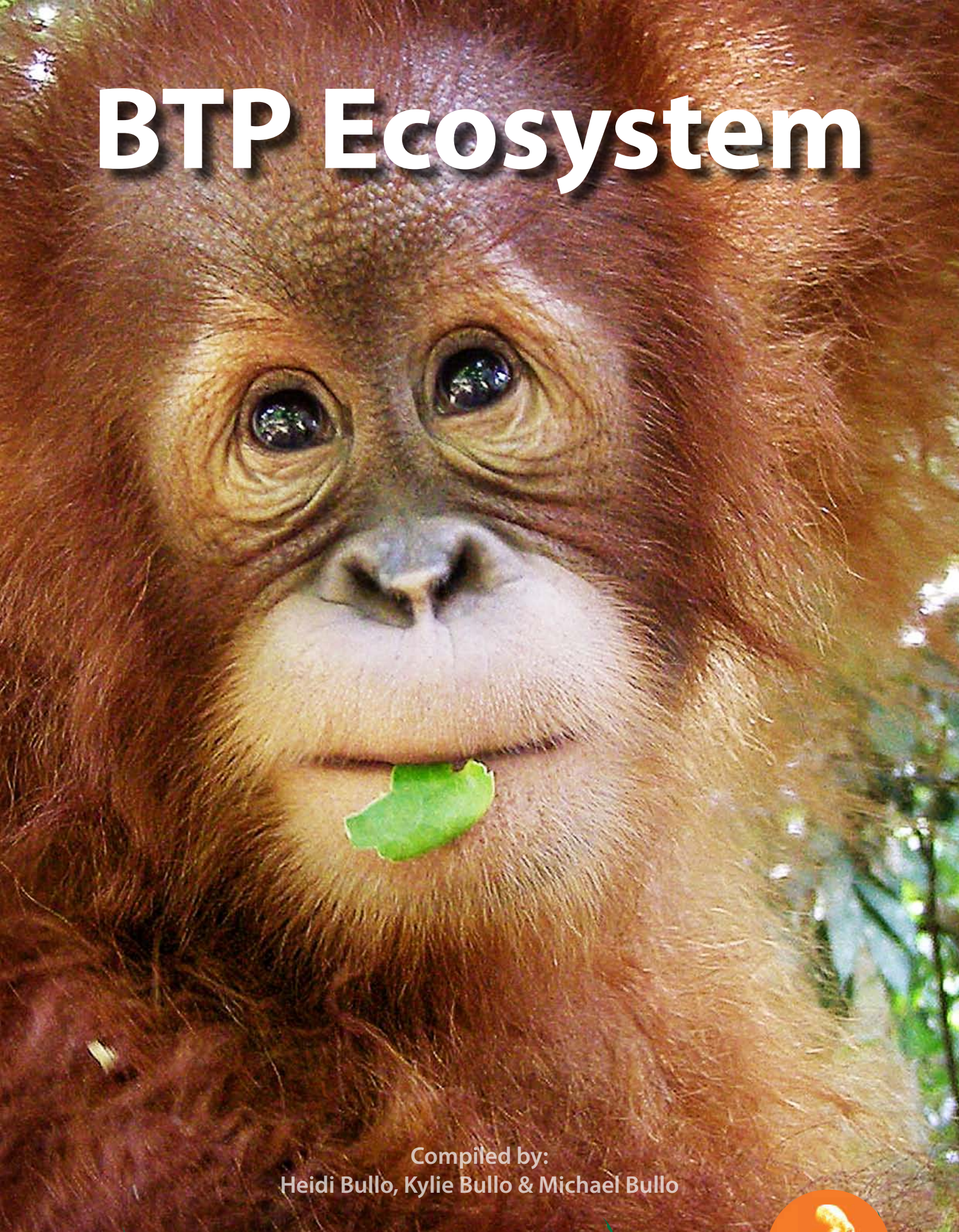
BTP Ecosystem



Compiled by:
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Year Level R-7

Bukit Tigapuluh Ecosystem

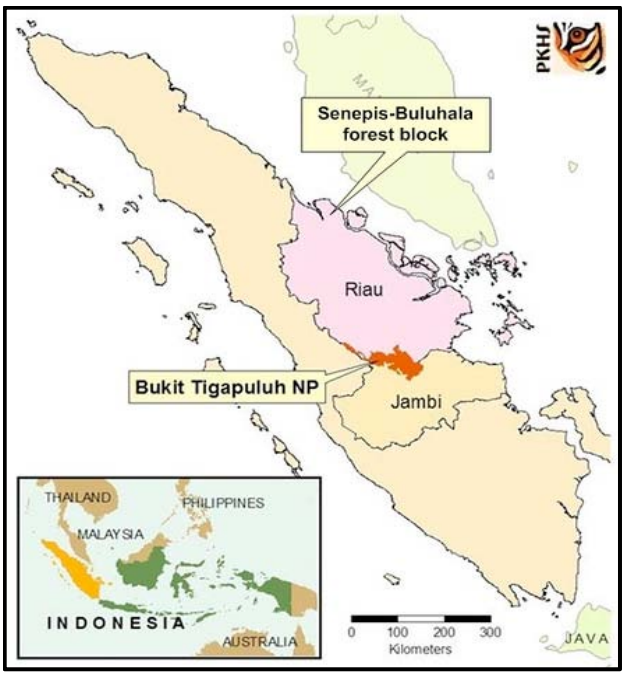
In the Sumatran Rainforest

The Bukit Tigapuluh ("The Thirty Hills") ecosystem, is located in the provinces of Jambi and Riau on the Indonesian island of Sumatra. It is an extremely important area of land which is inhabited by countless species of plants and animals – many of which are threatened with extinction.

The area is of prime importance to the Australian Orangutan Project (AOP) as Sumatran Orangutans have been reintroduced to this habitat. As habitat destruction is the main reason why orangutans are faced with extinction, the AOP decided to fund the Wildlife Protection Units when they were established in 2004. The people in these units are professionally trained to stop illegal logging and poaching activities. In so doing, they also monitor and guard the orangutans and other wildlife (including the endangered Sumatran tiger and Asian elephant), which inhabit this region. This constitutes the AOP's biggest funded project. The AOP also assists with the running costs of the Sungai-Pengian release site in this part of the Sumatran jungle.

As most people have not visited this remote area, it was decided to compile and present some images of the BTP ecosystem. These should enable everyone to better envisage and appreciate this part of the Sumatran tropical rainforest. The images have been classified into sections which are listed on the next page. Each of these sections also contains some introductory information and activities. It is hoped that these will encourage further research about the biodiversity in this region.

As 2011 has been designated the international "Year of the Forests", many people may wish to learn more about the forests of the world. Unfortunately, despite the abundance of material in this area, very little is devoted to the Sumatran rainforest. This lack of information and consequent ignorance has contributed to the current destruction of this region. If our awareness and knowledge of the Bukit Tigapuluh ecosystem in Sumatra increases, so too does the likelihood that we can save this unique environment.



Location of Bukit Tigapuluh ecosystem in Sumatra

Year Level R-7

Bukit Tigapuluh Ecosystem

In the Sumatran Rainforest

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Vegetation of the Sumatran Rainforest

Year Level R-7

Although tropical rainforests only constitute about 3% of our planet's land, they contain about half of the world's species. (This fact alone clearly illustrates their importance to mankind.) Trying to analyse and classify all of these species is a daunting process. In order to simplify it slightly, the rainforest has been divided into four major sections or layers. Each of these provides a home for different species of plants and animals.

The highest level is called the "Emergent Layer" and it is created by the tallest of trees. Some of these are more than 76 metres in height. The second section is known as the "Canopy Layer". Most of these trees are about 3 to 12 metres in height. They fit together and shade the rest of the forest to such an extent that only about 2% of sunlight reaches the forest floor. The next level, progressing downwards, is known as the "Understory Layer". It consists mainly of palms, ferns, shrubs and young trees. Many of these plants have large leaves. It is thought that this allows them to absorb more of the small amount of sunlight which penetrates to this level. The fourth layer at the bottom of the rainforest is known as the "Forest Floor". Here, the dark, humid conditions are ideal for the recycling of detritus. Fungi play a crucial role in this process. It would take more than a life time to study all of the plant species in a rainforest. (You may decide to study just one or two.)

One extremely important characteristic of rainforest plants, is the way that they release oxygen and moisture into the air during the process of photosynthesis. Rainforests are extremely well balanced ecosystems. A rainforest tree is capable of sucking up hundreds of tonnes of water in a year. What it doesn't utilize returns to the forest as mist and vapour. When the balance in this habitat is upset by a single species – such as mankind – it can lead to total ecological collapse.

Vegetation of the Sumatran Rainforest

Activities

Year Level R-7

1 To see how the rainforest plants grow after the "natural death" of a forest giant, watch a spectacular sequence of time lapse photography on the DVD series "Planet Earth" by David Attenborough. Disc 3 , "Jungles". It commences at the 5 minute mark with a giant tree crashing to the ground. What ensues is a "race for a place in the sun" involving a huge variety of plants. Although this was filmed in New Guinea, it is representative of all tropical rainforests.

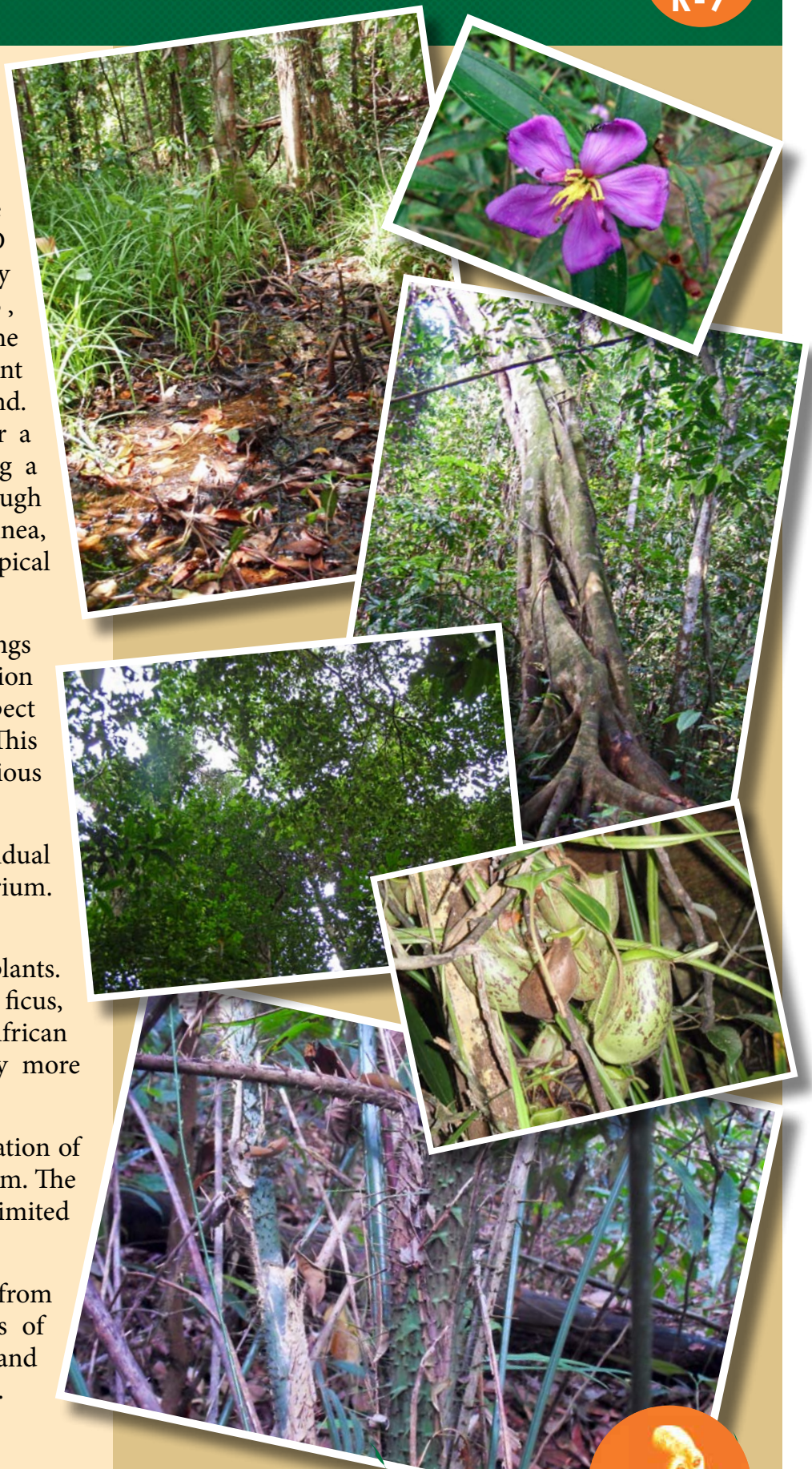
2 Create a series of drawings to illustrate the germination of a seed or another aspect of growth in the forest. (This could be based on the previous vision.)

3 Create your own individual rainforest in a terrarium. (Recycle a plastic bottle.)

4 Grow some real rainforest plants. Eg. bromeliad, begonia, ficus, orchid, umbrella tree, African violet etc. There are many more from which to choose.

5 Create an artistic representation of a rainforest in your classroom. The possibilities here are only limited by your imagination.

6 Make prints or rubbings from the leaves and other parts of rainforest plants. Utilize and adapt these in creative ways.



Fungi of the Sumatran Rainforest

Year Level R-7

The presence of fungi in a forest environment can not be understated. Quite simply, without fungi, a rainforest could not exist. How then, can fungi be defined and what role does it play in a forest ecosystem? Fungi are organisms which have no leaves, flowers or chlorophyll. Some examples of these are mushrooms, toadstools, moulds and mildew.

It is thought that there may be nearly one million different kinds of fungi in the tropics. In the tropical rainforests where humidity is high, life is built on the processes of decay. Fungi assist greatly in the decomposition process of fallen plant material. They flourish in these humid and dark conditions on and under the forest floor. Many types of fungi which we see above ground are the tops of a huge underground network of fungal filaments. These fungi have symbiotic relationships with plants – especially trees. As fungi are unable to produce their own sugars, they take these from the host plant. In return, the fungi access water and other nutrients to help the host plant to flourish. In so doing, crucial minerals are recycled instead of being leached away by rain.

Fungi of the Sumatran Rainforest

Activities

Year Level R-7

1 Purchase a box containing a "mushroom farm". Keep this in a dark place in the classroom. Observe the growth of the fungi on a daily basis. Keep a growth diary which contains written observations, sketches and/or photos.When appropriate to do so, harvest the mushrooms, cook and eat them. Record your recipes.

2 Try to obtain different types of edible mushrooms. Farmers' markets are often a good source for these. Observe/ sketch/photograph these. Cook and eat them as well.

3 Watch the spectacular time lapse photography of a variety of fungi growing on the DVD "Planet Earth" by Sir David Attenborough. Disc 3, Jungles. It's only 3 minutes of vision from the 24th minute.

4 Having observed fungi, try to create some from clay and paint these with vivid colours. They can be used as garden ornaments. (These are often seen at markets.) If you are creating a rainforest in your classroom or dioramas, they could also be incorporated into these activities.

5 Construct a collage using textiles to create a variety of fungi. (In the Planet Earth vision, many fungi appeared to have what looked like "lacy skirts".)

Fruits of the Sumatran Rainforest

Year Level R-7

Throughout the rainforests of the world, plants flower and fruit at different times of the year. Consequently, if animals such as orangutans are to survive, they must spend years learning from their mothers, which foods to eat and where and when to find them. In essence, they must have a map of fruiting trees and other plants in their minds, but they must also remember the sequence of when they are available.In all rainforests, varieties of the fig tree are amongst the most reliable food sources. They are, in fact, the single most important food source for the fruit-eaters in the jungle. There can be up to twenty different species of fig trees in a rainforest and one strangler fig tree can produce up to 100,000 figs.

Many animals are dependent on fruits for their survival, but this is a reciprocal relationship as many fruiting plants rely on animals to act as couriers for their seed dispersal. Sometimes this happens immediately during the process of eating. Often though, highly mobile animals such as orangutans, bats and birds consume the fruits and then disperse the seeds in their droppings in areas far from the original plant. This is yet another example of the complex web of relationships within the rainforest environment. Even the fruits which fall to the ground are not wasted as their nutrients are recycled by the decomposers.

Fruits of the forest are also of vital importance to the local people. Instead of earning an income by destroying the forest through illegal logging and the growing of palm oil plantations, forest products such as rotan stem and dragon fruit can be harvested and sold. If people can benefit directly from the rainforest in this manner, they will be more inclined to protect it.

Once again it can be shown, that all species of plants and animals in the rainforest are interdependent and combine to produce a finely balanced ecosystem.

Fruits of the Sumatran Rainforest

Activities

Year Level R-7

1 Try to purchase some Indonesian fruits. (e.g. rambutan, durian, longan and dragon fruit) Taste and assess these. Try them raw or in different recipes.

2 Create your own tropical fruit smoothies. Challenge everyone to design their own recipes. Modify if necessary and then compile them into a book of Tropical Smoothie Recipes. Try water instead of milk.

3 Fruity iceblocks are another healthy snack option.

4 Utilize tropical fruits to create some artistically presented food. It's always easy to start with fruit skewers and fruit salad. Then, stretch your creative imagination. Perhaps arrange a variety of fruits to create faces or animals.

5 Select different animals in the rainforest which eat fruits and then draw food chains, food webs and energy pyramids for them to illustrate the interdependence of the biodiversity.

6 Durian is one of the orangutans' favourite fruits. Have you ever seen or tasted it? It is available in Australia – just in case you'd like to experience it. It is cheap in Indonesia but expensive in Australia. It is interesting to note that in some hotels in Singapore, guests are not permitted to eat durian on the premises. Why do you think this rule was implemented?

Animals in the BTP Ecosytem

Year Level R-7

The Sumatran rainforest is home to a huge variety of animals. On entering this environment, you'll probably hear many of the animals before you actually see them. Many live high in the canopy (see the section on Vegetation), whilst millions of others live on the forest floor. Most rainforest animals are particularly suited to one level. This specialization enhances the ability of so many diverse creatures to share the same ecosystem.

When reference is made to Sumatran rainforest animals, most people usually think of large and impressive animals such as the orangutans, tigers, elephants and sun bears. (The BTP ecosystem is the only area in Sumatra which contains a complete collection of its mega fauna.) However, it should be remembered that 80% of all insects live in rainforests. These animals are of critical importance to the ecosystem. According to E.O Wilson – Harvard University's ant specialist- "the disappearance of all ants would lead to total ecological collapse." (p.135 "Tree – A Life Story" By David Suzuki & Wayne Grady)

Whereas plants are primary producers which create their own food, animals must eat food from a diverse variety of sources to survive. As a consequence, they can be classified as herbivores, carnivores or omnivores. Some creatures are called decomposers as they eat detritus. (Dead plant and animal matter which is decomposing.) Healthy rainforests are very finely balanced ecosystems. If one species starts to dominate, the crucial balance is destroyed. Unfortunately, it must be stated that mankind is now widely accepted as the greatest threat to all ecosystems.

Animals in the BTP Ecosytem

Activities

Year Level R-7

1. Read a selection of picture books about animals which live in the rainforest. e.g. "Little Sibu" by: Sally Grindley and "Mang the Wild Orangutan" by: Joan van Loon.
2. Select a particular animal which lives in the BTP ecosystem and learn as much about it as possible. Share your findings with others through a medium of your choice. e.g. Writing, art, music or drama. Create riddles or quizzes about your animal.
3. If your animal is endangered, what action can be taken to try and help it? If several students would like to help, you may consider establishing a "Roots and Shoots" group at your school. Helping to protect some endangered animals would be a wonderful project for the Animals section of "Roots and Shoots". (See the Mobile Education Unit for more details.)
4. Constuct your own ant farm. (e.g. p 29 of "The Remarkable Rainforest" by Toni Albert) Observe these remarkable creatures and share your findings.
5. Create your own animal masks. These could be used in plays which you also create.
6. If you have created an artistic forest in your classroom, ensure that it contains a vast diversity of animal species at every level of the ecosystem.
7. Create food chains, energy pyramids and food chains for specified rainforest animals. (See "Rainforest Food Chains" by: Bobbie Kalman)

Enrichment Activities for Orangutans

Year Level R-7

It is widely accepted that most adult orangutans are about as intelligent as a six year old child. Examples of how orangutans demonstrate their intelligence include problem solving, planning ahead and using tools. They can also learn human sign language. When they are held in captivity in Sumatra, waiting to be released back into their wild environment, it is essential to care for both their physical and mental health. They need stimulation to keep their bodies and minds active. Activities should also be given to help keep their natural instincts alive.

If you have been fortunate enough to watch some of the "Orangutan Diary Series 1 & 2" on DVD, you would have seen many examples of enrichment activities. Steve Leonard and Michaela Strachan also explained the importance of this on many occasions.

The photos on the following page show orangutans being taught important skills which will be needed to survive in the wild. Some of these include the utilization of tools such as sticks. Orangutans also need to be resourceful when fruits are scarce and be able to access other food sources such as termites. Hence, the human demonstration of how to suck termites from a nest. Durable green feeder balls and rotan stem have also been successfully introduced to encourage problem solving and foraging.

These enrichment activities promote natural behaviours. Orangutans that master these activities, have a greater chance of successfully living in the forest after their release. Wonderful vision of an orangutan mother and her daughter living naturally in the Sumatran rainforest can be seen in episode 10 of the DVD entitled "Life". Key scenes are to be found in the introduction and from 27:54 – 32:10 minutes.

Enrichment Activities for Orangutans

Activities

Year Level R-7

1 Watch "Orangutan Diary Series 2" – Episode 7. (See Teachers' Notes) Of particular note is vision of orangutans being taught to use sticks as tools to obtain honey from a log. (Vital survival skills in the rainforest.)

2 Human beings also need enrichment activities. Make a list of the activities which you choose to do when you have free time. Perhaps you could classify these into groups. e.g. pure entertainment, developing sporting skills, enhancing knowledge etc

3 If you visit an orangutan exhibit at a zoo, carefully observe the puzzle boxes and other forms of enrichment which are provided for the animals. Many involve a food reward on completion of the task.

4 Pets are intelligent animals which can also become bored. This can lead to negative behaviour. Try to develop some enrichment activities for them in which they are encouraged to forage and play. Some examples for dogs.
- Use "Kongs". Fill these with peanut butter and dog kibble.
- Dog ice blocks. Dissolve a beef cube in hot water. Add carrot and meat. Freeze.

Environmental Devastation in Sumatra

Year Level R-7

It is hard to state the magnitude of this huge problem. It isn't just a problem for Sumatra. It's a problem for the entire planet. It is far too easy for concerned conservationists to be critical of the people living in Indonesia and other rainforest areas of the world. The people who are cutting down trees and exploiting other natural resources, are often doing so in order to provide their families with basic needs. It must also be remembered that most of the forests in "The West" were cleared during the Agricultural Revolution and that currently, most of the rainforest products are sold to these more affluent "forestless" countries. Consequently, we all must take responsibility for the situation.

Instead of becoming disillusioned though, it is important to become more aware of what is currently happening and to take appropriate action to improve this dire situation. Sometimes, as individuals, we feel powerless, but if we speak up and voice our concerns, we can make a difference. This was clearly demonstrated in 2009 when Cadbury decided to withdraw palm oil from its chocolate and revert back to its traditional recipe. This action was taken as a result of a huge protest from the public.

It is also vital to educate the local people who currently earn an income from the rainforest. If they can continue to provide for their families by sustainable means or by protecting the BTP ecosystem, then everyone will benefit.

This issue is of prime importance to the AOP as habitat destruction is the main reason why orangutans and countless other species in the Sumatran rainforest may become extinct in the wild in less than ten years.

Environmental Devastation in Sumatra

Activities

Year Level R-7

1 Become more aware of what is happening by watching documentaries such as "Orangutan Diary Series 1 & 2. On the AOP's Education website, students worksheets are available for all of Series 1 and Series 2 has a very comprehensive set of Teachers' Notes ready to be downloaded.

2 DVDs such as "The Last Trimate" (see the resources section) are also very informative. Worksheets to accompany this documentary are also available and some of these deal directly with the problem of logging.

3 The sheets entitled "Palm Oil Orphans" (also ready to download), are informative and offer many practical ideas ready for implementation. e.g. Checking the labelling on products to see if they contain palm oil, joining the "Don't Palm Us off" campaign and writing letters of concern to companies which use palm oil in their products.

4 If you wish to address any of these environmental issues, forming a "Roots and Shoots" group at your school may be an effective way of attaining some of your goals with like-minded students. See Mobile Education Unit for details about "Roots and Shoots".

Working in the Sumatran Rainforest

Year Level R-7

The two orangutan release stations in BTP provide employment for the local people. There are two station managers, each one in charge of running one of the release sites. Orangutan technicians are employed to look after the orangutans in the cages. Their tasks include feeding and providing enrichment for the orangutans, cleaning the cages, collecting forest fruits and leaves and taking suitable orangutans out to forest school. People are also employed to follow released orangutans and record their behaviours on a protocol sheet. This is a very long and tiring day. Trackers must get up at 4.30am, have breakfast and then travel to the orangutan's nest by 6am. The orangutan must be followed all day until it makes a nest in the evening to sleep for the night. Leeches live in the rainforest, so people wear protective clothing including leech-proof socks.

There is also a vet who works at the release sites. She is in charge of the overall health and diet of the orangutans. She also treats orangutans if they become ill or if they are injured in forest school. Two female cooks work at each release site. All of these employees live on-site in basic wooden huts with an outdoor toilet room and a mandi. (This translates as "bath", but in reality, you pour a bucket of cold water over yourself!) Drivers are also employed to drive the Toyota 4WD vehicles on the very rough terrain into the release sites. They transport staff and supplies to the release stations. People are also employed in the Wildlife Protection Units and Mobile Education Unit. (See separate sections.)

The Programme Director, Peter Pratje and other office staff work in Jambi city as there is very limited electricity at the release site. Dr Pratjie makes frequent visits to the release sites as well as attending meetings in Jambi and Jakarta.

The orangutan release sites at BTP are restricted to visitors. Only highly experienced conservationists and scientists are allowed access to the site. Limited contact is allowed with the orangutans as they are susceptible to human diseases and in this ecosystem, the welfare of the orangutans is the top priority.

Working in the Sumatran Rainforest

Activities

Year Level R-7

1 Become more aware of products which come from rainforests. Try to avoid purchasing unsustainable forest products such as furniture and palm oil.

2 Try to do your homework without using technology. In fact, try not using any technology for a day, or longer if you can. Record and discuss the results.

3 Develop and practise your First Aid skills.

4 Many of the highly trained conservationists and scientists who work in BTP do so on a voluntary basis. In Australia too, the AOP has a dedicated team of volunteers with a diverse range of skills, who also work diligently without any financial reward. They do this quite simply, to help save the orangutans and their habitats in Sumatra and Borneo. Do you willingly offer you services and help others without any financial payment? If so, what do you do and how does it make you feel? Share your experiences with others.

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Wildlife Protection Units in BTP

Year Level R-7

The Bukit Tigapuluh (BTP) ecosystem is the only release site for the ex-captive Sumatran orangutans. This ecosystem requires protection from wildlife and habitat crimes, such as poaching and illegal logging. Research has shown that the best way to conserve a species is through habitat protection. Thus, Wildlife Protection Units (WPU) were established in 2004 to patrol the BTP ecosystem. Whilst doing this, the habitat is protected for the introduced Sumatran orangutan population and other endangered species.

The Wildlife Protection Units have four core goals:

1. Prevent poaching of wildlife.
2. Prevent illegal logging.
3. Actively assist the reintroduction/ translocation of orangutans at BTP.
4. Collect wildlife data to evaluate ecosystem conditions at BTP.

WPUs track illegal loggers and collect evidence of illegal activities. Once found, the WPUs dismantle loggers' camps and dissuade the loggers from returning. The WPUs have established the respect and support of surrounding villages by employing and collaborating with locals. This method has been inclusive of local knowledge which in turn has aided evidence and data collection. WPUs receive specialist training and cooperate with other conservation groups to develop their skills and networks. WPUs have been trained in first-aid, GPS navigation, evidence collection, flora/ fauna data collection and conflict mitigation training. These skills have given the WPUs a broader set of skills to draw upon to deal with both known and unforeseen circumstances.

There has been a significant decrease in poaching activities, forest encroachment and illegal logging since the introduction of WPUs in BTP. The WPUs have built a strong cooperative network of contacts amongst locals, government representatives and other conservation groups in the region.

Wildlife Protection Units in BTP

Activities

Year Level R-7

1. Practise navigating with a compass or GPS.
2. Go camping with your family. Help to set up the tent and prepare the fire. Check to see if fires are permitted.
3. See how many plants you can identify in your garden.
4. Evaluate the ecosystem in your backyard. Is it healthy? Do birds, bees, butterflies and other insects frequent your garden to pollinate plants? Are ants, worms and other decomposers busily recycling in your garden? If not, why not?
5. Conduct a similar ecosystem evaluation at your school.
6. Learn some first aid skills.
7. Develop your conflict mitigation skills. Many schools have programmes in place for conflict resolution – especially in regard to the problem of bullying.

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Living in the Sumatran Rainforest

Year Level R-7

The basic needs of all human beings are the same. However, the manner and degree to which these needs are met varies immensely from one country to another. When people from the developed world look at the lifestyle of those living in the BTP ecosystem, they would undoubtedly say that it is very simple or basic.

All meals that are eaten generally contain rice as it the staple food in Indonesia. Vegetables are grown and eaten and fish from local rivers are also caught. Chicken is sometimes eaten but other meats are very rare. Chickens are kept by some people for laying eggs. Sometimes families have pets such as cats and dogs.

Family is very important to Indonesians and most families have numerous children in them. The children play simple games with their brothers and sisters, friends and neighbours. Even people living in simple villages sometimes have a TV and a satellite dish. Extended families often live together so they will all help to pay for this equipment.

Due to the hot and humid weather, people often have a rest during the middle of the day. Mosquitoes are prevalent in some areas of Indonesia. Overseas visitors to Indonesia will often take anti-malaria medication and utilise protective equipment against mosquitoes including sleeping under mosquito nets and wearing long sleeved shirts.

Despite having a much simpler life style than the Western world, most Indonesian people seem happy. Bearing this in mind, we should ask ourselves: "Does material wealth equate with happiness?"

Living in the Sumatran Rainforest

Activities

Year Level R-7

1. Define "needs" and "wants".
2. Make a list of your basic needs.
3. Make a list of your possessions. Of these, which do you really need?
4. Discuss why society is so materialistic. Is it "good" for us to be materialistic?
5. With growing water and energy shortages, how can you reduce your usage and live more sustainably? Discuss this with your family. Make a list, set targets and monitor your progress.
6. Discuss: What really makes you happy?

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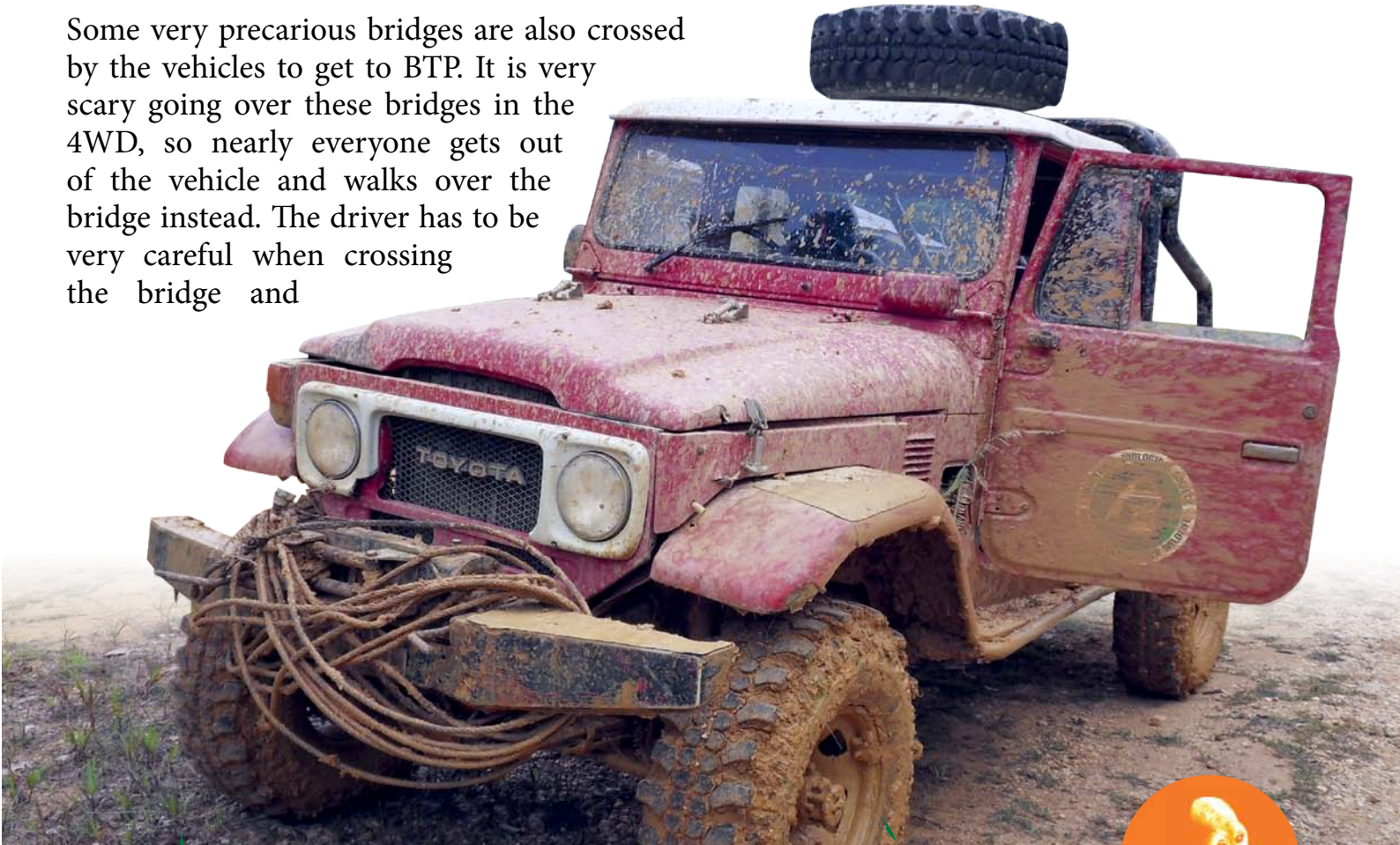
Traversing the Sumatran Rainforest

Year Level R-7

The road leading into the Sungai Pengian release station at BTP is very treacherous. If the rainfall has been heavy then the river is often too high to cross in a 4WD and the road becomes extremely muddy. The vehicles often become bogged. Only modified Toyota 4WD vehicles and motorbikes are used to access BTP. The 4WD vehicles are used to transport staff and supplies to the release stations and also to deploy the Wildlife Protection Unit members to strategic locations. The 4WDs are equipped with a heavy duty winch as they often need to be winched out of mud and trenches. A modified bumper and shock absorbers are needed to minimise the stress put on the vehicle. Large, extreme trekker tyres are used because they ride very well over rocky terrain and are puncture resistant.

Some very precarious bridges are also crossed by the vehicles to get to BTP. It is very scary going over these bridges in the 4WD, so nearly everyone gets out of the vehicle and walks over the bridge instead. The driver has to be very careful when crossing the bridge and another person will stand on the other side of the bridge and direct them. Road rules are very different in Indonesia and there are no road rules when driving to BTP. Up to 10 people will travel in the back of a 4WD truck with a tray on the back.

In Borneo, the condition of the treacherous roads is often so bad, that travelling by river is the only option. Siska certainly discovered this in Episodes 6 & 7 of Orangutan Diary Series 2. (See Teachers' Notes.) These two episodes vividly show both the horrendous conditions of the "roads" and the ingenuity, determination and self reliance needed by the people to be able to cope with these situations. Although this series was filmed in Borneo, the environmental conditions in BTP are similar.



Traversing the Sumatran Rainforest

Activities

Year Level R-7

1. Is there anyone in your class who has experienced living in, or travelling through a remote area? If so, ask that person to recount their memories of this.

2. Imagine that your family is planning an adventurous journey into a very remote area. Compile a list of all of the supplies and equipment which you should take. Make sure to include survival equipment for at least a few days, just in case you become stranded for some reason and cannot be rescued immediately.

3. Are there any new skills which you and other family members should acquire before you embark on your adventure?

4. Watch "Orangutan Diary Series 2", episodes 6&7 to discover how Siska and her team coped in absolutely horrendous conditions. (The Teachers' Notes specify exactly where these segments can be found.)

5. Compile a list of adjectives to describe the terrain. Write acrostic poems or general descriptive poems about the conditions.

Water in the Sumatran Rainforest

Year Level R-7

The actual word "rainforest" is intrinsically interesting as both the rain and the forest are mutually dependant on each other. Rainfall is what keeps the rainforests alive and trees play a crucial role in creating up to 60% of this rain. A single tree can suck up hundreds of tonnes of water each year. What it doesn't utilize returns to its surroundings as mist, vapour and rain clouds. This constitutes a rainforest water cycle.

Indonesia is in the tropics, so most days are very warm with slightly cooler nights. Tropical downpours are common and as the trees shade the water-soaked ground, this increases the humidity. The dry season is from May-September and the wet season is from October-April. The average rainfall in the BTP ecosystem is about 2,500mm/year.

As more rain falls in rainforests than anywhere else on Earth, it could be assumed that an abundance of pristine drinking water would be available. However, due to the pollution of rivers by humans, this is not the case. Instead, in the BTP ecosystem, rainwater is collected in tanks and filtered before it can be safely consumed.

The BTP ecosystem provides vital catchment protection for several large rivers that sustain downstream agricultural communities. It also protects the hydrology of the Kuantan Indragiri watershed. A regular supply of rainwater is especially needed by the subsistence farmers who grow crops such as rice and tropical fruits. Examples of these are durian and rambutan. Many villagers and tribes rely on local rivers for fishing as well.

Rivers in Sumatra also provide an important way of travelling, especially if excess rain has rendered roads impassable. A variety of craft such as small man powered boats, canoes and larger motorised boats are all utilized. Supplies are also transported on larger boats. Travelling on these rivers can be dangerous as rapids are often encountered.

Fresh water is essential for life in the BTP ecosystem and trees play a pivotal role in the rainforest water cycle.

Water in the Sumatran Rainforest

Activities

Year Level R-7

1 Create your own rainmaker. Place a plastic bag over a house plant. Securely tie the bag around the pot to ensure that no air can get in. Carefully observe your plant until droplets of water appear on the inside of the bag. Discover and discuss why this occurs.

2 Is your school a "Water Wise School"? If not, you might like to find out about this extremely important programme.

3 Has your family discussed ways of conserving water at home? If so, what action have you taken? If you have not made any efforts to conserve water, discuss this vital issue with your family and friends and share your ideas and knowledge.

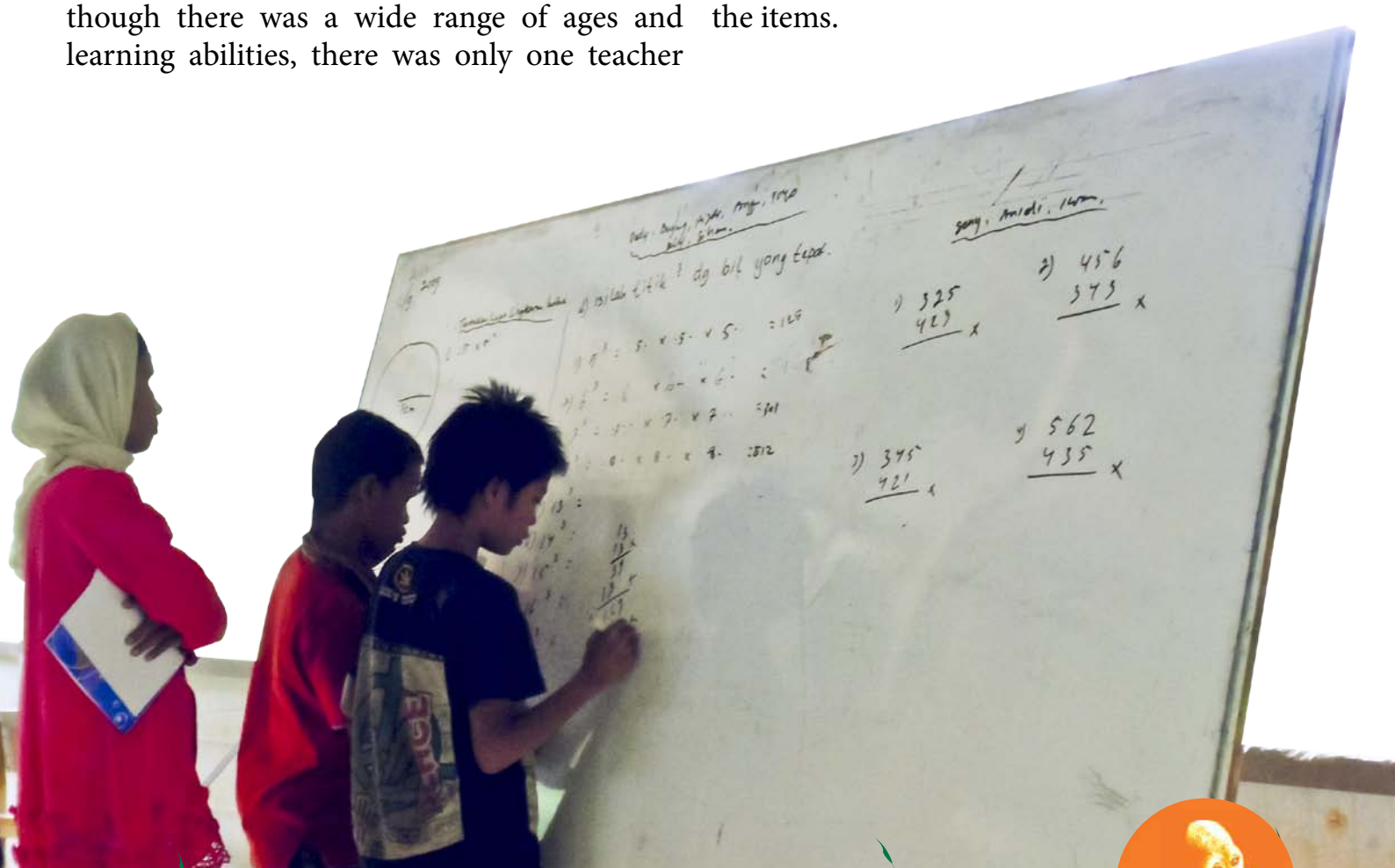
Visiting a School in BTP - 2009

Year Level R-7

In Australia, it is often stated that many of our schools are poorly resourced. After analysing the photos of Sekolah Jauh school in the Semerantihan Village in Sumatra's forest, it should become immediately apparent that statements such as this are extremely relative. (It is interesting to note that Sekolah Jauh means "Faraway" school in English.)

The outside of the school appeared to be in a very dilapidated state. No door could be seen and the window frames were empty. Inside, the children were seated at very old wooden desks and the only teaching aid seemed to be a white board on a stand. This classroom constituted the entire school. The students would be aged from about six years old to teenagers. (The very young child was the teacher's daughter.) Even though there was a wide range of ages and learning abilities, there was only one teacher and her name was Ibu Rama.

On this occasion, the visitors from Perth Zoo (who also volunteer for the AOP) brought all of the items shown on the desks. These were educational gifts for the class that were kindly donated by Perth Zoo and the AOP. The gifts included puzzles, books and animal hand puppets. All of the books and puzzles were about animals as the development of conservation awareness was the goal. The students had never seen jigsaw puzzles before and consequently needed demonstrations before they could utilise them. Although the picture books were in English, the children still enjoyed looking at the illustrations. In the future, the teacher will hopefully incorporate them into some of her lessons. All the children were excited to receive the items.



Visiting a School in BTP - 2009

Activities

Year Level R-7

1 Compile a list of the resources in your classroom. Compare it to those in this forest classroom.

2 Some Australian students complain of "boredom" even with a well resourced classroom. Imagine being in this classroom. What would you do while the teacher was helping the children of a different age group to you?

3 Considering that the volley ball net is the only piece of equipment in the playground, what would you do during recess and lunch breaks?

4 Create some simple, but enjoyable games for the children to play outside. You may only utilize materials from the natural forest environment such as leaves, sticks, stones and sand. Trial the games with your friends. Modify the rules until you are completely happy with the results. Name the games and write down the instructions.

Visiting a School in BTP - 2010

Year Level R-7

When the same AOP visitors returned to the school in 2010, they were very pleased to see that a new school building had been constructed. If the two photos are compared, there is a definite improvement. Initial impressions showed that a door was now present as was glass in the window frames. It is interesting to note that the same volley ball net still hung outside the classroom. (This was the students' favourite game.) Inside though, it seemed that very little has changed. The old wooden desks and chairs appeared to be the same. There were 5 new posters on display and the same old whiteboard was on the wall instead of on a stand.

On this occasion, the Perth Zoo visitors, who are also on the AOP committee, brought stationery gifts from Texta. (Texta is the sponsor of the AOP Education website.) The students used these pencils and textas to draw pictures of orangutans. They proudly displayed these in the group photo. If you compare this photo to that in the previous year, you may recognise the teacher (Ibu Rama) and some of the students. Perth Zoo once again donated books, toys and other interactive gifts associated with animals, such as hand puppets, puzzles and face masks to the children. It was hoped that these would help to develop a positive attitude towards animal conservation. The ultimate aim is that all of the local people will learn to live in harmony with their environment.

Visiting a School in BTP - 2010

Activities

Year Level R-7

1 Have you ever considered trying to help a class or school of students in a really poorly resourced area? Perhaps you could discuss this with your teacher, classmates, friends and relatives.

2 If several students would like to help, you may consider establishing a "Roots and Shoots" group at your school. You would also need one adult to act as a facilitator. Helping students at another school would be a wonderful project for the humanities section of "Roots and Shoots". (See the Mobile Education Unit for more details.)

3 Try to create your own board game. Make the Sumatran Forest the setting and incorporate some of its animals such as orangutans, Sumatran tigers and Asian elephants. Make it from very simple and cheap materials. It should be portable, and able to be played in a remote area without the use of any technology.

The Mobile Education Unit

Year Level R-7

If the BTP ecosystem and the Sumatran Rainforest in general are to be effectively conserved and protected, it is essential for the local people to understand, appreciate and accept the programme. To facilitate this objective, a mobile education unit was established in 2009. The two teachers, assistant and driver travel to many remote regions of the provinces of Jambi and Riau in Sumatra. Their goal is to increase students' knowledge about conservation and to build feelings of love and care towards animals.

As the team travel to extremely remote areas, a reliable vehicle is essential. It was also decided to paint it in a unique manner. The tiger stripes are certainly distinctive and very appealing to the students.

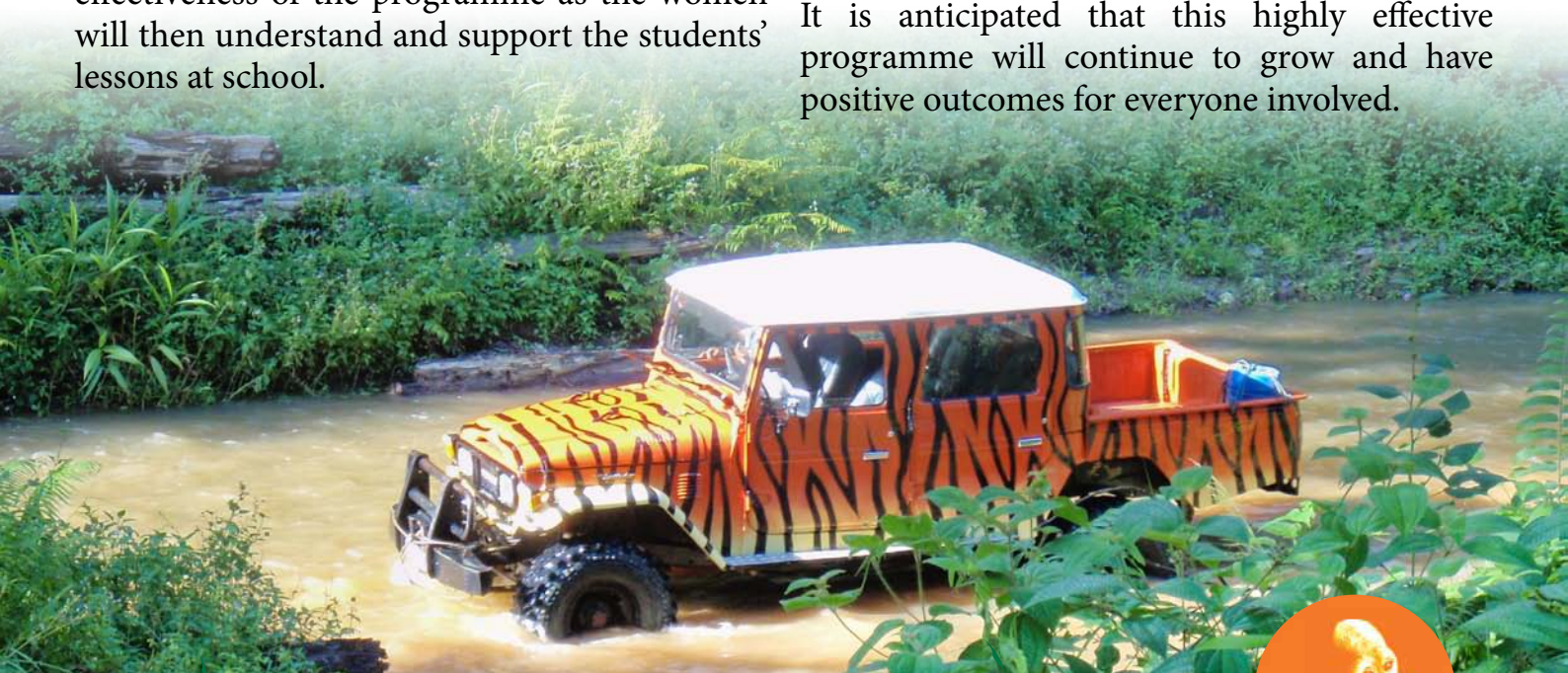
In 2010, in the months of September, October and November, this dedicated team visited seventeen villages. Whilst there, they visited and conducted lessons at elementary schools as well as junior and senior high schools. Community education – mainly with women's groups - was also conducted. This should increase the effectiveness of the programme as the women will then understand and support the students' lessons at school.

In remote areas, the utilisation of technology is often impossible. Hence, the reliance on basic teaching aids such as cardboard posters. This semester, most of the lessons focussed on the tiger and the forest. To make the sessions interesting, wildlife games and songs were used. Art and craft activities such as mask-making were also implemented.

In order to evaluate the effectiveness of the programme, a pre-test and post-test system has been implemented. The results of these are very positive and show that the programme is definitely achieving its goals.

This semester, a new correspondence programme was also introduced. It was instigated by Peter Pratje (MEU Programme Director) and Bill Waterer, who is the co-ordinator for "Roots and Shoots" in Western Australia. (See further details in the Activities section.) Through this initiative, the students of many "Roots and Shoots" schools in WA, began corresponding with elementary and junior high school students in Sumatra.

It is anticipated that this highly effective programme will continue to grow and have positive outcomes for everyone involved.



The Mobile Education Unit

Activities

Year Level R-7

1 Create a game with a conservation theme relating to a forest ecosystem. It needs to be a game which can be played in a remote area without the use of any technology.

2 Create a play with a strong conservation message. Make the puppets and any necessary scenery for your play. Be as imaginative as possible with added sound effects or music.

3 Design a poster with a specific conservation message suitable for use in Sumatra. If it is about orangutans, it could be entered into the AOP's Writing and Art Competition. (See the AOP's Education web-site to download the entry form.)

4 The "Roots and Shoots" organization was established by Jane Goodall. Its purpose is to give the youth of the world hope. They are empowered and encouraged to make a difference in three areas. These are: Animals, Environment and Humanities. Once the group is formed, the students decide which project they would like to focus on in each area and what action they would like to take. Each group of students needs an adult to act as a facilitator. If you would like to establish a "Roots and Shoots" group at your school, or if you would like more details, please contact Bill Waterer at wa@orangutan.org.au or phone 08 94570291. If you do not reside in WA, he will assign all enquiries to the appropriate contacts in your state.

Conclusion

Year Level R-7

"We are called to assist the Earth to heal her wounds and in the process heal our own – indeed, to embrace the whole creation in all its diversity, beauty and wonder."

Wangari Maathai
(2004 Nobel Peace Prize winner)

Wangari Maathai is also known as "Mama Miti – The Mother of Trees". Her initial planting of 9 seedlings in 1977, grew into the Green Belt movement in Kenya. Spreading across the world, this movement eventually saw the planting of thirty million trees by 2004.

Conclusion

Year Level R-7

"Man did not weave the web of life-
he is merely a strand in it.
Whatever he does to the web,
he does to himself."

Chief Seattle, 1854

It is difficult to understand why it has taken mankind so many years to appreciate the profound truth of these wise words.

Documentaries such as "The State of the Planet" by Sir David Attenborough make it clear that our planet has indeed been severely damaged. Bukit Tigapuluh is just one example of a threatened ecosystem.

Each one of us should ask:

Do I care about this?

If so:

What action will I take?