan Mantanani islands	✓	-	500,000	• Per site • Stakeholder workshops	• Agency allocations • EFT • External grants
e.	Develop and implement management plans for migratory sites that are under threat from anthropogenic pressures.	✓	✓	500,000	• Per management plan (inc. stakeholder engagements and consultancy costs)	• Agency allocations • NCTF • Sabah Biodiversity Fund • External grants
f.	Enhance regional cooperation on migratory species monitoring.	✓	-	500,000	• Stakeholder workshops • Capacity building / training	• Agency allocations • External grants

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Strategy 13: Strengthen enforcement actions to significantly reduce poaching, illegal harvesting, and illegal trade of flora and fauna.						
Action 13.1: Combat poaching and illegal harvesting of flora and fauna.						
a.	Expand and strengthen collaborative ecosystems, especially Ops Khazanah and the Wildlife Crime Bureau for effective patrolling, monitoring, and enforcement throughout terrestrial and marine landscapes.	✓	✓	2,000,000	• Capacity building / training • Materials & equipment	• RMK allocations • Agency allocations • EFT • External grants
b.	Expand and strengthen programmes and incentives to hire IPLC as well as retired police, foresters, and army personnel as honorary patrollers to increase enforcement capacities.	✓	-	1,000,000	• Capacity building / training • Materials & equipment	• RMK allocations • Agency allocations • EFT • External grants
c.	Strengthen support for all patrollers, in terms of financial compensation and protection, personal safety, as well as training and equipment.	-	-	-	• Part of 13.1(a) costs	-
d.	Leverage on advancing technology, including remote surveillance, monitoring, and reporting tools to enable data-driven and intelligence-led adaptive management of patrolling and enforcement.	✓	-	1,000,000	• Capacity building / training • Materials & equipment	• RMK allocations • Agency allocations • EFT

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
						• External grants
Action 13.2: Combat illegal trade of flora and fauna in and from Sabah, including transboundary and regional networks.						
a.	Establish joint engagement platforms with relevant enforcement authorities to develop appropriate interventions along all points of the illegal trade chain.	✓	✓	1,000,000	• Capacity building / training • Materials & equipment	• Agency allocations • EFT • External grants
b.	Strengthen assessments of products being imported/licensed, particularly those containing or claiming to contain wildlife products.	✓	-	500,000	• Capacity building / training • Materials & equipment	• Agency allocations • External grants
c.	Improve the detection of illegal shipments through systematic and regular monitoring using enhanced equipment and techniques.	✓	-	1,000,000	• Capacity building / training • Materials & equipment	• Agency allocations • External grants
d.	Revive the Transboundary Wildlife Crime taskforce to curb smuggling of wildlife across the border.	✓	-	500,000	• Capacity building / training	• State allocations • Agency allocations
e.	Improve training and capacities to ensure survivability of live confiscated wildlife and facilitation of repatriation process with origin countries	✓	-	1,000,000	• Capacity building / training • Materials & equipment	• Agency allocations • External grants

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Action 13.3: Reduce demand through increased public awareness and behavioural change.						
a.	Work with civil society organization and non-governmental organization to harness public participation initiatives to support law enforcement, such as through citizen science and AI machine learning for reporting suspected incidences of poaching, illegal harvesting, trafficking, and sale of protected species.	-	✓	800,000	• Annual events • Capacity building / training	• State allocations • Agency allocations • External grants
b.	Collaborate with a range of businesses including restaurants, pet shops, aquarium traders and traditional medicine practices to remove RTE species and their derivatives from the supply chain.	-	✓	500,000	• Capacity building / training	• Agency allocations • External grants
c.	Conduct awareness and education programmes to the local communities and tourists to reduce demand for wild meat consumption.	-	✓	500,000	• Awareness events	• Agency allocations • Sabah Biodiversity Fund • External grants
Action 13.4: Strengthen state legislations and institutional arrangements to improve species protection.						
a.	Review current legislations and institutional frameworks to effectively address the conservation and protection of marine and freshwater biodiversity.	-	✓	200,000	• Stakeholder consultation costs (workshops, forums)	• Agency allocations
b.	Review and strengthen the regulations of industries that are directly or indirectly related to wildlife trade, including imposition of stricter penalties and fines and increasing enforcement powers of authorities.	-	✓	200,000	• Stakeholder consultation costs (workshops, forums)	• Agency allocations

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Strategy 14: Implement measures for the prevention, eradication, containment, and control of invasive alien species in Sabah.						
Action 14.1: Improve understanding and public awareness of IAS across all segments of society.						
a.	Increase research in all aspects of IAS management including their pathways and ecological impacts towards Sabah's landscape and continue development of technologies and interventions to contain and control IAS.	✓	-	1,000,000	• Capacity building / training • Materials & equipment	• State allocations • Agency allocations • External grants
b.	Educate the public on threats posed by invasive alien species and problems caused by smuggling of wild animals and plants, accidental impacts, escapes from legitimate enterprises and pet trade, and pathogen exposure.	-	✓	500,000	• Awareness events	• Agency allocations • Sabah Biodiversity Fund • External grants
c.	Strengthen information sharing and extension services to stakeholders so that prevention, control, eradication, and mitigation efforts can be effectively implemented.	-	✓	500,000	• Stakeholder workshops	• Agency allocations
Action 14.2: Initiate state response plans to contain and eradicate IAS.						
a.	Leverage on the National Action Plan on Invasive Alien Species to formulate and implement state level actions and interventions.	✓	-	500,000	• Consultancy costs + stakeholder engagements	• State allocations • Agency allocations • External grants
b.	Establish interagency platform to streamline management of invasive alien species at state level.	-	✓	200,000	• Periodic stakeholder workshops	• Agency allocations

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
c.	Identify natural ecosystem affected by IAS and develop collaborative programmes to prevent or reduce the impacts of IAS in these ecosystems.	✓	-	800,000	• Consultancy costs + stakeholder engagements • Fieldwork documentation	• State allocations • Agency allocations • NCTF • Sabah Biodiversity Fund • External grants
Action 14.3: Strengthen control measures to prevent entry and release of IAS						
a.	Enhance enforcement of legislations on the importing, trading, keeping and release of wild animals, fishes, and plants, and strengthen legislation where necessary	✓	-	800,000	• Capacity building / training	• State allocations • Agency allocations
b.	Adopt relevant provisions of international conventions that Malaysia is party to in relation to management and control of IAS at the state level	-	✓	200,000	• Periodic stakeholder workshops	• Agency allocations
c.	Enhance quarantine facilities and improve the skills and capabilities of quarantine, customs, and other border officials.	✓	-	800,000	• Capacity building / training • Facility upgrades	• State allocations • Agency allocations • External grants

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
GOAL 4: SABAH'S BIOIVERSITY IS USED SAFELY AND THE BENEFITS FROM ITS UTILISATION ARE SHARED EQUITABLY						
Strategy 15: Enhance capacities to implement Access-Benefit Sharing (ABS) framework in Sabah to realize Fair and Equitable Sharing of Benefits Arising from Biodiversity Utilization						
Action 15.1: Enhance awareness and capacities to implement the ABS framework in Sabah.						
a.	Strengthen institutional and legal capacities to enforce and operationalize the ABS framework at the State level.	✓	-	800,000	• Capacity building / training • Stakeholder workshops	• State allocations • Agency allocations
b.	Increase awareness and knowledge of ABS to users and providers of biological resources through targeted outreach programmes, training modules, and digital tools.	✓	-	1,000,000	• Capacity building / training • Stakeholder workshops • Awareness events • Material publications	• State allocations • Agency allocations
c.	Strengthen the literacy of indigenous peoples and local communities on their rights to traditional knowledge to facilitate ABS implementation.	✓	-	800,000	• Capacity building / training • Stakeholder workshops • Awareness events	• State allocations • Agency allocations • External grants
d.	Establish effective communication channels between regulating agencies and rights-holders in implementing ABS protocols.	-	✓	800,000	• Capacity building / training • Stakeholder workshops	• State allocations • Agency allocations • External grants

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Action 15.2: Document and protect traditional knowledge, innovations, and practices of indigenous and local communities.						
a.	Enhance documentation of traditional knowledge, innovations, and practices of indigenous peoples and local communities and establish MOUs that acknowledge them as rightful custodians and shared benefits from their usage.	-	✓	800,000	• Capacity building / training • Stakeholder workshops	• State allocations • Agency allocations • External grants
b.	Recognize, support, and legislate where possible, customary laws, community protocols, procedures, and other similar systems that supports traditional knowledge associated with biological resources that are used by indigenous peoples and local communities.	-	✓	500,000	• Periodic stakeholder workshops	• Agency allocations
c.	Integrate all documented traditional knowledge associated with the utilization of biological resources of indigenous peoples and local communities into the Sabah Biodiversity Information Integrated System (SaBIIS).	-	-	-	• Internal costs	-
Strategy 16: Establish and operationalize comprehensive biosafety system to manage potential and adverse impacts of modern biotechnology on biodiversity and human health.						
Action 16.1: Enhance inspection and biosafety compliance in Sabah.						
a.	Strengthen cooperation and coordination in relation to enforcement and regulatory functions of various agencies related to living-modified organisms (LMOs).	-	✓	500,000	• Periodic stakeholder workshops	• Agency allocations
b.	Leverage on national tools and guidance to strengthen the implementation of the CPB provision on transit, contained use, and unintentional or illegal transboundary movements of LMOs at the state level	-	✓	500,000	• Periodic stakeholder workshops	• Agency allocations
c.	Leverage on the national codes of best practices and procedural guidelines for handling, transport, packaging, and identification of LMOs for implementation at the state level.	-	✓	500,000	• Periodic stakeholder workshops • Capacity building /	• Agency allocations

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
					training	
d.	Strengthen mechanisms and capacities to regulate the importation, management, and use of LMOs and regulate production of LMOs arising from domestic research and development.	-	✓	500,000	• Periodic stakeholder workshops • Capacity building / training	• Agency allocations
e.	Ensure that biosafety considerations are fully embedded into relevant state policies, plans, and programmes, especially for the agriculture, aquaculture, marine and health sectors.	-	✓	500,000	• Periodic stakeholder workshops	• Agency allocations
Action 16.2: Assess the impacts of Living-Modified Organisms (LMOs) on Sabah's biodiversity and human health.						
a.	Enhance capacities and guidance for risk assessment, management, communication, together with pre-and post-approval monitoring of new LMOs based on the national guidance.	✓	-	500,000	• Periodic stakeholder workshops • Capacity building / training	• Agency allocations
b.	Integrate socio-economic impact issues and analytical frameworks into decision-making on applications for release of LMOs at the state level	-	✓	300,000	• Periodic stakeholder workshops • Capacity building / training	• Agency allocations
c.	Increase research on biosafety, including environmental impacts and safety studies for field trials of new and locally developed LMOs and its products including those developed from new technologies.	✓	-	1,000,000	• Materials & equipment • Capacity building / training	• Agency allocations • External grants
d.	Develop biology documents for primary commodities that can be used as a reference document for risk assessments.	✓	-	500,000	• Stakeholder engagements • Material costs	• Agency allocations • External grants
Action 16.3: Develop state response plans to biosafety emergencies.						
a.	Establish state emergency response plans and emergency	✓	-	800,000	• Consultancy costs	• Agency

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
	response teams to alert, contain and eradicate any harm or damage caused directly or indirectly by LMOs or its products.				• Stakeholder engagements • Capacity building / training	allocations • External grants
b.	Leverage on the national biosafety framework to strengthen state legislations for the inclusion of essential elements of liability and redress for damages resulting from the transfer, handling, release, or use of LMOs or its products in Sabah, as well as any adverse effects towards the conservation and sustainable use of biological diversity and human health	✓	-	300,000	• Stakeholder workshops • Capacity building / training	• Agency allocations
c.	Strengthen cooperation and coordination among state agencies involved in the implementation of liability and redress related to LMOs.	✓	-	200,000	• Periodic stakeholder workshops • Capacity building / training	• Agency allocations
GOAL 5: THE CAPACITIES, KNOWLEDGE, AND SKILLS OF ALL STAKEHOLDERS TO CONSERVE BIODIVERSITY IN SABAH HAS BEEN IMPROVED						
Strategy 17: Strengthen Sabah's capabilities to implement the Strategy.						
Action 17.1: Improve the capacities of the Sabah government to conserve biodiversity						
a.	Strengthen the technical capacities of the Sabah Economic Planning Unit with regards to biodiversity conservation and management to improve state level decision-making.	✓	-	500,000	• Capacity building / training	• State allocations • Agency allocations
b.	Incorporate a biodiversity conservation module within the state civil service training programme to improve biodiversity awareness, especially for new civil servants.	✓	-	500,000	• Stakeholder workshops • Capacity building / training	• State allocations • Agency allocations
Action 17.2: Strengthen the role of the state legislature and judiciary in biodiversity conservation.						

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
a.	Review the present state legislations on biodiversity to identify gaps, and create synergies with Federal laws while also strengthening state needs	✓	-	200,000	• Stakeholder workshops	• State allocations • Agency allocations
b.	Conduct targeted training programmes to improve the technical knowledge and awareness of the state judiciary and public prosecutors on biodiversity-related offences	✓	-	500,000	• Stakeholder workshops • Capacity building / training	• State allocations • Agency allocations
Action 17.3: Develop local biodiversity-related human resource capabilities						
a.	Identify specific technical capacities that are needed for biodiversity research and conservation in Sabah and position prominent research institutes and centres as focal points for developing these capacities to the next generation of Sabahans	✓	-	500,000	• Stakeholder workshops • Capacity building / training	• State allocations • Agency allocations
b.	Strengthen existing, while also developing new collaborations with local and international organizations for continuous technical capacity building in biodiversity research and conservation.	-	-	-	• Internal costs	-
c.	Strengthen and promote biodiversity-related jobs in the State as a viable career pathway across all genders.	-	✓	500,000	• Stakeholder workshops • Awareness events	• State allocations • Agency allocations
d.	Certify biodiversity conservation related jobs as recognized professions under the Malaysian Qualification Statement	-	-	-	• Internal costs	-
e.	Establish mentorship programmes that connect academicians and conservation professionals with graduates to pursue biodiversity conservated related careers in Sabah	-	✓	200,000	• Stakeholder workshops • Awareness events	• State allocations • Agency allocations

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
Strategy 18: Strengthen funding allocations for biodiversity conservation from both government and non-government sources.						
Action 18.1: Increase public funds available for biodiversity conservation						
a.	Improve state financial resource allocation for biodiversity conservation in terms of human resource, materials, and capacity development.	-	-	-	• Internal costs	-
b.	Strengthen disbursement of the state Ecological Fiscal Transfer (EFT) allocations to ensure fair and equitable funding to support the Strategy.	-	-	-	• Internal costs	-
Action 18.2: Mobilize sustainable conservation funding from the private sector.						
a.	Establish a state policy and mechanism, while also reviewing present legislations, to operationalize the Sabah carbon market	✓	-	1,000,000	• Consultancy costs • Stakeholder workshops	• State allocations • Agency allocations
b.	Regulate future carbon projects to ensure that financial returns are channelled into conservation initiatives that support the Strategy	-	-	-	• Internal costs	-
c.	Re-explore the feasibility of generating biodiversity credits from major ecosystems in Sabah.	✓	-	1,000,000	• Consultancy costs • Stakeholder workshops	• State allocations • Agency allocations
Action 18.3: Diversify the revenue streams of the Sabah Government.						
a.	Re-align the state fiscal system to entrench biodiversity conservation as part of the annual budget requirements / allocation	-	-	-	• Internal costs	-
b.	Assess the feasibility of establishing a debt-for-nature swap programme to incentivize conservation actions.	✓	-	500,000	• Consultancy costs Stakeholder workshops	• State allocations • Agency allocations

No.	Activities	Type of Expenditure		Estimated Cost (RM)	Remarks	Potential Source of Funds
		Capital Expenditure	Operating Expenditure			
c.	Establish a dedicated state task force to study and pursue sustainable financing opportunities to support biodiversity conservation in Sabah.	-	✓	200,000	• Stakeholder workshops • Capacity building / training	• State allocations • Agency allocations