The Fish and The People

114°E HONG KONG REEF FISH SURVEY | SUMMARY REPORT — JULY 2020 TO JUNE 2023

HONG KONG 114°E
REEF FISH
SURVEY

PHOTO BY° SUMI LEUNG@114°E HONG KONG REEF FISH SURVEY

REPORT PERIOD
1 July 2020 to 30 June 2023

SUBMITTED ON
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PREPARED BY
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COVER PHOTO
Ken Kwok@114°E Hong Kong Reef Fish Survey

Building the connection between fish and people.

Before people can get excited about conservation for fish, they need to learn to see them as more than just "food".

The year 2023 marks the ninth year of the 114°E Hong Kong Reef Fish Survey (114°E Survey). Although the project began as a simple effort to document Hong Kong's reef fish species diversity and where along our long coastline they reside, the project has over the years grown into so much more. The more we discovered about our marine life, the more it became apparent that we needed to work harder for their conservation.

In these three project years, the 114°E Survey has worked towards building the relationship between *fish* and *people*. Part of this work is in educating people that fish can be defined as more than just food, and as a part of the local wildlife worthwhile of and needing our conservation attention.

Moving forward, we hope that this new way of appreciating reef fish can be transformed into support for the work to conserve the local marine life, such as through the creation of more marine protected areas. While we as people hold the key to bringing a better future for reef fishes, we also rely on healthy reef fish populations and healthy oceans for our own future.

STAN SHEA
Principal Investigator & Co-founder of the 114°E Survey project

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To protect the ocean is to ensure our own future.

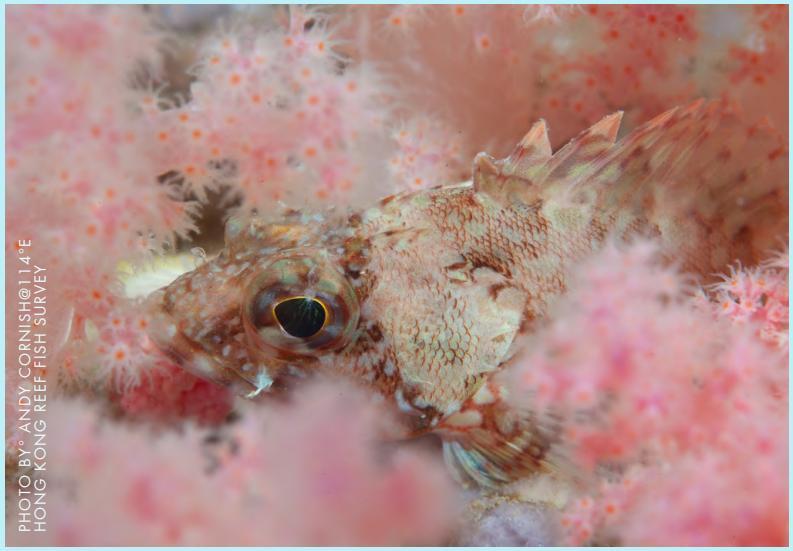


PHOTO BY° ANDY CORNISH@114°E
HONG KONG REEF FISH SURVEY

PHOTO BY° ARTHUR CHUNG@114°E
HONG KONG REEF FISH SURVEY

In 2022, global governments came together and set goals to protect 30% of the world's marine and coastal areas by the year 2030: also known as “30x30”.

This commitment was made by countries and territories worldwide to the Convention on Biological Diversity (CBD). Commitment to the Convention has been extended to Hong Kong since 2011, but Hong Kong is still a long way to go from achieving this goal of protecting 30% of is coasts and waters by 2030.

The Hong Kong Marine Protection Alliance (HKMPA)

The HKMPA is a collective of academics, experts and NGOs with shared conservation goals for Hong Kong’s marine environment. The Alliance was officially launched in August 2022. BLOOM HK as one of the Alliance’s members contributes the data and knowledge gained from the 114°E Surveys to inform the ongoing work of gathering information on potential sites to propose as new MPAs in Hong Kong. Through this collective effort, we hope to bring the future of protecting 30% of Hong Kong waters closer within reach.

What's New?

114°E Survey 2.0

From when it started in 2014, the 114°E Survey has continued to evolve as a project. In this cycle - project phase 2.0 - we aimed to bring new value to the underwater surveys with emphasis on the following elements:

01 Focus on surveys within and around MPAs, specifically the Hoi Ha Wan marine reserve

02 Educate the public about Hong Kong's MPAs and their importance for conservation

03 Showcase the potential of using a citizen science-based methodology for the long-term monitoring of MPAs

04 Continue underwater reef fishes surveys across Hong Kong's waters, to reach at least a 10-year dataset

PHOTO BY° SAM INGLIS@114°E HONG KONG REEF FISH SURVEY

PHOTO BY° YIU WAI HONG@114°E HONG KONG REEF FISH SURVEY

The Fish

SUMMARY OF KEY FINDINGS

What are Marine Protected Areas?

MPAs are areas of water where human activities are regulated for the purpose of protecting the area's marine life and habitats in the long-term.

MPAs are one of the few existing tools with international, legal frameworks for the systematic protection of our ocean. Globally, around 7% of the ocean are protected as MPAs, and of this, less than 2% are no-take zones - areas where any form of fishing is forbidden.

In Hong Kong, only one fully no-take MPA - the Cape D'Aguilar marine reserve - exists, set up in 1996 as one of Hong Kong's first MPAs. In other marine parks, fishing by commercial fisheries and indigenous locals holding special permits was initially still possible. Finally as of March 2022, commercial fishing was also phased out in five marine parks, leaving just two marine parks still open to fishing at commercial scales by those carrying special permits.

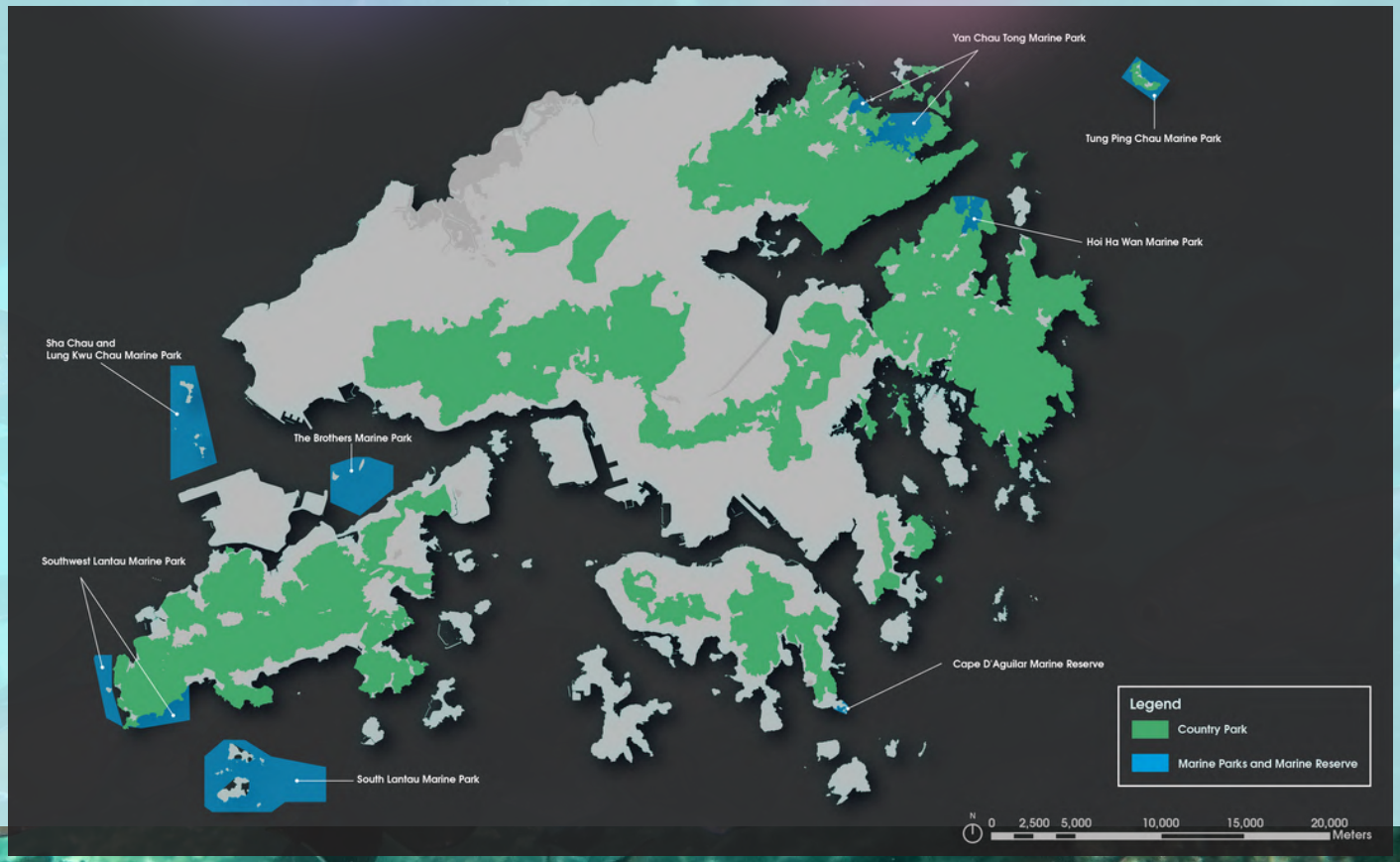


PHOTO BY° SUMI LEUNG@114°E HONG KONG REEF FISH SURVEY

CURRENTLY ONLY

<5%

OF HONG KONG'S WATERS ARE PROTECTED AS MPAS

THIS COMPRISES

8

MPAS, INCLUDING SEVEN MARINE PARKS AND JUST ONE MARINE RESERVE

IN COMPARISON

40%

OF THE LAND AREA ARE PROTECTED AS COUNTRY PARKS

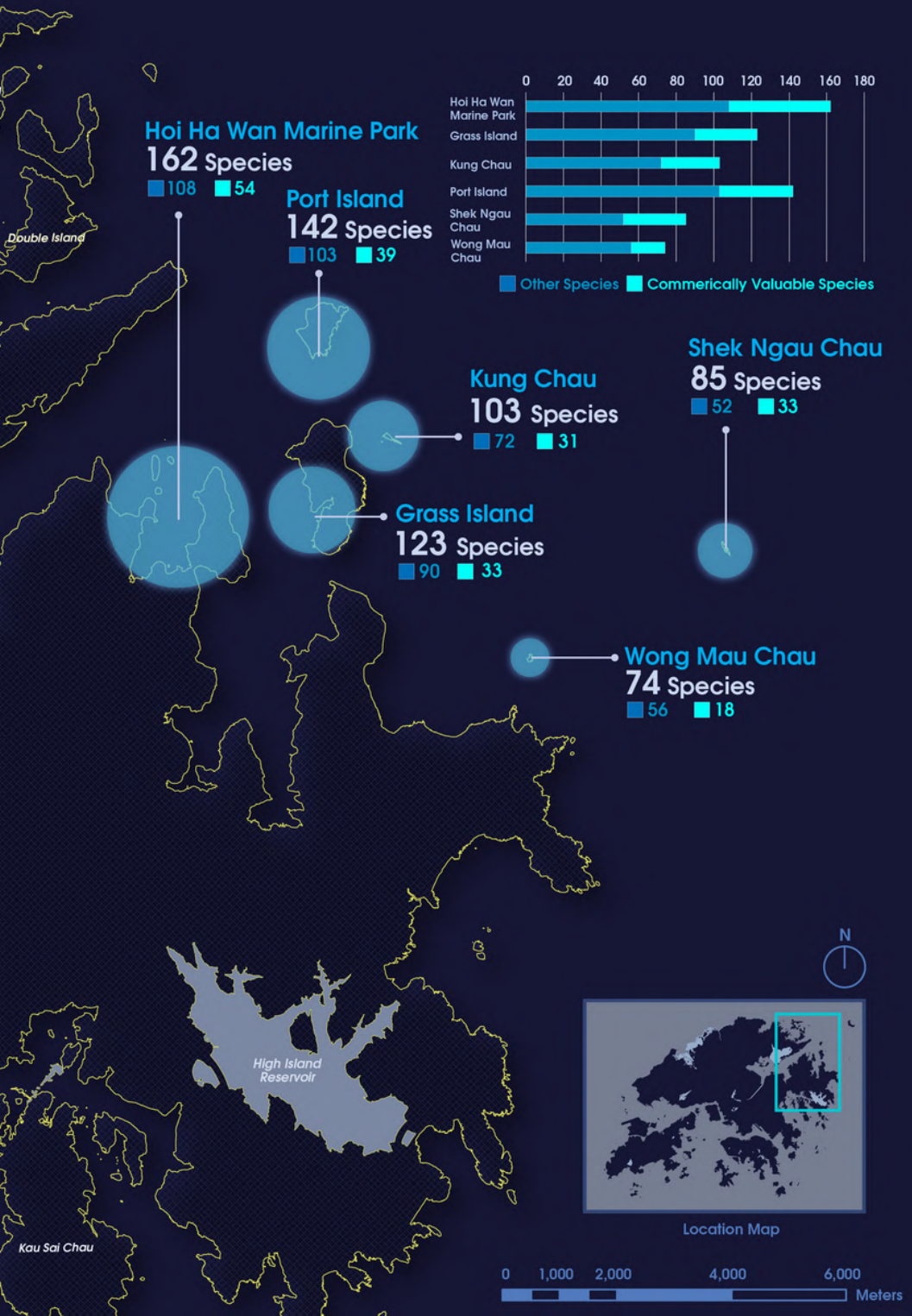
THE GOAL OF

30x30

REMAINS FAR OUT OF REACH, UNLESS HONG KONG STEPS UP IMMEDIATELY

Hong Kong MPA case study:

HOI HA WAN MARINE PARK



Updating the species list for the marine park

As one of Hong Kong's MPAs, the Hoi Ha Wan marine park is managed by the local government. However, there have only been a few organised effort (with published results) to systematically document the species occurring inside the marine park.

From surveys conducted by the project in the Hoi Ha Wan marine park, more than 60 reef fish species new to the marine park's published records were documented. These were submitted to AFCD for updating official records. Notably, Hoi Ha Wan marine park was also the project's second highest survey site for number of alien species observed (one of such species is pictured right, living among local species), likely as a result of release. More research is needed to understand the potential impacts of these species on the area's ecology.


PHOTO BY© BIU MUI@114°E
HONG KONG REEF FISH SURVEY

Comparing reef fishes inside vs. outside the marine park area

Apart from the differences observed in species diversity and commercially high-valued species within and around the marine park, fish behaviour and size was also observably different inside marine parks, in that fish were potentially larger and less shy towards divers. In the next project phase, the methodology will be updated to begin measuring fish "flight distance" to look for any actual differences in fish behaviour.

Notably since the phasing out of all commercial fishing activities in the Hoi Ha Wan marine park, some commercially high-valued species are observed in greater abundance within the marine park area (such as the large school of sizeable jacks pictured right).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114°E Surveys (overall)
AT A GLANCE

SINCE 2014...

50
NEW-TO-HONG KONG SPECIES DISCOVERIES

460
TOTAL IDENTIFIED SPECIES IN DATABASE

IN THIS REPORT PERIOD (JULY 2020 TO JUNE 2023)

16
NEW-TO-HONG KONG SPECIES DISCOVERIES

455
SPECIES COUNTED (INCLUDING SPECIES PENDING IDENTIFICATION)

166
RARE SPECIES ENCOUNTERED

5
IUCN RED LIST THREATENED SPECIES

101
DAYS OF SURVEYS

41
DIVE SITES VISITED

3,051
MAN-HOURS UNDERWATER

330+
CITIZENS AS VOLUNTEERS

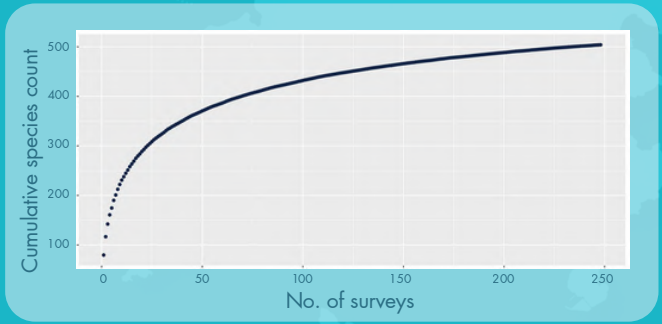
OVERALL SURVEY SITES

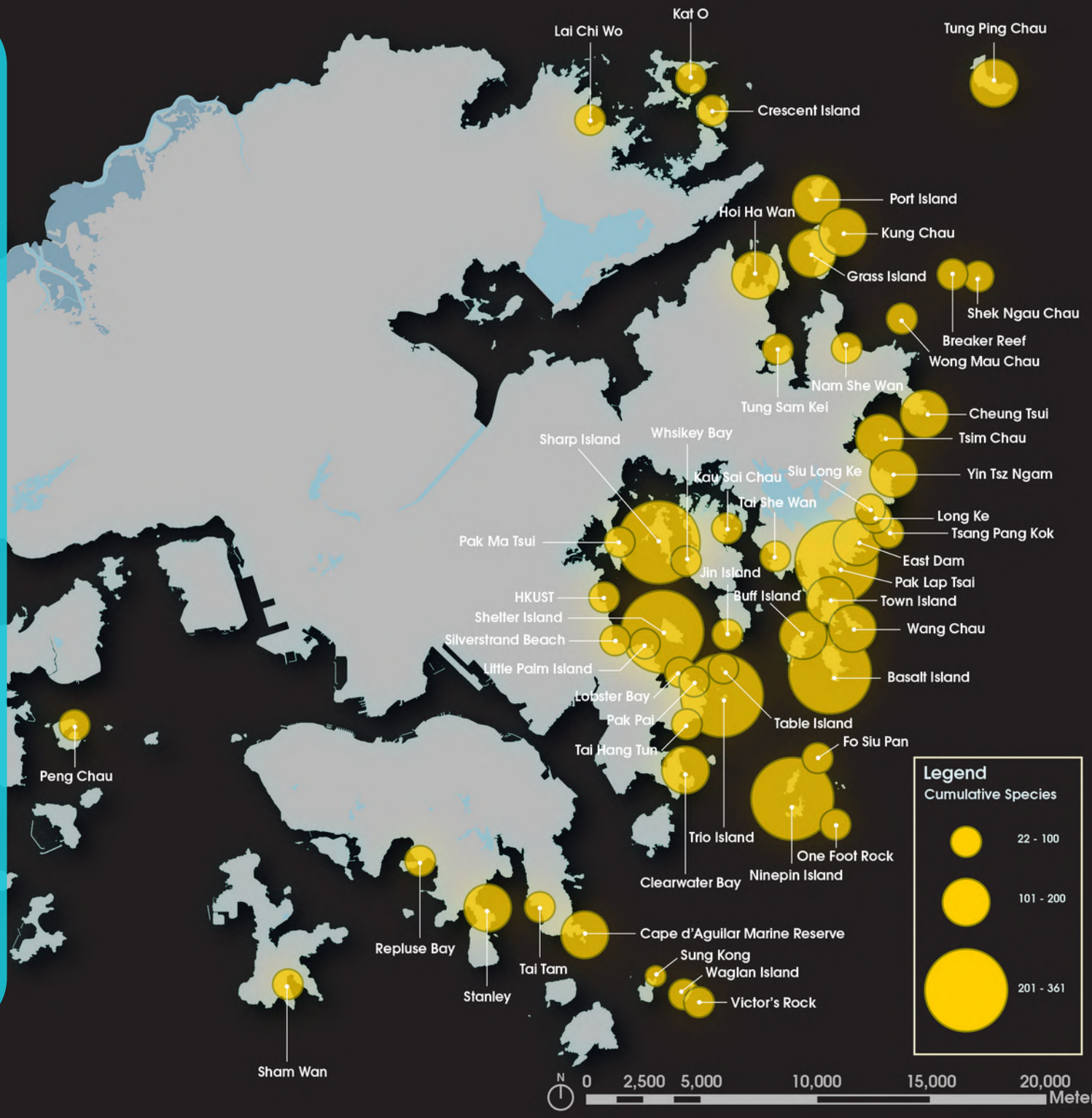
Cumulative species count for all survey sites (2014 - 2022)

A few dive sites continue to stand out as having relatively high reef fish species diversity, including Sharp Island, Basalt Island, Pak Lap Tsai, Ninepin Island group, Shelter Island and Trio Island.

The current graphic displays a preliminary showcase of the diversity of species recorded at each survey site. It is worth noting that survey frequency has not yet been taken into account. This work will be undertaken in the next project phase, as part of the in-depth analysis of dataset after it reaches ten years of data.

Cumulatively, the total species count for Hong Kong is still continuing to grow, indicating that the potential for more species to be documented in Hong Kong waters is not yet exhausted (as shown in the graph below).





Reef Fish

SPECIES HIGHLIGHTS...

Species considered threatened under the IUCN Red List of Threatened Species

01	*Evynnis cardinalis*	**Endangered (EN)**
02	*Taeniurops meyeni*	**Vulnerable (VU)**
03	*Epinephelus akaara*	**Endangered (EN)**
04	*Hippocampus kuda*	**Vulnerable (VU)**
05	*Epinephelus bruneus*	**Vulnerable (VU)**

Five species listed as threatened were recorded. These species were also documented in the last project cycle.

Rare species encounters

These species are not new to local records, but are defined as rare as indicated in the existing literature. Many of these, such as the Indian threadfish (*Alectis indica*) pictured left and the Pineconefish (*Monocentris japonica*) pictured right, can also be quite unusual in appearance.

PHOTO BY© GABRIEL LEE@114°E HONG KONG REEF FISH SURVEY

New to Hong Kong species

The 50 new species to Hong Kong records documented since 2014 are found in the next few pages. All of these are already published in various peer-reviewed journals. The latest publication is available in the following link:

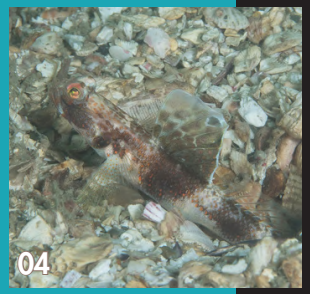
Thirty-one new records of reef fish species for Hong Kong waters
https://doi.org/10.1017/S0025315423000036

50 2014 - 2022 NEW TO HONG KONG RECORDS


01


02


03


04


05


06


07


08


09


10 GOBIES


11 CLINGFISHES


12 DARTFISHES

01 *Amblyeleotris japonica*
Arthur Chung

02 *Valenciennea wardii*
Ryan Tsang

03 *Amblyeleotris wheeleri*
Sumi Leung

04 *Tomiyamichthys oni*
Caron Wong

05 *Gobiodon axillaris*
Gomen See

06 *Gobiodon prolixus*
Sumi Leung

07 *Eviota teresae*
Yiu Wai Hong

08 *Amblygobius nocturnus*
Stan Shea

09 *Gnatholepis cauerensis*
Tony Liu

10 *Cryptocentrus nigrocellatus*
Stan Shea

11 *Pherallodus indicus*
Kathleen Ho

12 *Ptereleotris heteroptera*
Kamy Yeung

01

02

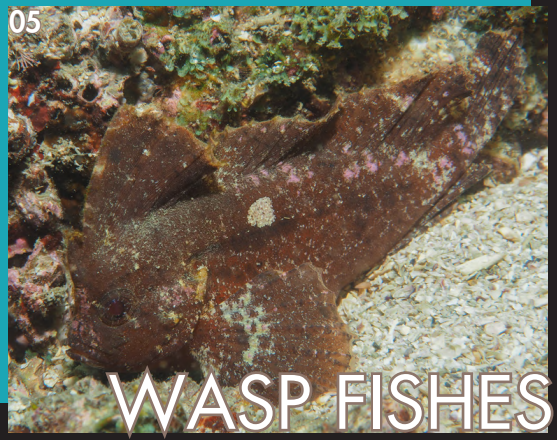
03 BLENNIES

06

07 SANDPERCHES

08 GOATFISHES

04 GHOST PIPEFISHES



05 WASP FISHES

01 *Petroscirtes springeri*
Dr. Andy Cornish

02 *Aspidontus taeniatus*
Gomen See

03 *Xiphasia setifer*
Caron Wong

04 *Solenostomus paradoxus*
Gomen See

05 *Ablabys taenianotus*
Tony Liu

06 *Parapercis millepunctata*
Stan Shea

07 *Parapercis tetracantha*
Stan Shea

08 *Upeneus* sp.
Stan Shea

01

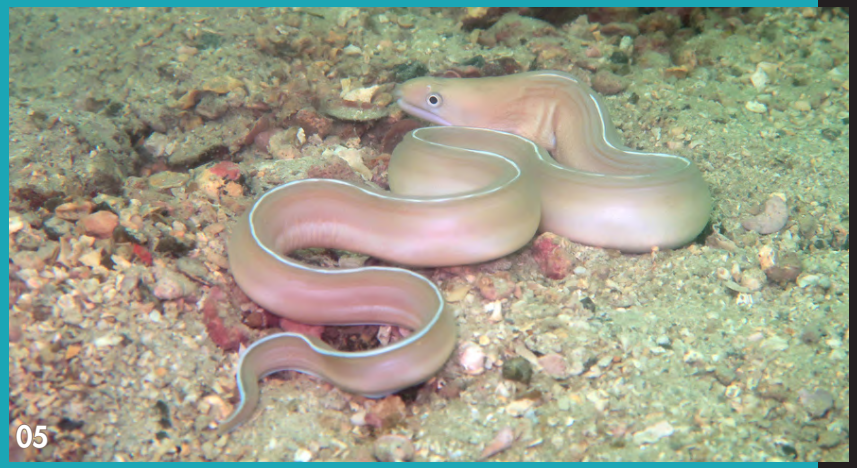
02

CARDINALFISHES

03

04

SURGEONFISHES



05

06

MORAY EELS

01	*Cheilodipterus* sp. Gomen See	06	*Echidna polyzona* Caron Wong
02	*Rhabdamia gracilis* Nicole Kit	07	*Chaetodon adiergastos* Ryan Cheng
03	*Acanthurus xanthopterus* Eric Keung	08	*Heniochus singularius* Arthur Chung
04	*Naso unicornis* Yiu Wai Hong	09	*Chaetodon selene* Ryan Cheng
05	*Gymnothorax albimarginatus* Dr. Calton Law	10	*Parapriacanthus* sp. Allen To

07

08

09

BUTTERFLYFISHES

10

SWEEPERS


01


02


03


04


05


06


07


08


09

WRASSES


10

MONOCLE BREAMS


11

GROUPERS


12

ANGELFISHES

01 *Thalassoma lutescens*
Kamy Yeung

02 *Bodianus dictynna*
Kamy Yeung

03 *Cirrhilabrus cyanopleura*
Eric Keung

04-05 *Halichoeres hartzfeldii*
Stan Shea, Gomen See

06 *Anampses geographicus*
Yiu Wai Hong

07-08 *Halichoeres marginatus*
Allen To; Stan Shea

09 *Halichoeres melanochir*
Stan Shea

10 *Scolopsis ciliata*
Stan Shea

11 *Pseudanthias squamipinnis*
Kamy Yeung

12 *Centropyge bicolor*
Caron Wong


01


02

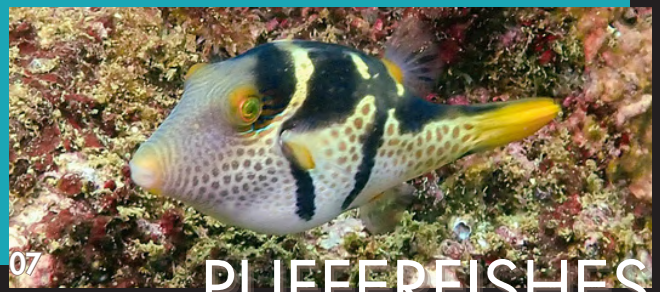

03


04

DAMSELFISHES


05


06


07

PUFFERFISHES


08

PORCUPINEFISHES

01 *Pomacentrus nagasakiensis*
Eric Keung

02 *Pomacentrus tripunctatus*
Stan Shea

03 *Plectroglyphidodon leucozonus*
Dr. Andy Cornish

04 *Chromis fumea*
Gomen See

05 *Canthigaster papua*
Allen To

06 *Arothron mappa*
Dr. Calton Law

07 *Canthigaster valentine*
Gigi Cheung

08 *Diodon hystrix*
Grape Tang

09 *Myripristis botche*
Tony Liu

10 *Myripristis hexagona*
Gomen See


09


10

SOLDIERFISHES

New species records and climate change

In the last project cycle, it was highlighted that the number of tropical species recorded in the underwater surveys were increasing. The number of subtropical and temperate species, on the other hand, had remained fairly stable and reached plateau. Preliminary analysis on the data showed that this continued to be true for findings in the current cycle. As Hong Kong belongs to a subtropical climate, this osbervation is worth further investigation.

While it has been observed in other places that such a trend could suggest climate change impacts, the current dataset was found to need more years of data for drawing conclusions on this observation. The project will continue working with academic parters to conduct more in-depth analysis on the dataset as more years of data accumulate.

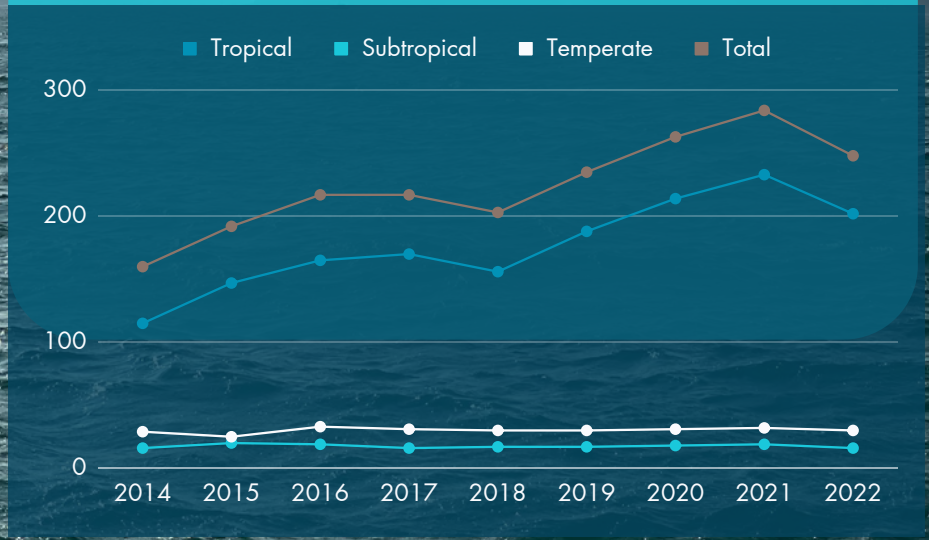


PHOTO BY° ARTHUR CHUNG@114°E HONG KONG REEF FISH SURVEY

PHOTO BY° KAMY YEUNG@114°E HONG KONG REEF FISH SURVEY

The People

ACTIVITIES HIGHLIGHT

PHOTO BY° SAM INGLIS@114°E HONG KONG REEF FISH SURVEY

PHOTO BY° GOMEN SEE@114°E HONG KONG REEF FISH SURVEY

Thinking about reef fish as part of the wildlife

Can we learn to think about *fish* as something more than *food*?

As a citizen science effort, we recognize the importance of the project's *people* and their ability to make a true difference for Hong Kong's fishes. Growing up in Hong Kong - the eighth highest per capita seafood consumer in the world (and the second in Asia) - most of us think about *fish* in terms of *food* and seafood, and rarely stop to think about them as a part of the wildlife. To succeed in achieving better marine conservation in Hong Kong, a change in this perception is a crucial step to ensure that the changes can be supported by the local people and long-lasting. It has therefore become part of our mission **to help Hong Kong shift their definition of *fish* to more than just *food***, and learn to see them as an integral part of the marine life keeping our oceans healthy.

Raising awareness about Hong Kong's MPAs (and the need for more)

The 114°E Survey engages people through diverse channels. The most direct channel is through participation in underwater surveys as *citizen scientists*, but we hope to also reach the non-divers and local youth. We are constantly searching for more ways to bring the beauty of the underwater world to these audiences, through compelling story-telling and the vibrant images captured by our surveyors.

All engagement efforts in this project cycle have aimed to deliver a core message: that Hong Kong's marine life is worth all our effort in conserving. Anyone can play a part by supporting the ask of establishing more MPAs in local waters.

In the next project cycle, we will continue to give focus to Hong Kong's MPAs, with a goal of motivating the establishment of more MPAs within Hong Kong waters in the next few years. This work will need strong support from Hong Kong people to demonstrate a united voice in this ask.

CITIZENS SCIENTISTS

The 114°E Survey recruits recreational divers as citizen scientist volunteer surveyors. Citizen science is popularly applied all over the world in projects involving large-scale data collection for wildlife. In this project, citizen scientists are trained in the survey methodology, designed to be easily applied by any competent scuba diver, as well as underwater visual fish identification skills. With some divers trained annually since 2014, all new-joining volunteers are able to more quickly pick up both the method and fish identification skills through a buddy-system with the project's more long-standing volunteers.

Because these volunteers are also recreational divers part of the larger scuba diving community in Hong Kong, they are also able to bring their knowledge gained from participating in the 114°E Surveys to their friends in other scuba diving circles, and even bring new volunteers to the project. In this way, the project's volunteer base has grown organically since the beginning.

PHOTO BY° SAM INGLIS@114°E HONG KONG REEF FISH SURVEY

Engagement

Outside of the underwater surveys' citizen scientists, the 114°E Survey has undertaken diverse engagement activities to bring its core messages to a greater range of audiences.

SEMINARS

Including for schools, corporate groups or general public audiences.

WORKSHOPS

With interactive activities to inspire interest in fish-related topics among the general public.

MEDIA FEATURES AND INTERVIEWS

Making use of opportunities to bring attention to MPA-related issues in Hong Kong.

SOCIAL MEDIA

Outreach through both the 114°E Survey and parterns' platforms (e.g. Swire TrustTomorrow).

HKMPA COLLABORATIONS

Contributing knowledge on local reef fishes to support HKMPA's shared goals and activities.

Royal Hong Kong Yacht Club

RTHK Radio interview

Seminar guest speaker

Hong Kong Reef Check

114°E briefing seminar

Reef Check technical seminar

114°E Special seminar

Swire Lunch & Learn series

114°E x Gyotaku workshop

Sai Kung Scuba sharing

Marine Parks and Marine Ecological Resources Public Webinar

Swire employee's seminar

Beneath Taiwan Beyond Dive

School seminars

HK Maritime Museum seminar

2020-21 2021-22 2022-23

DATA AND KNOWLEDGE SHARING

Data collected from the 114°E Surveys were also shared to partners for further research and creating additional resources.

- Creating posts for the AFCD-managed social media page, "Hong Kong Marine Classroom"
- Assist database update for some reef fish Families for the AFCD-managed HK-Fish.Net
- "Feature study" on the AFCD's Hong Kong Biodiversity Information Hub
- 1,228 images from the underwater surveys for 195 reef fish species submitted to FishBase.Org, including three species listed on their database as missing photos

PEOPLE HIGHLIGHTS

Community outreach collaborations

Many outreach activities this year focused on schools and diver communities. Local scuba diving activities have become highly popular during the coronavirus pandemic years and both old and new divers have taken to exploring Hong Kong waters. This trend presented many opportunities for educating the growing diver community on the local marine life, so that many more may become ambassadors for its conservation and protection.

CUHK Hoi Ha Wan Citizen Science Project

This is the first citizen science activity focusing on Hoi Ha Wan, one of Hong Kong's MPAs, commissioned by the AFCD. As a collaborator, the 114°E Survey methodology is adapted for data collection on reef fish species, and other experts were invited to develop the methodology for corals and nudibranchs.

Corporate and community group surveys

Underwater surveys were joined by volunteers from the Swire Group and the Time Auction platform. A special survey was also conducted for Peng Chau by invitation from a local interest group to learn more about the marine life residing around their home island.

AFCD Hong Kong Reef Check Species Guide

Once again, 114°E Survey's knowledge and photographs were included in a collaboration with AFCD's publication about the local marine ecology.

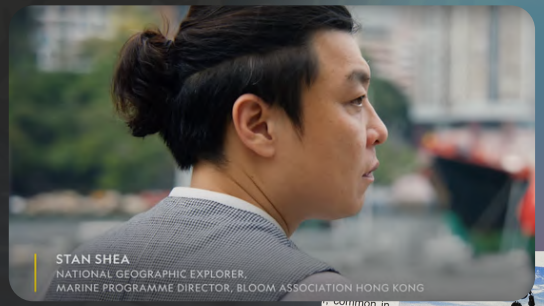
Student board game design with OWLHK

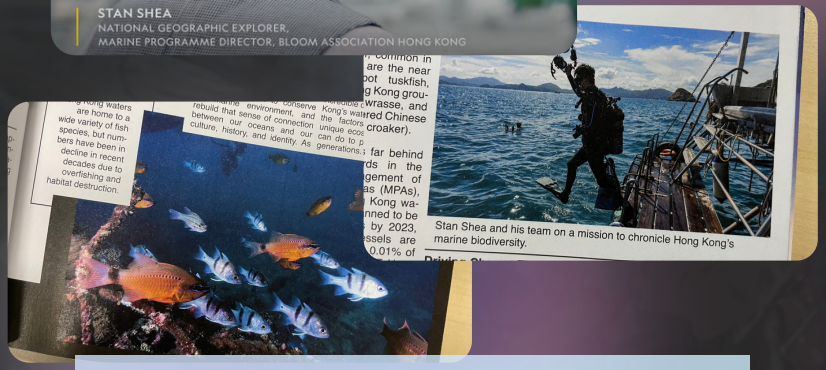
The 114°E Survey participated in OWLHKs Hong Kong Ecology Board Game Ambassador Scheme by providing input about games related to the local reef fish species.

PEOPLE HIGHLIGHTS

Creative communication channels

Worth highlighting are some of the opportunities we have had to reach audiences outside of the 114°E Survey's established community, through unusual channels. These campaigns have given our project the chance to talk about Hong Kong's reef fishes and the fight for their greater protection to people who may not have heard about the project or even about the diversity of fish living in Hong Kong waters.





National Geographic Explorer series

The 114°E Survey was featured in a short film and the Nov 2021 issue of the National Geographic Magazine, introducing Hong Kong's diverse marine reef fish and the need for their conservation.

Today at Apple

Collaboration with Howard Wong and Jonathan Jay Lee, leading participants to create a mural featuring Hong Kong's marine life.

Corporate brand campaigns

Campaign collaborations with international and local brands to promulgate the 114°E Survey mission.

PHOTO BY© SAM INGUS@114°E HONG KONG REEF FISH SURVEY

114°E Web-Portal

The 114°E Web-Portal was launched in June 2019 with the goal to share the survey's findings, and the many underwater photographs taken of the marine life, through a publicly accessible online platform. Through this platform, users are also able to submit their own species encounters with the project, and past submissions have even led to new-to-Hong Kong species records.

SINCE LAUNCHING IN 2019

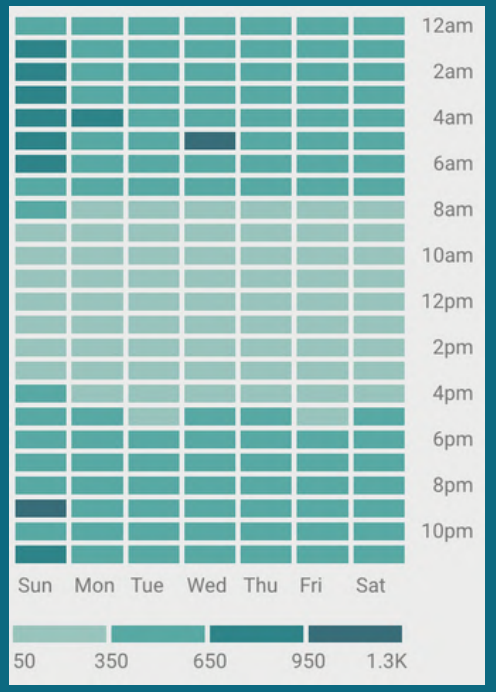
92K

USERS VISITED

TOP 5 MOST VIEWED PAGES

1. HK REEF FISH FINDER (CHINESE)
2. MOST COMMON ENCOUNTERS (CHINESE)
3. HK REEF FISH FINDER (ENGLISH)
4. DIVE SITES (CHINESE)
5. SABAH GROUPER PROFILE (CHINESE)

USERS BY TIME OF DAY



TOP 3 USER LOCATIONS

1. HONG KONG SAR 2. TAIWAN 3.MAINLAND CHINA

www.114ehkreeffish.org

Next Steps

The 114°E 3.0 will run from 2023 to 2026. In this time, the underwater survey dataset will reach the goal of ten years, enabling new insights into the marine life.

In the next phase, the project will continue to pursue conservation goals for Hong Kong, such as contributing the collected data to ongoing efforts for increasing MPAs in Hong Kong. Additionally, brand new elements will be introduced.

01 **Continue data collection**

To ten years and beyond, and conducting the first in-depth analysis with the additional support enabled by the **Pew Marine Fellowships.**

02 **Additional data collected for MPAs**

Including the new element: flight distance of commercially high-valued fish species.

03 **Hong Kong reef fish pictorial guide book**

A comprehensive guide book for Hong Kong, with all species documented through the underwater surveys.

04 **Outreach through the 114°E Web-Portal**

Utilizing the web-portal to disseminate knowledge about Hong Kong's MPAs, and why we need more.

05 **HKMPA collaborations**

Continuing collaborations with the HKMPA to work towards marine conservation goals in Hong Kong.

PHOTO PROVIDED BY EXECUTIVE COUNCIL

Launch of the Hong Kong Marine Protection Alliance on 30 August 2022

PHOTO BY© KEN KWOK@114°E HONG KONG REEF FISH SURVEY

Thank you!

ACKNOWLEDGEMENTS

The 114°E Survey would not have been possible without the support of all the people working hard for the love of reef fishes. Thank you to everyone who helped to put this summary report together, and who continue to work hard for the next big step.

01 **Map design**

Terry Ho

02 **Photographs**

Photographers are credited where their photographs appear. If no credit is given, the photograph was provided by the project team.

03 **Volunteers (underwater and on land)**

Thank you to everyone in the 114°E Survey team who have been volunteering any time they could find to come count fish with us.

04 **Unwavering support**

Thank you to the teams at ADM Capital Foundation and The Swire Group Charitable Trust for enabling the project's continuation year after year.

05 **Project funders, donors and sponsors**

Thank you to all who have contributed to the 114°E Survey project over the years with funding support, donations and sponsors.

06 **All collaborators**

Finally, thank you to everyone who has worked with the 114°E Survey project in these three years.

That's all for now.
See you underwater
next year!

HONG KONG 114°E
REEF FISH
SURVEY

BLOOM