

Group builds free ‘Pokedex’ app to help identify and log local fish

By Ang Qing Correspondent

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Despite its busy straits, Singapore’s position near one of the world’s most biodiverse marine areas has allowed it to yield a surprising variety of fishes, though their significance is occasionally lost on those who catch them.

Such was the case at Bedok Jetty in August, when an angler mistook a globally endangered zone-tail butterfly ray for the average stingray. The butterfly ray is distinguished by its wide, triangular body and short tail, compared with the rounder body and long tail of more common stingrays.

Fellow fishing enthusiast Brian Sng, a Singapore Management University software engineering student, quickly realised the value of the catch from the photo he was shown, and informed the angler of his rare find.

To avoid these cases of mistaken identities, Sng, 21, and a group of fellow enthusiasts interested in the scientific study of fish built a free mobile app to help people identify the fishes that live in Sin-

gapore’s murky waters.

On Sept 17, the Ichthyological Society of Singapore (ISS), which has more than 150 members, launched SGFish on the Apple App Store. The app can identify more than 900 species using an image recognition model.

Users snap a photograph of their catch via the app, and the program will identify the species. It will also log down where each find was made.

To maintain scientific integrity, volunteers and co-founders of the society will manually verify all submitted records before they are officially logged into a database.

Currently, the database has about 2,300 observations covering more than 400 species. Before the launch of the app, this database was compiled using a Telegram bot built by volunteer and fellow app developer Samuel Pua, a 36-year-old cybersecurity professional.

The bot was dubbed Angler’s Pokedex, a reference to the portable electronic encyclopaedia from hit franchise Pokemon that is used to identify and record new monsters encountered.

Pua said the team decided to de-

velop the app partly because time and location details could not be extracted from images submitted on Telegram, making it difficult to pinpoint data accurately.

To build the app’s computer vision model, Sng, who is the lead developer of the mobile app, collated and vetted more than 90,000 photos of fish species found near Singapore and neighbouring waters. These were sourced from international databases, society members and his own photos.

It took two months to train the model with his dataset until it reached an 82.7% accuracy rate, said Sng, who was working on this while studying. He noted that it is more accurate than the model created by the US-based flora and fauna database iNaturalist, which has an accuracy rate of about 80% for fish across the world.

Novice anglers can sometimes mistake dangerous fish for harmless ones or lack awareness of sustainable fishing practices, the developers told The Sunday Times.

This prompted them to include a pop-up feature that alerts users on what to do if a scanned fish is a protected, rare or harmful species.



The Ichthyological Society of Singapore launched SGFish on the Apple App Store on Sept 17. The app can identify more than 900 species using an image recognition model. PHOTO: COURTESY OF BRIAN SNG

For example, if an endangered fish is caught, users are advised to release it.

To minimise the risk of incorrect identifications, the app shows the top five predictions of the scanned fish’s identity, ranked according to how similar they are to the specimen. Users then finalise the identity of species by selecting one of the options.

In future updates, the developers hope to make the app available on the Google Play Store and incorporate the initial Telegram

bot’s popular gamification elements, such as a high-score board that recognises users who record the highest diversity of unique species.

Fish biologist Jeffrey Kwik said citizen science initiatives like the SGFish app can help supplement fish surveys involving diving or snorkelling, which rely heavily on good water visibility.

Spotting and counting fish populations visually in Singapore is particularly challenging owing to the Republic’s murky waters.

“This is exacerbated for well-camouflaged species or species that find refuge in associated marine habitats like seagrass and corals, which are even harder to spot,” said the associate professor at the Singapore Institute of Technology.

Records from anglers are particularly useful for covering large survey areas, Kwik added, as gathering detailed, wide-ranging data through official surveys requires significant resources.

Even with potential biases from hook sizes or bait types, data from anglers is useful for supplementing species lists and tracking the distribution of fish, he said.

As the community logs more observations, ISS co-founder Andriel Cheong hopes the database built from these records can inform environmental impact assessments, giving the authorities a clearer picture of marine biodiversity when planning coastal developments.

Beyond recreational fishing and divers, the team hopes the public will use the app to learn about fishes.

“We encourage the average person to test it out on everyday sightings of fish, such as those you see in the market, just to learn more about the varieties of fish that can be found in our local markets,” said Cheong, noting that this could promote more conscious consumption of seafood.

aqing@sph.com.sg