

## Appendix 1

# Summary report consultation meeting with 7 local school On 28 January 2020 at A.H. Link School under the patronage of Princess Mother Srinagarindra

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### Introduction

On 28 January 2020, a meeting was held together with teachers from the following seven schools: (1) A.H. Link School under the patronage of Princess Mother Srinagarindra; (2) Ban Pu Khem School; (3) Ban Pong Luek Border Patrol Police School; (4) Naresuan Pa La-u Border Patrol Police School; (5) Insee Asa Border Patrol Police Learning Center (Ban Pakayor) (6) Ban Nam Sap School and (7) Ban Mae Ka Moei School



### Result

The results of the meeting were as follows:

#### **I. Guidelines for developing environmental education curriculum and integrating with boy/girl scout subjects.**

- Environmental education can be integrated with the core curriculum already taught by each school in subjects such as science and geography. In addition, the curriculum can be integrated with other subjects such as foreign language, health, vocational studies and Thai language, etc.

- A local course can be organized and environmental education can be integrated with lessons, depending on the interest and techniques of individual teachers. It has been recommended that teachers should begin with flexible lesson content, particularly in integrating the content with boy/girl scouts, which would be the most suitable subjects.

- Boy/girl scouts are scheduled for lessons 40 periods/year. Lessons take place weekly. Regardless, boy/girl scout courses also teach other important subjects such as discipline, tying knots, using a compass and first aid, etc. Therefore, environmental education lesson plans can be made in activities approximately 4-6 periods/year, which would be an appropriate amount of time.

- The lesson content should be area-specific, so students in upper primary school (Grades 5-6) can learn about Kaeng Krachan National Park, varieties of living things, relationship between the ecosystem and biodiversity, the value and importance of ecosystems in lifestyles.

- Apart from using the environmental education handbook, VDO presentations mixed with animation and real pictures of wildlife should be used (photographs of wildlife from camera traps) that can attract the attention of students in learning. VDO media content

should correspond and be related to environmental education content for boy/girl scouts for all 4-6 periods.

- Making signs on the meaning of nature (vinyl signs) for each school. For border police patrol schools, natural resource conservation projects are already under way following the Royal Initiatives of His Majesty the King, so these activities can be performed together.

## II. Cooperation with Kaeng Krachan National Park

- Kaeng Krachan National Park gives importance to creating knowledge and understanding for youths and students about environmental conservation in the Kaeng Krachan area. At present, officials have been tasked with instructing youths at various schools and the Park is happy to support this environmental education course.

- Kaeng Krachan National Park organizes a forest conservation boy/girl scout camp for upper primary students and secondary students every year with approximately 100 students per time and a budget of 200,000 baht/group. Courses and lecturers/resource persons are arranged for the camps. Therefore, people can work together. Organizing the camps involves testing the knowledge, understanding and skills of students who have had 4-6 hours of environmental education lessons/year.



- Organizing environmental education course curriculum in close coordination with Kaeng Krachan National Park involved personnel and Train for Trainers curriculum (for high school boy/girl scouts). The content should provide the knowledge for students on the following topics: (1) general knowledge about Kaeng Krachan National Park (2) ecosystems and biodiversity; (3) wildlife food chain and food web and (4) roles and duties of forest conservationists.

## III. Community Participation

- Only building knowledge, understanding and awareness among youths and students might be insufficient; people in the community or parents with knowledge, understanding and awareness need to be called in.

- Teaching arrangements might employ the method of giving homework to students to do together with parents, e.g. homework assignments to ask parents questions about making benefit of forests, herbs and edible plants; nevertheless, according to the meetings, there is not much confidence about the aforementioned method, because it is difficult for students to communicate with parents and come to a mutual understanding.

- The method of inviting local community leaders or scholars with knowledge about nature to participate in providing instruction for students during environmental education lessons, as well as during boy/girl scout camps. Nevertheless, having local community leaders or scholars come to provide instruction might not be easy. Although these people might have knowledge, there might be problems with communication and the transfer of knowledge and understanding to students.

#### **IV. Work Plan**

- Study and draft the environmental education handbook; study and prepare the animation to accompany the handbook by closely collaborating with the teachers at the seven target schools and Krachan National Park. The aforementioned handbook will be the product of a joint effort (Perform from January to April 2020).

- Training of Trainer: Use the environmental education handbook given to teachers by initially using Naresuan Pa La-u Border Patrol Police School as the training venue (Perform in May 2020).

- Using the main content about environmental education from the handbook, include the VDO animation in lessons with students during boy/girl scouts or integrate with other subjects studied. In preparing lessons, invite community leaders to participate in the lessons, too (Perform from June-October 2020).

- Organize boy/girl scout camps at the primary school level in cooperation with Kaeng Krachan National Park in order to test the knowledge, understanding and skills studied. In organizing camps, community leaders and scholars can be invited to participate in offering additional knowledge for the scouts (Perform in November 2020).

- Gather experiences and lessons learned, including evaluation tests on the boy/girl scout camps to be held at the primary school level in order to make improvements in the complete environmental education handbook and disseminate to other interested schools.

## Appendix 2

# Summary report Kaeng Krachan Environmental Education Curriculum development

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### Background

The environmental education curriculum was developed under the UNESCO guidelines, which defined the term “environmental education” as a process for raising environmental awareness and concern with attitudes, skills and knowledge about environmental problems as well as commitment to solving current environmental problems and prevention potential problems in the future with goals for developing people in gaining capacity in the following areas to prevent and solve environmental problems:

1. Awareness: The student is alert to the environment in general and various problems occurring.
2. Knowledge: The study has a basic understanding about the environment in general and related problems, including personal responsibility and roles.
3. Attitudes: The study has social values in relation to concerns about the environment and is inspired to participate in environmental protection and improvement.
4. Skill: The study is able to solve environmental problems.
5. Evaluation Ability: In terms of environmental measures and studies about ecosystem, political, economic, social, ethical and academic issues.
6. Participation: Development of participation in responsibility and viewing environmental problems as urgent in order to ensure suitable hands-on solutions.

In Thailand, the instruction provided by schools must correspond with the core curriculum for basic education, which has established subjects composed of knowledge, skills or learning processes and wanted qualities by having all students enrolled in basic education to learn the following eight subjects: (1) mathematics; (2) science; (3) social, religious and cultural studies; (4) vocation and technology; (5) health and physical education; (6) foreign language; (7) art and (8) Thai language.

The main subjects directly concerned with environmental education are as follows:

### 1. Subject: Science

#### Topic 1 – Living Things and Life Processes

1. Understanding about basic components of living things, relationships between the structures and functions of various systems of living things for which functions are interrelated. There are processes for seeking knowledge, communicating learning and applying knowledge obtained to individual lifestyles and the care of living things.

2. Understanding about the processes and importance of the transfer of genetic traits, the evolution of living things, biodiversity, use of biological technology with impact on mankind and the environment processes for seeking knowledge and psychology, communication about lessons learned and beneficial use of knowledge.

## **Topic 2 – Life and the Environment**

1. Understanding of the local environment, relationships between the environment and living things, relationships among various living things in ecosystems; seeking of knowledge and psychology, communication of lessons learned and beneficial use of knowledge.

2. Understanding of the importance of natural resources, use of natural resources at the local, national and global levels; application of knowledge to the management of the sustainable use of local natural resources.

## **2. Subject: Social, Religious and Cultural Studies**

### **Topic 5 – Geography**

1. Understanding of the physical world and the relationships among things with mutual impact in natural systems; use of maps and geographical instruments in efficiently searching, analysing, summarizing and use of information technology.

2. Understanding of the relationship between mankind and physical environmental conditions resulting in the creation of cultures, awareness and participation in conservation of natural resources and the environment for sustainable development.

The development of drafted environmental education course curriculum based on this handbook was a learning activity that met the learning goals for basic education management as stated above. Nevertheless, the environmental education activities were applicable subjects that could be integrated with all eight subjects, e.g. mathematics, foreign language, art, health, etc., depending on the ability of the students in adjustment various applications. In addition, the curriculum can be applied to student development activities focused on personal development for students to can competence and general development, e.g. boy/girl scout activities, Girl Guide activities, community activities and clubs, etc.

The environmental education learning activities organized were suitable for the target group of primary school students in Grades 5-6. The activities were focused on gaining knowledge and understanding of the following four main topics:

1. Knowledge and understanding about Kaeng Krachan forests.
2. Living things in Kaeng Krachan forests.
3. Food chain of living things in Kaeng Krachan forests.
4. Food webs in Kaeng Krachan forests.
5. Mankind and the environment.

The organizational plans for the activities were as follows:

- Topic 1** Getting to Know Kaeng Krachan
- Topic 2** Aquatic Investigators
- Topic 3** Insects in Kaeng Krachan Forests
- Topic 4** Birds in Kaeng Krachan Forests
- Topic 5** Big Wildlife in Kaeng Krachan
- Topic 6** My House
- Topic 7** Leaf Artistry
- Topic 8** What Am I?
- Topic 9** Who Am I?
- Topic 10** Wildlife Bingo
- Topic 11** Food Chain
- Topic 12** Food Web

### **Topic 13** Man and the Environment

The organizational plans, objectives, learning activity models and time spent performing the activities are summarized as shown in the table below.



# Summary report

## Kaeng Krachan Forest Complex Environmental Education Manual Training

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### Introduction

Between 24-25 April 2022, IUCN developed the KKFC Environmental Education Manual for 6 school around Kaeng Krachan National Park and will organize a manual use training of the KKFC Environmental Education Manual and provide the tool box for teachers to use for teach students in school on 24-25 April 2022 at Kaeng Krachan National Park, Kaeng Krachan District, Phetchaburi province. The objective is to get a knowledge and understanding on the KKFC Environmental Education Manual using for the target teachers for teach the scouts and students.

That training, IUCN and CEEA provided the KKFC Environmental Education Manual's equipment to 6 schools to use for teach the students. The equipment in box is the fish net, bug fish, color, insect set box, box set for water animal and insect etc. that followed up the topic in KKFC Environmental Education Manual



## Appendix 4

### Analyse the survey results from local school teachers.

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#### Introduction

IUCN-Thailand Programme prepare and produce a questionnaire in Thai and used for survey with local school teachers the key question is;

- What grade do you think is the appropriate time to introduce the program?
- Please be specific about what you anticipate students will gain from the program.
- What are the things you will get out of this program?
- Please describe the advantages/disadvantages of the program and any areas for improvement.
- What skills will you personally gain from this training?
- Please select the items that you think are necessary for the continuation of this environmental education program.
- How did you feel throughout the entire training seminar?

#### Analyse the survey results

In this survey, we have 10 teachers from 6 school who participate in project answered this survey. The conclusion of this survey as below;

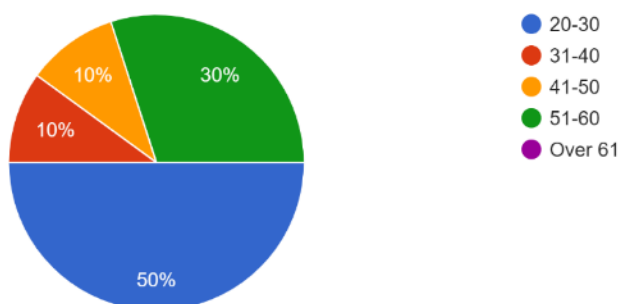
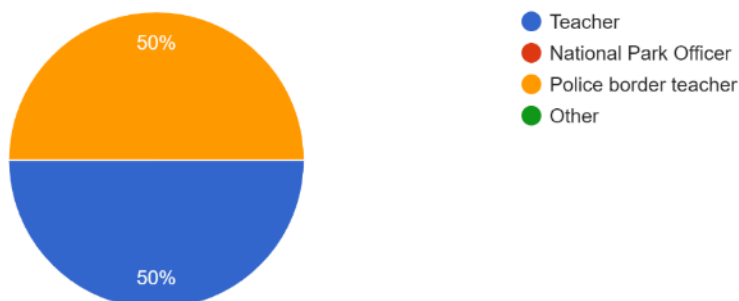
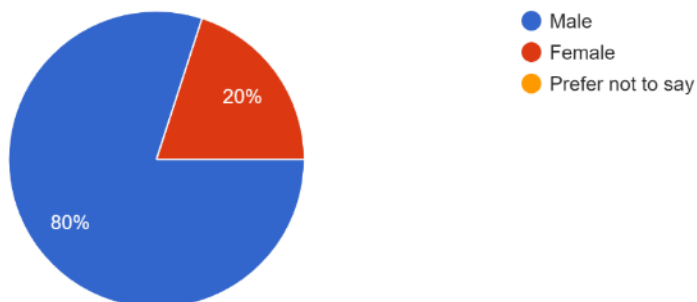
The teachers who joined in project total 80% is male and 20% is female. For the age, total 50% has the age between 20-30 years old, total 30% has the age between 31-40 years old and the last total 20% has the age between 41-50 years old. The result survey like this because at least 4 schools is so far from the city, difficultly logistic and travel. In this number 3 school is the Border Police School near the Thailand – Myanmar border and had the security issue in this area, so all most of the teacher is the man that is the police border.

The interesting from the result survey is, the Border Polices are teaching in 3 Border Police School had the main responsibility in the border security issue. They are not study directly in education management. We not has a suspicion about the spirit of teacher but w It's hard to deny that it's has a knowledge gap in learning and teaching course management between Border Polices teacher and the teacher from basic education school (A.H. Link School under the patronage of Princess Mother Srinagarindra, Ban Phu Khem School and Ban Nam Sup School).

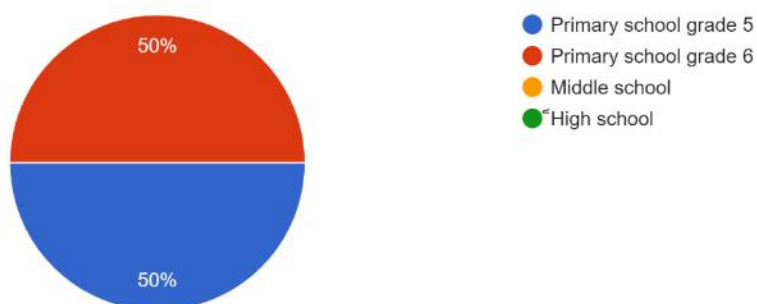
However, the teachers from 3 Border Police Schools that joined in the project are very importance for environmental and nature conservation issue. Because all most student in Border Police Schools (more than 540 students) is the Ethnic Group who have a way of life, house in the forest and uses the natural resources in Kaeng Krachan National Park. When they are growth up, they are a key factor of protected area management in long term.



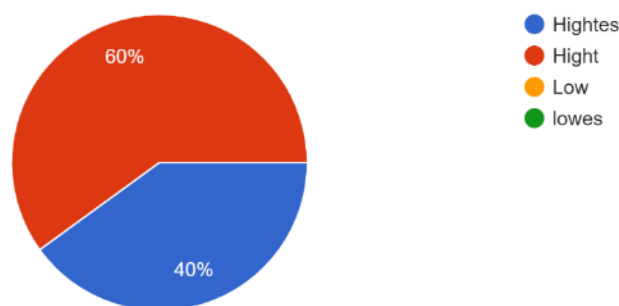
Type of school	Total students	%
Border Polices School under Royal Thai Police	540	75%
Basic education school under Office of The Basic Education Commission	180	25%



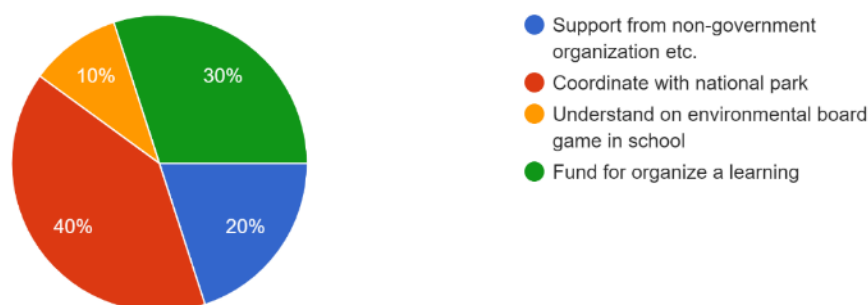
## 2.The suitable of the Kaeng Krachan Education Manual



### 3. The learning level of the environmental education from project



### 4. What next need to do



### 5. Expectations from the project

- Need the students know and aware about the importance of natural resources
- Get to know about natural resource and wildlife conservation specially the wildlife and biodiversity in Kaeng Krachan National Park
- The students aware on nature and have a way of life friendly with nature
- Students know and understand the meaning of national park and conservation
- Student aware about the importance of forest and learn about the forest conservation
- Student can be transfer knowledge to father and mother to aware about the importance of forest
- Student love forest and help to conserve the natural resource.
- Knowledge about wildlife near the community and children
- More learning on environment and nature conservation
- Awareness building on nature
- Knowledge and understanding about nature conservation
- Knowledge about Kaeng Krachan National Park
- Understanding on ecosystem, food chain and food web/Nature conservation
- The students understand and aware to conserve Kaeng Krachan forest complex
- Funny in learning
- Aware on environmental and nature conservation around community
- Know about community's environmental

## **6.What is gained from the project**

- The guideline to nature course for student
- Understand about the nature learning course development and technic to transfer knowledge to student.
- Nature education development
- Technic to integrate the nature education and learning course
- Fulfil the nature education project from the king rama9
- Learning activity/Learning activity guideline
- Understand about nature education teaching and learning process and integrate with the learning course.
- Equipment to use for nature education learning and teaching/Guideline to organize an environmental and nature study course
- Knowledge on environmental and nature learning tool/empower to teacher on nature conservation teaching for student

## **7.Opinions and suggestions to improve the work.**

- Not have enough budget for equipment that use for nature education teaching
- The objective of learning topic should have a short and clearer.
- Support to organize a knowledge exchange and continue to support.
- Project should continue and monitor in long term
- Exchange the knowledge and experience with difference school

## **8.Training need from teacher**

- Technic to organize an environmental and nature camp in school
- Law of national park
- Using the card for food chain and food web learning
- Nature camp organizing and management

## **9. Other recommendation**

- The school has a limit to use the learning equipment because Border Police School not has electric. Recommend to develop the manual learning equipment, for example; picture, poster or pop-up etc.
- Add wildlife card for the school that not has the electric/Add the knowledge about world heritage site in wide and focus to Kaeng Krachan National Park in deep.
- Need IUCN organize a teaching on the nature education directly to student in school.
- Organize 2-3 days learning camp with the teacher and student from difference school to learn and exchange knowledge in the field.
- Need to continue support from IUCN and CEEA

## Appendix 4

# Nature Education Camp

## Between October 31 - November 1, 2022

### At Ban Krang Camp, Kaeng Krachan National Park

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### Background:

On October 31 - November 1, 2022, IUCN-Thailand Programme in collaboration with the Conference of Earth Environment from Akita (CEEA) and Kaeng Krachan National Park organized the 3 days Nature Education Camp at Ban Krang Camp, Kaeng Krachan National Park, Phetchaburi Province. The main objectives of camp included (1) to enhance the experience and knowledge of teaching and learning the environmental education for teachers from 6 target schools by using the Kaeng Krachan National Park as a learning station (2) to educate the students on environment, nature, biodiversity, linkage between nature and human, as well as having a good experience from learning in the field.

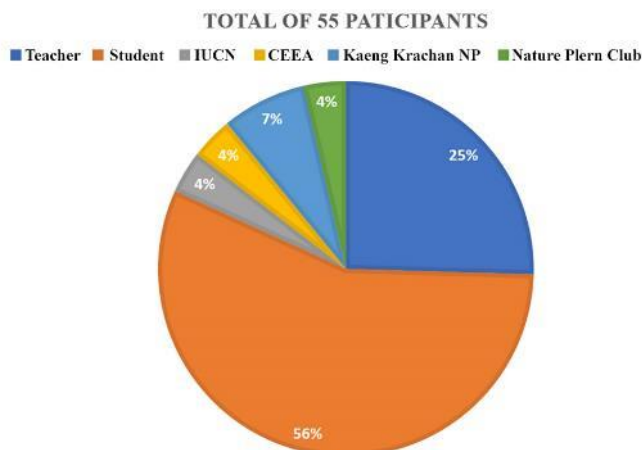
The target group consisted of teachers and students about 42 participants from (1) A.H. Link School under the patronage of Princess Srinagarindra Boromarajonani (2) Ban Phu Khem School (3) Ban Pong Luek Border Patrol Police School (4) Naresuan Palau Border Patrol Police School (5) Insee Volunteer Border Patrol Police Learning Center (Ban Pakeyaw) and (6) Ban Nam Sap School.

### 1. Participants:

14 teachers and 31 students from 6 schools joint the 3 day-nature education camp on 31th October to 2nd November 2022, at Ban Krang Camp, Kaeng Krachan Nation Park, Petchaburi Province. The details of participants are in table below;

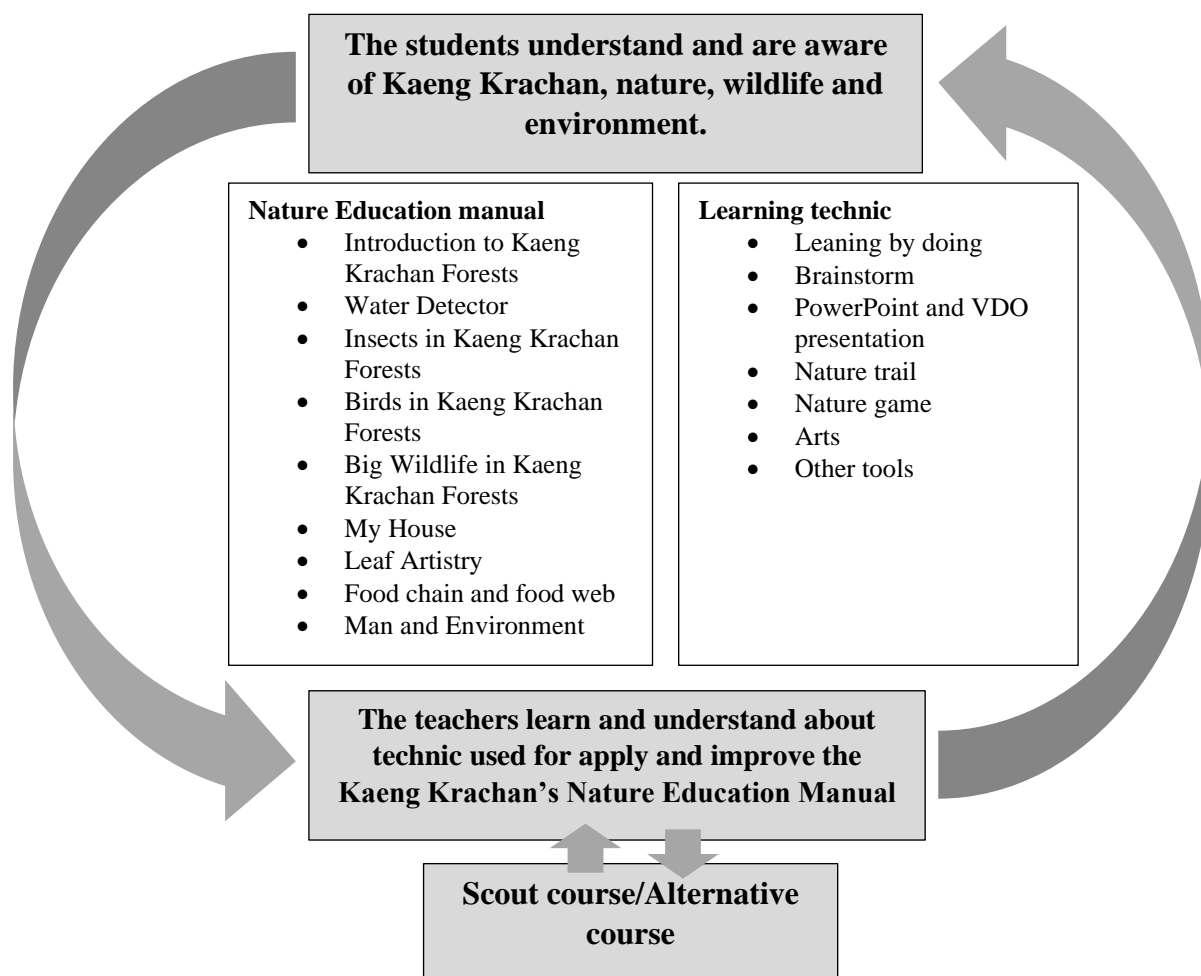
School	No. of teachers	No. of students	Total
1. Naresuan Palau Border Patrol Police School	3	5	8
2. Ban Pong Luek Border Patrol Police School	3	5	8
3. Insee Volunteer Border Patrol Police Learning Center (Ban Pakeyaw)	2	5	7
4.A.H. Link School under the patronage of Princess Srinagarindra Boromarajonani	2	5	7
5. Ban Nam Sap School	1	6	8
6. Ban Phu Khem School	3	5	8
<b>Total</b>	<b>14</b>	<b>31</b>	<b>45</b>

In addition, key speakers and support speakers included 2 IUCN officials, 2 from the Conference of Earth Environment from Akita (CEEA), 4 from Kaeng Krachan National Park and 2 from the Nature Plern Club.



## 2. Learning process:

This environmental education camp was designed by using the concept of “Learning by doing” for teacher engagement. The students focused on learning experiences by participating in activities and exchanging knowledge among the students. Most of the students from the Border Patrol Police schools are ethnic children, who live in the forests. Therefore, their way of life and knowledge about the forest and wildlife conservation should be enhanced and integrated. While the students from the mainstreamed education schools will live in a lower land and having rare opportunity to see the abundance of forests and wildlife. Therefore, it is an opportunity to create joint learning among student living in the two different ecosystems.





### 3. Key learning topics, objectives and technic.

#### 3.1 Introduction to Kaeng Krachan Forests

##### Objective

To enhance the student's knowledge and understanding about Kaeng Krachan National Park on forest landscape, value and importance of Kaeng Krachan National Park.

##### Learning process

- This session organized by the academic team from Kaeng Krachan National Park. They used the PowerPoint to present the information about Kaeng Krachan National Park including; (1) History (2) World Heritage Site (3) Geographic and boundary (4) Ecosystem (5) Wildlife (6) Plant and (7) Value
- Using the wildlife VDO clip from camera trap and present the important species ex; tiger, elephant, leopard, gaur, bear, tapir etc. this species link with "Big wildlife in Kaeng Krachan" session.

#### 3.2 Water Detector

##### Introduction

Water Detector course developed by the Green World Foundation. They use fresh water species as the water quality indicator. In this session, the students were taken to Ban Krang Creek (Upper Pan Buri River) near the camp and find the water species.

##### Objective

To enhance the student's knowledge and understanding on biodiversity and habitats in the Kaeng Krachan forests by focusing on small living creatures naturally found in water sources.



##### Learning process

- Explained the instruction of water detective, how to use a net or tool to catch a freshwater species.
- The survey found Mayflies, Stonefly and Trichoptera that indicated good quality of water in Ban Krang Creek.
- Explained about freshwater species, specific water's ecosystems and linkage between species and poor, medium and good level of water quality.
- Students can remember the picture and understand more about indicators by drawing the water species that they found in the creek.

### 3.3 Insects in Kaeng Krachan Forests

#### Objective

To enhance the student's knowledge and understanding on biodiversity and habitats in the Kaeng Krachan forests by focusing on insects, which are primary living creatures in the food chain.

#### Learning process

- The facilitator explained about the insects, their behaviours, key species, how to use a net or tool and not to cause the injury or death of those insects at the learning site.
- Explained about diversity of insect that found in Kaeng Krachan National Park, the insect in the level food chain and food web and the importance of insect in the ecosystem for example; food for predator, help to mix the pollen of the plant, some insect species control other insect pest etc.
- Students can remember the name of insect and understand about the importance of insect in ecosystem and benefit for human.



### 3.4 Birds in Kaeng Krachan Forests

#### Objective

To enhance the student's knowledge and understanding on biodiversity and habitats in the Kaeng Krachan forests by focusing on common birds.

#### Learning Process

- The facilitator explained about birds in Kaeng Krachan Forests and their behaviours, using Bird Guide, the key bird species, how to use telescope and binocular for bird watching.
- Explained about diversity of birds in Kaeng Krachan National Park, the bird in the level food chain and food web and the importance of bird in the ecosystem for example control the insect, spread the seed of plant, help to mix the pollen of the plant etc.
- Students can remember the name of birds and understand about the importance of birds in ecosystem and benefit for human.



#### Session conclusion

- Kaeng Krachan National Park specially Ban Krang Camp is the popular place for the bird watching and bird photographer with 440 bird species.

### 3.5 Big Wildlife in Kaeng Krachan Forests

#### Objective

To enhance the student's knowledge and understanding on biodiversity and habitats in the Kaeng Krachan forests by focusing on endangered large wildlife species, and found in Kaeng Krachan forests; for instance, elephants, tigers, leopards, gaurs, bantengs, Asiatic black bears and serows.

#### Learning process

- Relating with “Introduction to Kaeng Krachan Forests” session and other session. The facilitator organized a brainstorming process to identify the importance wildlife in Kaeng Krachan National Park.
- The key question is “What is the important wildlife/key species in your view?”
- Output of brainstorming session, the students recognize (1) Tiger (2) Elephant (3) Leopard (4) Gaurs (5) Black bear (6) Serow (7) Crocodile (8) Tapir and (9) Deer, as 9 big wildlife in Kaeng Krachan Forests.

### 3.6 My House

#### Objective

To enhance the student's knowledge and understanding on different types of wildlife in Kaeng Krachan Forests and the relationships between the habitats and wildlife species with diverse and unique characteristics.

#### Learning process

- Related to “Introduction to Kaeng Krachan Forests” session and other session. The facilitator organizes a children brain storming to identify the importance wildlife in Kaeng Krachan National Park.
- Using the paper charge and matrix. The key question is “What is the habitat/home of this wildlife?”
- Output of brain storm, the students recognize (1) Tiger (2) Elephant (3) Leopard (4) Gaurs (5) Black bear (6) Serow (7) Crocodile (8) Tapir and (9) Deer as 9 big wildlife in Kaeng Krachan.

### 3.7 Leaf Artistry

#### Objective

To enhance the student's knowledge and understanding on leaf variety existing in nature with diverse types and characteristics.

#### Learning process

- Introduce the diversity of “leaf” pattern and give the challenge question “Try to find the leaf in mostly difference pattern”
- Give a tool for a group work including; (1) water colour (2) A0 drawing paper (3) water colour dish (4) brush
- The students find the difference leaf from around (1 student/ 1 leaf).



- Paint the water colour on the leaf and print that leaf on the drawing colour.
- Discussed about diversity of leaf pattern.

### 3.8 Food chain and food web

Food chain is a chronological pathway shows the flow of energy from one organism to the others. In a community which has producers, decomposers and consumers, the energy flows in a specific pathway. Energy is not created or destroyed, yet it flows from one level to the other, through different organisms. A food chain shows a single pathway from the producers to the consumers and how the energy flows in this pathway. In the animal kingdom, food travels around different levels. To understand a food chain better, the terrestrial ecosystem will be used for analysis. There are many interconnected food chains, which make up a food web. A food web shows a realistic representation of the energy flow through different organisms in an ecosystem.

#### Objective

To enhance the student's knowledge and understanding on the relationships among various types of wildlife in the food chain, where animals consume one another in steps from decomposers to producers and to consumers. The extinction of one living thing has impact on another living creatures.

#### Learning process

- Introduce definition of food chain and food web.
- Give a card (species picture) for a group work.
- The members of working group discuss about the energy flows in a specific pathway.
- The member's up stand from producers, decomposers and consumers.
- Observe the understanding of the children in group and ask a question to bring an idea.
- Give a card (species pictures) to working group and input on the flip chart.
- The members of working group discuss about the energy flow in a complicated pathway of food web.
- Use a pen draw a line link energy flow between difference species.
- Group presenting

### 3.9 Man and Environment

#### Introduction

Man and environment game is the final session of the learning session that focus on the relationships between human, natural resources and environment. Many students joined this nature education camp is Karen Ethnic group, who depend on the forest and nature ex; food, water, herbal medicine, and housing. The damage of natural resource will cause the negative impact to the people and their livelihood.

#### Objective

To enhance the student's knowledge and understanding on the importance of conservation, restoration of natural resources and the environment.

#### Learning Process

- The facilitator explained about the learning topic from small creatures in the nature link up to the complicated food chain and food web. Human being is on top of the food web.



- Use flow chart to identify the link between man and other species from the small species up to the man that in the top of food web.
- Improve the understanding, when some species is lost, the consequence of loss, impacts to other species in each step and human beings.
- Brainstorm by use a card with question; what is the human's activity that has impact on species or environment, for example; pesticide or chemical fertilization in the agriculture, deforestation, waste water from community, and poaching.

### 3. Learning from Nature Trail

On 1 November 2022, IUCN organized a nature trail walk in the “Vanilla Nature Trail”, which the distance is about 1.4 Kilometer and take around 1 hour. The students will learn about ecology of mix forests, evergreen forests and orchid Vanilla and Saprin ram. This activity was led by 3 officers of Kaeng Krachan National Park. Learning stations in the trail included;



#### Station 1: Saprin ram

In this station, the students learned about “Sapria ram” that is a holophrastic flowering plant endemic to Thailand. It is found in central and southern Thailand. This biennial plant reduces, no true laves. The flowers are quite small. Sex flower single flower bract is tacked several flowers buds' round. Stamens with a perfect 20th. Have stamens and pistil are sterile. The ovaries are the female flower petals grow well. Can be found near Ban Krang until Panoen Thung field, rare plants species are endemic plants in the Southwest and the upper South.

#### Station 2: Vanilla Orchid

In this station, the students learned about a Vanilla orchid (*Vanilla pilifera*) that is a climbing orchid in mixed deciduous forest and it's a rare species wild orchid found only in Malay Peninsula and peninsular Thailand.

#### Station 3: Mix deciduous forest

In this station, the students learned about Mix deciduous forest that is the dominant forest type in Thailand. It's recognizable by a fairly well spaced growth of trees that allows sunlight to penetrate to the ground and allow grasses and other ground growths. The trees are broad leafed (such as teak) with a distinct shedding on leaves in the dry season which can last 4 months.

#### Station 4: Evergreen forest

In this station, the students learned about an evergreen forest that is a forest which remains green throughout the year. The trees lose their leaves continuously throughout the year, old leaves are shed at the same time new leaves are borne. There is not a particular season when trees lose all their leaves altogether which happens in deciduous forests in which trees starts losing all its leaves in a particular Season called autumn or fall in temperate deciduous forests and dry season in tropical deciduous forests.



## Station 5: Salt licks

In this station, the students learned about salt lick that is deposit of mineral salts used by animals to supplement their nutrition, ensuring enough minerals in their diets. A wide assortment of animals, primarily herbivores use salt licks to get essential nutrients like calcium magnesium, sodium and zinc. Salt licks are natural mineral which are mineral outcrops in the soil which are visited by herbivores for soil eating or licking. They also supplement mineral that are deficient in animal vegetable diets



Moreover, in this station the students learn about the difference type of wildlife's foot ex; Deer, Gaur, Tiger, Leopard, Elephant etc. The students learned how to use plaster to cast the footprints of the wildlife.

### What did you learn from nature trail?

<b>What did you see?</b> <ul style="list-style-type: none"> <li>• The footprint of tiger, wild boar, deer</li> <li>• Hornbill, Leaf Monkey, fish, butterfly, turtle</li> <li>• Big liana</li> </ul>	<b>What did you hear from the forest?</b> <ul style="list-style-type: none"> <li>• Water flow</li> <li>• Voice of Hornbill, Rodent</li> </ul>
<b>What did you smell from the forest?</b> <ul style="list-style-type: none"> <li>• Smell from tree/forest</li> <li>• Fresh air</li> <li>• Smell from soil</li> <li>• Smell of salt lick</li> </ul>	<b>What is the new thing that you learned?</b> <ul style="list-style-type: none"> <li>• Know new species; Vanilla orchid, Sapria ram</li> <li>• Salt lick for wildlife</li> <li>• Dry forest</li> <li>• Black giant squirrel</li> <li>• Snake head fish</li> <li>• Fungi cup</li> </ul>

## 4. Output

According to the evaluation of learning efficiency, 31 students who participated in the environmental camp activities are assessed. Most of them had 20 - 70 percent (n=31) increase in their scores after completing the environmental camp activities, especially on their knowledge and understanding about Kaeng Krachan National Park and knowledge about river detector.



## Pre-Test and Post-Test Result

Questions	Pre-test result	Post-test result	Outcome	by
<b>1) Kaeng Krachan national park is the world's largest national park</b>	<b>26%</b>	<b>97%</b>	↑	71%
・ A.H. Link	100%	100%	→	0%
・ Ban-Nam-Sup	17%	83%	↑	67%
・ Ban-Pu-Khem	0%	100%	↑	100%
・ Karen	0%	100%	↑	100%
・ Pa-La-Oo	40%	100%	↑	60%
・ Pong-luek	0%	100%	↑	100%
<b>2) Petchburi river in the Kaengkrachan is upstream of the Chaopraya River</b>	<b>45%</b>	<b>87%</b>	↑	42%
・ A.H.Link	100%	100%	→	0%
・ Ban-Nam-Sup	83%	33%	↓	-50%
・ Ban-Pu-Khem	0%	100%	↑	100%
・ Karen	0%	100%	↑	100%
・ Pa-La-Oo	60%	100%	↑	40%
・ Pong-luek	20%	100%	↑	80%
<b>3) Lions and Giraffes have their habitat in the Kaengkrachan national park</b>	<b>83%</b>	<b>100%</b>	↑	<b>17%</b>
・ A.H.Link	100%	100%	→	0%
・ Ban-Nam-Sup	100%	100%	→	0%
・ Ban-Pu-Khem	60%	100%	↑	40%
・ Karen	100%	100%	→	0%
・ Pa-La-Oo	100%	100%	→	0%
・ Pong-luek	40%	100%	↑	60%
<b>4) "Water Detective" is an approach to looking for water insects that can indicate the quality of water</b>	<b>47%</b>	<b>100%</b>	↑	<b>53%</b>
・ A.H.Link	80%	100%	↑	20%
・ Ban-Nam-Sup	0%	100%	↑	100%
・ Ban-Pu-Khem	0%	100%	↑	100%
・ Karen	100%	100%	→	0%
・ Pa-La-Oo	0%	100%	↑	100%
・ Pong-luek	0%	100%	↑	100%
<b>5) Even insects that seem like pests can be beneficial to plants.</b>	<b>77%</b>	<b>100%</b>	↑	<b>23%</b>
・ A.H. Link	100%	100%	→	0%
・ Ban-Nam-Sup	33%	100%	↑	67%
・ Ban-Pu-Khem	80%	100%	↑	20%

Questions	Pre-test result	Post-test result	Outcome	by
· Karen	100%	100%	↑	0%
· Pa-La-Oo	60%	100%	↑	40%
· Pong-luek	100%	100%	→	0%
<b>6) Red-wattled lapwing loves staying on trees 'limbs</b>	<b>71%</b>	<b>100%</b>	<b>↑</b>	<b>29%</b>
· A.H. Link	100%	100%	→	0%
· Ban-Nam-Sup	33%	100%	↑	67%
· Ban-Pu-Khem	100%	100%	→	0%
· Karen	100%	100%	→	0%
· Pa-La-Oo	100%	100%	→	0%
· Pong-luek	0%	100%	↑	100%
<b>7) Is this a barking deer's footprint?</b>	<b>81%</b>	<b>97%</b>	<b>↑</b>	<b>15%</b>
· A.H. Link	60%	100%	↑	40%
· Ban-Nam-Sup	80%	80%	→	0%
· Ban-Pu-Khem	100%	100%	→	0%
· Karen	0%	100%	↑	100%
· Pa-La-Oo	100%	100%	→	0%
· Pong-luek	100%	100%	→	0%
<b>8) The benefits of forests are - sources of food - sources of water for consumption - provide Clean air - provide tourist places - being wildlife habitats</b>	<b>97%</b>	<b>97%</b>	<b>→</b>	<b>0%</b>
· A.H. Link	100%	100%	→	0%
· Ban-Nam-Sup	83%	80%	↓	-3%
· Ban-Pu-Khem	100%	100%	→	0%
· Karen	100%	100%	→	0%
· Pa-La-Oo	100%	100%	→	0%
· Pong-luek	100%	100%	→	0%
<b>Over all understanding</b>	<b>67%</b>	<b>97%</b>	<b>↑</b>	<b>31%</b>

### Feedback from students:

Question	Agree	Disagree	Not Sure
The participants benefited from participating in the environmental camp.	100%	-	-
The participants would like to join the camp again in the future.	100%	-	-
The participants will tell their peers about the camp when they return to schools.	93%	-	3%

### Meetings with Teachers:

Questions	Feedbacks
<b>1) How the activities benefit you in terms of</b> - Consultation process - Equipment - Manual book - Camp arrangement	- It would be great to have a manual for children, such as an activity book, and other attractive equipment for kids. - The activity can be leveraged into environmental education in the world heritage sites.
<b>2) Do you find benefits from the camp?</b>	- The camp provided benefits, which the curriculum can be integrated into the stakeholders' work - Children learned from real nature, not from the zoo - The children enjoyed the activity; they exchanged their experiences with children from other schools. They can relate their local environment to the camp' activities - The activity can be transferred to other schools in the province, not only the school located in the upstream area, considering that each school has a different context and characteristic in which the activities are adaptive. - The camp should be relocated to other areas, such as exchanging area between participating schools so that they can learn from the different environment
<b>3) Next step from the camp</b>	- The camp should be organized annually while keeping small activities regularly. For example, the park rangers can visit schools from time to time for 1-2 hours at each school. It should allow the community to work with the national park officers to create amicable relationships. - Teachers believe that park rangers can convey knowledge to children better than teachers because they are a professional people. - There should be a focal point from this activity - The activity can be integrated into the annual scout camp or science class

Questions	Feedbacks
	<ul style="list-style-type: none"> <li>- We need specific knowledge for each area. IUCN should work with the National park to develop such knowledge. This can be done through the academic department of the national park</li> <li>- We should connect the border patrol's schools with those basic education schools; which needs to be prioritized to allocate limited resources (budget and manpower)</li> <li>- It might need to engage private sectors for investment</li> </ul>

*End of the report*  
*Pratheep Mekatitam*  
*01 December 2022*