

22th September, 2022

***Tung Chung River Ecology and Water Quality Assessment* highlights urgent calls for stewardship to protect water quality and species of conservation value, including first record of Glass Goby on Lantau**

Environmental group **Green Power** today announced the latest findings from *Tung Chung River Ecology and Water Quality Assessment* which recorded 66 freshwater fishes, 15 amphibians, 17 reptiles, 55 dragonflies and 360 vascular plants native to Hong Kong. Among these, several stand out in ecological significance—such as the endangered Romer's Tree Frog (*Liuixalus romeri*), Burmese Python (*Python bivittatus*), a Class II state-protected species in China, the “Vulnerable” dragonfly Mangrove Skimmer (*Orthetrum poecilops*) and “Vulnerable” plant *Gmelina chinensis* (for details, please refer to the Appendix). The first sighting of the Glass Goby (*Gobiopterus macrolepis*) in Tung Chung River is thrilling. On the other hand, the water quality part of the study exposed a looming threat to all the exciting discoveries. Intensifying and pervasive pollution in the downstream section of Tung Chung River is jeopardizing the overall ecology of the basin.

Green Power commenced the ecological and river water quality assessment in 2018, with support from the **Hong Kong International Airport Environmental Fund**. The study covers Tung Chung River Catchment from the upper through the lower courses including the stream channels, their riparia and the estuary. **Elaine Yuen, Assistant Education & Conservation Manager of Green Power**, who is in charge of the study, emphasised that the surveys have identified a wide array of species with conservation value, reflecting a high degree of biodiversity in Tung Chung River Catchment. For example, the first Lantau record of Glass Goby, a species endemic to China which has only been found in Zhujiang (the Pearl River) waters, is invaluable. The species is listed as “Vulnerable” in the *Red List of China's Vertebrates* and scientific understanding of its habitat requirements and ecology is still limited. **Yuen** expected their work to provide useful information to different stakeholders during the stages of planning, designing and implementing conservation measures under Tung Chung New Town Extension.

Degrading habitats in urgent need of rehabilitation

Yuen explained that Tung Chung River is the last remaining large natural river in Hong Kong. It is of high ecological and conservation value for the largely pristine features throughout its headwaters to the estuary and the bay area. The western side of the present Tung Chung New Town Extension plan overlaps the downstream sections of Tung Chung River, which would bring drastic changes to the river basin. Fortunately, the government has responded positively to public concern on the issue. Instead of “channelizing” natural rivers as in conventional practice in the past, the future Tung Chung River will keep its natural river beds and banks. Only polders would be installed to separate river flood zones and residential areas for flood control.

As a step further, the government promised to rehabilitate a section of Tung Chung River channelised in 1998 under Tung Chung New Town Development. The 650-metre section is located downstream of the eastern tributary near Shek Lau Po. Upon rehabilitation, most of it will be included in the future River Park. **Yuen** remarked that this will be the first attempt of large-scale river rehabilitation work in Hong Kong and has galvanized much public expectation.

The above-mentioned section is covered by Green Power's ecological survey. However, only 17 fish species have been reported over the last four years, lower than the reference figure of 29 fish species in the western tributary. **Yuen** added that by comparing fish densities of different sections using the random quadrat method, nearly no fish was recorded in the concrete channel without natural substrates, while 3-19 individuals could be recorded in other natural river sections downstream, we can observe the deterioration of the river habitat and aquatic community conditions. Much efforts are needed to rebuild the complex and diverse habitats if we want to increase the chance of success of rehabilitating the river ecosystem.

Persistent pollution threatens the future River Park

Regarding water quality, it was found that wastewater was continuously discharged via stormwater drainage into Tung Chung River from Shek Mun Kap Village, which situates upstream of the future River Park, in addition to several pollution sources along the river. Indicator figures revealed deteriorating water quality downstream: dissolved oxygen levels were relatively low, conductivity and nitrate levels were high, and pH levels were abnormal. More precisely, at the most downstream survey location of the eastern tributary, dry season nitrate-nitrogen concentration averaged 5.2 mg/L (with a highest of 40.8 mg/L), more than five-fold the level in the upper course. The water here tends to be alkaline, reaching a pH level of 8.4 on average. Near the wastewater discharge point at Shek Mun Kap, high levels of ammonia, a water pollutant, were frequently reported. On average, ammonium-nitrogen concentration reached 8 mg/L, and even 15 mg/L at the peak, both exceeding the standards stated in the *Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters* ^(Note 1). **Yuen** concluded that the many indicator figures showed that downstream water pollution is deeply worrying.

Yuen noted that the issue of illegal sewage discharge has been long-standing in rural areas of Hong Kong. People's habits, lack of public awareness and slack law enforcement have contributed to the problem. As Tung Chung New Town Extension development comes into place, the population increase will bring in more pollution problems. If the government fails to effectively control and eliminate the pollution sources, not only will the Tung Chung River ecology be worsened, but the future River Park water-friendly measures will also be affected. She called for the government's attention and action in this aspect.

A novel Sustainable Urban Drainage System (SUDS) will be installed in Tung Chung West by the government. The system includes elements such as porous pavements, bioswales, and attenuation ponds to collect and treat surface runoff before discharging it into Tung Chung River. **Yuen** said that the SUDS is an important line of defence in protecting the water quality and ecology of Tung Chung River. The government must ensure the system covers sufficiently all residential and other land use areas. Public recognition of the value of the river should also be highlighted as part of the efforts to overcome the pollution problem.

Note 1: The Environmental Protection Department has issued the *Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters* according to Section 21 of the Water Pollution Control Ordinance (Cap 358). The standards for effluents apply to four groups of inland waters for different purposes (Group A: abstraction for portable water supply; Group B: irrigation; Group C: pond fish culture; Group D: general amenity and secondary contact recreation). Green Power carried out 10 measurements of ammonium-nitrogen concentration at the pollution source. The results showed that 60% - 100% of the tested samples exceeded the standards for Group A, B and C.

Editor's Note

Tung Chung River

Tung Chung River is the last remaining large natural river in Hong Kong which retains much of its pristine landscape from the headwaters to the estuary and bay. Numerous precious fish species inhabit the premium water, including the rare Beijiang Thick-lipped Barb. A large area of natural mangrove and mudflat lies at the estuary which is home to many important creatures. Further out in Tung Chung Bay waters is the breeding and nursing grounds for horseshoe crabs, seahorses, pipefishes and other commercially valuable fishes.

“In-To Tung Chung River”

The project was launched in 2018 by Green Power with full support from the **Hong Kong International Airport Environmental Fund**, as well as support from the Sustainable Lantau Office of the Civil Engineering and Development Department, the Drainage Services Department, and the Water Supplies Department. The objective of the programme is to engage the public in “protecting our own river” through the concepts of “holistic river” and “river basin management” to better conserve Tung Chung River and the ecosystem services it provides. *Tung Chung River Ecology and Water Quality Assessment* is a key aspect of the programme. Over the years we have built an important ecological database of species distribution and water quality in Tung Chung River Catchment through regular surveys and monitoring.

To learn more: <http://www.greenpower.org.hk/tcriver>

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Tung Chung River Ecology and Water Quality Assessment
Species Recorded within Tung Chung River Catchment

Taxa Group	No. of Species (No. of Native Species)	Species of Conservation Concern	
		Examples	Remarks
Freshwater Fishes	76 (66)	Glass Goby (<i>Gobiopterus macrolepis</i>)	Vulnerable# New Record to Lantau
		Rice Fish (<i>Oryzias curvinotus</i>)	Data Deficient*
Amphibians	16 (15)	Romer's Tree Frog (<i>Liuixalus romeri</i>)	Endangered * Class II State-protected Species Locally Protected Species
		Hong Kong Newt (<i>Paramesotriton hongkongensis</i>)	Near Threatened * Class II State-protected Species Locally Protected Species
Reptiles	22 (17)	Burmese Python (<i>Python bivittatus</i>)	Vulnerable * Class II State-protected Species Locally Protected Species
		Reeves's Tokay Gecko (<i>Gekko reevesii</i>)	Critically Endangered # Class II State-protected Species
Dragonflies	55 (55)	Mangrove Skimmer (<i>Orthetrum poecilops</i>)	Vulnerable *
		Guangdong Hooktail (<i>Melligomphus guangdongensis</i>)	Vulnerable *
Vascular Plants	429 (360)	<i>Gmelina chinensis</i>	Vulnerable ^
		Incense Tree (<i>Aquilaria sinensis</i>)	Near Threatened ^ Class II State-protected Species Locally Protected Species

^ Status in China listed in *Rare and Precious Plants of Hong Kong* (Hu et al. 2003)

* Status in *IUCN Red List of Threatened Species* (up to September 2022)

Status in *Red List of China's Vertebrates* (Jiang et al. 2016)