

Biodiversity

What is Biodiversity?

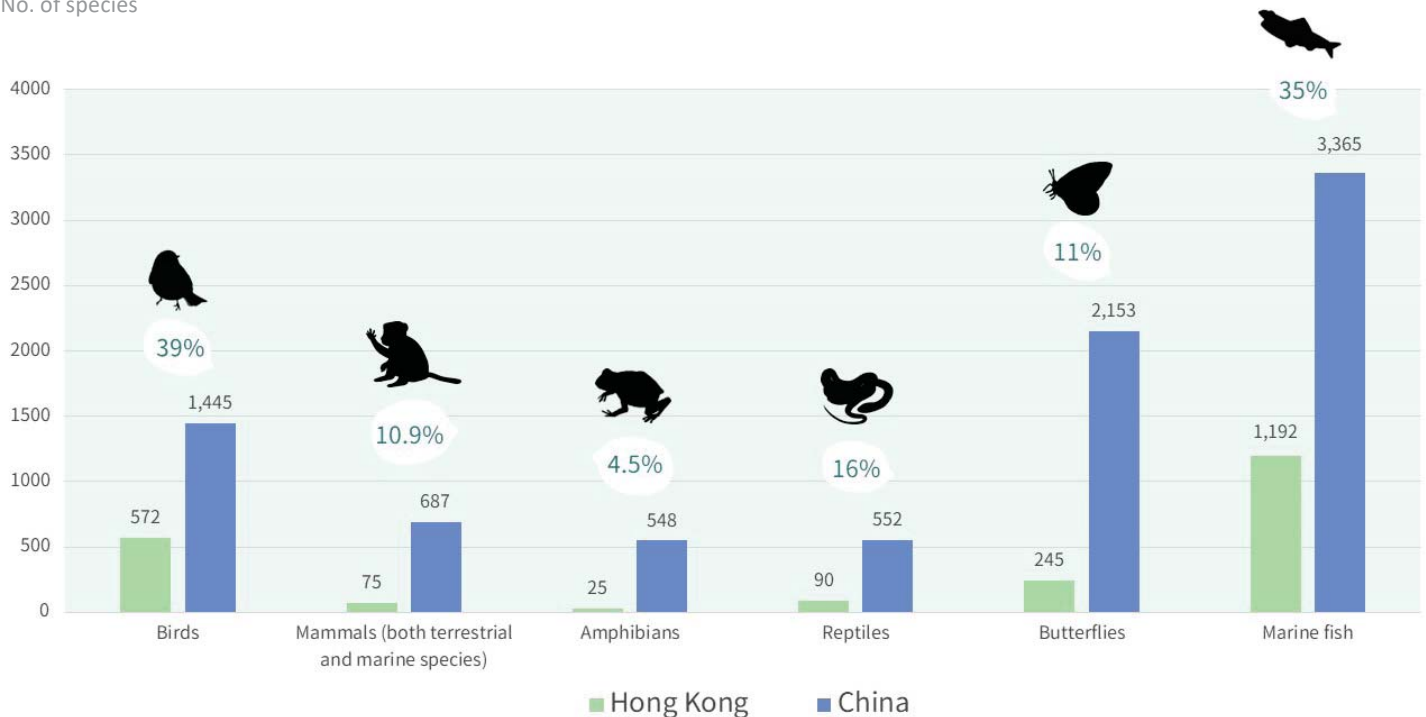
Biodiversity refers to the variety of life on Earth, which can be divided into three levels: **genetic diversity**, **species diversity**, and **ecosystem diversity**.

Biodiversity in Hong Kong

Although Hong Kong only occupies 1,114 km² of land area, equivalent to 0.01% of China's total, it boasts an exceptionally diverse range of flora and fauna.

Biodiversity in Hong Kong compares to China

No. of species



What are Ecosystem Services?

Ecosystem services are the benefits that humans derive from nature, which are underpinned by biodiversity and can be grouped into four main categories, namely provisioning, supporting, regulating, and cultural services.

Globally, these services are estimated to be worth over **100 trillion US dollars per year**.



Threats to Biodiversity

Climate change, habitat modification and destruction, pollution, overexploitation, and invasive species introduction.

Causes

ALL driven by human activities

Results

Loss of species and ecosystems



Reduce the functioning of ecosystems and provision of ecosystem services, and ultimately impair human well-being.

Impacts of Climate Change on Biodiversity

Changes in Species Distribution and Abundance

More frequent and severe extreme weather events (e.g. droughts, floods, heatwaves) may have significant impacts on biodiversity.

Changes in Phenology

Change in timing of seasonal events (e.g. flowering and migration) may disrupt ecological relationships and cause cascading effects on ecosystems.

Changes in Ecosystem Functioning

Functioning of ecosystems (e.g. nutrient cycling and carbon storage) may be altered, indirectly impacting biodiversity.

Habitat Loss and Degradation

Some habitats (e.g. coral reefs and Arctic sea ice) may be lost, leading to increased fragmentation of habitats and isolation of species populations.

Increased Extinction Risk

An increase of 1.5°C in temperature on average may push 20-30% of species to the brink of extinction.

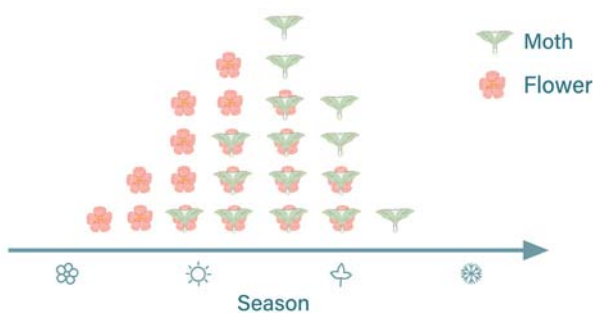


Know more about Climate Change

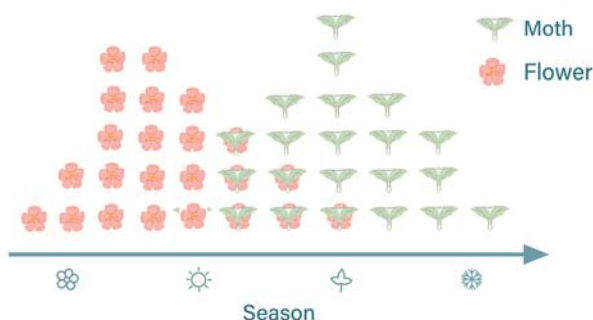
The planet is expected to warm by around 2.8°C by the year 2100 if countries continue their current levels of greenhouse gas emissions

Change in Phenology and Range Shift for Moth Population

More insects, including moths and butterflies, are emerging during the warmer winter, while plants are flowering earlier as the response to global warming. However, this mismatch can lead to intense competition between insects during the winter when food is scarce. In addition, the hotter climate in the summer may result in fewer pollinators being available to pollinate plants that flower during that season, causing declines in their populations.



Climate Warming



Climate Change impact on Waterbirds

77% tidal mudflats within Mai Po Inner Deep Bay Ramsar site are projected to be lost by 2100. This loss poses a significant threat to the site which is home to over 80,000 wintering and passage waterbirds. In fact, the populations of 12 waterbird species, including a number of duck species, have declined over the past two decades, which could partially be attributed to the impacts of climate change.



Sealevel Rising



Other Impacts of Human Activities on Biodiversity

Habitat Modification and Destruction

Habitat modification and destruction can lead to the loss of critical habitats for many species. (e.g. channelization and urbanization)

Overexploitation

Overfishing and unsustainable poaching are examples of overexploitation that have led to declines in populations of many species worldwide.

Pollution

Pollution (e.g. plastic pollution, urban wastewater) can reduce water and air quality, harm or kill wildlife, and disrupt ecosystems.

Invasive Species Introduction

Invasive species may directly prey on or outcompete native species, spread diseases, and introduce genetic pollution to ecosystems.

Case Study

Microplastic Pollution



In 2021, a staggering amount of 2,331 tonnes of plastic waste was generated every day, with only approximately 12% of it being recycled. This high level of plastic pollution has severe impacts on life on Earth. For example, mangrove crabs in Hong Kong have been found to have an average of over 60 pieces of microplastics in their stomachs and/or gills, highlighting the widespread contamination of plastic waste in our ecosystems

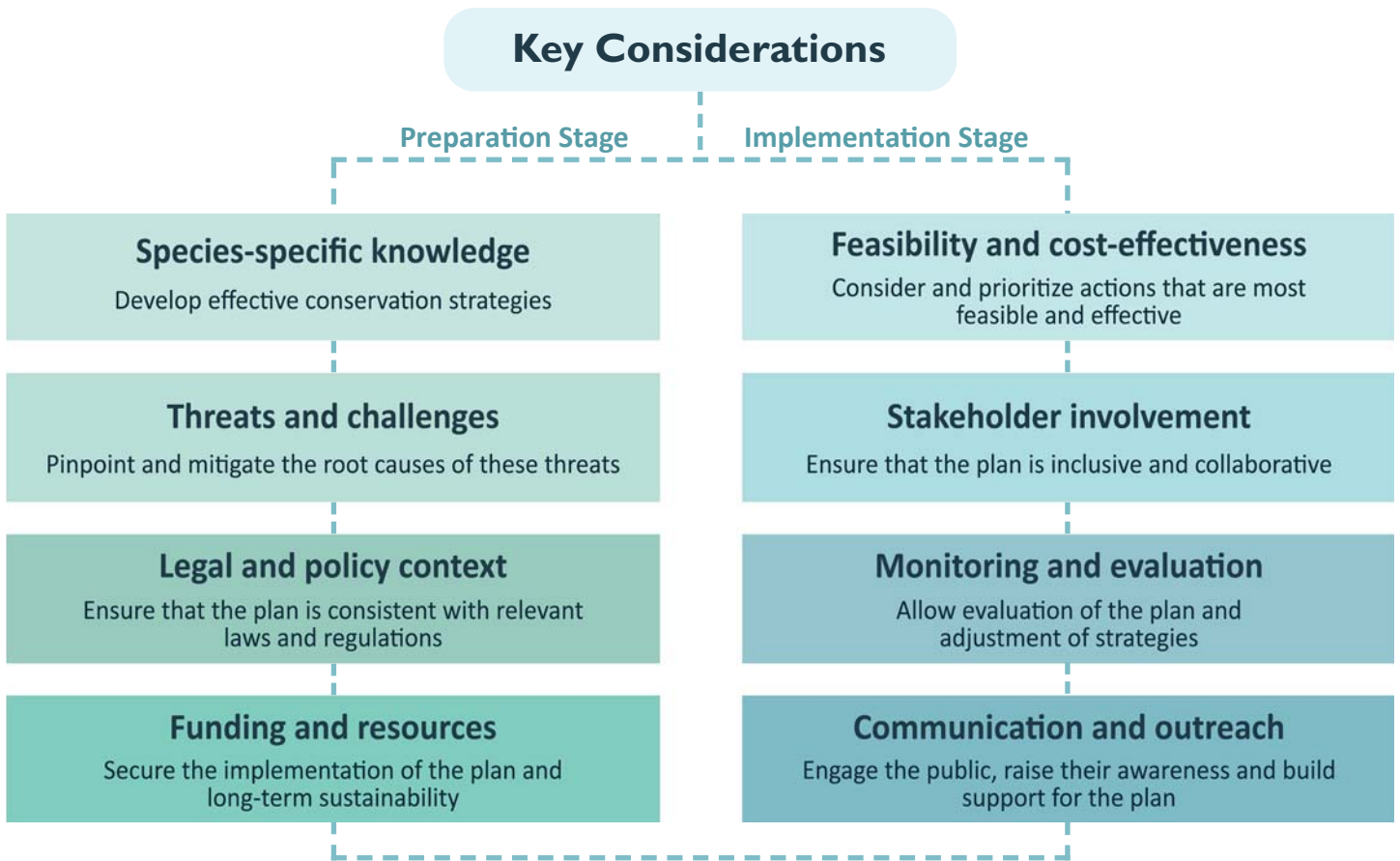
Overexploitation – Asian Turtle Crisis



Between 2000 and 2003, a shocking number of 950,251 individual turtles from 157 species, including threatened species, were recorded being traded in Hong Kong, Shenzhen, and Guangzhou. Through collecting evidence simply from the social media, at least 29,121 individuals from 120 turtle species have been illegally traded between 2017 and 2018. Many of these turtles were endangered species and believed to have been captured from the wild in their natural habitats. The study has revealed that the problem might persist.

What is Conservation Planning

A conservation plan is a tool that connects the necessary actions for improving a species' status with the means and implementation details to achieve them.



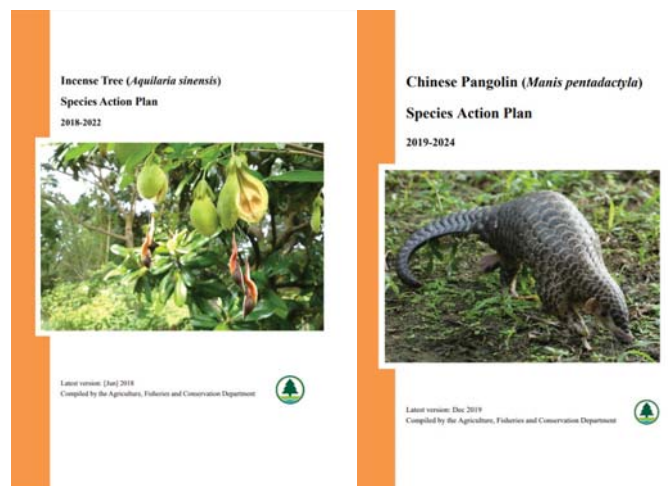
Case Study

Successful Case: Black-faced Spoonbill



In 1994, the Black-faced Spoonbill was listed as Critically Endangered, with a global population of only 300 individuals. Since then, two international action plans have been implemented to conserve the species. A recent census revealed that the population has increased to 6,000 individuals. With increasing population, the species' conservation status is currently considered as Endangered.

Recent Conservation Planning



Specific species action plans for Incense Tree and Chinese Pangolin have been published recently by the Hong Kong government in 2018 and 2019 respectively.

Challenges and Opportunities in Biodiversity Conservation

Although biodiversity faces numerous threats, advancements in civilization and technology have created opportunities for conservation efforts to protect and preserve ecosystems and species.

	Past Challenges	Future Opportunities
Tools and Technology	<ul style="list-style-type: none"> • Few tools • Limited data access 	<ul style="list-style-type: none"> • Big data • Advanced technologies (e.g. artificial intelligence and remote sensing)
Public Engagement	<ul style="list-style-type: none"> • Limited understanding of the importance of biodiversity • Lack of engagement • Limited access to information 	<ul style="list-style-type: none"> • More digital platforms and social media for promotion and knowledge transfer • More education programs
Collaboration	<ul style="list-style-type: none"> • Fragmented efforts • Lack of cooperation between sectors and countries 	<ul style="list-style-type: none"> • Synergistic efforts • Better international cooperation and multisectoral partnerships
Development	<ul style="list-style-type: none"> • Unsustainable land use • Overexploitation of resources • Inadequate consideration of biodiversity 	<ul style="list-style-type: none"> • Nature-based solutions • Green infrastructure • Circular economies
Funding and Resources	<ul style="list-style-type: none"> • Insufficient funding • Reliance on traditional funding sources • Limited private sector engagement 	<ul style="list-style-type: none"> • Innovative financial instruments (e.g. green bonds, impact investments) • Better engagement of private sector • Public-private partnerships

Conservation in Hong Kong – Legislation

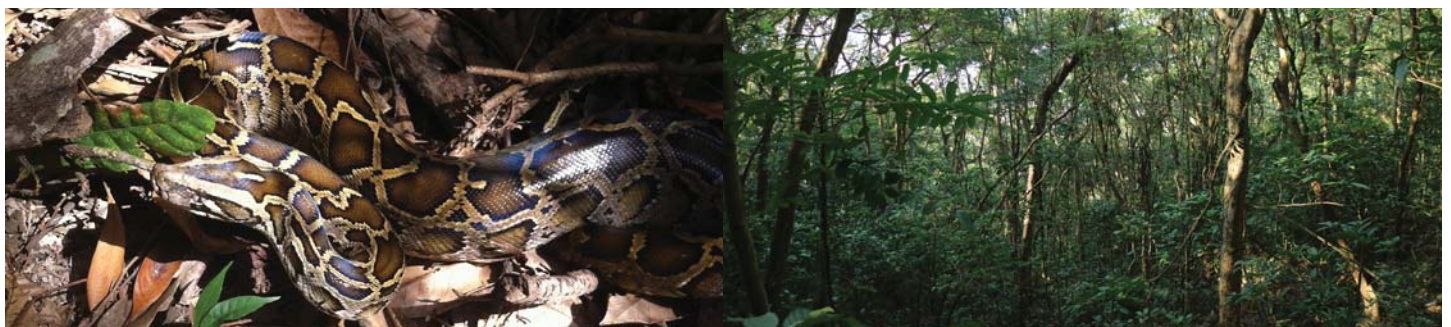
Various laws and ordinance have been legislated to conserve ecosystems and species diversity.

Protection of ecosystems

- Country Parks Ordinance (Cap. 208)
- Marine Parks Ordinance (Cap. 476)
- Town Planning Ordinance (Cap. 131)

Protection of species

- Forests and Countryside Ordinance (Cap. 96)
- Wild Animals Protection Ordinance (Cap. 170)
- Protection of Endangered Species of Animals and Plants Ordinance (Cap.586)
- Fisheries Protection Ordinance (Cap. 171)
- Genetically Modified Organisms (Control of Release) Ordinance (Cap.607)



Conservation in Hong Kong – Deliberate and proactive measures

Deliberate and proactive measures include measures such as habitat restoration, reforestation, species translocation, species monitoring, etc.

Case Study

Plantation Enrichment Programme

Plantation Enrichment Programme was launched in 2019 by the government to improve the biodiversity and ecological value of exotic plantations. Proactive measures including thinning of aging exotic tree species, planting of native tree seedlings and post-planting maintenance have been implemented.



River De-channelization

Over the past two decades, several projects aimed at revitalizing river channels have been initiated by the Drainage Service Department to restore the natural stream environments. These include the Kai Tak River and Upper Lam Tsuen River Improvement Works.



Contact Us

Email: info@hkiqep.org

<https://hkiqep.org/>



Disclaimer: Any opinions, findings, conclusions or recommendations expressed in this material do not necessarily reflect the views of the Government of the Hong Kong Special Administrative Region and the Environment and Conservation Fund. The Hong Kong Institute of Qualified Environmental Professionals Limited has taken great efforts to ensure the accuracy of the information contained in this booklet. However, the content and interpretation of some topics may change over time. We assume no responsibilities for any actions as a result of the use or reliance on this booklet.

The production of this booklet is made possible by the Environment and Conservation Fund. All rights reserved. All photographs and images used by permission. Copy right: This resource may be reproduced for educational use only. It may not be reproduced for any other purposes without prior written permission by the Hong Kong Institute of Qualified Environmental Professionals Limited.