

Toyota

Sustainability & Biodiversity

Learning Center

Public release version
some sensitive information has been redacted

Annual Report

April 2019-March 2020

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1 Acknowledgments

Without the long-term support of our key supporter none of the activities described herein would be possible so we are extremely grateful for the support of Toyota Motor Thailand Co. Ltd (TMT). The operations of TBSLC would not be possible if not for the support of many other organisations also, especially:

1. Our on-site partner, the TMT-TBSLC/Ban Pho plant team. TMT are not only our main financial supporter but are also our on-site partner at TBSLC
2. Many Local Government agencies, from Tambon, Amphur and through to Provincial levels, particularly in the educational sector

We owe particular thanks to Benjakun Saengthongphao (Kasetsart University) and Ayawatt Cheariwattanakanok (Bird and Nature Conservation Society of Thailand) for their assistance with our "Citizen Science" biodiversity survey (see §7.1). Thanks also to assorted members of Birdlife Thailand (BCST) for their advice and mentoring on aspects related to our bird observations in TBSLC.

Special thanks are also due to Anchana Thancharoen (Kasetsart University) for her advice and guidance with our "Firefly Garden" Project (see §7.2).

Thanks to Dr Chaweewan Hutacharern for her comments and assistance with the compilation of this 2019-2020 annual report.

Of course, while we appreciate the advice and help of all, any errors are ultimately the responsibility of the TBSLC team.

2 Executive summary

Toyota Biodiversity and Sustainability Learning Center (TBSLC) has completed another successful year (April 2019 -March 2020) in collaboration with our supporters and work colleagues from Toyota Motors Thailand (TMT).

During our past year TBSLC has hosted 4500 visitors who participated in various aspects of our activities and programmes (§4).

Fifty-one new animal and 16 plant species were newly recorded from TBSLC during RY2019 (§5.1). In addition to species inventory work TBSLC also carried out a number of other environmental monitoring or improvement projects, viz.: water quality monitoring; monitoring nesting and behaviour of Asian Golden Weaver birds; work on developing a “Firefly Garden”; monitoring survival of trees on site (§§5, 7.2).

TBSLC has authored and printed one promotional flyer and has prepared and posted 85 stories via our Facebook page which is followed by 1472 people, up by 496 from RY2018 (§6).

In addition to the environmental projects and species inventory work mentioned above during RY2019 TBSLC held a “citizen science” activity with sixty participants joining in our “Winged Detective” (focused on insects and birds) activity aimed at allowing citizens to assist with our species inventory work. No new insect species were recorded, one new bird species was recorded as a result of this activity (§7.1).

During the later part of RY2019 the COVID-19 emergency started to impact some of our activities, with cancellations and the closure of TBSLC.

3 Introduction

3.1 Background

Biodiversity and Sustainability Learning Center-Cheewa Panawet (Toyota Biodiversity and Sustainability Learning Center, TBSLC) is an ongoing project (11 years) following on from the reforestation of part of the Toyota Ban Pho Production Plant area in accordance with the “Miyawaki method” of forest restoration. The Foundation for Environmental Education for Sustainable Development (FEED) has the responsibility to manage activities at TBSLC on behalf of Toyota Motors Thailand Co., Ltd (TMT). In this report we will use TBSLC to refer to both the FEED team at TBSLC as well as the site. The main focus of activities at TBSLC is as a Nature Education Center providing services for all those with an interest in Environment and Nature, especially local school children, though in this past year more attention has also been given to site monitoring and rehabilitation activities.

3.2 Report scope and structure

This annual report covers the period April 2019 to March 2020, herein we will use RY2019 to refer to this reporting period.

This report covers our major activities in four categories:

1. Visitors: catering for visitors
2. Environment: activities related to environmental aspects of TBSLC
3. Public relation: activities related to environmental aspects of PR
4. Others: other projects and activities

In this report there is a mix of baseline funded activities and special projects. Special projects are “tagged” for reader information.

We report on each of the activities in each of these categories in separate parts, with the remainder of activities being covered in an Others category. Financial details are only reported in Thai in the Thai report only.

This report is the English language version of the annual report for RY2019 and there is a corresponding Thai version (note they are not translations of each other).

In addition to this report we also produce monthly reports, in both Thai and English, which document TBSLC’s activities on a monthly basis, and a 6-month report (Thai).



4 Visitors

Visitors to TBSLC can be considered to fall into two major categories:

1. Educational visitors
2. Others: these visitors are composed of many sorts of visitors, but many of them are from businesses or organisations interested in seeing and learning about the site rehabilitation and development of TBSLC at TMT's Ban Pho plant

During RY2019 TBSLC hosted a total of 1792[Δ≈-3000¹] educational visitors in 25 groups. These data being as at 2020-03-13.

During RY2019 TBSLC hosted a total of 2708[Δ≈+480] other visitors in 108 groups. These data being as at 2020-03-13.

Most visitors to TBSLC, more than 50%, are groups categorised as “General visitors” (participating in study tours mainly), with “Educational visitors” making up the next largest group (41%) (Figure 1).

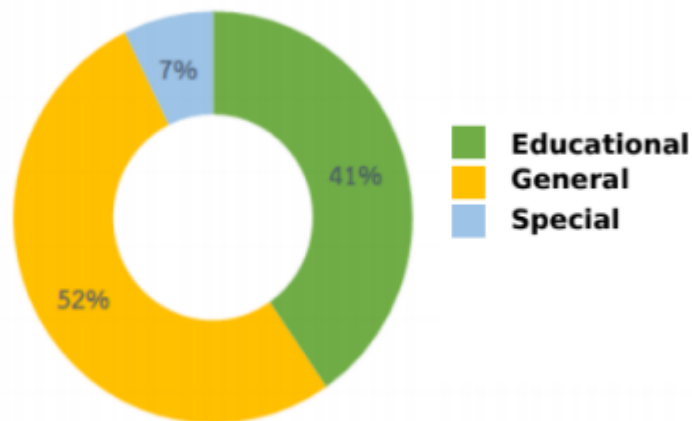


Figure 1: Visitor numbers and proportions by category during RY2019

During RY2019 most of our visitors were from our “home province” of Chachoengsao, Bangkok and a few neighbouring provinces, a total of 9 provinces. Our most distant visitors travelled from the southern province of Phuket (Figure 2). Some provinces, such as Khon Kaen are represented by only very small numbers of visitors (a small group of 3 people, a monk and some family members, in this case). Small groups are typical of visitor groups to TBSLC with ≈ 60% of visitors coming to TBSLC in groups of 20 or less.

¹, indicates the change relative to RY2018

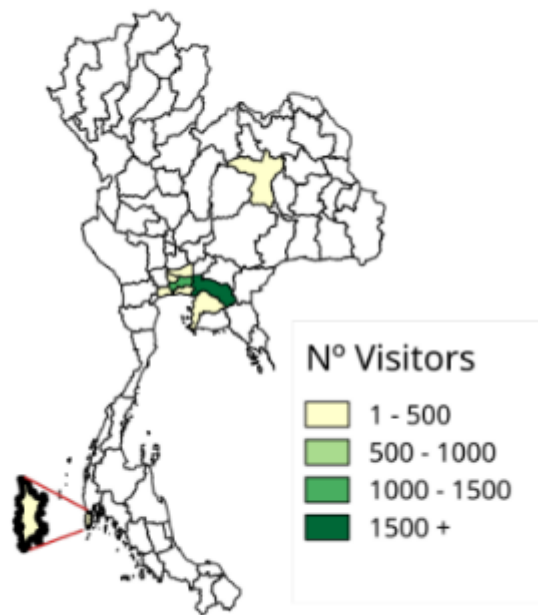
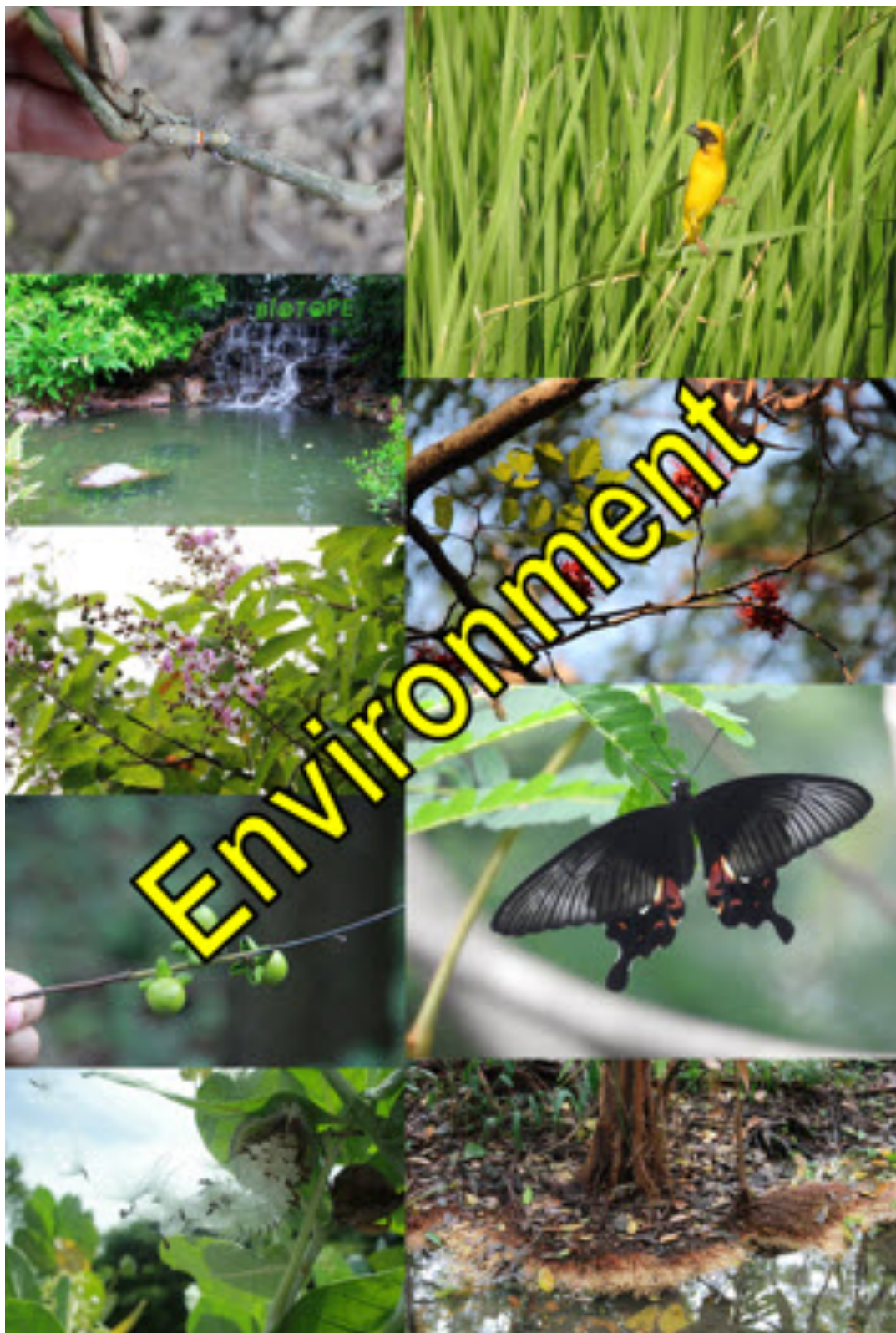


Figure 2: “Catchment” of visitors to TBSLC during RY2019

In addition to visitors from Thailand during RY2019 we have hosted international visitors from:

1. Brunei Darussalam
2. Cambodia
3. China
4. France
5. Indonesia
6. Japan
7. Laos
8. Malaysia
9. Myanmar
10. Philippines
11. Singapore
12. Vietnam



5 Environment

TBSLC carries out a number of regular activities as part of understanding and documenting the environment of TBSLC, viz.

1. ad-hoc species inventory work
2. formal species inventory work
3. monitoring and maintenance of the “Ecoforest”

In addition, during RY2019 TBSLC, carried out work related to several specially funded projects related to the environment, viz.

1. activity and nesting behaviour of the Asian Golden Weaver
2. Water quality monitoring Furthermore several other special projects, carried out as major collaborations with outside parties, which are also environment-related matters are also documented in §§7.2 and 7.1.

5.1 Species richness



During RY2019 we added a further 67 species to TBSLC’s species inventory (details above) Figure 3 show two of the new species recorded for TBSLC during RY2019.



Figure 3: Two new species records for TBSLC: *Sternocera aequisignata* [L]; *Aviceda jerdoni* [R]

5.2 Monitoring and maintenance of the “Eco-forest”

During RY2019 100 (of the total 244) planting mounds were surveyed, finding 5432 plants representing 74 species from 33 families.

In “Zone C” (planted 2018) 150 trees were found to have died, with a further 30 in “Zone B” (from a 2019 planting) also having died. The main causes of death of these trees seems to be:

1. high mistletoe load
2. failure to remove planting ties
3. failure to remove planting bags
4. planted too shallow

Where these problems (2-4) were noticed with still living trees we have remedied these problems.

In addition there are ongoing problems associated with the dry season, particularly the 2019-2020 dry season which started earlier than usual. During the dry season there are widespread tree deaths across the “Eco-forest” with the following species being most affected (in order of severity):

1. *Hopea odorata*
2. *Dipterocarpus alatus*
3. *Ardisia polycephala*
4. *Murraya paniculata*

As suggested in last year’s annual report (see §5.2) the only solution to this “drought” issue is either substitution with drought tolerant species or with establishment of a better reticulation scheme.

5.3 Monitoring activity and nesting behaviour of the Asian Golden Weaver [SPECIAL PROJECT]

During RY2019 TBSLC had a special project monitoring the Activity and Nesting behaviour of the Asian Golden Weaver, *Ploceus hypoxanthus*, in TBSLC. *P. hypoxanthus* is considered “Near Threatened- NT” species according to the IUCN Red List, with the main threats being habitat destruction generally and especially of nesting sites.

TBSLC has developed an artificial wetland and since this habitat is considered suitable for *P. hypoxanthus* (though TBSLC is near the southern limits of this species in mainland Thailand [BirdLife International (2020)]) we have paid special attention to this species during RY2019, with some efforts to make the wetland area more suitable for *P. hypoxanthus*. In conjunction with these “habitat improvements” we have been monitoring *P. hypoxanthus* activity and nesting behaviour (5 days/week, morning and afternoon) from April 2019 to March 2020. We observed a total of 16 nests were constructed by males but none of these nests were found to be suitable for females so we found no breeding pairs/nests during RY2019, Figure 4 summarises the phenology of our observations.

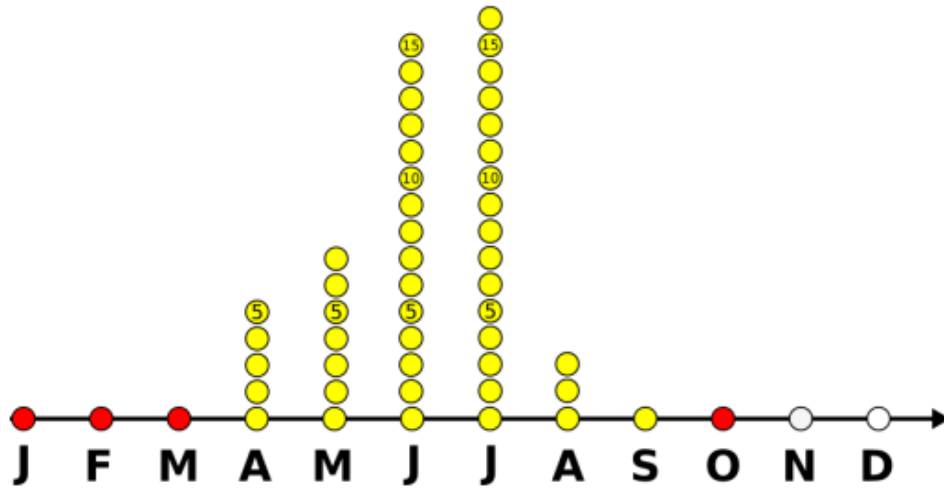


Figure 4: Asian Golden Weaver phenology (January-December, 2019) [red-filled: birds seen, but no breeding behaviour evident; yellow-filled: birds observed in some aspect of breeding behaviour (# of nests ranged from 1-16); unfilled-circles: no birds seen]

5.4 Water quality monitoring [SPECIAL PROJECT]

During RY2019 TBSLC conducted water monitoring activities at several sites around the TBSLC, monitoring both physio-chemical and biotic indicators of water quality. Figure 5 shows the sampling locations and details of sampling follow.

not for release

Figure 5:

5.4.1 Physic-chemical parameters (physical)

not for release

5.4.2 Biological indicators of water quality (biotic)

Water quality using aquatic invertebrates and a biotic indicator was also carried with assessments being made at 5 sites every 2 months. Of the five sites, two were rated as “good”, two as “Fair”, with one, the “wetland” scoring an ASPT (Average Score Per Taxon) of ≈ 4.88 and so falling into the “Poor” category.

Given the concerns for water quality (biotic) arising here and also from the unusually high mortality of Firefly larvae reared in TBSLC stream water (cf. tap water), see §7.2, water quality issues in TBSLC need further ongoing attention.



6 Public relations

Public relations, both to promote TBSLC and as an outreach channel for our message are important aspects of TBSLC's work.

During RY2019 TBSLC carried out the following public relations activities:

1. Facebook posts to the TBSLC Facebook page
2. other Facebook channels
3. outreach activities and exhibitions
4. a PR flyer

6.1 TBSLC Facebook page

An important part of our external PR effort is via our Facebook page which can be found at this link <https://www.facebook.com/CheewaPanavet/>

During RY2019 we prepared and posted 85 stories (Thai language with accompanying images/video) covering the following topics:

1. Educational visits: 20
2. General study tour visit reports: 43
3. Biodiversity: 12
4. Miscellaneous: 10

During RY2019 our Facebook pages likes increased to 1472 [Δ +496]
Data as at February 28, 2020.

6.2 Other Facebook channels

On August 19, 2019, the "Facebook channel "Suthichai Live by Suthichai Yoon" visited TBSLC with the pieces "airing" as 2 episodes, August 24 and 25, 2019.

On November 19, 2019, the "Facebook channel "PERSPECTIVE FULL HD" visited TBSLC with the piece "airing" December 10, 2019.

6.3 Outreach activities and exhibitions

TBSLC organised exhibitions or other displays at 6 different special events during RY2019, viz.

1. May 22-24, 2019 TBSLC exhibited "Animal of TBSLC" as part of a "World Biodiversity Day" at Centara Hotel, Bangkok
2. July 17-21, 2019, TBSLC and TMT prepared and staffed a booth on "Animal of TBSLC" at the "Thailand Industry Expo" at the Impact Arena, Muang Thong Thani
3. October 24-25, 2019 TBSLC joined in an exhibition activities (decorating cloth bags from natural materials for student handicrafts) at Wat Don Thong School, Chachoengsao
4. January 11, 2020 TBSLC helped with the organisation of activities for Children's Day at Wat Don Thong School, Chachoengsao
5. January 18-19, 2020 TBSLC participated in the "1st Asian BirdLife Festival and Nature Expo 2020" at the Rama IX Museum National Science Museum Organization, Pathum Thani
6. February 21, 2020 TBSLC joined in the annual "open house" education exhibition at Wittayaratrang School, Chachoengsao.

6.4 Flyer

During RY2019 TBSLC produced an information flyer for distribution to potential guests. The flyer carried information about the activities and programme of TBSLC and provided contact details.

An initial print run of 500 flyers at A5 (single-sided) full-colour (130 GSM), see Figure 6 was made with these being distributed to visitors to TBSLC, during outreach events and to those contacting TBSLC for information.

ชีโวพนาเวศ
ศูนย์การเรียนรู้ด้านหลากหลาย
ทางชีวภาพและสวนยั่งยืน

ตั้งอยู่ในเขตป่าไม้สง่าป่าแม่สี ๑๕๐ ไร่
มีพื้นที่ทั้งหมด 60 ไร่ แบ่งเป็นป่าดิบ 30 ไร่
และไม้ผล 30 ไร่

จัดตั้งขึ้นเพื่อส่งเสริมความรู้ทางด้านสิ่งแวดล้อมศึกษา
และเรียนรู้วิถีเกษตรอินทรีย์ (เกษตรแบบเอ) เพื่อใช้วิถีธรรมชาติ
ใช้ระบบนิเวศที่สมดุลและยั่งยืนทางหลากหลายทางชีวภาพ
อย่างยั่งยืน

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เวลาทำการ
วันจันทร์ - ศุกร์ 08.30 - 15.30
(หยุดพัก-อาทิตย์และวันหยุดราชการ)

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☎ 086-104-2540 ☎ 036-122-445 (8.30 - 15.30)
f Cheewapornvet 📧 cheewapornvet.feed@gmail.com

Figure 6: TBSLC PR flyer [life-size]



7 Others

7.1 “Citizen Science” biodiversity survey [SPECIAL PROJECT]

Besides TBSLC’s own observations and records creating an inventory of species in TBSLC we have also carried out several activities inviting guests to participate in special “Citizen Science” biodiversity survey work in TBSLC, viz.

1. November 23-24, 2019 TBSLC organised a weekend “Winged Detective” event. Sixty high-school students from local schools attended and were invited to participate in an exploration and inventory of insects and birds in TBSLC, with 34 attending on day 1 (insects) and 26 on day 2 (birds)

2. No new insect species records were made as a result of this activity

3. One new bird species was recorded as a result of this activity (*Aviceda jerdoni*, see Figure 3 [R])

7.2 “Firefly Garden” Project [SPECIAL PROJECT]

not for release

7.3 TBSCL-Teachers Workshop

TBSLC has a project aimed at developing better educational activities in collaboration with teachers from local schools (Chachoengsao).

This project aims to hold a joint workshop to develop the contents of TBSLC’s activities and programmes to better match the needs of our local schools.

A workshop with 50 local teachers and other educators was scheduled for March 18-20, 2020 but has been delayed as a result of concerns over COVID-19.

7.4 Staff

7.4.1 Complement

TBSLC is fully staffed with a current complement of six staff. During RY2019 there was no staff turnover at TBSLC, giving a 100% staff retention rate.

7.4.2 Staff development

Staff development activities during RY2019 included one training course, viz.

1. April 25, 2019, three TBSLC staff were trained on firefly rearing and culture techniques at TBSLC by our “firefly project” consultant Anchana Thancharoen.

And several study tours, viz.

During RY2019 TBSLC staff were able to participate in a number of study tours, viz.

1. May 9-15, 2019, the head of the TBSLC visited Japan with the support of TMT to study some of the environmental concepts of Toyota Motor Corporation. Including guidelines for creating, developing, and improving environmental work and developing green spaces as “natural classrooms”
2. July 6 2019, TBSLC staff visited the “firefly village” of Bang Kruay (Samut Prakan) to participate in activities for World Firefly Day 2020. The team attended a seminar on “Problems and conservation of fireflies in the local area and globally” as well as examining local firefly conservation and tourism activities in the area
3. July 12, 2019, Promyoti Royal Thai Army (RTA) camp in Prachinburi to see fireflies in their natural habitat and to observe how the RTA manages the area for firefly ecotourism
4. December 13, 2019, TBSLC staff visited the Lam Takhong EGAT Learning Center (Nakhon Ratchasima)
5. February 16-18, 2020, a TBSLC staff member attended a “Lichen basics and classification workshop” held in Khao Yai National Park organised by Ramkhamhaeng University

7.5 AV library

All activities at TBSLC, or involving TBSLC staff in outreach activities, are extensively photo-documented (with occasional videos). Animals and plants encountered during environmental, or other work, are also photo-documented (with occasional videos). AV media are extensively used in social media posts, in teaching materials, and in other ways as needed. Following a group visit we typically upload all the pictures taken during the visit to Facebook albums available to all.

8 Errata

Because of the two week lead time this English language Annual Report has over the Thai language version there has been an opportunity to detect errors in the Thai language version and these are noted here.

1. §4.2 the second mention of *Sclerotia aquatilis* was improperly used, *S. aquatilis* being correct usage
2. §4.3, Covid-19 should be COVID-19
3. §4.6 states that a new staff member joined TBSLC during RY2019, that is incorrect. This staff member joined the team during RY2018 and was reported in the annual report for that period

Of course, there are likely to be further mistakes in both the Thai language, and this English language version, not yet detected for which the TBSLC team apologises.

9 Bibliography

1. Wikipedia (2020) "Regions of Thailand", retrieved 2020-03-05.
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2. BirdLife International (2020) "Species factsheet: Ploceus hypoxanthus", retrieved 2020-03-05.
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