



Progress Report 2018

Restorasi Ekosistem Riau

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📷 The RER area on the
Kampar Peninsula represents
one of the last and largest
remaining Sundaic lowland
tropical peat forests in
Sumatra



BEY SOO KHIANG
Chairman, Advisory Board
Restorasi Ekosistem Riau

FOREWORD

As we advance towards 2020, acknowledgement continues to grow of the importance of ecosystem restoration as a strategy to mitigate the impact of climate change and protect biodiversity.

The United Nations' recent declaration of a Decade of Restoration commencing in 2021, to restore 350 million hectares of degraded land by 2030, sends the strongest signal yet that ecosystem restoration is not only critical to the reduction in global greenhouse gases emissions, it also has a vital role to play as an agent of sustainable development.

Restorasi Ekosistem Riau (RER) welcomes this injection of global impetus - which builds on Indonesia's own action to encourage the restoration of peatland landscapes - as it reflects on efforts during 2018 to protect and restore 150,000 hectares of ecologically important peatland forest on the Kampar Peninsula and Padang Island.

We are reminded too that the communities in these areas are essential partners in this program and that the lasting conservation of this landscape will require a multi-faceted approach that includes protection and management, as well as sustainable economic development.

Similarly, the framework provided by the United Nations' Sustainable Development Goals is increasingly important as RER enters the second half of its first decade and will continue to inform our strategic direction.

Alongside these developments, RER recorded several highlights in a year characterised by patient, incremental and balanced progress.

The program recorded its fourth consecutive year free from forest encroachment or fire on the Kampar Peninsula. This represents the area's longest uninterrupted period of forest recovery this century, demonstrating again the effectiveness of the area's integration with well-managed plantations, as well as direct engagement with communities to discourage use of fire.

Related to the sustained protection of the RER area, biodiversity counts continued to increase, from 717 species in 2017 to 759 species in 2018. This included the identification of 34 new plant and five new bird species,

supported by revisions to the counts of other types of fauna in the RER. There were also notable first sightings of the Malay Night Heron (*Gorsachius melanolophus*) and Black-crowned Night Heron (*Nycticorax nycticorax*).

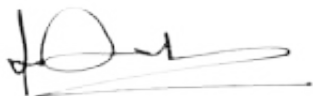
RER also celebrated its fifth anniversary in October 2018, hosting delegations from the Responsible Business Forum and World Business Council for Sustainable Development to coincide with events held in Singapore. RER continues to encourage visits from a broad range of stakeholders including researchers and academics, conservation specialists, customers and financial partners and civil society groups.

Our ability to host guests and provide insight and education into the ecosystem restoration process will be greatly enhanced during the coming year with the commission of a new eco-camp.

Also, in 2019 we will continue the biodiversity baseline mapping projects with partner Fauna & Flora International, as well as progressing a full-length documentary project detailing RER's effort to protect, assess, restore and manage this important landscape.

This later project - as well as a refreshed online presence in 2018 and the continued publication of papers and reports - will play an important role in generating awareness of RER and encouraging collaboration and knowledge sharing among the global conservation community, as the emphasis on ecosystem restoration grows with the advocacy of the United Nations, and others.

I would again like to extend my appreciation and thanks to our colleagues and partners who work on the RER program, as well as the important contributions offered by my fellow advisory board members. In the past five years, we have made real progress and collectively assembled a wealth of insight and knowledge. This head start on the UN's Decade of Restoration provides us with an opportunity to share our experience and contribute to a global program of lasting significance.




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ABOUT RER

The RER landscape
comprises five
concessions
operating under
60-year ecosystem
restoration licenses

01

 The restoration area on Kampar Peninsula provides a habitat for 55 globally threatened species, while also storing vast amounts of carbon in the peat soils





FIVE YEARS OF PROTECTING PEATLAND FORESTS IN INDONESIA



Established in 2013 by APRIL Group, a leading producer of fibre, pulp and paper, the RER landscape comprises five concessions operating under 60-year ecosystem restoration licenses granted by the Indonesian Ministry of Environment and Forestry. Totalling 149,807 ha, it includes 129,357 ha on the Kampar Peninsula and another 20,450 ha on Padang Island.

The restoration area on the Kampar Peninsula is approximately twice the size of Singapore and represents one of the last and largest remaining Sundaic lowland tropical peat forests in Sumatra. The forest provides a habitat for 55 globally threatened species, while also storing vast amounts of carbon.

A critical element of the RER initiative is operationalizing an integrated production-protection landscape model. The protection element of this model involves Acacia fiber plantations on the perimeter of the restoration area that not only provide protection, but actively fund ecosystem restoration, forest protection and operational capability. Years of experience have shown that this is a reliable, consistent and effective model for restoration in Indonesia given the extent of the financial and technical resources required for long-term and active landscape management.

THE KAMPAR PENINSULA AND PADANG ISLAND

The importance of the Kampar Peninsula as a haven for biodiversity has been highlighted by several international organizations. BirdLife International, The International Union for Conservation of Nature (IUCN), the Wildlife Conservation Society (WCS) and World Wildlife Fund (WWF) have recognized the area as an Important Bird Area (2004), Key Biodiversity Area (2006), and Tiger Conservation Area (2007), respectively.

Padang Island also contains ecologically important peat swamp forest. The largest block of this peat forest is located inside the PT GCN Ecosystem Restoration license area and comprises 20,450 ha. It is the source of water for three rivers, providing clean water for downstream communities and home to more than 258 species of plants and animals.

The work completed by our teams has had a significant positive impact on the everyday lives of the 17,000 people living in nine villages on the Kampar Peninsula and about 24,000 people across 14 communities on Padang Island. Support is provided for local businesses, while traditional activities like fishing are protected. For example, fishermen on the Serkap River have reported increased productivity since the beginning of the RER program. Similarly, the restoration area continues to be a source of non-timber forest products (NTFPs).



ABOUT RER



ADVISORY BOARD

RER receives guidance from an eminent Advisory Board which includes both Indonesian as well as international third-party experts.



M. NASHIHIN HASAN

Founder & Director, Community Resources Development Institute (BIDARA)

Mr. Nashihin is an internationally-respected development expert and founder of Community Resources Development Institute (BIDARA), a social equity consultancy. With over 30 years of experience in the fields of conflict resolution, prevention and peace building he has served as senior consultant to the Indonesian government, as well as national and international non-profit agencies such as CARE Indonesia, The World Bank, UNDP and OXFAM.

He has been an advisor to APRIL since 1998 on developing and managing the company's community development program, as well as on internal capacity development for stakeholder relations and social capital.



JEFFREY ARTHUR SAYER

Professor of Tropical Forest Conservation University of British Columbia

Jeffrey Arthur Sayer is an expert in ecology and has worked throughout his career either as a researcher or program manager, mostly at the inter-face between research and practical natural resource management. At present, he is Professor of Development Practice at James Cook University in Cairns.

He has worked for FAO and IUCN and was a Senior Environmental Adviser at the World Bank. He was the CEO of Center for International Forestry Research from 1993 to 2001 and has also worked as Senior Associate and Science Advisor for WWF International from 2001 until present. He held the chair of International Nature Conservation at the University of Utrecht in the Netherlands.

He was founding Director General of the Center for International Forestry Research in Indonesia and is now Senior Fellow of the International Union for the Conservation of Nature. He is a member of the Science and Partnership Council of the Consultative Group for International Agricultural Research and has authored papers in peer reviewed journals and a number of books on natural resources topics.



I MADE SUBADIA GELGEL

DG of Forest Protection Nature Conservation (2002-2003)

With decades of experience with the Department of Forestry of the Indonesian Government, Mr. Gelgel brings with him expertise in sustainable forest management, regulatory and inter-agency relations.

Mr. Gelgel graduated from the Forestry Department of Gadjah Mada University and received his postgraduate degree in national resilience studies at the same University.



ANTHONY SEBASTIAN
Conservation Planning Specialist

Mr. Sebastian is a wildlife ecologist by training and a conservation-planning specialist by profession. He has extensive experience in the fields of conservation, restoration, wetlands, forestry, and policy. He consults in the arena of development and conservation-planning across Asia and the Middle East.

Mr. Sebastian comes with over 20 years of experience working with governments and non-governmental organizations across 17 Asian countries. He is also actively engaged with the Forest Stewardship Council (FSC), and is a member of its international board of directors.



BEY SOO KHIANG
Chairman of APRIL Group

Bey Soo Khiang was appointed as Vice Chairman of the RGE group of companies in March 2011. A former aviation executive and distinguished defense leader, he oversees critical matters on business sustainability across the four key business groups within the RGE Group. He is also Chairman of APRIL, and actively guides APRIL's operations in Indonesia on matters relating to fiber plantations.

Mr. Bey previously spent 11 years in Singapore Airlines (SIA), holding various senior positions including Chairman of SIA Cargo Pte Ltd, Chairman of Silkair Pte Ltd, Chairman of Singapore Flying College, and Board Member at Virgin Atlantic Limited.

He holds a Masters in Arts (Engineering) from the University of Cambridge and a Master's Degree in Public Administration from the Kennedy School of Government, Harvard University.

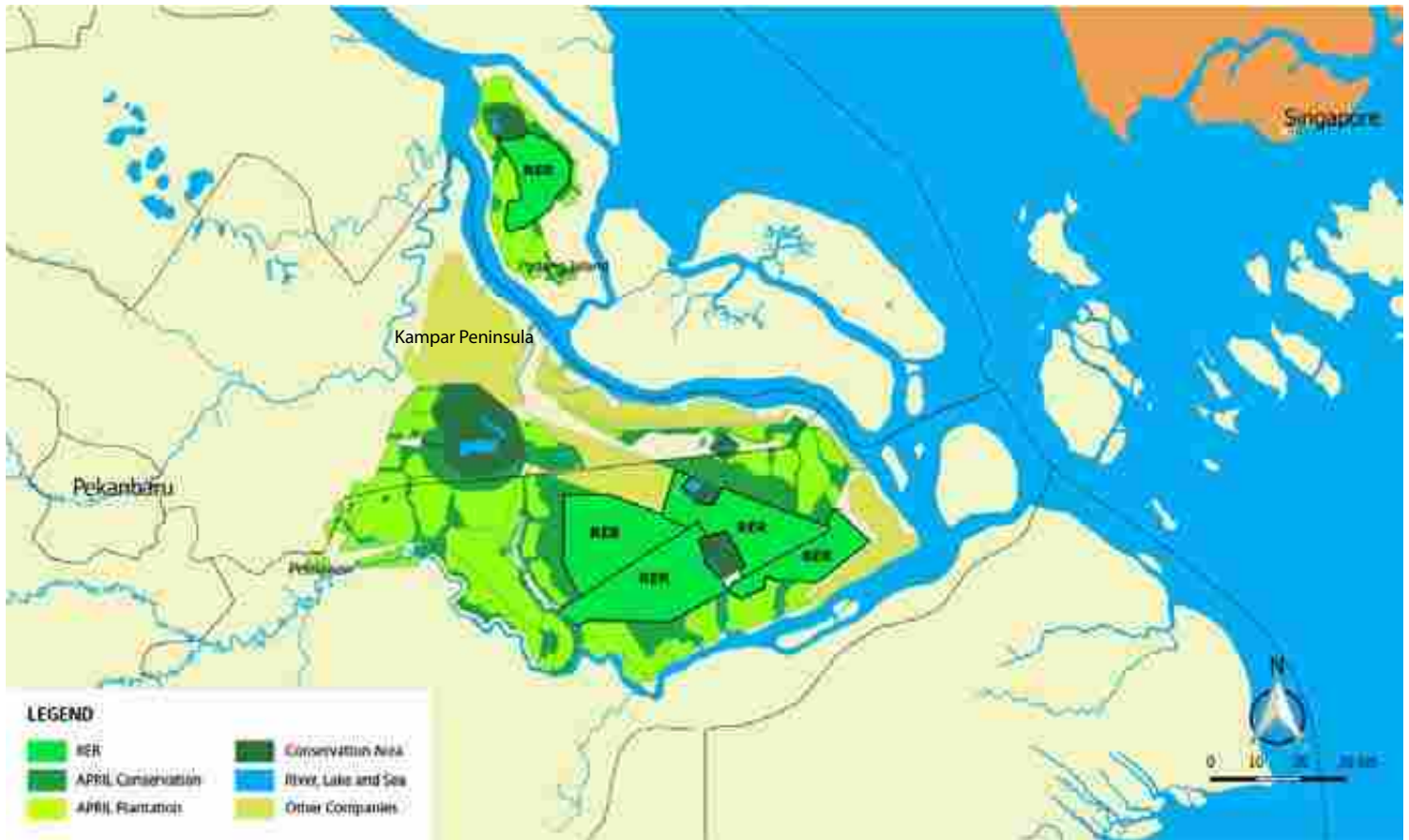


Lucita Jasmin
Director for Sustainability &
External Affairs of APRIL Group

Lucita Jasmin leads the advancement and implementation of APRIL's sustainability commitments, policy and programmes, including stakeholder engagement and communications. Ms. Jasmin has a global base of expertise in strategic and corporate communications in the intergovernmental and private sectors.

She has led intercultural teams that provided communications counsel to senior management, strategized and executed campaigns and advocacy initiatives, organized stakeholder outreach on priority sustainability issues, and mobilized partners to provide support.

Prior to her current post, she served at the United Nations Environment Programme headquarters in Nairobi, Kenya where she led strategy development, planning and execution of global communication programmes and campaigns, focused on Resource Efficiency and Sustainable Consumption and Production.



Map 1 Approximately 150,000 ha of degraded peat forest on the Kampar Peninsula and Padang Island, Riau Province, Indonesia

OPERATIONAL MANAGEMENT

RER adopts appropriate landscape protection strategies that include the establishment of formal guard and patrol functions, and bespoke resource management and protection schemes in partnership with the local communities. These have been effective in protecting the restoration area.

In the five years since the program was established, illegal logging and new land encroachment have

been significantly reduced (See Challenges), while the occurrence of fires has also been eliminated (See Fire Suppression) with zero fires reported in the RER area since 2015. This is testimony to the efforts of RER personnel who monitor weather, ensure the preparedness of fire suppression teams, and communicate with fishermen and other forest users to prevent fire use in the forest.

LANDSCAPE ASSESSMENTS

During the first five years of the RER program, government approved plans for the five concession areas within RER have been completed and significant progress has been achieved on boundary demarcation to establish definitive land tenure. Since 2015, baseline biodiversity studies have been completed on more than 60 percent of the RER area or approximately 92,507 ha, supplying vital data for landscape assessments and management planning.

These initial assessments of bio-physical and social environments establish benchmarks for future assessments.

RER's ongoing monitoring and inventory of the fauna and flora often results in new wildlife



These initial assessments of bio-physical and social environments establish benchmarks for future assessments.

discoveries and helps to identify restoration needs. This data shows that the number and diversity of identified species present on the Kampar Peninsula has increased dramatically since the start of the RER program (See Biodiversity).



RESTORATION

Tropical ecosystems generally recover rapidly without human intervention or disturbances such as illegal logging, land-clearing or fire. RER restores degraded sites through a combination of natural and active regeneration techniques. Natural regeneration of forest trees is the most cost-effective approach for recovering biodiversity, under favorable conditions.

Active regeneration requires planting of nursery-grown seedlings, direct seeding, and the manipulation of disturbance regimes to speed up the recovery process, often at high cost. RER implements a process of tree restocking on the most degraded sites, using seedlings from surrounding forests. We establish nurseries to cultivate seedlings collected from the wild before carrying out a program of staged replanting.



RER restores degraded sites through a combination of natural and active regeneration techniques

Water level restoration maintains peat soil moisture critical to the health and functioning of the peat forest ecosystem. An important element of this activity is canal blocking (See Hydrological Restoration), which closes old drainage canals, reduces fire hazard, and minimizes carbon emissions. By the end of 2018, 38 percent of the old drainage canals inside the RER area had been closed in an ongoing effort which we aim to complete by 2025.

PARTNERSHIP

The RER team continues to work with a number of partners who all play critical roles in the landscape restoration program.

BIDARA is a local organization based in Riau focused on community development. BIDARA works with RER to build the self-reliance of two rural communities on the Kampar Peninsula (Pulau Muda and Segamai villages) located adjacent to the RER area. BIDARA community officers build the capacity of individual farmers by organizing community groups to utilise

'no-burn' and intensive agriculture practices, organic farming, and animal husbandry.

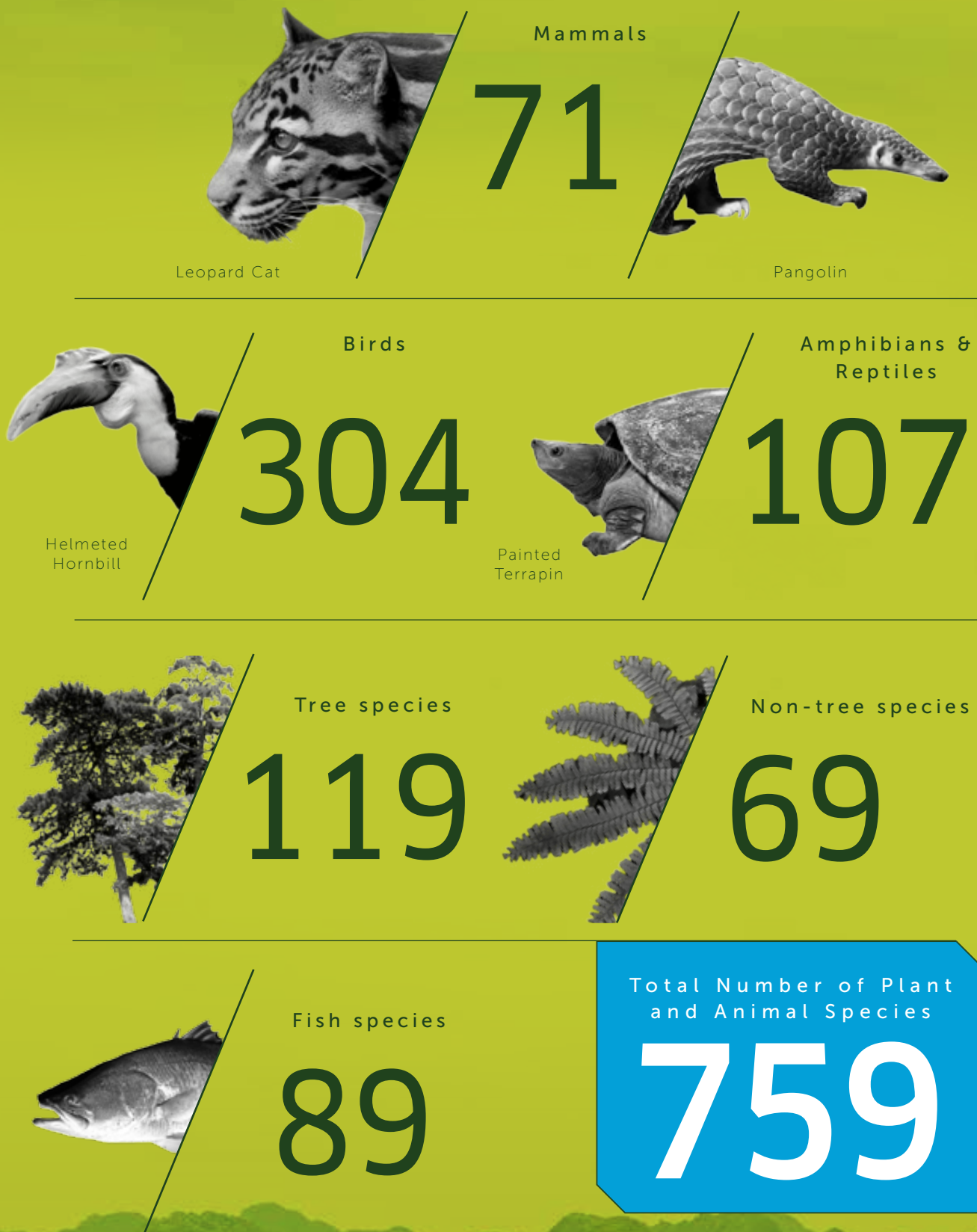
Fauna & Flora International (FFI) is an international NGO established in 1903. Its mission is to conserve threatened species and ecosystems by using sustainable solutions that combine science and human needs. As RER's technical partner, FFI manages essential studies related to biodiversity, climate and communities on the Kampar Peninsula and Padang Island.



RER partners contribute to the success of the ecosystem restoration through their expertise and experience nationally and globally

APRIL Group is a leading producer of fiber, pulp and paper with plantations and manufacturing operations in Riau Province. The company provides financial support, leadership, operational resources and technical expertise to RER.

BIODIVERSITY OF RER




Infographic 1 Biodiversity of RER as of December 2018



BIODIVERSITY

RER devotes considerable time and resources to protecting the wildlife populations on our landscapes

02

 Wildlife monitoring is a core component of our program and is integrated into our management cycle and decision-making processes



WILDLIFE MONITORING

RER devotes considerable time and resources to protecting the wildlife populations on our landscapes. Wildlife monitoring is a core component of our program and is integrated into our management cycle and decision-making processes. The monitoring provides regular updates on the status of wildlife presences and population. This information is used to evaluate the effectiveness of management actions relative to stated objectives, and is an important feedback loop to adapt future management practices.

Together with FFI, RER conducted the first survey of biodiversity on the Kampar Peninsula landscape in 2015 to establish the baseline of wildlife species present on the landscape. This was done with camera trapping as well as seasonal-focused, species-focused and general observations.

In 2018, RER once again deployed 70 camera traps across the Kampar Peninsula and another 19 cameras on Padang Island for a total of 3,660 days over two periods of the year. More than 10,000 images were obtained resulting in identification of 31 birds, 7 herpetofauna and 28 mammals on the Kampar Peninsula, and one bird, one herpetofauna and 13 mammals on Padang Island (see Table 1).

	Kampar Peninsula		Padang Island
Cameras	57	13	19
Period	Jan-Mar	Aug-Nov	Jan-May
Birds	29	8	1
Herpetofauna	7	2	1
Mammals	28	13	13

Table 1 2018 Camera trap data

In 2018, we also conducted the Asian Waterbird Census and semi-annual monitoring of migratory raptors that pass through the Kampar peninsula. The data obtained from these surveys was reported to Wetlands International Indonesia.

During the five days of the Asian Waterbird Census in January, over 580 individual birds were observed that included 21 different species. The most predominant species were the Purple Heron (*Ardea purpurea*), Lesser Whistling Duck (*Dendrocygna javanica*) and Black-crowned Night Heron (*Nycticorax nycticorax*).

To observe migratory raptors flying between the northern temperate forests of China and Russia and their wintering grounds in Indonesia and the Philippines, monitoring was conducted in March and October. Over 300 raptors were observed during the spring migration and 1,100 raptors during the Fall migration. The majority of the birds observed were Chinese Sparrowhawks (*Accipiter soloensis*) or Oriental Honey Buzzards (*Pernis ptilorhynchus*).



BIODIVERSITY



The Leopard Cat (*Prionailurus bengalensis*) is one of four small wild cat species captured by camera trap in 2018

As a result of these observations, other monitoring, and refinements to previous counts, RER had a net increase of 42 plants and animals in its biodiversity list from 717 species in 2017 to 759 species in 2018. This included 36 plants, one mammal, and 5 bird species.

Highlights of the 2018 wildlife monitoring season included observing migratory bird species such as the Malayan night-heron (*Gorsachius melanolophus*),

Eye-Browed thrush (*Turdus obscurus*), Blue rock thrush (*Monticola solitaries*), and Blue siberian robin (*Larvivora cyane*). The Black partridge, Malay crestless fireback and Short-toed coucal - all of which have an IUCN conservation status of Vulnerable (VU) - were also observed.

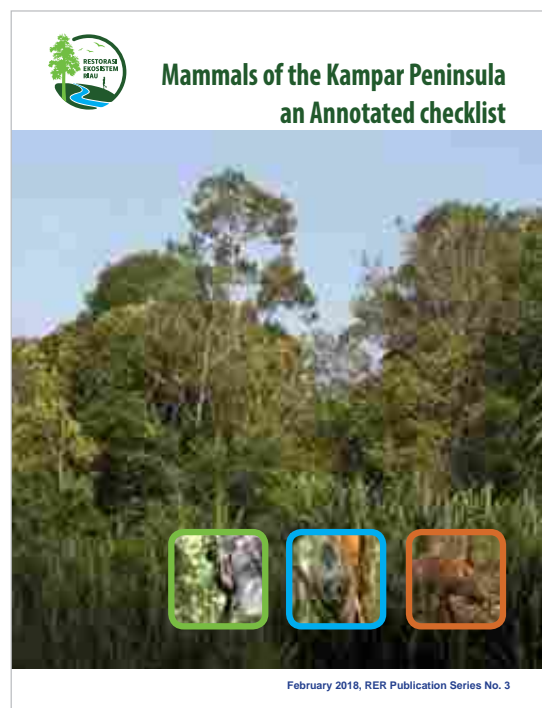
Interestingly, the Black magpie, Asian fairy bluebird and Hook-billed Bulbul, which are normally found in tree canopies, were seen drinking and bathing in small pools of water that are common in the peat land.

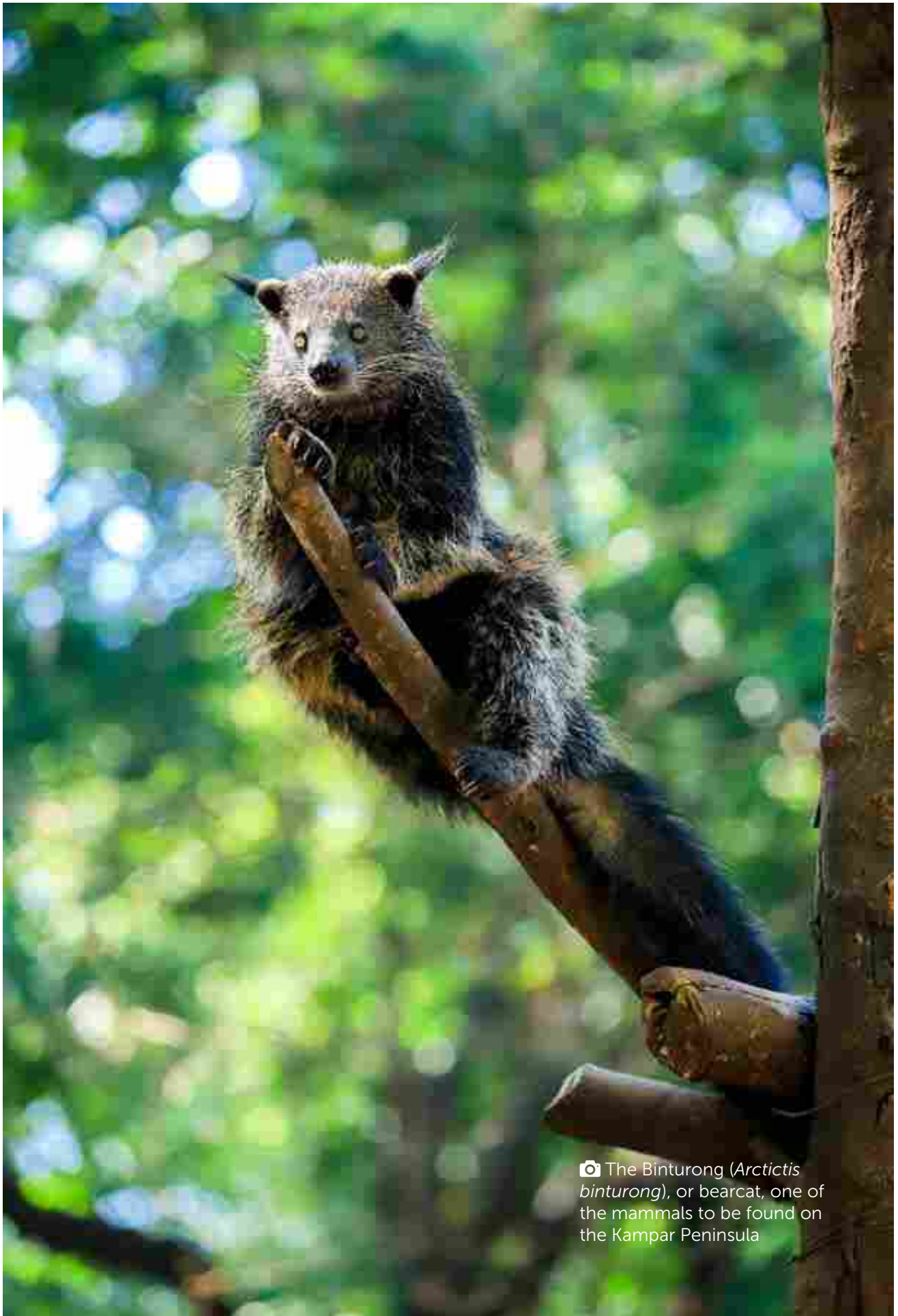
For mammal species, three of the five species of wildcat known to be present on Kampar peninsula were observed. These included the Leopard cat, Marbled cat, and Sunda clouded leopard; the last seen marking its territory by rubbing on a tree. Long-tailed and Pig-tailed Macaques were also observed trying to re-position camera traps. Other species captured by RER camera traps included a smooth-clawed otter, a large cobra and an Asian Leaf Turtle.

REPORT: MAMMALS OF THE KAMPAR PENINSULA

Through our publications, RER continues to contribute to building the knowledge of the biodiversity on the Kampar Peninsula. In February 2018, RER published a new report - *Mammals of the Kampar Peninsula: An Annotated Checklist* - which detailed the presence of 73 mammals, including 17 globally threatened species. Two species listed as critically endangered in the IUCN Red List of Threatened Species, the Sumatran Tiger (Harimau Sumatera) and the Sunda Pangolin (*Manis javanica*), were both recorded and documented.

The checklist was compiled by ecologists at RER and brings together the work of several biodiversity assessments, High Conservation Value assessments, and other reports. This was the third document in the RER publication series, which are made available to the public. Together with the previously published Birds of Kampar Peninsula checklist, this new checklist contributes to a better understanding of the biodiversity on Kampar Peninsula.





📷 The Binturong (*Arctictis binturong*), or bearcat, one of the mammals to be found on the Kampar Peninsula



BIODIVERSITY



IMPORTANT BIRD AREA MONITORING

The Kampar Peninsula was designated as an Important Bird Area (IBA) by BirdLife International in 2003, based upon several days of field surveys in 1991-92 by international experts (BirdLife International 2019, van Balen 1991, Burn and Brickle 1992) that identified 128 bird species present.

About 550,000 hectares of Kampar's peat swamp forest became known as Hutan Rawa Gambut Siak Kampar, joining the global network of more than 12,000 IBAs. The area contains a habitat for five bird species that are either threatened with extinction or have highly restricted distributions and is home to bird species assemblages that are characteristic of a peatland forest. Hutan Rawa Gambut Siak Kampar is one of 225 IBAs in Indonesia.

In 2003, only 25,000 ha of forest was protected by the Indonesian government and the area was considered to be subject to significant threats, such as forest clearance, logging, industry and infrastructure development for oil and coal mining.

In order to assess the effectiveness of conservation measures, BirdLife International established a process of monitoring the status of IBAs using agreed, objective, quantitative and scientifically defensible criteria (BirdLife International 2004). This also provides for an early indication of problems or progress in achieving conservation measures.

In 2018, a monitoring assessment was carried out on the management and conservation activities on the Kampar Peninsula. In summary, the IBA monitoring assessment noted the following highlights:

1. A total of 304 bird species are now present in the area (an increase from 128 species previously identified).
2. 241 (79%) bird species are resident, 54 (18%) are migrants and 9 (3%) are both resident and migrant.
3. 23 "trigger qualifying" bird species are present (an increased from 5 species previously) because

their global threatened status was recently re-evaluated and raised by IUCN. This includes the critically endangered Helmeted Hornbill (*Rhinoplax vigil*), five endangered bird species and 15 vulnerable bird species.

4. The White-winged Duck (*Asarcornis scutulata*) and Storm's Stork (*Ciconia stormi*) are present (previously not recorded).
5. A total of eight of a possible nine hornbill species found in Sumatra are known to be present.
6. 34 globally threatened species of plants and animals are known to be present such as *Meranti paya*, *Resak paya*, *Panthera tigris*, *Manis javanica*, *Tomistoma schlegelii*, *Batagur borneoensis*.
7. 40,909 ha of government wildlife conservation protected areas are now in place (an increase from 25,000 ha previously) and managed by the provincial Natural Resources Conservation Agency (BKSDA).
8. In 2010, the Riau province Tasik Besar Serkap Forest Management Unit (KPHP-TBS) was established to develop a landscape level



Chestnut Munia (*Lonchura atricapilla*)



The Kampar Peninsula was designated as an Important Bird Area (IBA) by BirdLife International in 2003

- management plan covering 513,000 ha of peat forest land on Kampar Peninsula that includes all forest license holders, communities and other stakeholders. Previously, there was no coordinating body responsible for the landscape management planning.
9. Since 2013, the threats of forest clearance, the logging industry, and infrastructure development noted in 2003 have been significantly reduced and in many cases eliminated due to a number of factors that include the following:
 - a. The completion of 92,000 ha of fiber and rubber plantation establishment that also includes 100,000 ha of High Conservation Value Forest within the fiber concessions to maintain and enhance conservation values.
 - b. The commitment of plantation companies to no longer convert natural forest to fiber plantations, as per their corporate Sustainable Forest Management Policies.
 - c. The establishment of 130,000 ha of Ecosystem Restoration Concessions to protect and restore productivity and ecosystem balance.
 - d. Improved forest protection has minimized illegal logging, forest encroachment and slash-and-burn land-clearing due to actively managed fiber plantation and ecosystem restoration concessions.
 10. A refinement for mapping of the IBA to follow established coastlines, rivers and other geo-physical and administrative boundaries which results in a 438,833 ha area of moist lowland forest and wetlands that are managed for industrial forestry (21%), conservation (75%), and community agriculture (4%).
- The monitoring information for Hutan Rawa Gambut Siak Kampar IBA was provided to both BirdLife International and their national affiliate, Burung Indonesia for their consideration to update their DataZone website (www.datazone.birdlife.org).



BIODIVERSITY



CASE STUDY: CHALLENGES WITH SUNBIRD COLLECTORS

The most significant threat to birds remaining on the Kampar Peninsula is the seasonal collection of some protected bird species and the Van Hasselt's Sunbird (*Leptocoma brasiliana*) by local community fishermen. In late 2016, RER began observing an increase in the collection of birds by local fishermen from rivers that flow through the RER area in the Kampar Peninsula. We then trained our rangers to begin monitoring and collecting data about this practice.

Local fishermen who initially objected to the monitoring eventually agreed to cooperate after several meetings and discussions, where they came to understand that RER was only gathering data for informational purposes. From this data, the scale of bird collecting became better understood. In 2018, over 11,068 birds were recorded at the RER guard posts as being removed from RER area. An average of 922 birds was removed per month, with the highest number recorded in January 2018 - over 5,600 birds. This surprisingly large number prompted the need for more detailed investigation to better understand the supply and value chain in the area.

Through investigation, it was found that the fishermen collect and sell the sunbirds to local agents with links to Java Island, where they are transported and re-sold to collectors. Due to its relative abundance in the wild, the sunbird is identified by IUCN as Least Concern and is not a protected species in Indonesia. RER is working closely with the local conservation agency, the Riau province Natural Resource Conservation Agency (BKSDA), to better understand this supply chain, so that we can seek ways to control it before the practice threatens the population of sunbirds. RER also aims to identify alternative supplemental income sources for local fishermen and collection agents.



The most significant threat to birds on the Kampar Peninsula is the collection of song birds, such as the Van Hasselt's Sunbird



RER is working closely with the local conservation agency and also aims to identify alternative supplemental income sources for local fishermen and collection agents.

Fishermen explained that the low tree or shrub tree known as Sea Apple (*Syzgium zeylnicum*), which is called the Nasi-nasi locally, bloomed between November and January, and its nectar attracted sunbirds. Trappers placed long sticks, coated with sticky latex, into the flowering Sea Apple trees that are found immediately along the river's edge. Once a bird landed on the stick, it could not free itself.

Trappers would also sometimes place a small recorder and speakers in a plastic bag in a Sea Apple tree to broadcast a pre-recorded bird-call, in the hopes of attracting wild birds to the location to fall prey to latex traps. The trappers usually receive Rp3,000 (US\$0.25) for female birds and Rp25,000 (US\$1.75) for male birds. However, in markets in Jakarta, the supply chain increases the selling price to a range from Rp100,000 (US\$7) to Rp400,000 (US\$28).

In April 2018, the Riau province Natural Resource Conservation Agency (BKSDA) held a public meeting in Teluk Meranti village to inform the public on the biodiversity impact, and the legal limitations and requirements for collecting, transporting and trading protected and unprotected wildlife. However, there remains still some reluctance among the villagers to change their practices, as they argue that their actions have little effect on the overall ecosystem.

By May 2018, sunbird collections on the Serkap River were almost nil as the blooming of the Sea Apple tree was completed. However, a resurgence of sunbird collecting resumed in October 2018. This time, the BKSDA began conducting periodic patrols along the Serkap and Sangar Rivers, including the Tasik Serkap Wildlife Conservation area, where they identified a number of illegal bird collectors that possessed not only the Van Hasselt's Sunbird, but also several protected species of birds.

When the BKSDA officers met and discussed the legal implications of possessing sunbirds and protected bird species with the identified

“ Law enforcement alone is not the long-term solution to the bird poaching challenge. The solutions involved in preventing bird poaching take time and are complicated.



RER's rangers monitor and collect data about bird poaching

offenders, the individuals often reluctantly cooperated, agreeing to release the birds.


However, law enforcement alone is not the long-term solution to the bird poaching challenge. The solutions involved in preventing bird poaching take time and are complicated. Villagers are also requesting alternative supplemental income to their livelihood, should they stop trapping birds in the forest. With perseverance, expert guidance, government support, the right level of multi-stakeholder collaboration, and developing local advocates within the villages to champion the protection of wildlife, we believe the threats and impacts of bird poaching can be controlled.



CLIMATE

For the fourth consecutive year, no hotspots or fire occurred inside RER concessions

03

 The fire prevention program is supplemented by a comprehensive weather monitoring system, collected from weather stations operated by RER and APRIL and their joint venture wood suppliers



FIRE PREVENTION

Fire management in RER is anchored primarily by a comprehensive fire prevention program. In 2018, for the fourth consecutive year, no hotspots or fires occurred inside RER concessions.

Fire prevention is always preferable to fire suppression actions, as the latter involves high cost and high risk to lives. As there are no natural causes of fire in tropical peat swamp forest, fire prevention is a social endeavor. Our fire prevention team takes a multipronged approach toward monitoring human activity within concessions and engaging with the 17,000 community members around the Kampar Peninsular.

Direct engagement measures include efforts to ensure that the RER and APRIL security posts are strategically located at each of the main access rivers into the RER concessions, which allows us to monitor and control the flow of forest users and fishermen. RER's daily patrols also engage with forest users and fishermen to ensure they do not use fire for land clearing activities.

RER has many initiatives that aim to establish long-term ties with the communities. These include:

- APRIL's Fire Free Village Program, implemented in all nine communities in RER, which incentivizes a community over a two-year period to avoid the use of fire in land preparation.
- Bidara's Eco-Village program in the Sangar and Segamai sub-villages which promotes no-burn agricultural methods.
- A memorandum of understanding between RER and fishermen on the Serkap river that prohibits the use of fires to clear embankments.

The fire prevention program is further supplemented by a comprehensive weather monitoring system. Monitoring weather conditions over the long-term helps the team to understand the prevailing or normal conditions of the landscape. Monitoring is also used to inform Fire Danger Ratings (FDR), that estimate the likelihood of a fire to ignite and spread in a certain time and area.

Weather data is collected from weather stations operated by RER and APRIL and their joint venture wood suppliers. Nine weather stations on Kampar and four stations on Padang Island are used.

Two dry periods occur every year on the Kampar Peninsular and Padang Island. It is during these dry seasons, occurring from late January to mid-March and June to September, that forest vegetation may become susceptible to fire.

The daily Fire Danger Ratings on both the Kampar Peninsula and Padang Island were primarily low to moderate for 90% of the days of the year. This is significant as there were only about 30 days during 2018 when the fire danger was high or extreme and indicated that vegetation conditions were receptive for a fire to ignite, spread and require suppression action. Based on this information, RER managers and forest protection staff prepared firefighting equipment, conducted focused patrols in high-risk zones, and informed forest users of the dangerous conditions in order to prevent, detect and respond to fires efficiently.

“ 2018, for the fourth consecutive year, no hotspots or fires occurred inside RER concessions ”



CLIMATE

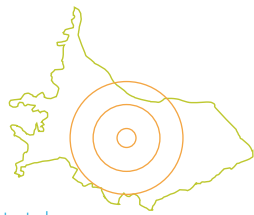


2018 ANNUAL RAINFALL

Kampar Peninsula



Total
2090 mm



4%

Below the annual total
rainfall average
2186 mm



63 - 413 mm
averaging 178 mm

Padang Island



Total
2.724 mm



41%

Above the annual
total rainfall
average 1934 mm

62 - 409 mm
averaging 161 mm



Knowing the daily FDR helps forest protection teams prepare to scale up prevention measures in a certain area as necessary, and to have their firefighting equipment on stand-by for quick deployment.

As part of the fire prevention process, RER conducts regular patrols and monitors Hotspot

data - remote-sensed data from NOAA and MODIS satellites that indicate a thermal anomaly within a 1.1 km² area. When RER identifies hotspots that may be inside or close to the RER boundary, field teams are immediately directed to the coordinates to ground truth the findings and execute the necessary procedures.

FIRE SUPPRESSION

RER firefighting teams receive specialized training and forest firefighting equipment, which is lightweight for easy mobility and includes high pressure water pumps to move water over large distances. Such equipment is essential when fighting fire in dense and closed forest terrain.

Zero fires have occurred in the RER area since 2015, a testament to the efforts of RER's fire prevention program and ongoing patrols of the field teams.



RER firefighting teams during a regular training session with firefighting equipment

TREE NURSERIES

RER managed eight tree nurseries in 2018, ending the year with more than 35,000 seedlings in stock, consisting of over 70 different native tree species. In addition to the stock of the 35,000 trees, over 6,700 have been planted to restore 58 ha of degraded forest. In addition to the stock of the 35,000 trees, over 6,700 trees have been planted to restore 58 ha of degraded forest.

More than 11,000 seedlings produced and maintained in RER nurseries were also provided to local communities and near-by concessions for peatland restoration plantings.

In the natural forest, new seedlings come from three sources: uprooted seedlings; seeds that have fallen from forest trees; or cuttings from mature trees. In the

case of uprooted seedlings and seeds, housing in nurseries dramatically increases their odds of survival. They are taken from areas of forest with abundant seedlings with the intention to plant them at active regeneration sites after they have become more robust. Compared to tree propagation from cuttings, reproduction from seed provides the advantage of ease of transport and storage and simplifies introducing genetic diversity.

The highlight of the year was the production of seed from three species of dipterocarp trees, commonly known as Light Red Meranti, with local (and scientific) names; Meranti Bakau (*Shorea uliginosa*), Meranti Bunga (*Shorea teysmanniana*), and Meranti Paya (*Shorea platycarpa*). These are classified by the IUCN as Vulnerable (VU), Endangered (EN) and Critically Endangered (CR),

respectively. Dipterocarps rarely and unpredictably produce fruit – this was the first time in the past five years that these trees were known to produce seed.

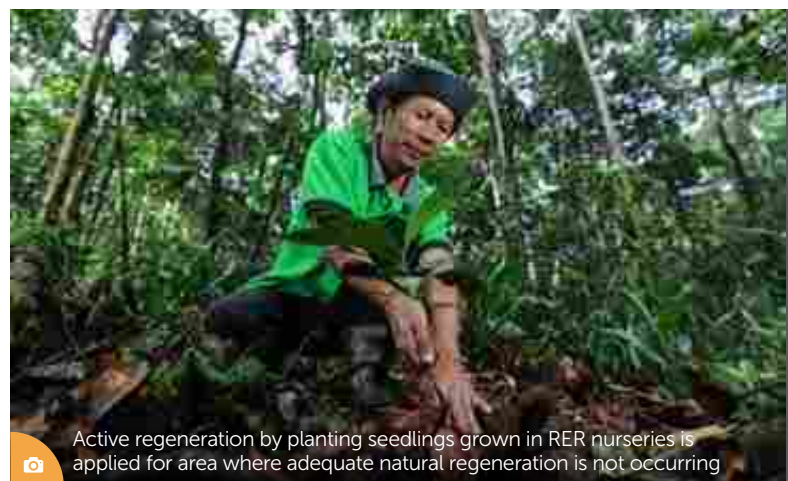
RER's staff first identified the flowering dipterocarps in February 2018 and collected over 10,000 seeds from March to May. These were then allowed to germinate in mass before more than 6,000 seedlings were transferred to individual polybags to mature for later use.

Dipterocarps are important for the timber trade because of their large size and high-quality wood in terms of strength and durability. As a result of over-cutting, illegal logging and forest conversion, many species of dipterocarps are now endangered. There are 16 general in the dipterocarp family of trees that are mainly found in tropical lowland forests.

FOREST RESTORATION

RER's peat swamp forest is vast, isolated and difficult to access. The identification and prioritization of restoration sites is essential to ensure operational efficiency. Since 2014, RER has implemented restoration on 88.5 ha based on government approved annual activity plans. Satellite imagery, aerial reconnaissance and drone photography are used to identify and initially assess a site. This is supplemented by ground survey and data collection on existing vegetation conditions, which is used to develop a site specific restoration prescription.

In 2018, RER initiated restoration on 58.2 ha of degraded forest, our largest accomplishment to date, and nearly doubling what has been accomplished in the previous four years. The 2018 achievement consisted of 28.3 ha of planting and 29.9 ha of assisted natural regeneration. These activities were focused at sites where intensive logging and fire had occurred in the past, before RER received its license to operate. In addition, 9.4 ha of previous plantings were maintained to ensure full stocking of desired trees and control of competing weeds.



Year	Planting	ANR	Total (Ha)
2016	17.87	-	17.87
2017	8.48	4.0	12.48
2018	28.34	29.87	58.21
Total	54.69	33.87	88.56

Table 1 2016-2018 forest restoration activity



CLIMATE



RER's forest restoration approach is highly linked to protection. Tropical ecosystems generally recover quickly without human intervention as long as there are no new disturbances such as illegal logging, land-clearing, or fire. An already high level of forest cover and often isolated nature of potential restoration sites make natural regeneration the most cost-effective approach for restoring forests.

In some sites however, such as where new, human-caused forest disturbance has occurred and/or where adequate natural regeneration is not occurring,

active regeneration may be used. Active regeneration may involve planting of nursery grown seedlings, seeding, and/or manipulation of disturbance regimes to speed up the process of recovery.

Active regeneration activities come in two forms. Planting makes use of seedlings grown in RER's nurseries in addition to the existing vegetation. Assisted Natural Regeneration (ANR) has restoration teams aid the growth of existing seedlings by weeding.

HYDROLOGICAL RESTORATION

Before 2013, RER concessions had been degraded by decades of commercial and illegal logging. Such activities not only removed larger trees from the area, but also resulted in the construction of networks of canals, which were built to facilitate access to locations deep within the forest and aided in moving logs out to rivers.

The canals, which range in width from 1-9 meters and can be 0.5-1.5 meters deep, contribute to the vulnerability of the landscape to fire by drying out surface peat and vegetation during dry seasons. Especially during periods of dry weather, canals facilitate water loss from the peat.

In its natural state, tropical forested peat is composed of over 90% water. The water table depth of peatland can vary seasonally with rainfall, and evapotranspiration. It may be several centimeters

above the surface in the wet season and drop as much as 150 cm below the surface in extended periods of drought. The hallmark of a peatland in healthy condition, however, is if it is actively accumulating peat.

RER's goal is to restore the hydrology of the peat forest by closing old drainage canals so as to restore water table fluctuations to normal seasonal fluctuations.

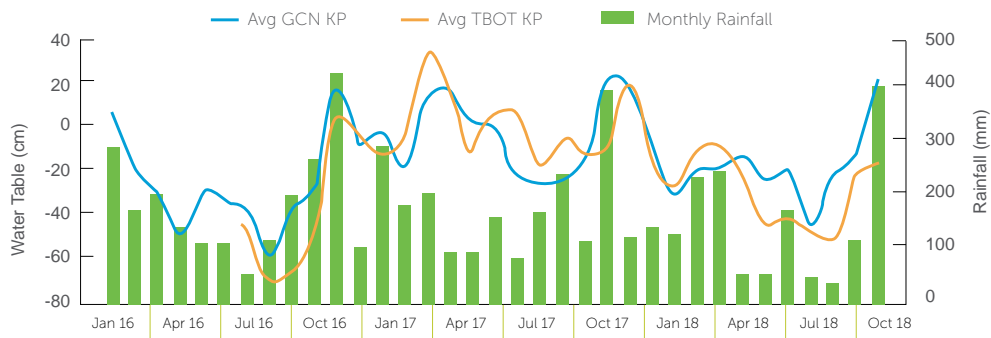
Canal blocking

Recent surveys using LIDAR and satellite imagery have refined and improved RER's ability to identify the location and length of old drainage canals within the RER concessions. RER has identified additional canal systems, now totaling 44, with a total length of 172 km. Thirty-four canals are on the Kampar Peninsula, totaling 146 km, while 10 canals are on Padang Island, totaling 26 km. RER's goal is to establish water control at 40 cm elevation intervals along all the canals systems by 2025. In 2018, an additional 30 dams were constructed, closing 38.1 km from 13 canals. To date, RER has achieved 38% of its goal by closing 21 canals, totaling 65.4 km, with 53 dams (Table 2). In 2017, RER staff mobilized large

Year	No. Canals	No. Dams	Length (m)	Sandbag	Velt	Other
2015	1	2	0.559	1	1	0
2016	5	17	15.343	6	9	2
2017	2	4	3.874	0	2	2
2018	13	30	45.682	4	24	2
Total	21	53	65.458	11	36	6

Table 2 RER annual canal closures

SUMMARY OF WATER TABLE MONITORING



Graphic 1 2016-2018 Summary of water table monitoring (GCN, TBOT)

amounts of material (e.g. sandbags, velt) to dam closure sites and in 2018 was able to physically close the canals using this material. As a result, we nearly tripled our accomplishment, compared to previous years.

The most difficult and time-consuming aspect of closing the canals is mobilizing materials to the site along the distant and narrow river channels. Once material is available, constructing the dam-closure is a rapid and straightforward process.

Water Level Monitoring

In 2018, monthly water table monitoring continued through a system of manually measured dip-wells in the peat. These dip-wells are located along established transects which traverse the terrain from river's edge to inland locations. The monitoring system provides data to better understand the seasonal changes in water table depth and its relation to monthly rainfall.

After nearly three years of monitoring, it can generally be surmised that monthly average peat water levels directly fluctuate as monthly rainfall varies with the seasons, and that water tables are

only at or above the peat surface during the wettest and highest rainfall period(s) of the year. This usually occurs from November-January and/or April-May when monthly rainfall is above 250+mm during a 12-day period each month.

Comparatively during the dry season, when monthly rainfall is normally well below 150 mm and distributed over a 6-day period per month, water table levels remain below the peat surface. During the year in one of the RER concessions, the water table dropped to 50 cm below the peat surface in September after nine months of below normal rainfall (21%).

However, the water table was raised to 41 cm above the peat surface in December after 3-months of heavy and frequent rainfall that ranged from 267-412 mm per month during October-December (Graphic 1). Similar rainfall-water table patterns were observed along other transects within RER.

Retaining water in the peat during the dry season is the primary goal of RER in order to minimize peat drying, oxidation, and subsidence, as well as the potential hazard of fires and resulting carbon emissions. The long-term data (Graphic 1) indicates that water table responses to rainfall are rapid, short-lived and also influenced by localized rainfall events.

More study is required to better understand the impact of RER's canal closures for retaining peat soil moisture. However, it can be inferred that this management activity contributes to slowing the rate of peat drying by retaining more water behind the dams for a longer period of time, even as the dry season progresses.




Rainfall is one parameter regularly measured by RER team to understand the dynamics of water table in the peatland



COMMUNITY

In 2018, RER supported eight community groups to maintain and create no-burn vegetable farms

04

 RER works with chilli farmers to develop integrated farming methods

COMMUNITY

Communities living around the RER area continue to be important partners in conserving the landscape. This includes the 17,000 people who live in the Kampar Peninsula and the 24,000 who live on Padang Island. RER's project teams engage in long-term initiatives that protect traditional activities and support small business of local communities in ways that promote sustainable development and use of natural resources.

NO-BURN VEGETABLE FARMING AND FISH FARMING

Land preparation can be an arduous activity, and many farmers have previously resorted to slash-and-burn techniques to clear land for planting.

RER has worked with farmers not only to develop alternative no-burn techniques for vegetable farming, but also to develop integrated farming methods to improve yield and generate additional income for the communities surrounding the RER concessions.

In 2018, RER supported eight community groups covering 16 ha to maintain and create no-burn vegetable farms. Harvests for the 2018 planting year generated approximately US\$39,745 from an initial investment of US\$8,400 by RER.

In the Padang Island, we also piloted a catfish aquaculture program with the community. RER provided the initial fish spawn and trained the villages on aquaculture techniques. The first fish harvest, in September 2018, generated US\$7,350 in additional income for the community.



RER teams work with local fish farmers to help them increase productivity and create additional income



COMMUNITY



WORKING WITH LOCAL FISHERMEN ON THE SERKAP RIVER



Groups of fishermen have traditionally fished the Serkap River, now part of one of the RER concession areas. While these fishermen depend on the river for their livelihood, some had previously participated in unsustainable fishing practices like electric fishing, poison fishing, or burning vegetation on river banks to facilitate access. Instead of closing access, RER

works with a group of fishermen - Serkap Jaya Lestari - to promote responsible fishing practices.

In 2018, RER invested in the fishing community through the donation of three boat engines. These engines are new and will help the fishermen to maintain their catch rates without resorting to unsustainable practices. The year also marks RER's third annual cycle of monitoring activities on the river, where fishermen report their catches to RER rangers.

Monitoring helps the RER team to keep track of individuals using the rivers, and to aid in understanding the seasonal and annual trends in fish harvesting. Fish catches doubled in 2018 compared to the two previous years.



Monitoring helps the RER team to keep track of individuals using the rivers and to ensure that harvesting activities are carried out at sustainable levels

COMMUNITY RELATIONS AND EMPLOYEE VOLUNTEERING

In 2018, RER employees also spent time volunteering in the communities around RER.

In community elementary schools, RER provided stationary and recycling bins, and employees engaged students with Eco-education programs, conveying the importance of protecting their natural spaces through fun and engaging activities. The program raised awareness of the negative impacts of fire and taught students good waste management habits such as sorting and recycling. The Eco-education program is conducted in the hope that students will become champions for conserving their environment. Employees also conducted health and sanitation education activities, teaching students to care for their own health and covering important topics like dental hygiene.

By volunteering to paint houses and mosques, our employees also helped to revitalize older buildings. These activities not only forge camaraderie among RER employees, but also help community members and the RER team



to become acquainted with and understand each other better.

Through these volunteering programs, RER seeks long-term engagement with the communities surrounding its concessions. By forging closer relationships, RER hopes to create open channels for the community to talk about their concerns and challenges, so as to help ensure that RER is supporting both the environment and the communities surrounding it.




RER teams to reach out to young people in local schools to highlight the importance of ecosystem restoration



OUTREACH & ENGAGEMENT

Guests to RER said visits helped them to understand the size of the landscape that APRIL manages in the Kampar Peninsula, including the RER

05

 Students at the Indogreen Expo finding out more about biodiversity monitoring in the RER area



EXTERNAL ENGAGEMENT

The RER team shared updates on its progress at a number of external events in 2018. The team engaged with other leaders of peatland restoration at the Special Session of the 7th Southeast Asian Studies Symposium Sustainable Peatland Restoration and Management, hosted by the University of Indonesia in March.

By sharing our unique experiences, we aim to contribute to the growing body of knowledge on peatland restoration.

Other events attended include the 5th Annual Meeting of Tropical Biology and Conservation in Sarawak, Malaysia, the CIFOR Tropical Peatland Exchange in Bogor, and the 8th Climate Change Education Forum & Expo in Medan.

The RER was also showcased at the 10th IndoGreen Environment and Forestry

Expo 2018, and was highlighted at the Global Landscapes Forum in Bonn as an example of a privately-led initiative, during the Landscape Talks session 'Coupling restoration finance streams for long-term success'.

RER also welcomed a number of visitors to our sites. Typical itineraries for visitors included the no-burn farming sites, GHG Flux Tower, canal blocking sites, nurseries and camera trapping locations.

Several visitors were also invited to take a boat-trip down Serkap river to get a feel of a typical patrol.

Guests to RER said the visits helped them to understand the size of the landscape that APRIL manages in the Kampar Peninsula, including the RER, and the operational challenge of maintaining the site. Many also agreed that the visits helped them to realize the complexity of the situation on the ground, in terms of managing peatland landscapes.

Several also expressed an interest in finding out more about learning from the measurements being taken at the APRIL's GHG Flux Tower located in the RER.



RER staff talking to students about the canal blocking prototypes used in hydrological restoration

“By sharing our unique experiences, we aim to contribute to the growing body of knowledge on peatland restoration.”



OUTREACH &
ENGAGEMENT



Delegates from the World Business Council on Sustainable Development and the Responsible Business Forum on field visits to the RER in October 2018

06 FINANCIAL SUMMARY

*in USD

No	Description	2013	2014	2015	2016	2017	2018
1	Employees	89,505	125,810	227,706	395,852	547,389	1,022,351
2	Total Operational Cost	333,301	463,438	507,771	1,146,317	1,083,815	1,399,283
3	License and Related	1,013,912	3,309,819	131,838	268,703	2,286,009	17,040
4	Partnerships**	119,425	218,810	2,863,720	931,174	1,240,273	180,823
5	Advisory Board	-	-	8,980	140,881	31,626	180,989
6	Capex	-	3,121	6,664	555,737	487,834	376,979
TOTAL		1,556,142	4,120,998	3,746,679	3,438,664	5,676,946	3,177,465

** A number of Partnerships were subject to renewal in 2018

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