Hong Kong Reef Check 2023
Results Summary

(I) Background

There has been a growing attention and support from the public on Hong Kong Reef Check since the Agriculture, Fisheries and Conservation Department (AFCD) took up the coordinating role in 2000. In 2023, a total of 103 dive teams, involving over 1150 volunteer divers took part in the event and this represents a 30-fold increase in divers as compared with that in 1997 (only 40 divers).

(II) Objectives

The Hong Kong Reef Check is part of the global programme to promote sustainable management of coral reefs. Reef Check in Hong Kong serves 2 major functions: (a) to raise public awareness on corals and the need for coral conservation and (b) to provide updated information on local corals to facilitate conservation and management.

For further details of Reef Check, please visit the below website: http://www.afcd.gov.hk/english/conservation/con_mar/con_mar_cor/con_mar_cor_hkrc/con_mar_cor_hkrc.html.

(III) Reef Check 2023

Same as past few years, we organised a technical seminar for team members on standard survey methods and data collection prior to the Reef Check surveys. We also invited professional divers and marine ecologists to share knowledge and experience on diving safety and taxonomic identification of coral and other indicator species. This helps to improve the quality and accuracy of the field data, and enhance the safety awareness of team members and their understanding on marine ecology and the need of marine conservation.

(IV) Reef Check sites

The water areas covered in Reef Check 2023 are extensive and many of them are of ecological importance. The 5-month exercise from June to October covered the best coral growing sites known in the eastern part of Hong Kong waters extending from Tung Ping Chau in the north to Ninepin Groups in the south. A total of 33 sites were successfully surveyed, the locations of which are given in Figures 1 and 2. Out of the 33 survey sites, 9 of them are within marine parks.

(V) Major findings

(a) Coral coverage

- A variation in coral coverage (ranging from 12.8% to 74.3%) was recorded among 33 survey sites. The percentage of coral coverage for each survey site is shown in Table 1.

- Out of the 33 sites surveyed, 10 of them recorded high coral coverage (i.e. >50%). These sites included A Ma Wan and A Ye Wan of Tung Ping Chau, Au Yue Tsui of Yan Chau Tong, Coral Beach and Pier of Hoi Ha Wan, Tai Mong Tsai, East and North of Sharp Island, Bluff Island and East Dam.

- A Ma Wan of Tung Ping Chau was the site with the highest coral coverage (74.3%).

- 5 out of 9 survey sites within marine parks (i.e. Hoi Ha Wan, Yan Chau Tong and Tung Ping Chau Marine Parks) recorded high coral coverage (i.e. >50%).

- Out of the 33 sites surveyed, corals at 12 sites were identified up to genus level by the team scientists. This reflects the increased interest of team members on coral identification and the success of the technical training we offered.

(b) Species diversity

- 20 out of the total 20 assigned indicator species were recorded in the survey. Most of the survey sites record high species diversity.

- Out of the 20 assigned indicator species, butterfly fish, groupers, wrasses, snappers, sea cucumbers, sea urchins and cowries are species commonly found in the survey sites.

- Most of the groupers, wrasses, sweetlips, and snappers were found in survey sites at Eastern and North-eastern waters including Town Island, Port Island, Wong Chuk Kok Hoi and Crescent Island West.

(c) Change in Coral Coverage and Indicator Species

- Change of coral cover and indicator species were examined and compared. This helps to assess the coral condition and fauna diversity of a coral reef ecosystem over time.

- The growth and condition of corals at the 33 sites are stable with some sites showing slight variations, which may be due to natural variation of coral community coverage or sampling errors. The change of coral cover in 2022 and 2023 is shown in Figures 1 and 2.

- Long-term change of indicator species was examined. Results from past survey indicated that they are very stable and the species diversity remains on the high side.

(d) Other Observations

- No signs of destructive fishing practices were observed at all sites. However, we have recorded abandoned nets at 8 sites. The impacts were minor. We would arrange contractor to remove the abandoned nets.

- Coral bleaching was observed at 6 sites, including Kai Kung Tau, Au Yue Tsui, Wu Pai, Coral Beach and Siu Long Ke. The impacts were minor and localised. It may be caused by the elevated water temperature during this summer.

(e) Coral Watch

- The health condition of corals was assessed using specially designed Coral Health Monitoring Chart. The colour intensity of corals reflects the amount of the symbiotic algae (zooxanthellae) inside the corals, which in turn indicates the health status of the corals. The deeper the colour, the healthier is the corals.

- The Coral Health Monitoring Chart has four sample colours and 6 degrees of darkness (Code 1 to 6) for each sample colour representing different stage of coral health condition. Code 1 is the lightest and Code 6 has the darkest colour.

- Corals at 10 sites were assessed using Coral Watch tool in Reef Check 2023. The average health index is 4.28 (ranging from 3.5-5.0). The results are similar to last year (4.06). The average health index is well above the general average value (3), indicating corals were generally in a healthy condition.

(VI) Measures taken by AFCD on coral conservation

Coral reefs are highly productive systems, which support a high diversity of marine life. AFCD has put in place a series of measures and programmes to protect and conserve the coral communities in Hong Kong. Key areas include:

(a) Designation of marine protected areas

We have designated seven Marine Parks and one Marine Reserve for the conservation of marine environment and protection of corals. A plan is underway to designate more marine parks to better conserve the seascape feature and ecological resources.

(b) Education and publicity

We have organised a range of educational and publicity activities including public seminars, school talks, eco-tours, photography and drawing competitions and exhibitions to enhance public understanding of our marine ecology and the importance of protecting the marine environment. Coral restoration workshop and seminar have also been organised to educate divers and allow them to participate in protecting the marine environment and coral communities. We will continue to implement the educational programme "Hong Kong Marine Classroom" to consolidate and promote all the educational activities and services related to marine conservation on various social media.

(c) Monitoring and studies

We actively monitor the status of coral communities of Hong Kong through annual "Reef Check". Results of the Reef Check are publicised to raise public awareness of the current status of our marine environment and to seek their cooperation in protecting our precious marine resources.

We have implemented an online reporting system, which allows divers and other citizens to report sightings of coral bleaching, diseases, bioerosion or human damages. If severe threats to corals were found, we will take immediate actions to investigate the cause and work with local experts to formulate and implement appropriate remedial actions.

In addition to Reef Check, we undertake comprehensive coral studies to provide information for sound and adaptive management. In 2019, we completed an 18-month consultancy study of coral bleaching and bioerosion, which revealed that the coral coverage of the 33 major coral communities in Hong Kong were generally good. The findings are consistent with the trend of the Reef Check findings in the recent years.

(d) Coral restoration

While Reef Check results indicated that the hard corals of Hong Kong are generally healthy, a few sites appeared to have suffered some degradation due to different reasons. For example, the *Platygyra* brain corals in the northeastern Hong Kong waters were hit by partial mortality and bioerosion in 2015-2016. In collaboration with the University of Hong Kong, a restoration study was initiated in Hoi Ha Wan Marine Park in 2016. Besides, 3D-printed reef tiles were deployed in 2020 as a trial to further enhance the effectiveness of coral restoration. The initial result is encouraging that successful growth of new tissues has been observed among the restored brain corals and a high survivorship was recorded among the coral fragments transplanted onto the reef tiles.

Coral community degradation caused by bioerosion was also observed at Port Island and Wong Chuk Kok Hoi in recent years. In 2020-2021, we commissioned the University of Hong Kong to conduct a restoration study at the two reef check sites. After taking some trial mitigation measures (e.g. setting up in situ nursery and repairing colonies deemed at risk of imminent collapse), signs of recovery of corals at the two sites have been recorded.

(e) Reduce coral damage caused by boating and recreational activities

To protect coral communities from anchor damage, mooring and marker buoys have been installed in marine parks where recreation pressure is high.

Also, specially-designed marker buoys were installed at Bluff Island, Port Island and Sharp Island west since 2002 and South Ninepin Island, Shelter Island and Sharp Island East since 2015 for better protection of coral from anchor damages. The results of the post-installation monitoring at Sharp Island and Bluff Island indicated that damaged corals had shown signs of recovery.

Leaflets and posters on "No-anchoring area" at Bluff Island, Port Island, Sharp Island West, Sharp Island East, South Ninepin and Shelter Island and stickers on "Codes for visiting coral areas" have been published and distributed to the boaters and divers through various channels.

(f) Scientific database

Currently a total of 84 hard coral species, from 28 genera of 12 families have been found in Hong Kong waters. A total of 67 species of octocorals (29 species of soft corals and 38 species of gorgonians) and 6 species of black corals were also recorded in Hong Kong waters.

A series of field guides, including "Field Guide to Hard Corals of Hong Kong", "Field Guide to Common Corals of Hong Kong", "Field Guide to Common Reef Fishes of Hong Kong", "Field Guide to Indicator Fishes of Hong Kong Reef Check", "Field Guide to Indicator Fishes of Hong Kong Reef Check II", "Field Guide to Indicator Invertebrates of Hong Kong Reef Check" and "Field Guide to Indicator of Hong Kong Reef Check" were published to document the diversity and unique features of our local coral communities and reef-associated marine life.

The aforementioned consultancy study of coral bleaching and bioerosion completed in Hong Kong in 2019 also provided updated and scientific data and recommended appropriate management measures and long-term monitoring.

Marine Conservation Division (Biodiversity)
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Table 1: Hard coral coverage at 33 survey sites

Survey Sites	Coral Cover (%)
1. A Ma Wan, Tung Ping Chau	74.3
2. A Ye Wan, Tung Ping Chau	53.2
3. Wong Ye Kok,Tung Ping Chau	34.7
4. Kai Kung Tau, Kat O	20.2
5. Tau Tun, Kat O	27.5
6. Lai Chi Wo, Yau Chau Tong	46.2
7. Au Yue Tsui, Yau Chau Tong	51.3
8. Ngau Shi Wu Wan	22.5
9. Wu Pai, Crescent Island	44.7
10. Cresent Island West	44.5
11. Crescent Island South	42.5
12. Tung Wan, Double Island	26.9
13. Wong Chuk Kok Hoi	12.8
14. Port Island	21.1
15. Moon Island, Hoi Ha Wan	16.0
16. Coral Beach, Hoi Ha Wan	64.6
17. Pier, Hoi Ha Wan	67.2
18. Gruff Head, Hoi Ha Wan	38.9
19. Long Ke Wan	25.6
20. Siu Long Ke	47.9
21. Pak Lap Tsai	35.8
22. Pak A	46.8
23. Tai She Wan	48.2
24. Tai Mong Tsai	63.7
25. Town Island	41.0
26. Sharp Island East	60.7
27. Sharp Island North	65.2
28. Sharp Island South	42.5
29. Pak Ma Tsui	27.2
30. Shelter Island	37.8
31. Bluff Island	55.2
32. East Dam	63.2
33. Ninepin	23.8

Figure 1 Reef Check site location & hard coral coverage comparison (2022 vs 2023)

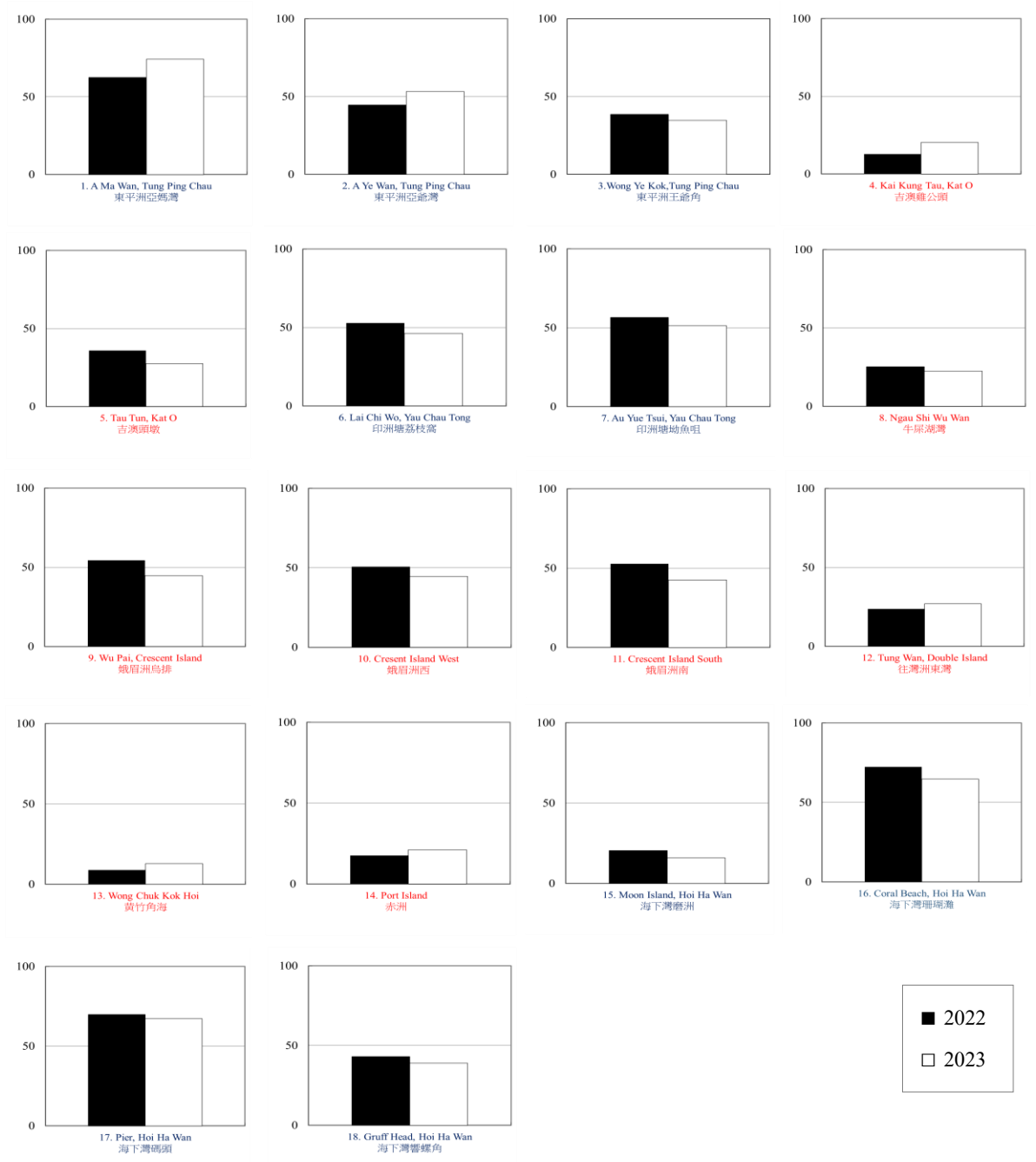

Figure 2 Reef Check site location & hard coral coverage comparison (2022 vs 2023)