

## CETACEANS IN HONG KONG – CHINESE WHITE DOLPHIN



You may have heard the term “Chinese white dolphins” mentioned many times but how well do you actually know these animals?

Did you know, for example, that the term “Chinese white dolphin” is only used locally in Mainland China and Hong Kong? Scientists elsewhere refer to them as the “Indo-Pacific humpback dolphin”, with the scientific name *Sousa chinensis*. One of some 80 cetacean species (whales, dolphins and porpoises) found around the world, the Chinese white dolphin belongs to the Family Delphinidae of the Order Cetacea, which also includes the bottlenose dolphin and the orca (killer whale). And although dolphins may look like a fish, they are in fact mammals like us and are life-bearing, warm-blooded, and they also suckle their calves and breathe with lungs.

### **Hong Kong Locals**

Did you know that Chinese white dolphins are “Hong Kong locals”? They were already swimming in the Pearl River Estuary and Hong Kong waters hundreds (or maybe even thousands) of years ago. Adventurer Peter Mundy recording the first sightings in western literature in 1637 whilst in China, the species was recorded in as early as the Tang



Dynasty!

Although the Chinese white dolphin has lived in Hong Kong waters for many centuries, they did not become well-known until the 1980's when the government announced plans to build a new airport in Chek Lap Kok, an area frequented by the dolphins. And it wasn't until 1993, when the actual work on the airport had begun, did the government give funding for research to assess

the possible impact the airport and its related land reclamation might have on the dolphins.

### Global Distribution



Despite its name, the Chinese white dolphin is not endemic to China. As already mentioned, their correct name is Indo-Pacific humpback dolphin, and as the name

suggests, the species can be found in both the Indian and western Pacific oceans. They prefer to stay in coastal waters such as estuaries and near wetlands with mangroves. Their distribution extends from the South China Sea in the east, to the eastern and southern coasts of Africa, Middle East, the Indian Ocean in the west, and Australia in the south. Apart from Beihai, Leizhou Bay, Xiamen and the Pearl River Estuary of the People's Republic of China, the species can also be found along the west coast of Taiwan, Vietnam, Malaysia, Thailand, India, Pakistan in Asia; Australia; and even Iran, Iraq, Saudi Arabia, Bahrain, Kuwait, Qatar, UAE and Oman in the Middle East; Mozambique, Madagascar and South Africa in Africa.

Here is a distribution map of humpback dolphin around the world:

*South Africa* ~ Other than the Pearl River Estuary of China, South Africa is another region where detailed research and surveys on the humpback dolphins have been conducted. The humpback dolphins in South Africa look very different to those in Hong Kong. They



are uniformly gray and their body colour does not change with age. Also, they possess an obvious hump, hence the name "humpback". The animals in South Africa usually occur within 2 km of the shore. Currently, the most significant threat facing the humpback dolphins in South Africa is being entangled in the coastal shark nets.

*Mozambique* ~ Some researchers carried out boat surveys and photo identification on the humpback dolphins in Maputo Bay in Mozambique during 1995-97 to assess the status of the population. The research revealed the population size is small with around only 105 individuals. Little is known about the current status of the humpback dolphins here with only preliminary research conducted over a decade ago

*Madagascar* ~ Very little is known about the humpback dolphins in the Madagascan waters. In boat surveys conducted between 1997 and '99, researchers recorded sightings of the dolphins along the western coast only. The largest threat the dolphins face today is being hunted by fishermen. Researchers have recorded hunting and selling of small

cetaceans – including humpback dolphins – for consumption in southwestern Madagascar. And the levels of documented exploitation are high.

*Oman* ~ Most of the limited information we have on humpback dolphins in the Middle East originates from the Sultanate of Oman – located east of Saudi Arabia – where this species is one of the most commonly recorded cetaceans. The humpback dolphins are found mainly in the shallow coastal waters of southeastern Oman. Currently, the biggest threats faced by the humpback dolphins there are entanglement in discarded gill nets and loss of habitat due to rapid coastal development.

*India* ~ Humpback dolphins have been seen along the coastline of India and northwestern Sri Lanka but little research has been carried out. Recent research indicates that there



could be two different forms of humpback dolphins in India. The photo on the left is a humpback dolphin from the west coast of India. This animal has a large hump and appears dark gray in colour, which resemble those in Middle East and South Africa. The photo on the right shows a humpback dolphin from the east coast of India. This animal possesses no

hump and looks pink, which looks more similar to those in Thai and Chinese waters.

*Malaysia* ~ Humpback dolphins have also been recorded in Malaysia. Currently kept in a local museum, a few skull specimens of the species have been found in Malaysian Borneo. And according to some literature from several decades ago, humpback dolphins were seen in the waters near Sabah and Sarawak. No systematic research or survey has ever been conducted in these waters until fairly recently and so the current status of the humpback dolphins in Malaysia is virtually unknown.

*Thailand* ~ Very little is known about the biology, ecology and status of wild humpback dolphins in Thailand. The scant information on these dolphins we have show that they had been spotted in the waters of both the Bay of Thailand and Andaman Sea.



*Guangxi* ~ There have always been records of humpback dolphins along the coastline of Beibu Gulf of Guangxi Province. In 2001 scientists conducted preliminary surveys in the Beibu Gulf and recorded sightings of the species in the Hepu State Dugong Reserve near Shatian. In recent years, regular sightings were made near Beihai City and the mouth of Daifengjiang in this province.

*Xiamen* ~ The Xiamen population of humpback dolphins was studied in the mid-90s and again in the past few years. These studies showed that the dolphin population is very small, with less than 80 animals. Although a national reserve was established for dolphin conservation purpose, the Xiamen dolphins are still facing tremendous amount of pressure from coastal development and shipping traffic.



*Eastern Taiwan Strait* ~ In 2002, the population of humpback dolphins along the central



west coast was discovered and described by scientists from *FormosaCetus* Research and Conservation Group for the first time. The dolphin population is numbered less 100 animals (and perhaps less than 60 animals), and is the first humpback dolphin population being classified by the IUCN Red List as “Critically

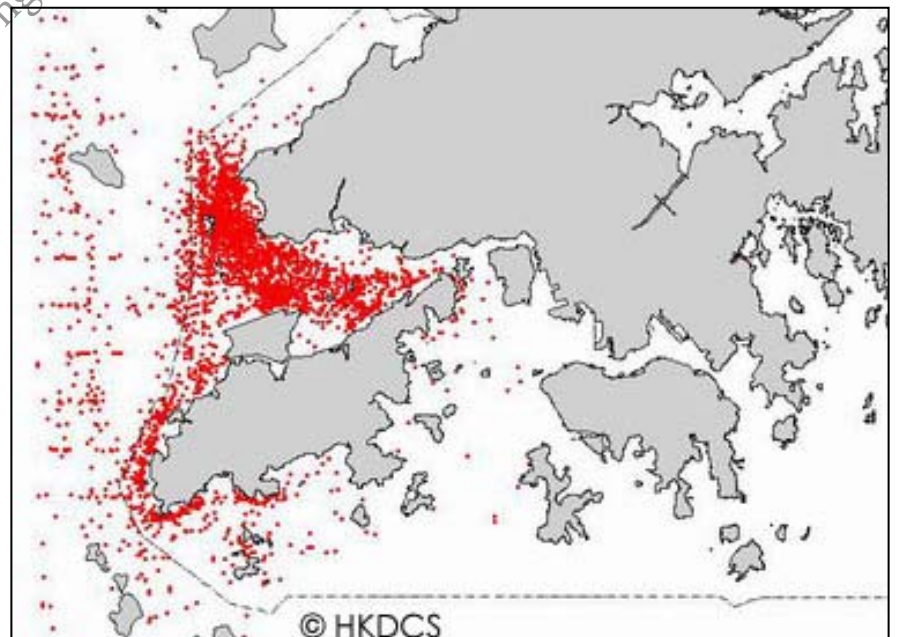
Endangered”. These dolphins are facing a myriad of threats in their habitat (e.g. fishery by-catch and lack of prey), and coastal development project have already destroyed a lot of their feeding habitats, further shrinking their overall range. Recently proposed petrochemical plant in the central portion of the dolphin population may be the “nail in the coffin” of the fate of these dolphins, and local green groups are protesting earnestly to reverse their plight.

*Australia* ~ What we know about the biology, ecology and status of the humpback dolphins in Australia are very limited. Humpback dolphins in Australia are primarily distributed along the shoreline in the north, mainly along the west coast. They do not have a hump and are dark gray in colour with their melon, rostrum and dorsal fin whitening with age. Surveys show that the humpback dolphins in Australia are very scattered. They mainly reside in coastal waters or estuaries, and are hence susceptible to human induced threats such as entanglement by gill nets.

### **Where to Find and How Many in Hong Kong?**

In Hong Kong, most Chinese white dolphins can be found in waters around Lantau Island, which is influenced by the Pearl River freshwater outflow. Some of the hotspots of dolphins in Hong Kong include: the Brothers Islands, Sha Chau and Lung Kwu Chau Marine Park, Black Point, Pillar Point, the northeast corner of airport, along the entire stretch of west coast of Lantau (from Tai O, Peaked Hill to Fan Lau), near Kau Ling Chung and around Soko Islands. From a detailed habitat use study, it was found that Chinese white dolphins in Hong Kong prefer the natural coastlines, waters around islands with stronger currents, and along the edges of deepwater channel (e.g. Urmston Road and Tai Ho Channel). However, they appear to avoid anchorage areas, shallow mudflat, vessel fairway with heavy shipping traffic, and areas with dredging and reclamation works.

Actually, the dolphins inhabit the waters of Hong Kong only comprise of a small portion of a large population in the Pearl River Estuary. Across the border, Chinese white dolphins can be found throughout the entire Lingding Bay (from Hu Men in the north to Guishan Islands in the south, and to Macau and Zhuhai



in the west), as well as Huangmao Sea, waters around Sheungchuan Island and Xiachuan Island.

According to recent search, using the systematic line-transect survey method, at least 2,500 Chinese white dolphins are estimated to be the size of the Pearl River Estuary population, with around 300 frequenting Hong Kong waters. This population is likely the largest throughout the species' range in the Indo-Pacific region, and the species itself is classified as "Near Threatened" (close to qualifying for or is likely to qualify for a threatened category in the near future) under the Red List of Threatened Species by IUCN (International Union for Conservation Nature).

### **Social Structure**

You may think that, like us, dolphins are highly intelligent animals and live closely with their friends and relatives. But whilst some dolphin species such as the orca do have intimate life-long relationships with their family members, Chinese white dolphins don't. Calves leave their mothers and live alone after being weaned and spend most of their time with a few other individuals when not alone. Also, they may not have fixed partner(s) and often live with different individuals according to social structure studies.

According to recent studies, there may be two clusters of Chinese white dolphins living in Hong Kong, with one occupying the waters in North Lantau waters and the other one in West/Southwest Lantau waters.



So how do we identify individual dolphins in order to understand their social structure? Well, researchers use a technique named "photo-identification" by taking up close photographs of their dorsal fins – similar to the way we use our fingerprints. As well as having different shapes, the dolphins' dorsal fins bear special features like nicks and



wound marks. Some dolphins also bear injury marks that are eye-catching and researchers can identify them at a glance. The photos can also be cross-referenced with the photo-ID catalogue to see if the dolphin has been recorded before. More than 680 Chinese white dolphins have been identified in Hong Kong waters and the Pearl River Estuary by photo-identification to date. The information collected helps us to understand more about their home ranges, movement patterns, social structure, and even life history!

### **Playful Behaviours**

Chinese white dolphins, like many dolphin species, are playful marine creatures. Researchers are tireless of their many tricks even after years of looking at them. Some their common behaviours are:

*Breaching* ~ this is when a dolphin leaps out and falls back into the water making huge splashes. The movement consumes a lot of energy illustrating how powerful the dolphins' tails are. Scientists speculate that dolphins are engaged in breaching behaviour in order to stun their prey, to get rid of itchy parasites on their backs (like the way we scratch our backs), or simply to socialize with others!



*Spy-hopping* ~ refers to a dolphin lifting its head out of the water to observe the surroundings. Chinese white dolphins are curious animals, and when we go dolphin-watching, it is hard to say whether the dolphins or the dolphin-watchers are more interested than each other!



*Porpoising* ~ this is most often exhibited by fast-moving dolphins. They leap forward out of the sea and back into the water smoothly. As the resistance of air is smaller than water, leaping into the air helps them to accelerate. Dolphins usually porpoise when following trawlers for fish.





Apart from these three common behaviours, dolphins often perform other surprising tricks such as tail-slapping or swimming on one side. Researchers are sometimes baffled as to what the dolphins are up to!

### **Life History**

*Diet* ~ Chinese white dolphins in the Pearl River Estuary feed exclusively on different species of fishes. In their stomach content, researchers have found over 20 fish species including yellow croaker, lion-head croaker, sardines and anchovies – basically the same types of fish we like to eat ourselves! It seems, however, that they are not interested in cephalopods (like octopus and squids) and crustaceans (like shrimps and crabs).



*Life Span* ~ It is difficult to tell the age of a dolphin by its appearance alone and so researchers have to find clues from dolphin carcasses and the teeth are the key to unveil the secret of a dolphin's age. By sectioning a tooth, researchers can estimate the age of a dolphin by counting the number of tooth layers. To date, the oldest Chinese White Dolphin confirmed in Hong Kong is 38 years old, but we believe they can live up to 40 years, just like their South African counterparts do.

*Colouration* ~ Among the some 80 species of whales and dolphins, Chinese white dolphins living along the coast of Southern China undergo the greatest colour changes in their life. Newborns are usually dark grey and about 1 m long. As they become juveniles, the greyness fades and they start to turn pinkish. The original grey becomes numerous spots which gradually disappear.



Adult Chinese white dolphins – with body lengths of up to 2.6-2.7 m and weights of up to about 250 kg – are mostly pink with only a few spots.

So why are Chinese white dolphins pink in colour? A plausible explanation for this is when the dolphins are swimming, the blood vessels near their skin dilate to enable more blood flow for heat release, therefore making the dolphins look pink – similar to flushing in humans during exercise. Researchers have also found that dead dolphins are not pink but milky white which further supports this second theory.

### **Threats Faced by Local Dolphins in Hong Kong**

Although Chinese white dolphins are not endangered, they still live in a place full of dangers. If you visit them at sea, you can feel the tremendous amount of pressure they are facing each day:

*Habitat Loss* ~ Over the past decade, the overall range of dolphins in Hong Kong has shrunk substantially because of the construction of the new airport at Chek Lap Kok Island and the associated land reclamation. The accumulative detrimental effects coastal development projects have on the dolphins is significant. Reclamation devastates coastal and benthic ecology, reduces the amount of fish available to the dolphins to feed on. The dredging may also unearth pollutants that have settled on the seafloor causing water quality to further deteriorate. Now that a number of coastal and marine projects, including the well-known Hong Kong-Zhuhai-Macau Bridge are planned in the near future, it is worrying that the local dolphins will have to continue to cope with all sorts of threats.





*Vessel collision* ~ Hong Kong is a busy harbour with numerous vessels traversing through waters to the south and north of Lantau Island where the Chinese white dolphins can be found. Dolphins frequent these high-speed ferry routes and researchers have witnessed many times how the ferries came close to striking dolphins. We

have found some dolphins bearing scars likely to have been caused by vessel propellers. These were lucky to survive, but our guess is that others would have been less fortunate and were killed. It also becomes a problem for the dolphins if they are being displaced from their favourable feeding habitat within these vessel fairways.

*Disturbance from Dolphin-watching Activities* ~ In recent years, more tour companies, green groups and schools are holding Chinese white dolphin watching tours. Allowing people to see and appreciate wild dolphins at sea is a good thing but because the activity is not regulated in Hong Kong, any type of boats can take visitors out and sometimes they disturb the dolphins. Research shows dolphins stay away from these irresponsible boats, or choose to dive for longer. In the long term, the dolphins may abandon the area where they have been harassed. In the last few years, small and speedy dolphin-watching boats are operating from Tai O fishing village. Knowing not much about dolphins, the skippers of these boats are chasing the animals at even higher speeds and harassing the dolphins.



*Water pollution* ~ Samples collected from dolphin carcasses in Hong Kong reveal high concentrations of organochlorines and heavy metals, suggesting that these pollutants are harmful to their immune and reproductive systems. Pollutants are washed into the sea from local discharges and the factories and agriculture farm along the Pearl River. The

high concentration of pollutants accumulated in dolphins' blubber or internal organs might be attributable to its polluted food source which contains persistent and bioaccumulating toxic substances. At the same time, a lot of pathogenic bacteria and viruses can be found in Hong Kong waters, thus making them even more susceptible to diseases which can be fatal in some cases.

*Underwater noise* ~ The underwater world the Hong Kong dolphins dwell in is noisy with scores of vessels traversing through Lantau waters, as well as coastal underwater works (particularly underwater piling). As dolphins rely on their hearing for echolocation and communication with companions, a deafening environment might affect its ability to locate food and communicate and in serious cases cause permanent damage.

*Fishery bycatch* ~ The dolphins like to follow trawlers, which catch the most fish and stir up fish at the sea bottom, but by doing so, they risk being entangled by the fishing nets. As dolphins have to surface to breathe, they will drown once entangled. However, fishery by-catch is not a serious menace to Chinese white dolphins in Hong Kong. It is observed that they are skilful enough to avoid getting entangled when following the trawlers.



### **Conservation Effort on Local Dolphins**

We should be grateful that Chinese white dolphins are not near extinction but it doesn't mean we should sit around doing nothing! In recognition of the numerous risks the dolphins are facing in their daily lives, the Agriculture, Fisheries and Conservation Department (AFCD) of the Hong Kong government and some local green groups carry out different strategies to protect them, hoping they would continue to thrive in our waters.

*Law Protection* ~ Chinese white dolphins in Hong Kong are mainly protected under two ordinances, the Wild Animal Protection Ordinance (Cap 170) and the Animals and Plants





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(Protection of Endangered Species) Ordinance (Cap 187), which are both regulated by the AFCD. The Wild Animal Protection Ordinance prohibits any harassing, harming, capturing or killing Chinese white dolphin. The Animals and Plants (Protection of Endangered Species) Ordinance gives effects to the Convention on International Trade of Endangered Species of Wild Fauna and Flora (CITES) to prevent any illegal export, import and sales of endangered species and its body parts. The Chinese white dolphin is listed in Appendix I of CITES, which means any trade of Chinese white dolphins for commercial purpose is strictly prohibited worldwide.

*Environmental Impact Assessment* ~ Local dolphins are facing increasing amount of pressure from coastal development that takes place in their living habitat. Fortunately, the dolphins are protected in some way under the Environmental Impact Assessment Ordinance (EIAO), which requires all project proponents to conduct detailed assessment on potential impacts of development projects on local dolphins and porpoises, and propose appropriate mitigation measures to minimize the impacts. In some cases, the proposed developments may never happen due to their impacts on important dolphin habitats, and some have to relocate the work site to other marginal habitats. In most cases, they are required to adopt many mitigation measures to safeguard the dolphins from the disturbance from construction works. And they are also required to conduct cetacean monitoring surveys which can contribute to a better understanding of the local dolphins and porpoises.

*Marine Protected Area* ~ Up till now, the AFCD has established four marine parks in the territory with Sha Chau and Lung Kwu Chau Marine Park to the northwest of Lantau Island set up for the protection of Chinese white dolphins. In the near future, a few more marine parks at Fan Lau, Soko Islands and Brothers Islands will also be established for dolphin conservation purposes. Under the Marine Parks and Marine Reserves Regulation, all vessels must limit their speed to 10 knots in the marine parks to avoid bumping into the dolphins. At the same time, trawlers are prohibited to operate in the marine parks so to protect the fish stock in the areas and eliminate the risk of fishery bycatch.

*Research* ~ Long term research and monitoring is crucial to dolphin conservation, by which researchers can learn more about the ecology, status, as well as trends and changes in



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abundance and distribution of the dolphins. In addition, information collected from dolphin carcasses further enhances our understanding of their status. For instance, their liver reveals the amount of toxic heavy metals accumulated, which can help researchers work out how environmental pollution directly affects the dolphins.

*Education* ~ Education is a vital part of dolphin conservation! The efforts spent by the few conservationists and the government will go in vain if public recognition and support is lacking! That's why the government and green groups such as HKDCS regularly hold talks, exhibitions and contests for schools and organizations, and publish different kinds of dolphin booklets and posters in order to prompt public awareness of the dolphins and their conservation. Also, they have websites (like the one you are reading now) to provide the public and students with lots of useful information about the dolphins.

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