



黑鳶
Black Kite

臺北•水溯源
石碇永安

Taipei • Water Traceability Shiding Yongan



穿山甲
Pangolin

小綠葉蟬
Tea green leafhopper

食蛇龜
Chinese Box Turtle



翡翠樹蛙
Emerald Tree frog



經濟部水利署臺北水源特定區管理局

Taipei Water Management Office, Water Resources Agency

臺北水源特定區環境教育學習中心

Taipei Water Source District Environmental Education Center

Shiding-Yongan landscape location map



(1)Yongan Elementary School

(2)Yongan Wastewater Treatment Plant

(3)The Lost Village

(4)Yongan Observation Trail

(5)Tushitou Observation Deck

(6)Shiding Thousand Lake Island Observation Deck

(7)Bagua Tea Garden

(8)Crocodile Island Observation Deck

Introduction of WRA

The Taipei Water Conservation Zone was the first conservation area to be established under the "Urban Planning Law". The zone covers the southeastern corner of the Greater Taipei area, which includes the districts of Pinglin, Wulai, a portion of Xindian, Shiding, and Shuangxi. Also covered is the Beishi River (Feicui Reservoir), Nanshi River, and Xindian River.



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In the 1980s, the TWMO has taken various measures to help protect these water sources, including the acquisition of pigs and removal of pig farmers, the acquisition of boats to reduce recreational boating, and assisting in the removal of the trash. In recent years, in order to collect and treat domestic point source pollution, the TWMO developed several sewerage systems; to reduce agricultural nonpoint source pollution, artificial wetlands and bioretention cells are devised. After continual communication and with collective dedication from the industry, government, academia, and public and private sectors, unsoiled water sources are therefore possible.

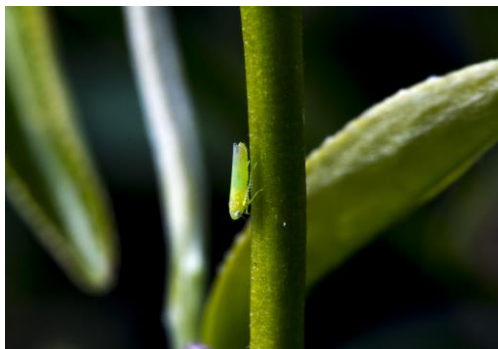
The Tea industry of Shiding-Yongan

Today, the most famous teas produced in the Shiding area are Oriental Beauty and Baozhong tea. Oriental Beauty, or “white-tip oolong” is planted every year during the rainy season. During this period, tea jassids multiply rapidly, feeding on the sap within the new buds of the tea tree. Any new buds that have been bitten will curl up, turn yellow, and stop growing. These leaves possess a large amount of catechins, resulting in a tea that produces a unique aroma of ripe fruit and honey when roasted. Therefore, in order to attract small green leafhoppers, tea gardens should not spray any insecticides.

Planting Tea are the local characteristic industry and the source of the livelihood of residents, but kind of tea can affect water quality, maintaining safety and protection of water sources, water based in Shi Ding areas of organic cultivation is very important , such as organic cultivation of fertilizer use is based on organic fertilizer instead of chemical fertilizer, helps to avoid rivers and lakes pesticide accumulation or reservoir optimal phenomenon In addition, organic farming requires mixed crop rotation and avoids the use of herbicides, so that the soil cover of the field is more complete and the direct erosion of rainwater is reduced.



Tea making experience activities



Tea and small green leafhoppers

Reduce the number of point source pollution

Wastewater treatment is our top priority of water resource quality protection. In order to decrease most pollution sources, it is advisable that the sewers in the Taipei Water Conservation Zone should be built in residential areas, populated areas, and major streets that are more convenient to be under construction. If the effluents at the Beishi River area is not treated properly, it will flow into Feitsui Reservoir directly.

Therefore, the upstream sewerage systems are built. The systems collect domestic wastewater through gravity or pumpage for tertiary treatment and release the treated water into the Beishi River. In other areas that are distant from the major streets in Pinglin but are still partially populated, small wastewater treatment plants, such as the one in Yongan, are built there to treat domestic wastewater.

As for the remote areas with distributed households and where sewerages are unavailable, combined or unitary Johkasou (purification tanks) are built to treat wastewater locally. For example, a johkasou is built at the Bagua Tea Garden.



Small sewage treatment plant



Bagua Tea Garden purification tank

Reduce the number of nonpoint source pollution

The major cash crop at the Beishi River watershed is tea. However, tea is considered a shallow-rooting plant. Therefore, during cultivation, half of the fertilizer is absorbed by the plant, but the other half residues on the soil. When the storm comes, the soil which contains nitrogen and phosphorus flows into rivers or water, causing eutrophication. This is called nonpoint source pollution.

What's worse, nonpoint source pollution comes from many diffused sources, making it difficult to treat the sewage collectively. The solution is to tackle from the sources and establish low-impact development at different places to treat wastewater.

For instance, the tea garden in Shiding which is included in the Feitsui Reservoir buffer zone has bioretention cells. Installed at the vacant space between the tea garden and the river, the bioretention cells are considered the natural filters which help filter out pesticide and fertilizer in the water.



Plant retention tank and reservoir protection zone

The installation of Feitsui Reservoir

The Feitsui Reservoir is the second-largest reservoir in Taiwan, its watershed covers Pinglin District, Shuangxi District, Shiding District, Wulai District, and Xindian District of the New Taipei City. It is under the Taipei Feitsui Reservoir Administration of the Taipei City Government, and its watershed is under the Taipei Water Management Office.

The main purpose of the reservoir is rainwater storage and constant water supply to the public, and the second is hydropower generation. After being transmitted to the Gueishan (Feitsui) Power Station, the water is discharged to the downstream Jhihtan Dam and Qingtan-Weir Reservoir and is treated at the Jhihtan, Changxin, and Gongguang Water Purification Plants. Then the treated water is supplied to the residents in the Greater Taipei area. In recent years, the application of “Water Supply Improvement in Banqiao and Xindian Districts Project” makes the water supply from Feitsui Reservoir available to residents in New Taipei City.

The first stage of the project is done in 2004, resulting in an available water supply to Bali, Sanchong, Zhonghe, Wugu, Taishan, Luzhou, and a portion of Xinzhuang, Banqiao, and Tucheng Districts. The second stage is done in 2019, resulting in an available water supply to all Shulin, Yingge, Sanxia Districts, and a portion of Banqiao, Xinzhuang, and Tucheng Districts. The installation of the Feitsui Reservoir causes the submergence of several households. Bishan Village, school, fields, and houses are submerged at the bottom of the reservoir, gaining its name of “the lost village.” The relics of the buildings are only revealed when the reservoir dries up.



A submerged corner of Bishan County



feitsui reservoir

Shiding Yongan Natural Landscapes

The present-day Yonganli area includes Shuidiliao and Bishan Village, which was submerged by the Feitsui Reservoir. The area is located in the Taipei Water Conservation Zone meaning that houses and fields are prohibited from being built there. As such, there is a rich ecological environment as well as a beautiful view of the lake. The residents of Yonganli mainly make their living by tea cultivation and tea production. The area is important for the passing down of Baozhong tea production methods. The reservoir and tea plantations have created special scenic locations such as “Thousand Island Lake” and “Bagua Tea Garden.”

There is a “Yongan Scenic Trail” located in Yonganli. The first section was formerly known as Baojia Road and was drawn in “A Map of Taiwan” during the period of Japanese rule, making this a century-old trail. Half of the trail consists of natural, mountainous paths and its total length is 1.1km. The trail is gentle and shaded by trees almost all the way, making it a very suitable beginner climb for families and elderly people. The trail has now been reconstructed around the Feitsui Reservoir and provides a panoramic and idyllic view of the lake and mountains that is bordered by tea trees and tea plantations.



Yongan Observation Trail



Shiding Thousand Lake Island



Tushitou



Bagua Tea Garden

Important Flora



Rhododendron kanehirai

The *Rhododendron kanehirai* possess funnel-shaped flowers with colors ranging from light pink to light purple. They flower between the months of March and April. These plants are sun-loving and mainly grow on rocky crevices along the Beishi River, which is 500m above sea level. Though since the completion of the Feitsui Reservoir, the flowers' habitat has been flooded with water, leading the native population to since disappear from the wild. Luckily, through the continuous efforts of the Endemic Species Research Institute and the Feitsui Reservoir Administration, the plant has been rehabilitated through cuttings and returned to its original site by the egret pool.



Dipteris conjugata

Dipteris conjugata can be either lithophyte or epiphyte and has a creeping rhizome. Its leaves are thin coriaceous and connected to stipes that can be as long as 60cm. The leaves reach 60cm in diameter and are divided into 2 spreading fan-shaped halves, which gives it the name of "halved umbrella fern" in Chinese for the resemblance. The fern can grow to 70cm in height. The fronds have reticulate veins and free veinlets are embedded in every lumen. The main veins are dichotomously branched. Its shape of sorus is round. The sori are exindusiate and are scattered around the free veinlets in lumens.



Taiwaniana Alsophila

Taiwaniana Alsophila is a large fern that can grow to the height of 10 meters. The fern has a distinguishing feature of suspension of the dead, dried leaves on the tree, not dropping off the crown, which is called the "tree skirt" given the looks.

Important Fauna



Emerald green treefrog

The Emerald tree frog is a large, protected species of tree frog endemic to Taiwan. They are found in by the Beishi and Nanshi rivers, Yilan, and low-elevation mountainous regions. Their proximity to the Feitsui Reservoir is where their name comes from.



Yellow-margined chinese box turtle

The Chinese box turtle can be found in southern China, Taiwan, and the Ryukyu islands of Japan. They are the only terrestrial fresh water turtle in Taiwan. They reside in secondary forests, broad-leaved forests, and marginal environments at less than 1000m elevation.



Besra

The smallest species of eagle in Taiwan. Their males are obviously smaller in size. The top of their heads are mouse gray. The male's eyes are orange-yellow and turn orange-red as they age. Their beaks and claws are curved and sharp. They feed on other birds, small lizards, frogs, and insects.



Pangolin's hole

Pangolin

Pangolins roll their bodies into a ball when faced with danger and use their tails to protect their vulnerable necks and abdomens. They are nocturnal cave-dwellers that use the sharp claws on their forelimbs to dig shallow burrows which are suitable for habitation, foraging, and hiding.

Something need to know before hydrophilic activities



The water source specific area is located in the upper reaches of streams in mountainous areas. Please be careful when entering the area for activities close to streams:

1. Before entering the mountain, please check the weather in advance. In case of heavy rain, typhoon and other weather forecast, please don't entering the mountain.
2. Observe the surrounding environment before activities in the water area, and know the routes that can be retreated or circled in case of emergencies.
3. Thunderstorms are often caused by terrain in mountainous areas. In case of temporary heavy rain, please leave the water area immediately.
4. Always pay attention to the surrounding conditions when you are in the water. If you see clouds on the top of the mountain, hear thunder. Please leave the water area as soon as possible.
5. Wear non-skid shoes when across a stream. If you are trapped in a muddy or swollen stream, try to take a high detour to a safe place for help. Don't wade rashly across a stream.
6. Please carry whistle when you are in mountain areas. You can call for help or warn others in case of emergency.



Upstream of Nanshi Stream