RESTORASI EKOSISTEM RIAU

2024
PROGRESS REPORT

Tasik Tengah Floating Ranger Post

Contents

FOREWORD

Restorasi Ekosistem Riau (RER) is an exceptional place. It is one of the most species-rich landscapes in Sumatra and in the wider South East Asia region and is a vast natural store of carbon. It can also be seen as a demonstration of how the private sector can work in partnership to achieve lasting forest conservation and biodiversity protection.

After celebrating the project's tenth anniversary in 2023, the team has doubled down on strengthening RER's protection, deepening connections with nearby communities and collaborating with international researchers to understand its rare and endangered biodiversity.

The return on this effort is remarkable. Surveys of key animal and plant groups have logged 896 species present in the forest and wetlands within RER's boundary, including the flat-headed cat, the pangolin and the Sumatran tiger. A total of 80 species are on the IUCN's Red List, including 14 classed as Critically Endangered.

The total area, which at over 150,000 hectares is about the size of Greater London, supports vital ecosystem services such as clean water for communities. The carbon it stores is globally important, avoiding 6.5 million tonnes of CO_2 equivalent per year from contributing to climate change.

APRIL is committed to preserving this vital landscape for the long term. It forms 42% of our 1-for-1 conservation commitment that is aiming to match our production plantations with an equal area of natural forest for conservation.

APRIL's production protection approach ensures the program is sustained by consistent, long-term funding. The company puts aside one dollar for every tonne of plantation wood delivered to its mill complex in Pangkalan Kerinci, Riau. That internal levy has generated over US$60 million for conservation since 2020, including RER.

Last year, over 200 guests came to experience our work in RER and its biodiversity. To support this, we've increased the capacity of the Eco-Research Camp. Since the completion of the 'peat lab' in 2021, RER teams have completed the construction of a third housing unit, a second storage facility and two additional remote guard posts for researchers to also use.

This means we can provide housing for more researchers looking for close access to what is one of the most fragile forest ecosystems in Indonesia.

Visitors last year included students from the international Forestry Students' Association. They gained insights into peatland ecosystem management, greenhouse gas monitoring, and the significance of community partnerships. We hope that the opportunity to spend time in the forest was a formative experience that they will carry with them throughout their professional lives.

A landmark PhD study completed in 2024 on the Kampar Peninsula highlighted the biodiversity benefits of the production-protection landscape model. The research, carried out by a team from the Durrell Institute of Conservation and Ecology at the University of Kent, in the UK, confirmed that wildlife from the forest also use the acacia plantations on the peninsula as extended habitat.

RER is a unique and valuable place, and it is through your hard work every day that it remains protected and is able to thrive.

MR. BEY SOO KHIANG

Chairman, APRIL Group
Chairman, RER Advisory Board

The research showed that the distribution of animals was higher in the natural forests toward the edge and along the linear forest remnants, indicating that the area near the edges of plantations is, in fact, a viable zone for wildlife.

Another key piece of research that was completed last year was a multi-year survey of Odonata (dragonfly and damselfly) by IUCN expert Dr Rory A. Dow. The survey revealed 100 species, including five that have never been recorded in Indonesia and one that was entirely new to science.

A further research highlight was the four-month study of Malayan sun bears by a team from IPB University in Indonesia and the University of South Wales in the UK. The work by the researchers on Sun Bear habitat preferences is vital to inform RER's management, but also conservation across Southeast Asia. The research also highlighted the value of the production-protection model, through which the RER landscape is protected.

On the less intensively studied Padang Island portion of RER, we completed the first comprehensive camera trap survey of its wildlife. The results of this baseline study have provided critical insights that will inform future conservation strategies to safeguard the biodiversity and ecological integrity of the forest on the Island.

Rehabilitating past impacts on forest landscapes is an important part of RER's work. Last year, we established a new ranger post at the remote Makmur restoration site to facilitate tree planting and forest protection. This area was highly degraded by canal drainage and fires prior to RER's protection and active restoration work to help it recover.

Our work with communities outside of RER's boundaries is another priority. We're currently in year two of a five-year collaboration with the Segamai Village Forest Management Institution which involves support to protect their own forest concession of over 2,000 hectares, to conduct forest protection and restoration. One major success in 2024 in this area was preventing any illegal logging, which had been a major threat in previous years.

In another collaboration, we are working with the community in Serapung Village and the NGO Tropenbos Indonesia on boosting the livelihoods of villagers through training and education in agricultural techniques.

As all this activity attests, the RER remains a thriving focal point for nature, conservation and community. I want to extend my sincere gratitude to the RER team, our long-term partner Fauna & Flora as well as our stakeholders in local communities and researchers from around the world who continue to add to the depth of the RER story each year.

RER is a unique and valuable place, and it is through your hard work every day that it remains protected and is able to thrive.

ABOUT RER

Restorasi Ekosistem Riau is responsible for protecting, restoring and conserving tropical peatland forests on the Kampar Peninsula and Padang Island in Riau Province, Indonesia.

RER Forest

RER's main partners contribute uniquely to advancing restoration efforts, community empowerment, and sustainable practices.

Eleven Years For Nature

Launched in 2013, Restorasi Ekosistem Riau (RER) is a pioneering private-sector initiative dedicated to protecting, conserving and restoring Indonesia's peatland ecosystems. RER began with a single Ecosystem Restoration Concession (ERC) license from Indonesia's Ministry of Environment and Forestry and now holds five licenses, encompassing a vast 150,693 hectares across the Kampar Peninsula and Padang Island in Riau, Sumatra—an area twice the size of Singapore. These 60-year government-issued licenses allow RER to restore the degraded forests' ecological balance and protect the critical biodiversity of peat dome ecosystems.

RER's approach is both comprehensive and strategic, focusing on the protection of peatland ecosystems and the restoration of peat hydrology and biodiversity, while creating meaningful employment opportunities for local communities that support conservation efforts. The project provides essential ecosystem services, including clean water, carbon storage, managed fisheries, and sustainable non-timber forest products, thereby contributing to environmental resilience and local socioeconomic well-being.

Initially, RER began in 2013 with the protection and restoration of 20,000 hectares of peat forest on the Kampar Peninsula. In 2015, at COP21 in Paris, APRIL Group committed to a significant expansion of the project, pledging US$100 million over ten years to protect and restore 150,000 hectares. In 2020, APRIL further strengthened its conservation impact by tying conservation funding to its fibre production, pledging US$1 for

every tonne of plantation wood supplied to its mill. This innovative funding mechanism has contributed over US$60 million since 2020, ensuring continued support for APRIL's conservation work, including RER's long-term objectives.

Now after completing its eleventh year, RER represents a model of sustained, impactful conservation, consistently advancing efforts to safeguard and restore one of Indonesia's most critical natural landscapes.

Concessions	Size (ha)	Location
PT Gemilang Cipta Nusantara (GCN-KP)	20,123.33	Kampar Peninsula
PT Gemilang Cipta Nusantara (GCN-PPD)	20,598.53	Padang Island
PT Sinar Mutiara Nusantara (SMN)	32,781.06	Kampar Peninsula
PT The Best One Unitimber (TBOT)	40,665.67	Kampar Peninsula
PT Global Alam Nusantara (GAN)	36,524.78	Kampar Peninsula
TOTAL	**150,693.37**	

RER concessions on Kampar Peninsula and Padang Island in Riau Province, Indonesia

Production-Protection Landscape Approach

RER's restoration area benefits from its strategic positioning on the Kampar Peninsula and Padang Island, where it is bordered by APRIL's responsibly managed plantations. These plantations serve a dual purpose: they act as a protective barrier, shielding the peat swamp forest from threats such as illegal logging, fires and wildlife poaching, while also financially supporting conservation work by generating a reliable funding stream for RER based on the fibre production capacity of the plantations. This "production-protection approach" not only preserves the integrity of the peat swamp but also provides US$1 for every tonne of plantation wood delivered to the mill per year in landscape conservation and restoration.

Central to the production-protection approach is RER's partnership with local fishing groups who have long relied on the peatland forest for their livelihoods. With the support of APRIL Group, RER collaborates with these groups through initiatives, including education and skills development for value-added products, provision of necessary equipment and supplies, and open dialogue sessions. This collaboration fosters sustainable practices and a shared commitment to conservation of the fisheries resource.

RER's engagement with local communities is designed to improve livelihoods in harmony with the restoration and protection of the forest. By equipping community members with knowledge and skills to pursue alternative income sources, RER's efforts help reduce dependence on activities that may pose risks to the natural ecosystem, creating a balanced approach to conservation and socioeconomic resilience.

Partnership and Collaboration

Over the past decade, collaboration has been integral to RER's success. RER's main partners contribute uniquely to advancing restoration efforts, community empowerment, and sustainable practices, as outlined below:

Fauna & Flora brings expertise in baseline assessments of biodiversity, carbon storage, and community conditions, providing essential data that informs RER's restoration strategies.

To foster meaningful connections with local communities on the Kampar Peninsula, RER partners with BIDARA, an organization renowned for its focus on community empowerment. BIDARA's programs support long-term community well-being through initiatives in developing alternative livelihoods, advancing land management skills for local farmers, implementing intensive "no-burn" land preparation, and supporting environmentally responsible agriculture.

Completing its second of a five-year program, RER assisted the 2,270 ha Segamai Village Forest immediately adjacent to PT Gemilang Cipta Nusantara (PT GCN) to strengthen their forest management institution. That included developing an annual work plan; protecting the forest from illegal logging; staff capacity building to monitor forest resources (wildlife, vegetation and peat depth); initiating business development; and ensuring statutory requirements are being met.

In partnership with Tropenbos Indonesia, RER has also taken significant steps to address economic opportunities for residents in the Serapung village. Now entering its third year, this partnership focuses on enhancing sustainable livelihood initiatives through enhanced organic agricultural practices.

Since 2024, RER has advanced its forest protection efforts through a collaboration with the Wildlife Conservation Society (WCS). The APRIL-WCS Strategy to Prevent Illegal Wildlife Trade is a proactive initiative

equipping RER and APRIL field teams with cutting-edge technology and specialized training to address wildlife crime within APRIL's landscapes. A central component of this strategy is the implementation of SMART (Spatial Monitoring and Reporting Tool) Patrols—a globally recognized tool developed by leading conservation organizations. The approach uses standardized data collection, analysis, and reporting to enhance resource management, prevent poaching, and track conservation progress. SMART Patrol represents an international benchmark in conservation monitoring, strengthening enforcement and safeguarding biodiversity within RER's restoration areas.

Landscape Management

The RER team is dedicated to safeguarding forest ecosystems and rehabilitating areas affected by drainage, logging and fire prior to the project's establishment, which necessitates comprehensive and proactive management strategies. Key activities include conducting regular biodiversity surveys; establishing guard posts at primary forest access points; implementing routine forest patrols; fostering partnerships with local communities; collaborating with adjacent land managers; and restoring deforested and degraded sites through canal blocking and tree planting.

To guide these efforts, RER employs a four-phase model known as PARM, which encompasses: Protect (landscape protection), Assess (evaluations of community needs, carbon stock, and biodiversity), Restore (restoration of natural tree species and wildlife), and Manage (sustainable management).

A notable outcome of this structured approach is the absence of fires within RER since 2014, a significant achievement that has facilitated ecosystem recovery and prevented new environmental degradation. This is due, in part, to the operational team's diligent monitoring of weather conditions and readiness of firefighting resources. Also important is proactive communication with local

RER Landscape

fishermen and other forest users by RER rangers during the dry season to prevent land-clearing and fire. The cumulative impact from more than a decade of preventing forest cover change in the RER through the production-protection approach is significant considering the high demand for land by surrounding communities.

In 2024, all five RER concessions conducted survey audits to maintain their certification from the Indonesian Forestry Certification Cooperation (IFCC) and the Programme for the Endorsement of Forest Certification (PEFC). This certification represents a pioneering achievement in Indonesia, with RER becoming the first ecosystem restoration concession program to attain this certification, underscoring RER's commitment to sustainable forest management.

Advisory Board

RER is supported by a distinguished Advisory Board comprising a diverse group of Indonesian and international experts. The Advisory Board provides strategic guidance, offering independent insights and recommendations that align with RER's restoration and conservation objectives. Furthermore, the Board facilitates knowledge-sharing and capacity-building among the RER team by connecting them with research and advancements in the field.

Additionally, the diverse expertise represented on the Board significantly enhances RER's engagement with a wide range of stakeholders, including government agencies, research institutions, and local communities.

Bey Soo Khiang
Chairman, APRIL Group &
Chairman, RER Advisory Board

Jeffrey Arthur Sayer
Professor of Forest Conservation,
University of British Columbia

Paul Hotham
Senior Conservation Director,
Fauna & Flora

Kartini Sjahrir
Indonesian Anthropologist

Lucita Jasmin
Director for Sustainability &
External Affairs, APRIL Group

Makmur Area Ranger Post

RANGER POST: Makmur Restoration Area

Over the past decade, the RER team has dedicated itself to mitigating the adverse impacts of illegal logging on the Kampar Peninsula. Their efforts have successfully safeguarded critical peat swamp forests and the diverse ecosystems they support, with the overarching goal of restoring the ecological structure and function of the RER area.

A significant milestone in RER's restoration efforts is the Makmur Restoration site, located within PT Gemilang Cipta Nusantara concession. In 2018, RER identified 875 hectares of highly-degraded mixed peat swamp forest on the Kampar Peninsula that likely needed active restoration efforts, including 45 hectares at the Makmur site, as a result of past canal drainage, intensive logging, and subsequent fires. To address the forest degradation, RER developed an on-site native tree nursery, blocked drainage canals, planted hundreds of trees per hectare, repeatedly maintained these trees and replaced dead trees, and consistently protected the site from new forest encroachment, fire and wildlife poaching.

This seven-year effort at the Makmur Restoration Area culminated in the establishment of a new Ranger Post located over 10 kilometers from the nearest road. This remote outpost represents a substantial investment in infrastructure, significantly enhancing RER's capacity to protect the restoration area. The Ranger Post also provides improved housing for researchers, further bolstering ongoing conservation and restoration efforts.

Mess III Eco-Research Camp

Eco-Research Camp

This year, the Eco-Research Camp expanded its facilities by developing a third housing unit for the RER operational team. This new accommodation allows for an additional 40 people to reside comfortably on-site close to RER's restoration concessions. In total, the Eco-Research Camp can now accommodate 88 staffs of the RER operational team and 15 guests comfortably. The Eco-Research Camp continues to strengthen its role as RER's operational base and a center for tropical peatland science.

BIODIVERSITY

For the past eleven years RER has worked to protect and restore the peat swamp forest in Riau. As part of this commitment, continuous biodiversity monitoring assessments are conducted within RER's two landscapes on the Kampar Peninsula and Padang Island. The surveys have identified 896 plant and animal species within this unique ecosystem.

Rhinoceros hornbill (Buceros rhinoceros) captured in RER Kampar Peninsula

Plant and animal monitoring is an integral part of RER's restoration efforts since 2015 when Fauna & Flora began comprehensive baseline surveys on 92,500 hectares across the Kampar Peninsula.

Among the hundreds of species identified in RER, 80 species are included on The IUCN Red List of Threatened Species, the world's most comprehensive information source on the global conservation status of animal, fungi and plant species.

Understanding that nearly 10% of the plant and animal species that have been identified in RER are globally threatened with extinction underscores the importance of monitoring, maintaining and enhancing RER's peat swamp forests.

Plant and Animal Monitoring

Plant and animal monitoring is an integral part of RER's restoration efforts since 2015 when Fauna & Flora began comprehensive baseline surveys on 92,500 hectares across the Kampar Peninsula. Since then, RER's field teams have expanded this baseline through annual surveys that include remote camera trapping, seasonal bird monitoring, and transects.

In 2024, RER's species list remained steady at 896 species of plants and animals, consistent with the previous year's findings. However, changes in the conservation status of species on the IUCN Red List required RER to update the status of its species list across several taxa. These changes include the conservation status of two bird species, three plant species, and one species each of fish, amphibian and reptile. Of the 896 species recorded, 80 are now listed as globally threatened

on the IUCN Red List comprising 40 species categorized as Vulnerable (VU), 26 as Endangered (EN), and 14 as Critically Endangered (CR). Additionally, 119 species are protected under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), while 101 species are identified as protected by the Government of Indonesia (GOI).

Taxa	Total	IUCN Conservation Status			CITES	GOI Protected
		CR	EN	VU		
Mammals	78	3	9	9	26	18
Amphibians & Reptiles	106	3	4	2	19	5
Birds	319	3	5	18	46	78
Plants	203	3	4	5	28	0
Fish	89	2	3	3	0	0
Odonata	101	0	1	3	0	0
Total	**896**	**14**	**26**	**40**	**119**	**101**

Plant and animal species recorded in RER in 2024

RER continued its avian monitoring program with the annual Wetlands International Asian Waterbird Census (AWC) held across the Asia-Pacific region in January and February. The AWC depends on local conservation initiatives such as RER to provide essential data on waterbird populations that are shared with the IUCN and the Ramsar Convention on Wetlands. During RER's 1-day AWC event in 2024 on the western seashore of Padang Island, RER biologists documented 8 different waterbird species, and a total of 130 individual birds observed. A fascinating moment occurred when RER documented kleptoparasitic interactions (one animal takes the prey from another that has caught, killed, or prepared the prey for consumption) between the Grey plover (*Pluvialis squatarola*) and the Tibetan sand-plover (*Anarhynchus atrifrons*), offering firsthand insights into species behavior in the region.

Kleptoparasitic interaction between Grey plover (Pluvialis squatarola), (right) and the Tibetan sand-plover (Anarhynchus atrifrons), (left) observed on the coast of Padang Island by RER staff during Asian Waterbird Census, February 2024.

No.	Survey	Period	Camera Trap Nights	Highlights
1	Asian Waterbird Census - Padang Island	February 2024	--	1-day survey documenting 130 individual birds from 8 species. Observation of kleptoparasitic behavior between Grey Plover (*Pluvialis squatarola*) and the Tibetan sand-plover (*Anarhynchus atrifrons*)
2	RER - Padang Island	May – Dec 2024	1,854	22 cameras deployed for an average of 84 days identified 13 mammals, 2 avians, and 1 reptile species, including Sunda pangolin (*Manis javanica*)
3	RER – Kampar Peninsula	Aug – Dec 2024	1,648	36 cameras deployed for an average of 67 days identified 19 mammal & 9 avian species including Sumatran tiger (*Panthera tigris* ssp. *sumatrae*) (CR) and Malay crestless fireback (*Lophura erythrophthalma*) (CR)
4	Camera trap survey - Segamai Village Forest	May – Nov 2024	758	7 camera traps deployed for 82 days identified 12 mammal species including Sunda clouded leopard (*Neofelis diardi* ssp. *diardi*) (EN) and East Sumatran banded langur (*Presbytis percura*) (CR)
5	Bird survey - Segamai Village Forest	8-11 August 2024	--	66 species observed included Greater green leaf bird (*Chloropsis sonnerati*) (EN) and black partridge (*Melanoperdix niger*) (VU)

RER's biodiversity surveys in 2024

RER's annual camera trap monitoring program continued on both Padang Island and Kampar Peninsula successfully deploying 58 camera traps and achieving 3,938 camera nights of observations.

Monitoring on Padang Island focused on Sunda pangolins (*Manis javanica*) and occurred from May to December 2024, successfully deploying 13 camera traps across 4,400-ha on a 2 x 2 km grid for a total of 1,854 nights. A total of 13 mammals, 2 birds and 1 reptile were identified. The results are consistent with RER's 2023 systematic survey of the entire concession (20,599-ha) and again identified the Long-tailed macaque (*Macaca fascicularis*) (EN) as the most abundant species on the island followed by the Lesser oriental chevrotain (*Tragulus kanchil*) (LC) with continued presence of the Sunda pangolin (*Manis javanica*) (CR) and Greater slow loris (*Nycticebus coucang*) (EN).

Camera trap locations on Padang Island in 2024

On Padang Island 22 camera traps were successfully deployed across various cover type locations focused on Malayan sun bear (*Helarctos malayanus*) for a total of 1,854 nights documenting a total of 28 species consisting of 19 mammals and 9 birds. As usual, the pig-tailed macaque (*Macaca nemestrina*) (EN) was the most abundant species observed and images were captured of three Critically Endangered species; Sumatran tiger (*Panthera tigris* ssp. *sumatrae*), East Sumatran banded langur (*Presbytis percura*), and Malay crestless fireback (*Lophura erythrophthalma*).

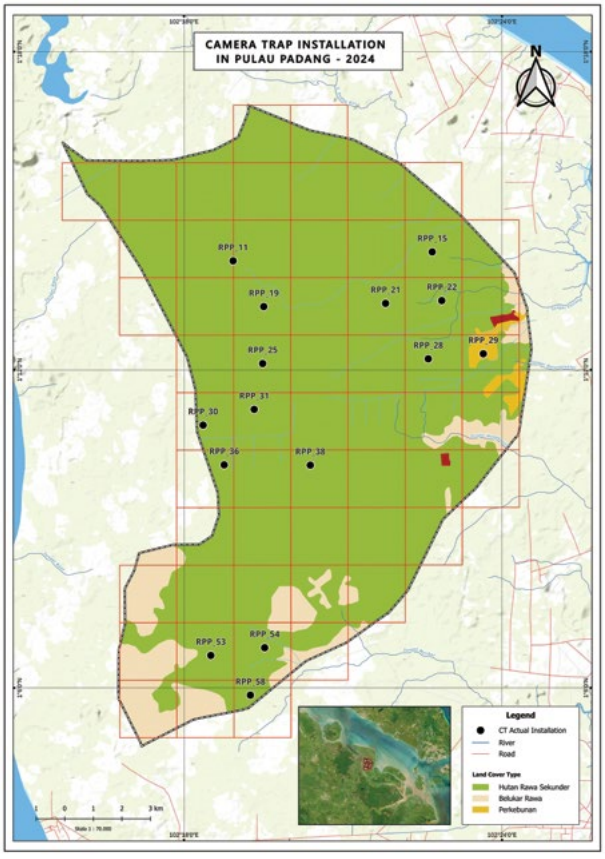


Figure 1. Camera Trap Installation in Padang Island - 2024

Seven of the 36 camera traps deployed on Padang Island were in mature *Acacia crassicarpa* (2+ years old) for an average of 51-days each where 6 mammals and 3 birds were identified consisting of Wild boar (*Sus scrofa*), Red junglefowl (*Gallus gallus*), Malay civet (*Viverra tangalunga*) and Malayan sun bear (*Helarctos malayanus*)(VU) as the most abundant species and additional sightings of Sunda leopard cat (*Prionailurus javanensis*), White-breasted waterhen (*Amaurornis phoenicurus*) and Long-tailed macaques (EN). These observations reinforce that the production fibre plantation-ring that protects the core peat swamp forest provides extended habitat for an assemblage of species that originate from the peat swamp forest ecosystem. This may also partly explain the frequent presence of Sumatran tigers in fibre plantations as some of the above species are potential tiger prey (e.g. wild boar and macaques).

Camera trap locations on the Kampar Peninsula in 2024

As part of the Kampar Peninsula camera trapping program, RER expanded the extent of its biodiversity monitoring efforts by collaborating with Segamai Village Forest Institution to conduct a baseline camera trap survey and a comprehensive bird survey. The Segamai Village Forest is immediately adjacent to RER's eastern boundary. Seven camera traps were successfully deployed for approximately 82 days from May – November across the 2,270 ha village forest area. Five days of bird surveys were conducted in August using 12 random points and walking 4.7 kilometers. The surveys identified 12 mammal species (5 are globally threatened and 4 species are protected in Indonesia) and 66 avian species (4 species are globally threatened and 13 species protected in Indonesia) with highlights that included the Sunda clouded leopard (*Neofelis diardi* ssp. *diardi*) (EN), East Sumatran banded langur (*Presbytis percura*)(CR), Greater green leaf bird (*Chloropsis sonnerati*) (EN), and Black partridge (*Melanoperdix niger*) (VU), a peat swamp specialist. The collective presence of these taxa and globally threatened species in this relatively small survey area highlights the high biodiversity value and exceptional importance of protecting the Segamai village peat swamp forest from deforestation, degradation and wildlife poaching.

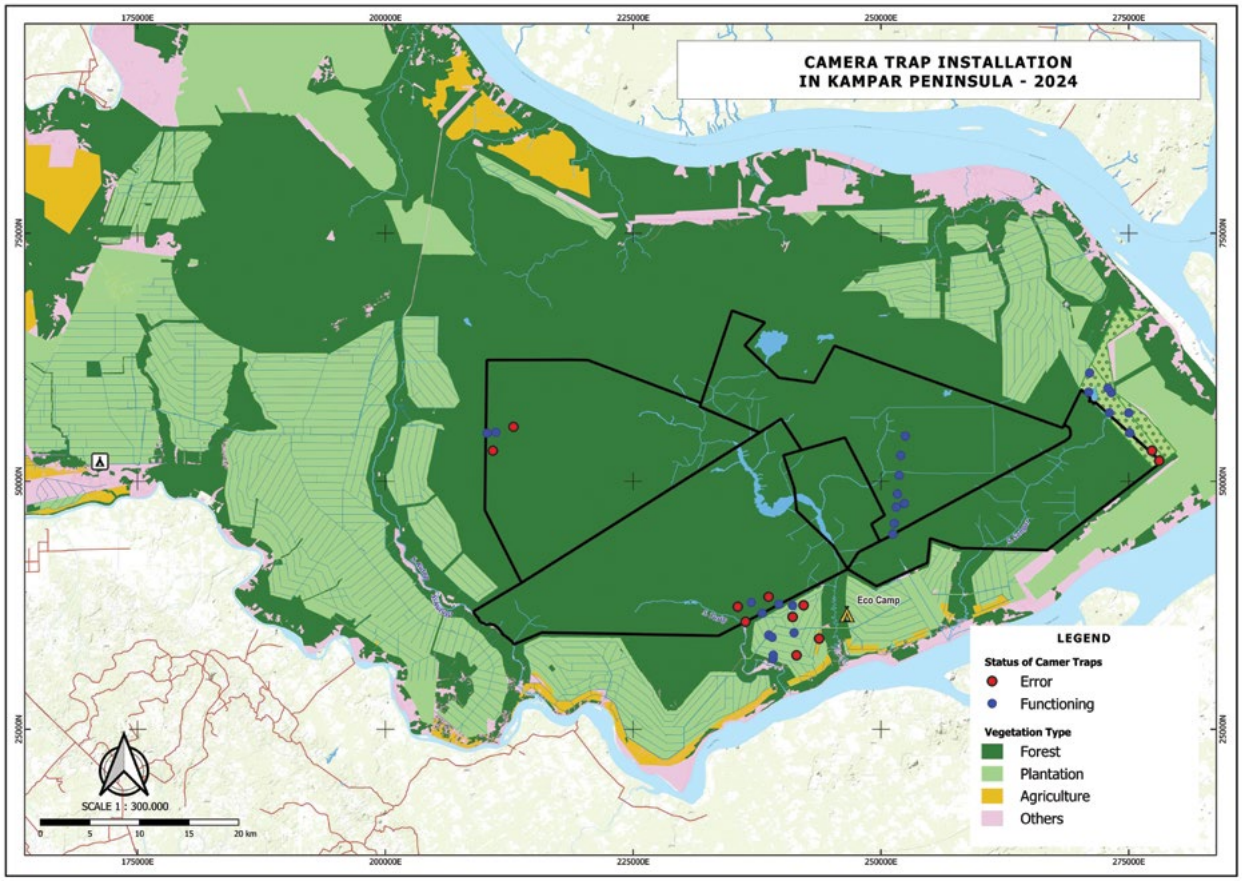


Figure 2. Camera Trap Installation in Kampar Peninsula - 2024

Gould's frogmouth (Batrachostomus stellatus) and nest with a single oval-shaped egg observed in RER, October 2024.

One notable finding on the Kampar Peninsula was the rare observation on 30 October of a female Gould's frogmouth (NT) (*Batrachostomus stellatus*) incubating her single egg in PT GCN – Kampar Peninsula in secondary peat swamp forest and within 1.5 meters of the ground. This observation of the mostly nocturnal bird is consistent with previously documented habitat and reproduction characteristics and reinforces the value of RER's continuous biodiversity monitoring and research program.

Malayan Sun Bear Research

As part of RER's mission to protect and restore the peat swamp forest ecosystem in Riau, RER supports scientific research by collaborating with both national and international academic institutions. In 2024 RER hosted two conservation ecologists — Dr David Lee, a Senior Lecturer in Wildlife Ecology from the University of South Wales (United Kingdom) and Meisye Wulandari, a Master's student from the IPB University (Indonesia) — from August to November 2024. During their four-month residency, the pair collaborated on the first RER research focused on the Malayan sun bear (*Helarctos malayanus*) habitat utilization and preferences in the peat swamp forest ecosystem. Although there is some understanding of how sun bear habitat associations drive the species' spatial distribution across its global range, there is a lack of data on the ecological understanding of sun bears in the peat forests of Sumatra. This work contributes significantly to addressing this knowledge gap and informing conservation management for the world's smallest bear.

Malayan sun bear (Helarctos malayanus) captured by camera trap in RER

The project provided a unique opportunity for the researchers to gather ecological data from an under-researched area of the sun bear's range. It contributes to the IUCN Species Survival Commission's ongoing revision of sun bear conservation assessments, which includes using range-based evidence to map the distribution of Asian bear species. Previous studies indicate that sun bears prefer undisturbed lowland forests, where food sources such as fruit-bearing trees are abundant. When these key food sources disappear, the sun bears are displaced, making their presence in these forests a key indicator of successful peatland restoration and recovery. This research also supports RER's long-term management strategy by providing a clearer understanding of habitat use and population changes of this globally vulnerable species.

Field surveys by the researchers in five forest cover types revealed that signs of sun bear presence are widely distributed across various habitats in the Kampar Peninsula; bear presence is identified through indirect evidence, such as claw marks or tree scratches. Preliminary analysis of these field data shows a positive correlation between sun bear presence and tree species diversity and composition. This may indicate that habitats with higher plant diversity can provide a more diverse food source for bears. Additionally, camera trap surveys conducted by the researchers and previously by RER have detected sun bears in various locations, including primary forests, secondary forests, and fibre plantations. These findings indicate that sun bears occupy a diverse range of habitats available in the Kampar Peninsula and that this is an important landscape for supporting the conservation of the species in the wild

First Comprehensive Camera Trap Survey of RER's Padang Island Concession

Padang Island, an 111,000-ha island located on the east coast of Sumatra, contains 65,757 hectares of degraded peat swamp forest. Despite the peat

forest's critical importance for biodiversity, the island has been subject to limited and sporadic biodiversity surveys due to its remote and inaccessible location. To fill this knowledge gap and establish a comprehensive baseline of faunal diversity, RER conducted the first systematic camera trap survey in the 20,599-hectare PT GCN. This is the Ecosystem Restoration Concession that forms the Padang Island portion of RER. The primary objective was to generate a robust dataset on species diversity, laying the groundwork for future monitoring and conservation activities.

The camera trap survey, conducted from May to September 2023, involved the deployment of 58 camera traps in a systematic 2x2 km grid across the concession. Data from 53 functional cameras revealed the presence of 17 mammal species, 2 avian species, and 1 reptile species. Notably, eight of the recorded species are classified as globally threatened on the IUCN Red List, including the Critically Endangered Sunda pangolin (*Manis javanica*). Additionally, seven species documented during the survey are protected under Indonesian law. Species with the highest relative abundance indices included the Long-tailed Macaque (*Macaca fascicularis*), Oriental chevrotain (*Tragulus* sp.), and Moonrat (*Echinosorex gymnura*).

The survey also highlighted that human activities are impacting the ecosystem, with 14 independent observations of human presence suggesting ongoing illegal wildlife poaching within the concession. These findings underscore the urgent need for enhanced protection measures, continuous biodiversity monitoring, and collaborative efforts to address threats to the island's unique ecosystems. The results provide critical insights that will inform future conservation strategies to safeguard the biodiversity and ecological integrity of the RER concession on Padang Island.

Sunda pangolin (Manis javanica) captured by camera trap in RER.

RER will release the complete results of this survey in 2025 in RER Publication Series No. 7 "Baseline Camera Trap Biodiversity Survey, PT Gemilang Cipta Nusantara – Padang Island".

Assessing the Conservation Status of Mammals in Human-Modified Landscapes of Sumatra

The first researcher to utilize RER's Peat Lab facilities at the Eco-Research Camp and conduct research in RER's peat swamp concessions completed her PhD in Biodiversity Management at the Durrell Institute of Conservation and Ecology (DICE), University of Kent (United Kingdom). Dr Irene Margareth Romaria Pinondang, who is a former RER employee, was supervised by Dr Mathew J Struebig, Reader in Conservation Science at Leverhulme Trust Tropical Defaunation Hub. The focus of Dr Pinondang's research was to:

1. Examine the conservation status of medium-large terrestrial mammals in the human-modified landscape of a peat swamp forest managed using a production-protection forest scheme.
2. Evaluate the biodiversity implications of plantation development on an extensive area of peat swamp.
3. Explore strategies to enhance wildlife-friendly practices in plantations.
4. Assess the population trend of terrestrial mammals during 7 years of protection and restoration on the Kampar Peninsula.

The study deployed 202 camera traps across three river basins on the Kampar Peninsula for an average of 90 days per camera from October 2021-January 2023 covering core peat swamp forest, linear forest remnants (riparian corridors and "greenbelts") and *Acacia crassicarpa* fibre plantations.

Results of the study documented 23 medium-large mammals over 17,132 camera trap days with up to 11 mammals in the Acacia plantations and 19 mammals in the peat forest. Mammal occupancy and richness was lowest in the young plantation (less than 2-years old during a 4+ year rotation)

and highest in the linear forest remnants and core forest which is a critical area for biodiversity among all forest classes. In general, mammals exhibited higher occupancy probabilities in high biomass forest, in the immediate vicinity of water sources, and close to the forest interior. They were not sensitive to human pressures such as roads.

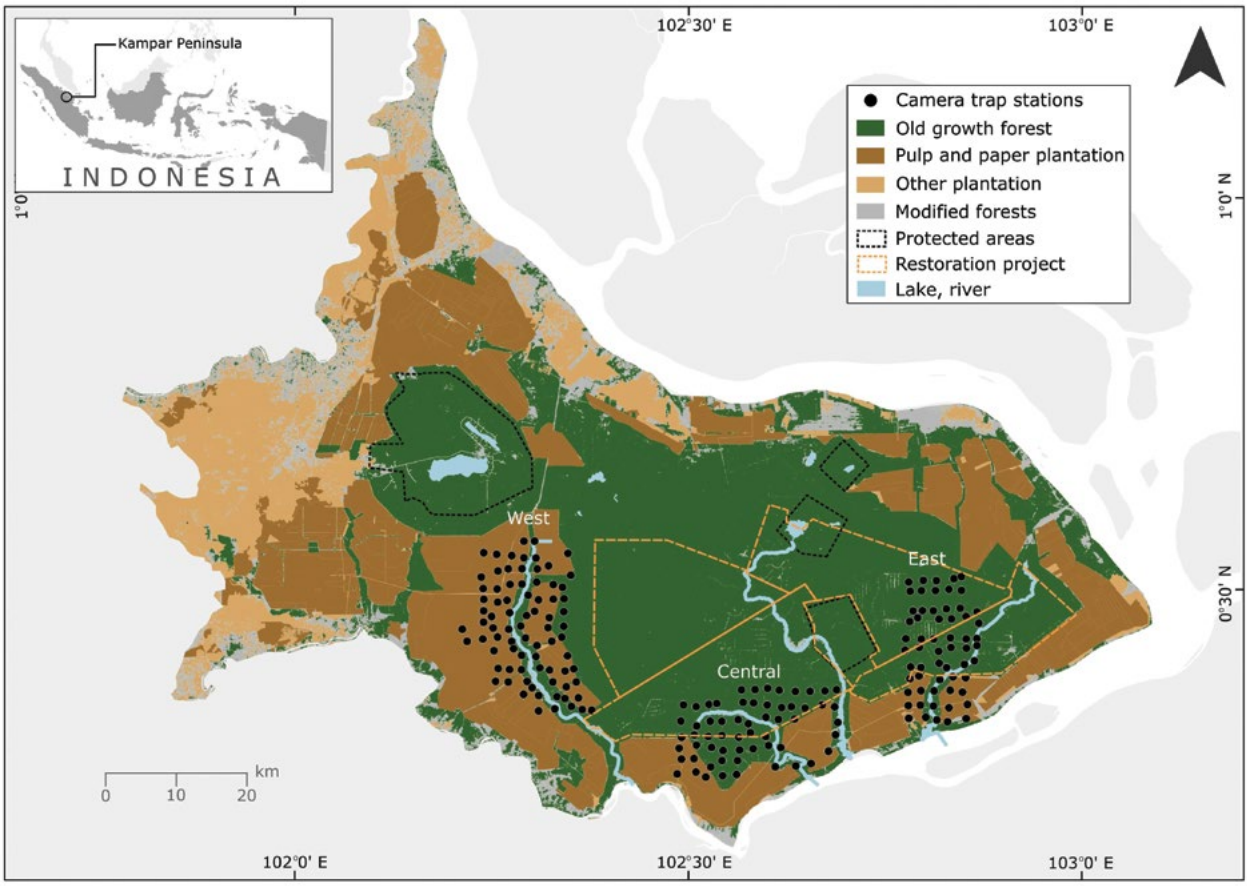


Figure 3. Kampar Peninsula production landscape showing the dominant land-covers and locations of camera traps used in the study. Camera trap placement was conducted in rotation across three blocks – East, Central and West.

"Within the context of our study, the landscape configuration adopted by the dominant private entity—preserving core forest integrity and maintaining linear forest remnants—demonstrates how such site-specific strategies can provide critical areas to harness biodiversity conservation."

Dr Irene Pinondang,

PhD Biodiversity Management
University of Kent, UK

Although the conversion of natural forest negatively affects biodiversity, the current production-protection landscape configuration that safeguards the core forest and retains the linear forest remnants across the plantation supports high mammal diversity. Interestingly, this study suggests that in general, mammal detection is higher near forest edges characterized by stable soil, proximity to water sources, and high biomass. Further, the functional and phylogenetic diversity of mammal assemblages across all forest classes was relatively similar. This suggests that the effects of land-cover change in the human-modified peat swamp landscape do not disproportionately affect distinct traits or lineages of the mammal species in the community.

"The temporal population trends of Kampar Peninsula's mammal community showed a tendency to increase over the seven years of the restoration projects. "

At the species level, the Critically Endangered Sumatran tiger (*Panthera tigris* ssp. *sumatrae*) was detected with a higher occurrence in plantations than in the core forest. Presumably the relatively open habitat tends to be associated with high detection rates (and presumably more predation opportunities) of their primary prey, such as Sambar deer (*Rusa unicolor*) and Wild boar (*Sus scrofa*).

Recommended actions to enhance wildlife-friendly practices within fibre plantations are:

1. Retain 'tree islands', whereby patches of native trees within plantations are protected and may lead to higher biodiversity and improved ecosystem functioning within the vicinity.
2. Harvesting activity should be in a directional order from the outer boundary of the plantation compartment towards forests. This strategy could alleviate pressure on wildlife by allowing mammals to find refuge and avoid contact with human activities.
3. Workers temporary camps should be built a considerable distance from the nearest forests, or protect them from roaming animals.

Finally, the research confirmed the importance of Ecosystem Restoration Concessions (ERC) for conserving natural forests and providing habitat for tropical mammals threatened by habitat loss and forest degradation in Indonesia. To quantify this, mammal population trends were analyzed by deploying a total of 203 camera traps for 52, 58, and 91 days during 2015, 2020 and 2022, respectively. The study revealed 22 medium-large mammal species recorded within the ERCs on Kampar Peninsula. This is the first study to document population trends of a mammal community in Indonesia's ERCs in peat swamp forests. Most temporal population studies on Indonesia's mammals have focused primarily on single species, typically flagships such as tigers in protected areas. The temporal population trends of Kampar Peninsula's mammal community showed a tendency to increase over the seven years of the restoration program (2015-2022), albeit responses varied among individual species. Seven species showed increases, five species showed decreases and one was unchanged. For the remainder there were insufficient data to determine a trend. Of significance in the landscape is the Bearded pig (*Sus barbatus*) and Wild boar (*Sus scrofa*) that experienced major population declines since 2015 which coincided with the arrival and spread of African Swine Fever (ASF) in Indonesia.

Through the repeated surveys, the research found that restoration efforts increased both mammal occupancy and species richness over time. Relying on formal protected areas within the landscape alone is inadequate to address the challenge of biodiversity protection posed by deforestation and numerous species have adapted or depend on production forests outside these designated zones. These findings suggest that restoration concessions within production landscapes can function as Other Effective Area-Based Conservation Measures (OECMs), effectively contributing to biodiversity conservation beyond formal protected areas.

"The findings demonstrate that restoration areas within production landscapes, such as Acacia plantations, serve as critical habitats for medium and large mammals, supporting at least 22 species, including threatened taxa."

By highlighting the potential of ERCs to protect biodiversity and enhance ecosystem resilience, this research emphasizes the critical role of multi-functional landscapes in mitigating biodiversity loss and climate change.

Completion of First Comprehensive Odonata Surveys on Kampar Peninsula

Dr Rory A. Dow, an IUCN Odonata Specialist Group member, completed a multi-year survey of dragonflies and damselflies on the southern Kampar Peninsula, covering 19 locations within

peat swamp forests, *Acacia* fibre plantations and rubber plantations. The Odonata of Sumatra are poorly known and information about the group in Riau province is particularly sparse where previous studies have mainly focused on oil palm plantations. Odonata are carnivorous insects with aquatic larvae and flying adults. This life-stage combination makes Odonata good indicators of ecosystem health due to their dependency on freshwater ecosystems for reproduction. Most species are already assessed on the IUCN Red List, making them valuable for conservation studies. This study aims to establish a baseline Odonata inventory for the Kampar Peninsula.

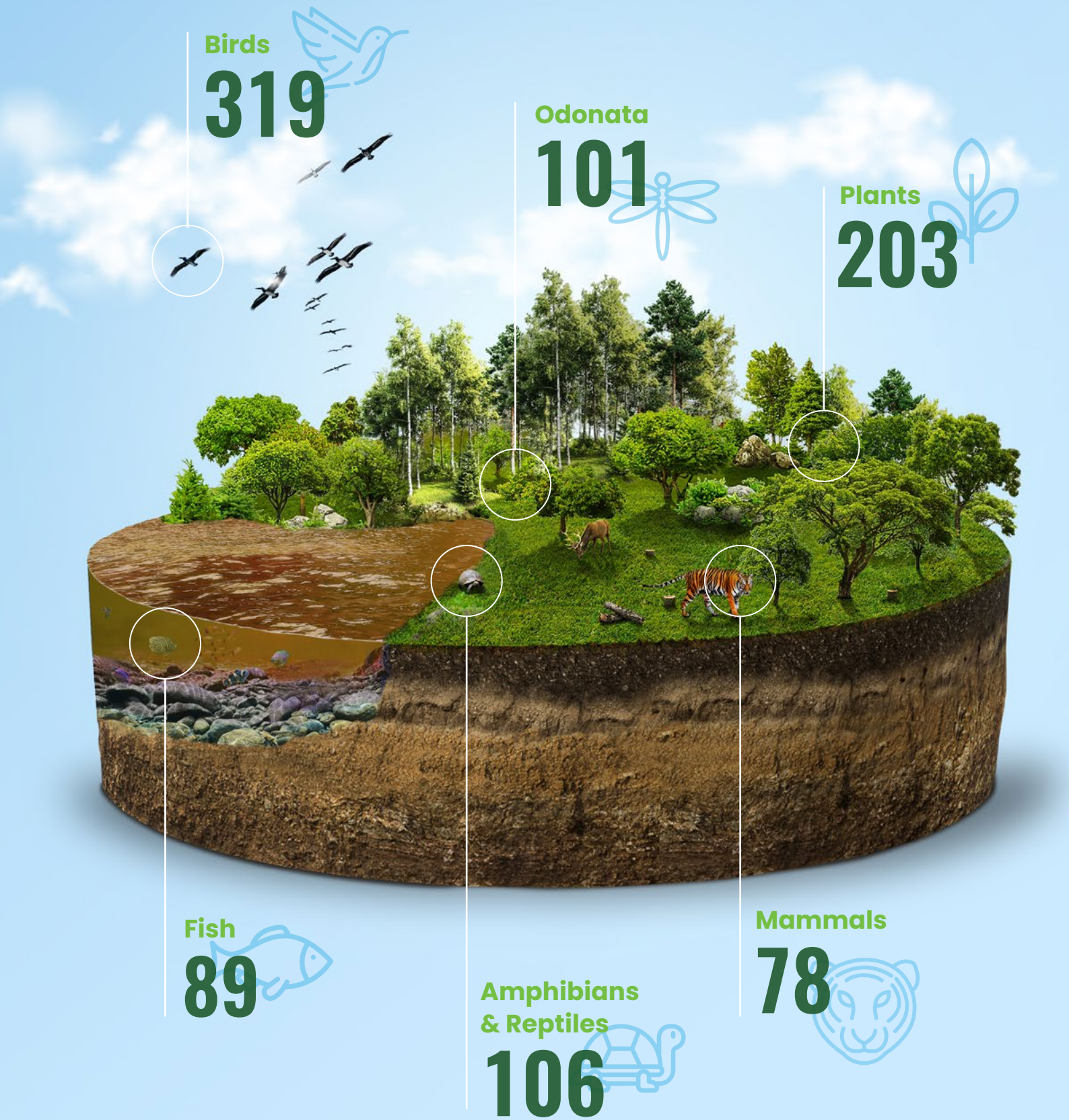
The survey began in January 2020 but was interrupted by the COVID-19 pandemic. Fieldwork resumed in February 2023, with subsequent surveys in May-June and September-October. During 2024, Dr Dow has been curating the specimens and preparing the data for peer-reviewed publication.

Results of the four surveys revealed 100 species across 12 families and potentially one species that is new to science. Thirty-eight of the recorded species represent first records for specific geographical entities — Indonesia (5 species), Sumatra and Riau Islands (2 species), mainland Sumatra (6 species) and Riau province (25 species). As a result of the surveys, the number of species recorded from Riau province has increased from 88 to 127.

Of the 100 species recorded, 49 are forest-dependent, highlighting the importance of peat swamp forests. While most species are classified as Least Concern (LC), 22 are globally threatened or have uncertain conservation status, including one EN, three VU, seven Near Threatened (NT), and four Data Deficient (DD) species. The project successfully established a baseline inventory for the southern Kampar Peninsula. Future surveys will focus on the northern Kampar Peninsula.

Marsh wisp (Agriocnemis minima)

BIODIVERSITY OF RER



CASE STUDY

Young Researcher in Malayan Sun Bear Research

Meisye Wulandari, a Master's student at the IPB University in Indonesia, became part of a groundbreaking research project focused on the Malayan sun bear (*Helarctos malayanus*). Wulandari expressed her awe at witnessing firsthand evidence of these elusive creatures' presence in the wild. This remarkable moment was made possible through the logistical support provided by RER, which played a pivotal role in ensuring the success of the study.

This research is more than just an academic exercise—it is a critical step toward better understanding the distribution and habitat use of the endangered Malayan sun bear. It also exemplifies the power of collaboration between academic institutions and conservation organizations in safeguarding species. By combining scientific expertise with on-the-ground restoration efforts, this research offers invaluable insights that will contribute to long-term conservation strategies for the species and the broader ecosystem.

The methodologies developed during the study will not only help monitor Malayan sun bears but also aid in future research on other fruit-eating mammals.

For Wulandari, the research has deepened her passion for wildlife conservation, particularly in understanding the intricate relationship between sun bears and their habitats. She reflected on how the success of RER's restoration initiatives has left a lasting impact on her. The presence of rare species like the Malayan sun bear is a hopeful sign for conservationists, reaffirming the importance of continuing such efforts.

CLIMATE

In 2024, the lowest monthly rainfall on the Kampar Peninsula was 39.9 mm in July and on Padang Island was 82 mm in December.

Fire training

There were no hotspots or fires in RER since 2014.

Weather Monitoring and Fire Management

The hot tropical climate and low elevation of the Kampar Peninsula and Padang Island where RER is situated, create the conditions necessary for the water-dependent, peat swamp forest ecosystem. Rainfall fluctuates seasonally, with two dry seasons and two wet seasons per year. A short dry season typically occurs for 2-4 weeks from late January to mid-March and a second, longer dry season occurs from June to September. Recordings from 13 weather stations on these landscapes indicated an annual rainfall average of 2,312 mm and 2,205 mm on the Kampar Peninsula and Padang Island. This is 1% higher and 3% below the long-term average, respectively.

Monthly rainfall varies considerably across RER. In the dry season the average dips below 150 mm, while during the wet season it rises above 200 mm. In 2024, the lowest monthly rainfall on the Kampar Peninsula was 39.9 mm in July and on Padang Island was 82 mm in December. November was the wettest month on both landscapes, with peak rainfall reaching 307.8 mm and 414.6 mm, respectively. Rainfall patterns were normal in 2024.

Understanding Rainfall Patterns in Sumatra

2024 was the warmest year since 1993 for a quarter of the global oceans. In Southeast Asia, mean Sea Surface Temperature (SST) Anomalies in the western equatorial Pacific were elevated between 0.5°C and 1°C. The year marked the end of the 2023 El Niño event–a naturally occurring climate phenomenon characterized by the warming of sea surface temperatures in the central and eastern equatorial Pacific Ocean. El Niño commonly causes below average dry season rainfall and two to three months of extended drought in Sumatra.

The El Niño event that had started during the boreal summer of 2023 and peaked in December 2023, died off in spring 2024. This led to a transition to a neutral condition with moderately negative anomalies in July 2024 over the Niño 3.4 region—an area in the equatorial Pacific Ocean, defined by the coordinates 5°S to 5°N and 120°W to 170°W that is a key monitoring region for El Niño Southern Oscillation (ENSO). So conditions in 2024 were primarily ENSO Neutral to La Niña, typified by normal to above normal rainfall in Indonesia.

Assessing the Ocean in 2024 - Mercator Ocean

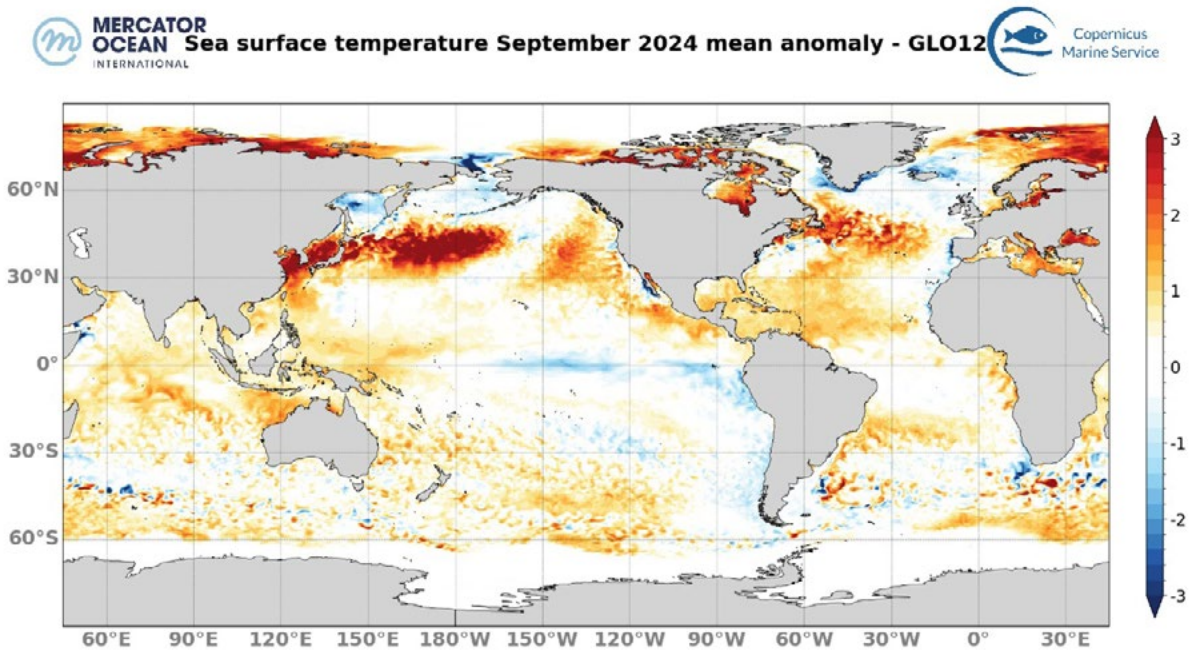


Figure 4. 2024 mean Sea Surface Temperature Anomaly relative to a 30-year average (1993-2022), calculated using daily data from Mercator Ocean International's GLO12 analysis for 2024 and from GLORYS12 reanalysis for the climatological mean. Credits: EU, Copernicus Marine Service/Mercator Ocean International.

Sea Surface Temperature Anomaly in NINO3.4 Region

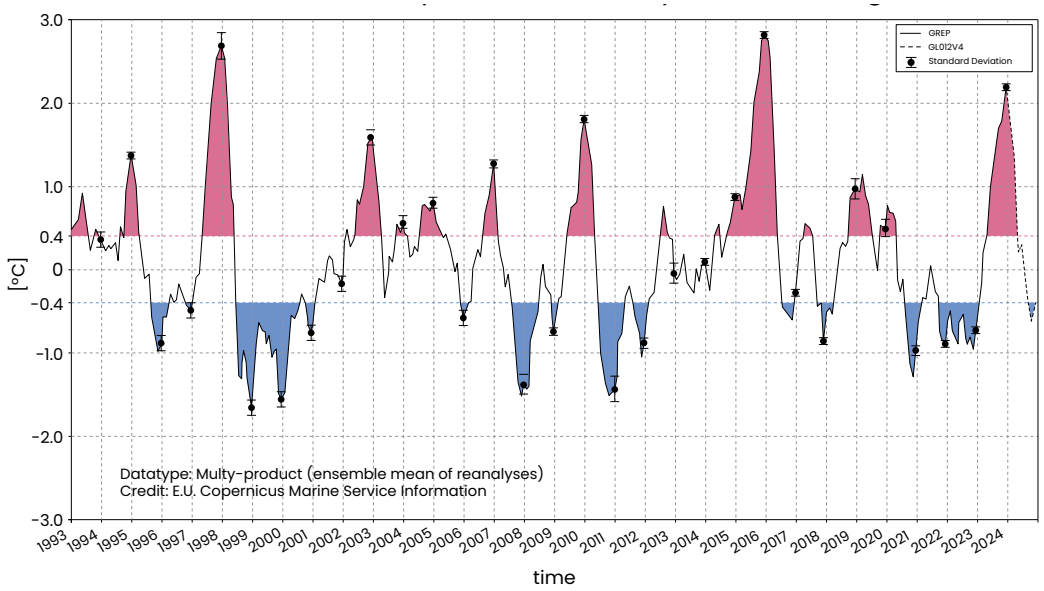


Figure 5. Monthly mean Sea Surface Temperature Anomaly (solid line) and standard deviation (bars) over the NINO 3.4 (170°W-120°W, 5°S-5°N), a key ENSO monitoring region. Reference climatology period over 1993-2014. Credits: European Union, Copernicus Marine Service/Mercator Ocean International

SST Anomalies

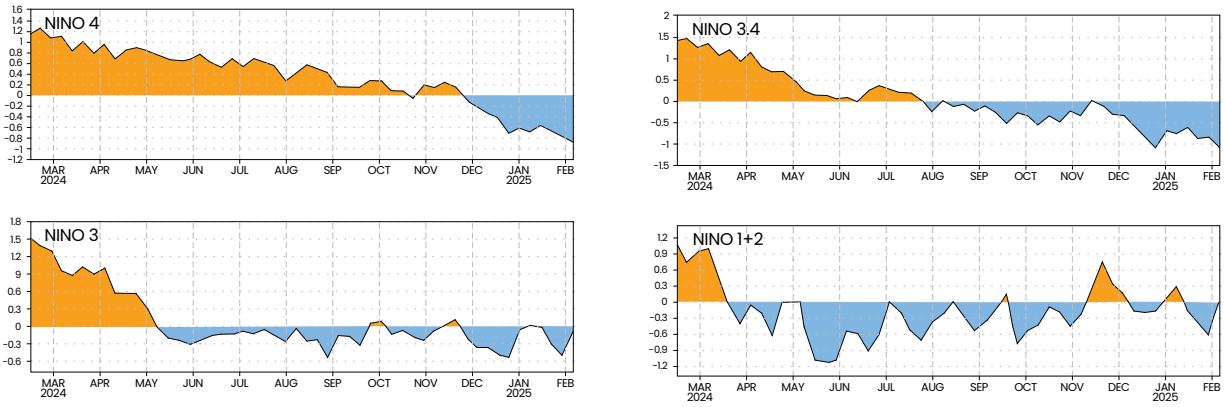


Figure 6. Time series of are-averaged sea surface temperature (SST) anomalies (°C) in the Nino regions [Nino-1+2 (0°-10°S, 90°W-80°W), Nino-3 (5°N-5°S, 150°W-160°E)]. SST anomalies are departures from the 1991-2020 base perod weekly means.

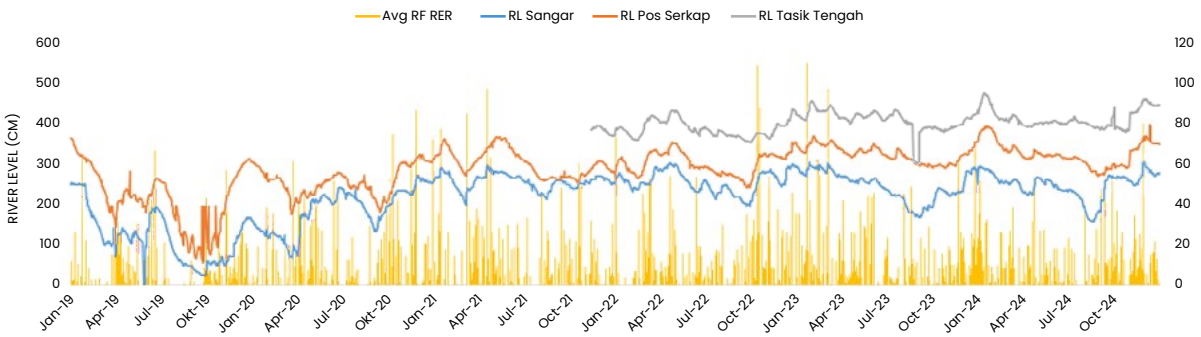


Figure 7. Rainfall and river level in RER Concession 2024

Understanding River Levels in RER: The Direct Impact of Rainfall

River levels and flows are directly correlated with precipitation. As monthly rainfall increases, river levels also go up. On the Kampar Peninsula, the Serkap River meanders 60-km through the largest river basin covering an area of approximately 78,000 ha. During 2024, it peaked in November at 399 cm and was at its lowest in July at 270 cm—a 130 cm water level change. Similarly, the Sangar River's peak and trough were 305 cm in December and 156 cm in August respectively—a 149 cm difference.

Increased rainfall and river levels cause surface flooding in the riparian zone of all river basins on the Kampar Peninsula and Padang Island. The seasonal flooding is an essential part of the wet-dry cycle in the peat ecosystem that contributes to slow peat accumulation from dead biomass (leaves and branches) that falls from the forest above during the dry season.

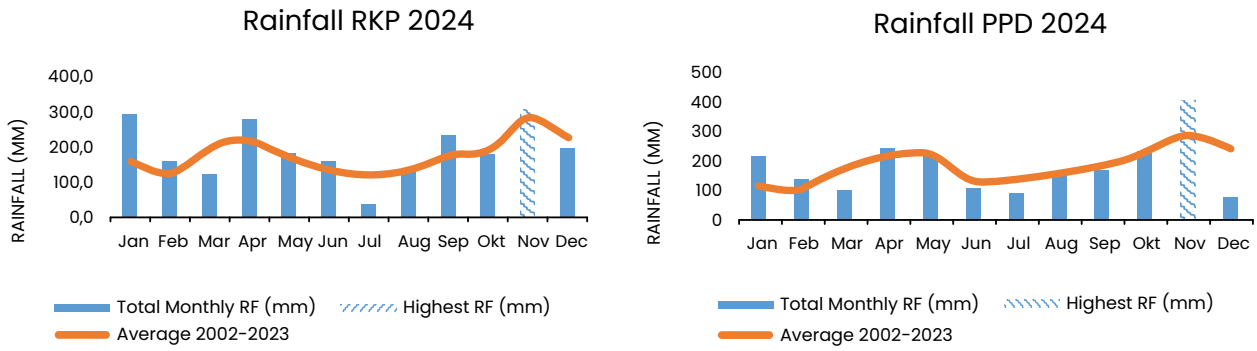


Figure 8.a. Summary of rainfall on Kampar Peninsula and Padang Island

Understanding Fire Hazard-Risk and RER's Response

Rainfall also correlates directly with fire hazard. As monthly rainfall decreases during the dry season, the peat water table also drops, causing drying of the peat surface and the accumulation of debris and dry vegetation. If the peat surface is exposed to direct sunlight as result of forest canopy removal, then drying intensifies and fire hazard increases further. During the dry season, RER calculates a daily Fire Danger indicator using five variables to assess the potential for a fire to ignite, spread and require active suppression. The variables used to calculate Fire Danger are:

1. 24-hour rainfall accumulation (mm)
2. Relative Humidity (%)
3. Number of days without rain
4. Total rainfall in the past 15-days (mm)
5. Fuel condition

However, even if daily Fire Danger reaches HIGH or EXTREME levels due to a long period with no rainfall, the only way a fire can ignite is from human-caused activities such as intentional burning for land-clearing or carelessness from smoking or cooking fires. Fortunately, 99% of RER is shaded, moist tropical peat swamp forest and only 1% of the total area is considered as heavily-degraded forest with potential for fire. RER is restoring forest cover here and providing 24-hour protection to prevent any source of human-caused fire ignition.

To ensure preparedness for responding to fire threats, RER maintains a two-pronged approach that includes actively engaging local communities in fire prevention efforts and maintaining the capability to effectively respond to fires as quickly as possible.

Given the absence of natural fire causes within tropical peat swamp forests, prevention of human-caused fires is a priority. RER's proactive approach includes monitoring human activity within concessions and extensive community engagement efforts in the surrounding areas. RER provides daily fire danger updates to forest users, prevents encroachment and forest clearing, and educates adjacent farmers on "no-burn" agricultural practices to mitigate fire threats to the peat forest.

Satellite imagery allows for the detection of "hotspots" which indicate active fires. Based on daily weather monitoring, fire patrols are conducted in high-risk areas where human activity is present. Specialized, lightweight forest firefighting equipment and teams can be rapidly mobilized by air or on the ground to respond to fires.

There were no hotspots or fires in RER since 2014. According to the Fire Information for Resource Management System (FIRMS), a NASA-run satellite monitoring system, 131 hotspots were recorded in Riau Province in 2024. None of these were within RER concessions.

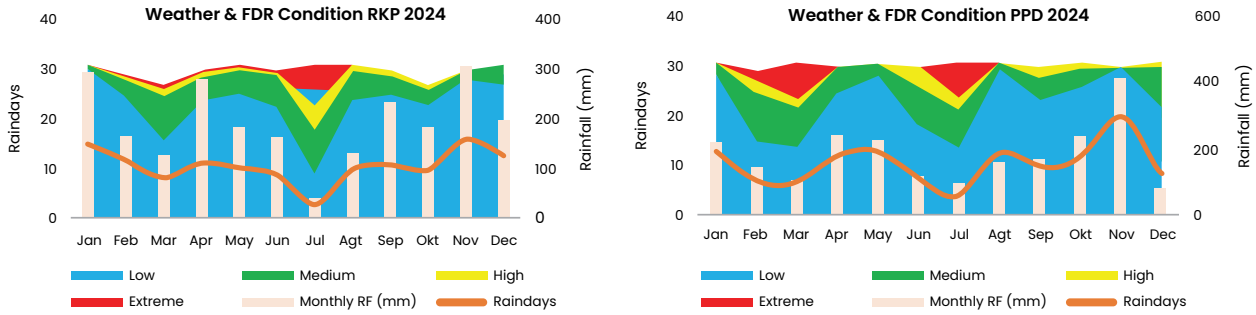
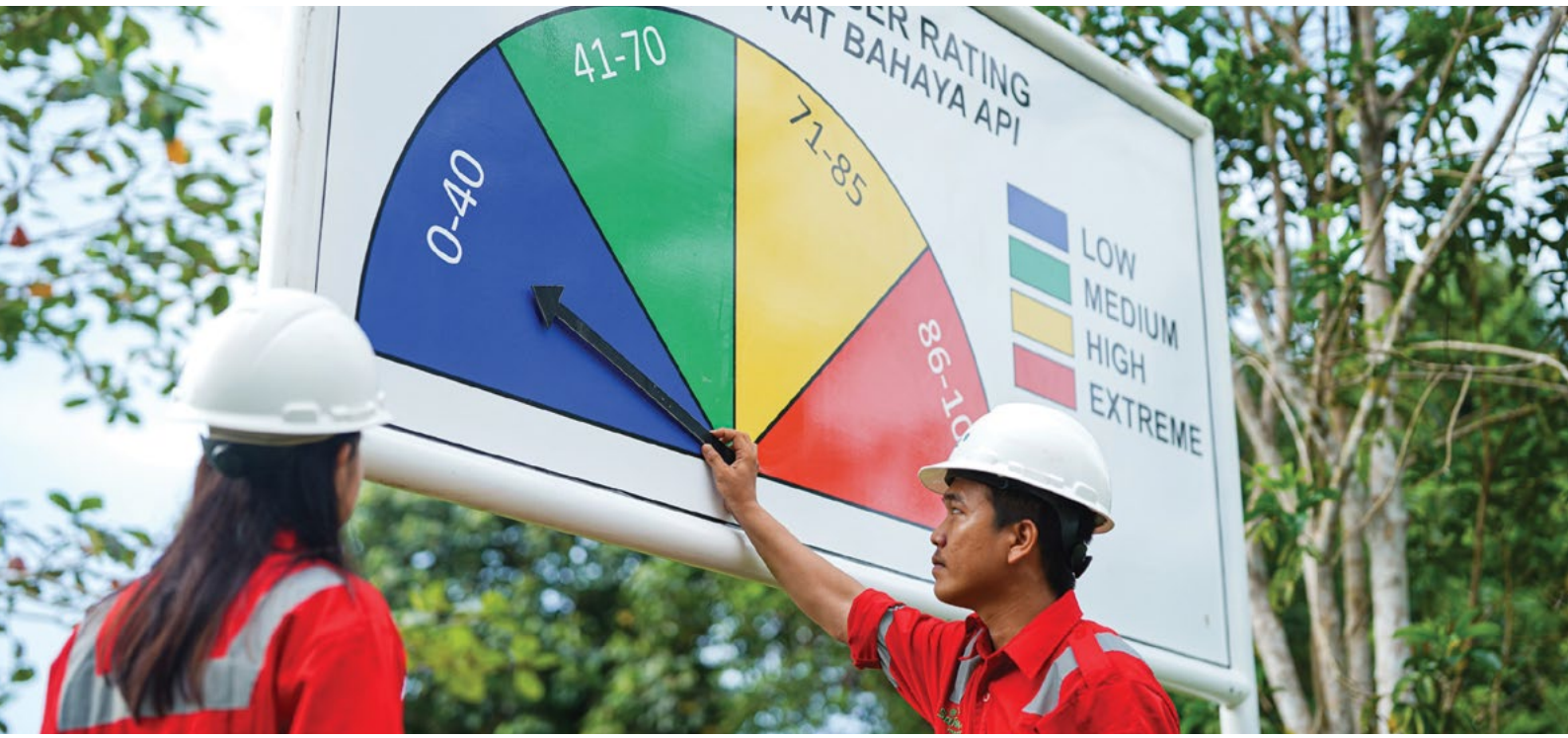


Figure 8.b. Summary of Weather and FDR Condition on Kampar Peninsula and Padang Island



Fire Danger Rating instrument

Forest Restoration

More than 60% of the RER forest on Kampar Peninsula has intact forest cover and another 39% has experienced selective logging and some canal drainage. Therefore, natural regeneration combined with canal blocking is the most cost-effective approach in these large areas. However, there are small, isolated locations where past drainage, intensive logging and fire had a significant impact on vegetation before RER began managing the concessions. The focus of active restoration efforts is at these locations. To assess these highly-degraded sites, the RER team uses satellite imagery and aerial

reconnaissance using helicopters and drones. Based on monitoring results, approximately 1% of the total area in RER requires human-assisted restoration.

The satellite and aerial monitoring is followed up with field inventories, which inform specific restoration plans for each site. These identify suitable native tree species, planting technique to be employed, monitoring and maintenance needs. For small areas of less than two hectares, tropical peat swamp forest can recover quickly in the absence of new human disturbance. For larger areas, forest rehabilitation requires human intervention including direct planting, enrichment, and assisted natural regeneration (ANR). Establishing adequate tree cover on a highly degraded site may require 5-7 years of repeated planting, maintenance and continuous protection. Young seedlings are frequently killed off by seasonal flooding or shaded out by the rapid growth of competing vegetation such as ferns and vines that overtop young trees.

The restoration goals for each location may vary, encompassing objectives such as increasing forest canopy cover, providing fruiting trees as habitat for birds, enriching the site with rare or endangered tree species or a combination of these goals.

Makmur Restoration Site October 2024

Tree Nurseries

Restoring isolated sites within a vast and remote peat swamp forest presents significant logistical hurdles. There are no roads within RER, only rivers and walkable forest trails, making access into the forest slow and challenging. To overcome these challenges, RER establishes small-scale nurseries at restoration sites. These nurseries maintain a diverse stock of native seedlings from a least 40 different species collected from the surrounding forest. This approach ensures ready access to young plants needed for restoration efforts.

In 2024, RER's nine nurseries across the Kampar Peninsula and Padang Island nurtured more than 32,000 natural seedlings. A continuous supply is needed to replace poorly performing or dead trees from previous restoration efforts — 3,487 seedlings were used for this purpose in 2024. Additionally, 16,707 seedlings are ready and waiting to be planted in restoration areas in 2025.

Estate	Number of Nursery	Number of Species	Number of Seedlings	Seedlings Planted in RER	Seedlings Ready to be Planted
Kampar Peninsula Restoration	7	68	26,119	3,412	15,237
Padang Island Restoration	2		6,798	75	1,470
Total	**9**	**68**	**32,197**	**3,487**	**16,707**

Figure 9. Nursery stock in 2024

Hydrological Restoration

Tropical peat swamp forest soils are typically composed of approximately 80% water and 20% organic material. The water table depth describes the boundary between water-saturated subsoil and unsaturated soil. This level is typically very close to the peat surface for most of the year, but undergoes seasonal fluctuations in line with periods of low and high rainfall. During the rainy season, the water table can rise several centimeters above the peat surface, while in extended dry periods, such as those caused by El Niño, it may drop by as much as 100 cm below the surface.

The depth of the water table plays a crucial role in determining the establishment and growth of trees within peat swamp forests. In response to these fluctuating conditions, peat swamp trees have evolved with specialized adaptations such as stilt roots, buttresses, and pneumatophores—roots that extend above the water's surface to enable the trees to access oxygen direct from the air. These adaptations are essential for the trees' survival and growth in the seasonally flooded conditions.

In 2016, RER planners identified specific locations on the Kampar Peninsula and Padang Island in a degraded and highly-degraded state due to past drainage, logging and fire. Logging activities involved cutting down large trees and creating a network of canals and extraction trails (rails) as timber transport routes out of the forest. The width of these canals varied from one to nine meters, with depths ranging from 50 to 150 centimeters. The presence of these canals caused the water table to drop, drying the peat surface and so increasing the risk of forest fires. An unseen effect of this surface drying is the increased oxidation and decomposition of organic peat, releasing carbon dioxide into the atmosphere. Globally, peat decomposition is a significant contributor to climate change.

To maintain peat moisture within normal seasonal fluctuations, RER has been working to close old drainage canals found across the landscape. On a larger scale, the goal of this effort is to rewet the peat and retain water during the dry season to minimize peat drying, oxidation, and peat subsidence, thus reducing the threat of fires and cutting carbon emissions into the atmosphere.

On Kampar Peninsula, there are 25 canals, totaling 137-km length and impacting 8,678 ha of forest. The RER team has constructed 80 dams since 2016 to block the canal drainage and re-wet the peat. That covers 129-km of the total canal length and has led to re-wetting of 8,159 ha (94%). Two canals remain open as part of a multi-year comparison study to better understand the seasonal peat soil water table changes caused by open drainage vs canal blocking. On Padang Island there are 14 canals totaling 65-km in length that impact an area of 3,966 ha. The RER team has constructed 7 dams on 5 canals, affecting 11-km which has led to the re-wetting of 1,200 ha (30%). The RER team inspects, maintains and repairs dams every year as required to account for settling, shifting and vegetation growth.

Progress	UoM	RKP			RPP		
		Target	Actual	%	Target	Actual	%
Total Canal Closure	Canal	25	23	92%	14	5	21%
Total Dam Installed	Dam	75	73	97%	42	7	31%
Sandbag	Dam	25	20	80%	14	4	29%
Felt	Dam	50	53	106%	28	3	32%
Dam Replacement	Dam	17	10	59%	4	4	100%
Dam Maintenance in 2024	Dam	73	73	100%	7	7	100%
Length	m	136,769	129,052	94%	64,960	11,169	17%
Impacted Area	Ha	8,678	8,159	94%	3,966	1,200	30%

Figure 10. Annual canal closures in RER. Corrected for miscalculations in the achievements of previous years.

To assess the impact of canal closure on the peat water table, water monitoring is conducted manually using dip-wells. These monitoring points are strategically placed across the landscape, from river edges to deep within the forest, with distances of several kilometers between each. The peat water table level is measured every one-to-three months. RER collects the data to monitor seasonal water table depth trends relative to monthly rainfall figures. The team has also installed 29 automatic recorders (level-loggers) from a total of 100 water table monitoring points in Kampar Peninsula and Padang Island, that constantly record water level fluctuations throughout RER to improve the quality of water level and peat subsidence monitoring data. Additionally, the RER team monitors river water levels in the Sangar and Serkap Rivers.

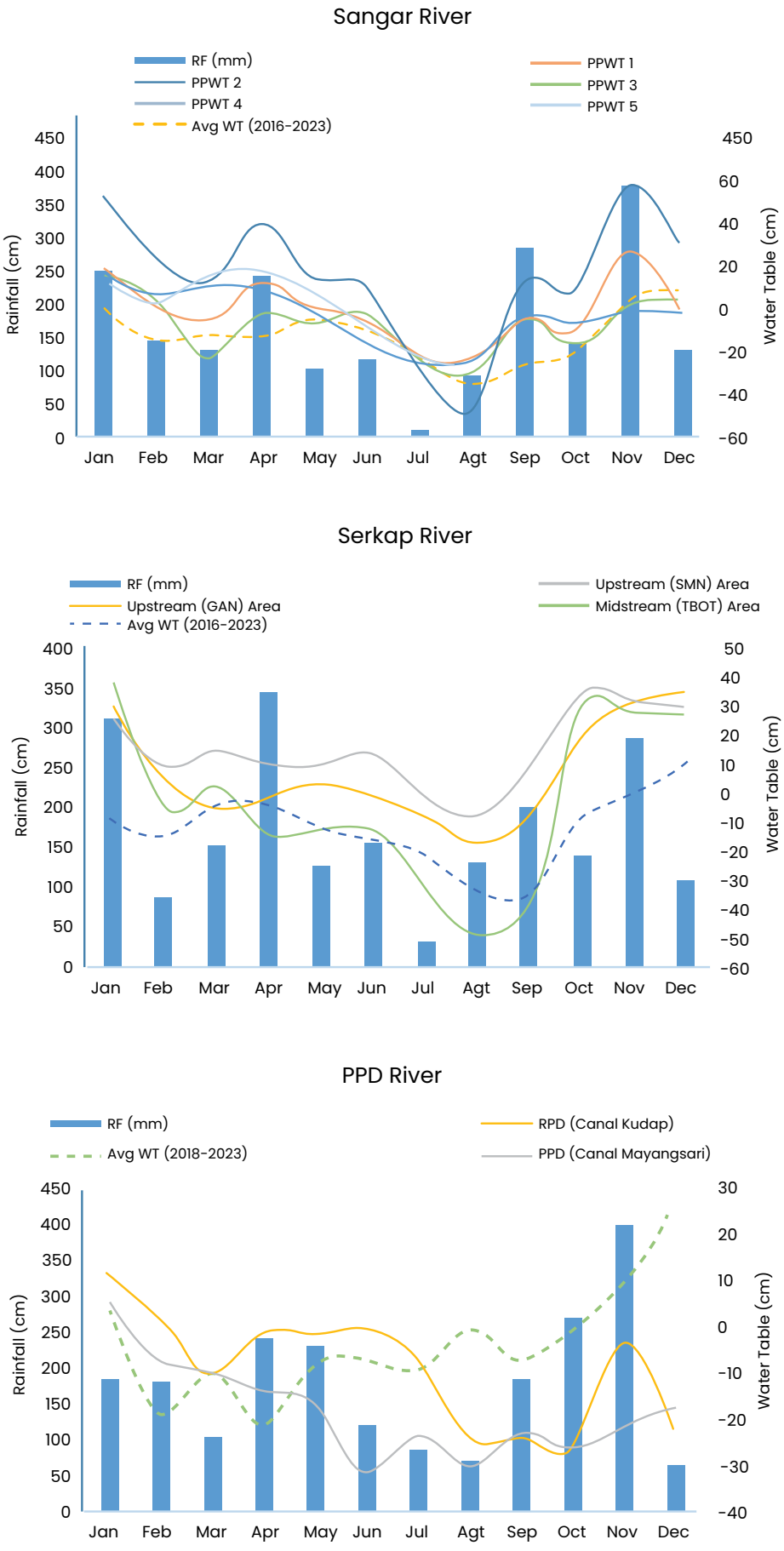


Figure 11. Water table in RER rivers

CASE STUDY

Innovations in Dam Construction

In 2024, RER evalutated the effectiveness of a new dam design using Fibre Reinforced Polymer (FRP). The design was developed by RER water management staff and the material is manufactured in Riau province. FRP is highly durable and well-suited for remote sites within the RER concessions where access is challenging. The modular structures are relatively easy to transport, making them particularly suited for hard-to-reach locations deep in the peat swamp forest, which can be 50 km from the nearest road.

FRP dams are composed of large (60cm x 30cm x 250cm), relatively lightweight (37 kg), hollow, modular boxes that can be transported two to three at a time in small boats. That makes them quicker and easier to mobilise compared to the traditional method of building dams using sandbags. These weigh around

30 kg each and at least 300 are needed for a 3-meter wide dam. RER can only transport 15 bags per trip in small river boats, so more than 20 trips are required per dam.

The FRP boxes are lighter because they are weighed down at the site with 450 kg of water and held in position by inter-locking with the adjacent boxes. One FRP block replaces the need for 15 sandbags and only 6 blocks are required for a 3m-wide dam. FRP has proved a more efficient solution for RER's hydro-restoration activities.

The RER team will continue testing the new material and dam designs in 2025. There are plans to construct two 10m-wide FRP dams. If the trial yields positive results, RER anticipates the widespread adoption of FRP as an effective and practical solution for canal blocking in RER's remote peatlands.

Aerial View of Serkap River

COMMUNITY

Community engagement is a cornerstone of our efforts to protect the forest from threats and promoting sustainable livelihoods across the Kampar Peninsula and Padang Island.

Field School (Sekolah Lapang) in Serapung Village

By enhancing local livelihoods and reducing community dependence on unsustainable resource extraction, we aim to create a model of forest stewardship that supports both the people and the environment.

Community engagement is a cornerstone of our efforts to protect the forest from threats and promoting sustainable livelihoods across the Kampar Peninsula and Padang Island. More than 55,000 people (BPS, 2024) live on the riverbanks and coastlines outside of the RER restoration concessions, so the participation and understanding of local communities is critical to the success of RER's mission to conserve biodiversity and promote the long-term health of the peat swamp forest ecosystem.

Located on the east coast of Sumatra, the RER program on the Kampar Peninsula directly contacts approximately 17,300 residents (BPS, 2024) in seven villages. The community primarily consists of Malay and Javanese peoples along with other ethnic groups who have migrated to the area in past decades. These communities depend on the environment, relying on a mix of agricultural activities and natural resources for their livelihoods. Their economic activities are dependent on the productivity of the land, rivers and commodity prices, making them adaptable and resourceful in their approach to income generation. Food harvests include rice, maize, betel nut, chili and other vegetables. Plantation activities are a significant income generator through the harvest of palm oil and rubber. Since the early 2000's White-nest Swiftlet (*Aerodramus fuciphagus*) birdnest harvesting has emerged as a new income source, with local communities constructing numerous multi-story birdhouses to harvest valuable nests.

Additionally, the region's peat swamp forests provide essential non-timber forest products such as fish, forest honey, and medicinal plants, further supporting local economies.

Situated off the east coast of Sumatra, 34,000 people (BPS, 2024) live on Padang Island in 20 villages. Here the RER program directly contacts approximately 12,500 residents in seven villages. The island is home to a rich cultural diversity, with indigenous Akit, as well as Malay, Banjar, Javanese, Batak, and Bugis communities. For decades, the primary sources of livelihood on Padang Island were rubber, sago, coconut plantations and timber harvesting, all of which have been integral to the island's economy since the 1960s. Agriculture and fishing continue to serve as sources of income for the island's residents.

Through our collaboration with these communities, RER works to promote sustainable practices that align economic well-being with the conservation of the last remaining blocks of peat swamp forest that RER is working to protect and restore. By enhancing local livelihoods and reducing community dependence on unsustainable resource extraction, we aim to create a model of forest stewardship that supports both the people and the environment.

Reducing Forest Threats and Empowering Communities, RER's Partnership with Tropenbos Indonesia

In the effort to reduce threats to the peat swamp forests of the Kampar Peninsula, RER has partnered with Tropenbos Indonesia (TI) to support community livelihood enhancement in Serapung Village. This program is designed to empower individuals and small farmer groups to transition from dependency on illegal logging toward other activities: organic agricultural for food security and tree plantations for cash crops.

Serapung Village, a small and isolated community of 2,200 residents, is located on the east coast of Serapung Island, which is itself 6-km off the east coast of the Kampar Peninsula. For decades, the residents have relied on timber harvesting from the Kuala Kampar islands and Kampar Peninsula for their boat building economy. As forests were depleted of their preferred tree species (Meranti, Kempas, and Bintangur) and industrial plantation concessions were developed, access to wood supply became more difficult. In 2016, Serapung received a 1,956 ha Village Forest license, from the Indonesian Ministry of Environment and Forestry (KLHK), located 14 km from the village in the interior of the Kampar Peninsula. However, the license did not allow for timber harvesting in the 6-10 meter deep peat. Despite this, illegal logging occurred in 2017-18.

To address this complex challenge, the RER-TI partnership set the goal of providing options for the community to shift to sustainable agriculture and plantation livelihoods on Serapung Island. Through this collaboration, the project aims to safeguard both the peat swamp forest and the economic stability of Serapung village.

Since September 2023, the community program has begun to transform livelihoods. Initial activities focused on understanding the needs of the community through Participatory Rural Appraisal—an internationally-recognized approach for incorporating the expertise and opinions of rural people in the management of development projects—as well as practical instruction on agriculture in acidic soils. The initial trials were productive and successful in gaining strong interest from the community. In 2024, the collaboration completed its first phase, contacting 149 individuals with hands-on training in organic rice and chili cultivation, the establishment of a cocoa seedling nursery, and the formation of a Women's Farmer Group.

The Field School for rice and chili cultivation graduated 48 farmers, with 40 men and 8 women completing the training. Meanwhile, 66 farmers participated in cocoa seedling nurseries, and 35 farmers joined the Woman's Farming Group comprised of 31 women and 4 men. Tropenbos also developed a Training of Trainers (TOT) program for 10 local farmers and one agricultural extension worker to reinforce and spread their knowledge and skills to others to ensure long-term sustainability of the program.

Through this training, participants demonstrated significant improvements in agricultural knowledge. Average pre- and post-test scores for rice and chili cultivation improved 57% and 68%, respectively. The technical training covered a broad range of sustainable farming practices, including microbial decomposers, bio-starter production, organic liquid fertilizer, and Integrated Pest Management (IPM) techniques to reduce chemical pesticide use. Additionally, the training emphasized vegetable cultivation for home gardens, providing families with nutritious food and a reliable source of income. The Woman's Farmer Group has improved their household economies through these small-scale and sustainable home-farming approaches.

The impact of the training has been significant. Over 400 ha of fields were historically cultivated for rice, but only 120 ha (30%) were growing rice using expensive chemical fertilizers and pesticides before the intervention. Through the Tropenbos training, an additional 21.59 ha is now being cultivated organically, applying less expensive IPM techniques to reduce pesticide use and improve soil health. The new rice farming techniques have increased yields by 45%—from 1.08 tons/ha to 1.57 tons/ha. Chili production has doubled with per plant yields increasing from 0.1-1.5 kg to 0.2-3 kg per plant. To diversify the community's land use and develop a future cash crop, community members learned cocoa cultivation techniques such as grafting and budding to improve local cocoa clones. The cocoa tree nursery now contains 12,500 seedlings, which are due to be planted on 52.5 ha of idle land. Two new Woman's Farmer Groups formed in 2024, with 19 and 16 members each. These groups have cultivated vegetables and chili in their home gardens, improving food security and bringing income to their households.

The involvement of village leaders has been crucial to the success of this project. Their active participation and leadership in the Participatory Rural Appraisal process contributed to transect surveys, focus group discussions and the socialization of the program. Their unwavering commitment and support have been instrumental in driving the initial program forward and assuring expansion in the years ahead.

Strengthening Segamai Village Forest Management

In 2024, RER completed year two of a five-year collaboration with the Segamai Village Forest Management Institution (LPHD). The purpose of the partnership is to secure their forest from illegal logging and other threats, achieve statutory compliance, and strengthen their capacity to manage and monitor forest resources.

Segamai village is located on the south bank of the Kampar River, more than 25 km from their 2,270 ha Village Forest license area in the interior of the Kampar Peninsula. The LPHD employs 6 Forest Rangers to guard and monitor the forest, one administrative accountant to handle purchases and finances, and one boat operator to safely transport staff more than 2-hours travel time from Segamai village to the Village Forest. LPHD also contracts local community members to provide goods and services such as transportation of building materials, supplies and labour for the construction of guard posts, tree planting, and assisting with forest monitoring. The LPHD achieved numerous important tasks in 2024 that demonstrate their motivation, determination and stewardship of the forest:

1. A second guard post constructed to ensure the safety and comfort of Rangers when on patrol in the remote, isolated and seasonally flooded peat swamp forest.
2. A tree nursery containing 475 native species seedlings for planting in degraded forest sites.
3. Planted 768 native tree seedlings to enrich species composition throughout the Village Forest.
4. With the assistance of five University of Riau forestry students, LPHD established 15 permanent vegetation plots to quantify tree species composition, above-ground biomass, annual growth and carbon content.
5. Mapping of forest density and condition class to prioritize location of restoration tree planting.
6. Measurement of 14 peat depth cores to quantify below-ground biomass and carbon content of the peat swamp forest.
7. Completion of a forest wildlife biodiversity study using 7 camera traps deployed for an average of 79 days each.
8. Completion of a four-day avian survey with RER ornithologists.
9. RER provided training on use of the SMART Patrol application using personal hand phones to digitally record observations of forest rangers while patrolling the forest.
10. RER accountants provided financial management training for 1 LPHD Administrative staff and 1 Accountant from Segamai village.
11. Purchase of forestry technical equipment to monitor and measure the forest and wildlife as well as firefighting equipment.
12. Initiation of multi-phase process for official boundary demarcation to establish the LPHD's tenure for the Village Forest.

13. RER conducted 11 technical trainings with LPHD staff on forest protection, forest monitoring, accounting and finance, website development and social media.
14. A website and Instagram account launched to promote the activities and accomplishments of the LPHD.
15. Land preparation and planting of 4 ha of bananas and 2 ha of rice in Segamai Village as LPHD's contribution to national food security for their village.

The Segamai Village Forest is generally in good condition with 2,000-ha (89%) of the total area in High to Medium density condition reflecting that past illegal logging between 2017 and 2022 had selectively removed large trees from 1,100-ha. This area can regenerate through natural reproduction of seed and seedlings. However, approximately 178-ha (8%) of the forest has been affected by more intensive logging and fire and this is where more active techniques to restore the forest are needed through tree planting and weed control. The remaining 75-ha is a beautiful natural peat water lake, Tasik Segamai, that has seen little or no human disturbance because of its isolation. The LPHD recognizes the value and sensitivity of this unique water body and the need to manage it with a precautionary approach to ensure the water quality is maintained and the fish population remains undisturbed by human intervention.

Nursery in Segamai Village Forest

Based on the vegetation surveys, 65 tree species have been identified in the Village Forest. Fifteen tree species are cultivated in the native tree nursery consisting of Meranti, Suntai, Matoa, Buni, and Durian and will contribute to the reforestation of degraded sites and enrichment throughout the forest.

Forest patrols occurred throughout the year, including the start of work on boundary demarcation and the installation of five signboards around the perimeter of forest to inform forest users that they are entering a protected Village Forest. The SMART Patrol system was implemented during the last half of the year and documented a total of 70-km of patrol coverage in the 11 x 1.5 km forest area. The constant patrols and consistent presence of the LPHD Rangers prevented new illegal logging from occurring in 2024. That had been a major problem during the previous six years.

In 2024, the LPHD purchased important technical equipment to monitor, measure and manage the forest. This included tree measurement equipment (diameter and height measurement); a drone for aerial photography and smoke monitoring; two GPS's for navigation; three level-loggers for water table monitoring; five camera traps for wildlife monitoring; a rainfall gauge to assess daily fire danger; and camping equipment for the rangers.

Biodiversity surveys identified an array of fauna and flora present within the Village Forest. Of 14 mammals, eight species are listed as globally threatened by the IUCN Red List, including the Critically Endangered Sumatran tiger (*Panthera tigris* ssp. *sumatrae*) and East Sumatran banded langur (*Presbytis percura*). Sixty-six birds were identified, 16 reptiles and amphibians, as well as 65 tree species. This demonstrates the unique biodiversity value of this small area of peat forest adjacent to the RER and underscores the importance of protecting it.

The partnership between RER and LPHD Segamai is a model for private sector collaboration with a Village Forest, under Indonesia's Social Forestry license program, that combines forest conservation

Tasik in Segamai Village area

with community empowerment. By focusing on forest protection, monitoring fauna and flora, and sustainable livelihoods, the initiative lays the groundwork for a resilient and sustainable future for the Segamai Village community.

Assuring Sustainable Fisheries

RER concessions on Kampar Peninsula contain four minor rivers—Kutup, Turip, Serkap and Sangar,—that meander and flow for tens of kilometers from the peat domes on the peninsula to the larger Kampar River. These side channels provide seasonal fishing grounds that are vital to the livelihoods of more than 40 families from the seven villages nearest to RER. The families' traditions and lifestyles are dependent with the health of the ecosystem and the productivity of the fisheries. Fishers travel from their village once or twice a month across the Kampar River and into the inner core of the peninsula to stay in small huts elevated above the highest water level. The huts are simple shelters, but effective to provide shade from the hot sun to rest, eat, sleep, and repair fishing nets and traps.

With more than 89 species of fish identified by biologists within the RER, the fishers may harvest up to 54 different species, depending on the season. Species such as Gabus, Baung, Lais, Toman, Tapah, and Tapah Koro are among the most sought after. Fish harvests are sold directly at local fish markets or to agents that supply demand throughout Riau province. RER also purchases fresh fish to serve to guests that visit our Eco-Research Camp located near the Serkap River.

In 2024, RER documented a fresh fish harvest from the Serkap and Sangar Rivers in RER of 7,009 kg and an additional 602 kg of dried fish. At 60-km, the Serkap is the longest of the four rivers on the peninsula and the most popular and productive. The Sangar River, at just 25-km length, is much narrower and difficult to access, representing less than 3% of the total fish harvest. The 2024 harvest of fresh and dried fish represents a 17% and 65% reduction, respectively as compared to 2023, which was a record year. However, this coincides with a 55% reduction in the number of entries (343) to the rivers by fishers as compared to 2023 (763). In the coming months, RER will investigate the reason for this drop. The area known as "Danau" on the Serkap River had the highest harvest and most fishers due to the wide basin and slow-moving waters at the heart of the peninsula.

RER's engagement with the local fishing community has been instrumental in promoting responsible fishing practices. Since 2016, RER has had a written agreement with Serkap Jaya Lestari (SJL), a traditional fishing group with 20 members that depends on the Serkap River for their livelihoods. The agreement prescribes the use of sustainable fishing practices and in return, RER assists in the form of fishing equipment and building materials to repair the fishers' huts. The SJL fishers have consistently complied with the agreement by not using electric shock or poisons to catch fish, and have also stopped the burning of vegetation along the river and improper disposal of plastic waste.

As a result, the Serkap River has become known by fishermen from other areas as a productive fishing ground. Since 2022, new fishers began entering the Serkap River because their previous fishing grounds elsewhere have become less productive. Not wanting to cause conflict, the head of SJL, Pak Bahtiar has agreed to an additional 20 fishermen on the Serkap River, but they must position themselves upstream and downstream from the 'zones' where SJL has established their traps and nets for many years. In 2024, RER negotiated a separate agreement with the new Tasik Guntung fishing group to comply with the same rules and procedures as SJL.

The success of the partnership with SJL, and now Tasik Guntung group, highlights the importance of integrating local knowledge with managed and monitored conservation efforts. By offering the fishers the proper tools and knowledge to fish responsibly, RER is fostering an environment where both the rivers and the communities dependent on them can thrive.

Because fish are the most important product that the communities harvest and depend on from the Kampar Peninsula, RER will be conducting additional fish surveys in remote river locations and lakes with the help of long-time partner and conservation NGO Fauna & Flora. RER also plans to hire an aquatics specialist to focus on improving the fishery management of the unique peat water ecosystem. The goal is to have robust monitoring systems that will help to identify potential issues and to jointly implement solutions to assure ongoing sustainable fish harvests into the future. Through these efforts,

RER is not only supporting the ecological health of the rivers, but also contributing to maintaining cultural traditions and the socio-economic stability of nearby communities.

Community Relations Program

The RER Community Relations program aims to have functional community structures that support the RER program to protect and restore the degraded forests on Kampar Peninsula and Padang Island.

RER focuses on education and works with the local communities to ensure that traditional activities like fishing and honey gathering can continue sustainably, that small businesses can thrive, and people are informed about the importance of protecting the forest environment and its biodiversity. RER seeks to demonstrate how conservation can contribute to economic prosperity from diversified employment and social benefits.

In 2024, the RER Community Relations Program engaged 18 villages across the Kampar Peninsula and Padang Island, fostering community well-being. It supported 170 events in 12 categories including sports and social events, religious gatherings, eco-education, clean and healthy living, agriculture and fish farming demonstrations, distribution of fishing equipment, and infrastructure support.

RER contracts to nine local entrepreneurs to provide labour supply and boats for transport on RER's rivers, contributing an average close to IDR 400,000,000 per month (over US$25,000) to the economy of these communities. And many community members work directly for RER. Half of the 71-member contracted Forest Ranger security team are from the Regencies in which RER is located. In addition, 54 people from the local communities are contracted as drivers and boat operators, or work in daily restoration and forest monitoring. RER also directly employs 20 full-time staff from the local villages as technical field supervisors.

RER ranger holding sustainable fishing equipment


SATRIA EFENDI
NIK: 04968

CASE STUDY

International Forestry Student's Association (IFSA) Visit to RER–Shaping Youth Perspectives

The IFSA Indonesia Restoration Tour was a collaborative program between the International Forestry Students' Association (IFSA) and APRIL-RER between October 27 and November 3, 2024. The initiative aimed to provide IFSA members with hands-on experience in peatland restoration and conservation. Participants included 10 IFSA students from Universitas Gadjah Mada (UGM), IPB University, and Universitas Hasanuddin (UNHAS), along with two students from Universitas Riau and Universitas Lancang Kuning.

During the visit to RER, the students engaged in various activities designed to enhance their understanding of the APRIL2030 sustainability initiatives. They gained insights into peatland ecosystem management, the techniques and results of greenhouse gas emissions monitoring, and the significance of community partnerships in restoration projects. Additionally, the program encouraged the development of public awareness initiatives, such as social media campaigns and educational webinars to highlight the importance of RER's conservation efforts.

At RER's native tree nursery, students learned about methods for growing seedlings from cuttings, seed and natural regeneration to actively restore highly degraded lands that were drained, intensively logged and burned prior to the RER program. They were taught about how the nursery cultivates more than 50 different native tree species including Meranti Bakau, Pelawan, and Terentang. A key component of the program was experiencing active restoration, where students prepared land for planting Meranti (*Shorea teysmaniana*) seedlings by clearing weeds, preparing the soil, preserving seedling root structure and tagging the seedling for later monitoring of survival and stocking.

A unique experience was the tour of the Greenhouse Gas Flux Tower, a 48-meter structure that continuously monitors carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) fluxes from the peat ecosystem. Not only did the students climb the tower for a dramatic view above the peat swamp forest tree canopy, they held lively discussions with APRIL's peatland

International Forestry Student's Association (IFSA) with RER operational team in RER Kampar Peninsula

IFSA member in Sangar River Ranger Post

A key highlight of the program was a visit to the Serkap River to meet and have discussions with the leader of the local fishing group, Pak Bahtiar, who transitioned from illegal logging to sustainable fishing with RER's support. The IFSA students gained insights on how RER's community relations activities can balance environmental protection with economic stability, reinforcing the importance of collaborative conservation efforts.

Prior to visiting RER, the IFSA group toured APRIL's Riau Complex, including the RGE Technology Center, Kerinci Tissue Culture Lab, Kerinci Central Nursery, Paper Mill, and Solar Panel facility.

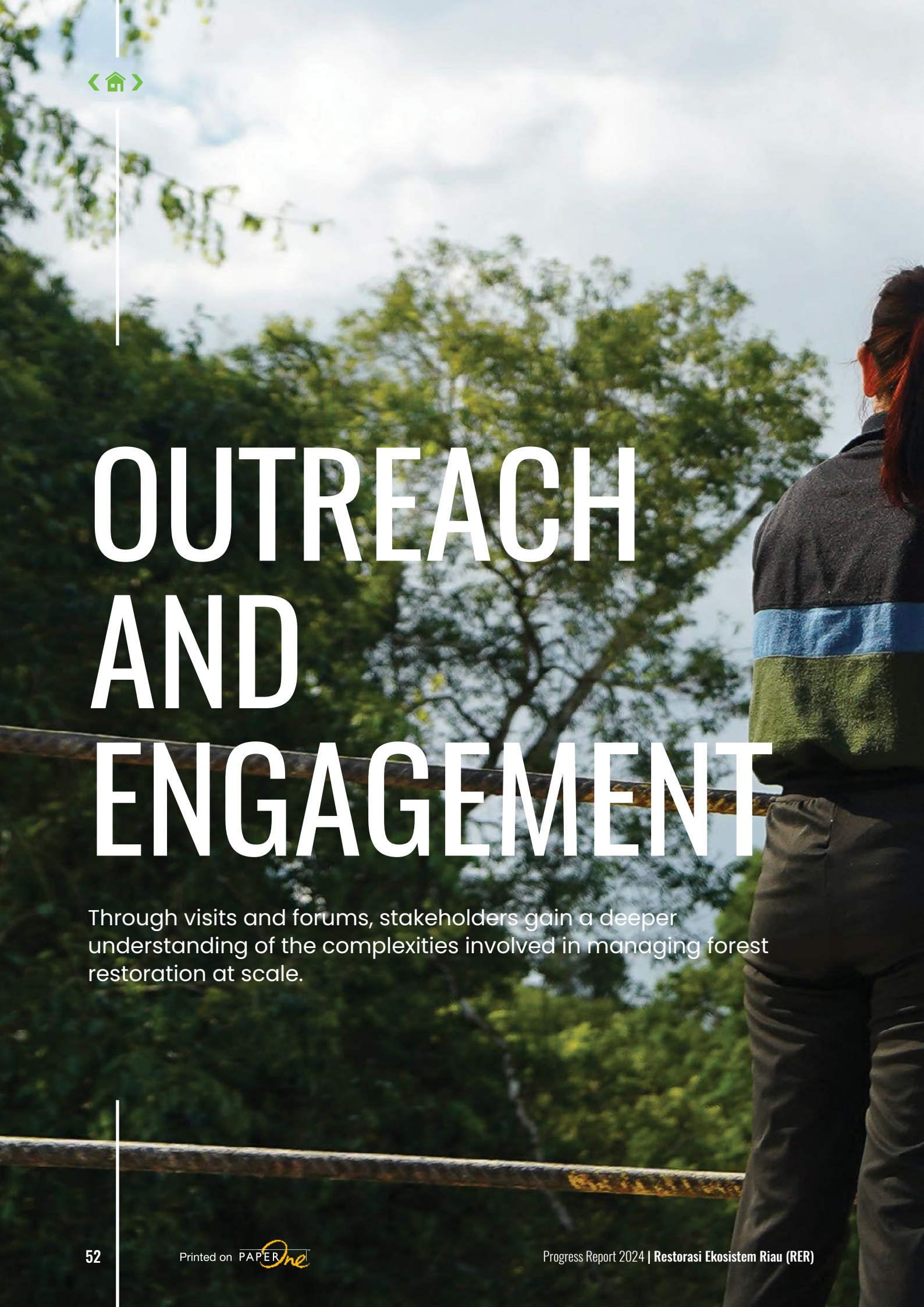
The IFSA Indonesia Restoration Tour provided an invaluable experience for participants, equipping them with practical knowledge, scientific insights, and a deeper appreciation for peatland conservation. By fostering awareness and active participation, the program contributes to the next generation of environmental leaders committed to sustainable restoration and biodiversity protection.

science experts. Participants gained valuable insights into GHG measurement techniques and the importance of science-based approaches for obtaining complete and accurate data in order to find solutions to mitigate global climate change.

Hydrological restoration was another focus of the program, with delegates observing various examples of RER's canal-blocking program to prevent drainage and restore peat water levels to natural seasonal fluctuations. By constructing sandbag dams to block water flow in old drainage canals, RER is maintaining peat moisture, which is key to minimizing peat subsidence, oxidation and drying that can otherwise lead to peat fires. Re-wetting peat soils is essential for the recovery of natural vegetation that contributes to long-term peat accumulation, as well as carbon sequestration and storage.

Wildlife conservation efforts were also highlighted through activities such as camera trapping and wildlife monitoring. Delegates installed infrared motion-sensitive camera traps to observe key species like the Malayan sun bear (*Helarctos malayanus*) and Sumatran tiger (*Panthera tigris* ssp. *sumatrae*), learning how these tools contribute to long-term biodiversity research. Additional sessions covered peat core sampling, tree growth monitoring, and discussions on sustainable forest management.

IFSA member planting native tree seedling



OUTREACH AND ENGAGEMENT

Through visits and forums, stakeholders gain a deeper understanding of the complexities involved in managing forest restoration at scale.

Nyoman Iswarayoga, APRIL Group Head of External Affairs and RER Communication, showcased RER's commitment through a screening of the documentary Frontier Sumatra at IPB University.

In 2024, RER welcomed over 200 visitors from across the globe, providing them with firsthand exposure to our work and detailed insights into biodiversity research at RER and the realities of operational implementation.

Field Visits

RER works closely with international and local forest conservation experts, integrating their specialized knowledge with valuable insights from local communities, government agencies, and adjacent forest concessionaires. This inclusive approach ensures that conservation efforts are coordinated, responsibilities are shared, and stewardship of the peat swamp forest is optimized for generations to come.

On-the-ground knowledge is invaluable for understanding the complexities and challenges of ecosystem restoration and experiencing the unique beauty of RER's peat swamp forest. In 2024, RER welcomed over 200 visitors from across the globe, providing them with firsthand exposure to our work. Visits include dedicated stops at key facilities like the Eco-Research Camp, "Peat Lab", remote guard posts, a native tree nursery and RER's 48m-tall greenhouse gas flux monitoring tower. They can also stop at the blocked canal.

These visits catered to a broad range of stakeholders consisting of our customers, financial institutions, civil society organizations, academics and other business partners. Their motivations and interests varied from observing restoration and conservation activities and enjoying remote river kayaking trips, to conducting operational safety evaluations and exploring potential business collaborations.

External Engagement

RER actively engaged with national and international audiences throughout 2024, sharing expertise and raising awareness about our restoration program. Key engagements included:

1. Indonesia Biodiversity Week, May 15-17, 2024, in Jakarta. RER Ecologist, Muhammad Iqbal, presented an overview of RER's environmental restoration and conservation initiatives.
2. The 5th International Summer Course on Forestry and Environment, August 8, 2024 at IPB University, Bogor. Nyoman Iswarayoga, APRIL Group Head of External Affairs and RER Communication, showcased RER's commitment to protecting over 150,000 hectares of unique peatland landscape through a screening of the documentary movie Frontier Sumatra.
3. Sustainably Speaking: Biodiversity, September 25, 2024 in Singapore. Brad Sanders, Head of Operations at RER, presented a special screening of Frontier Sumatra to the Singapore Fashion Council, highlighting RER's conservation work.
4. Peatland Restoration at the Indonesia Pavilion in COP 29 UNFCCC, November 19, 2024, in Baku, Azerbaijan. Dian Novarina, Director of PT Gemilang Cipta Nusantara (RER) concession shared RER's unique approach to production forest management.
5. 10th Asian Wetland Symposium, November 25, 2024, in the Philippines. Dian Andi Syahputra, RER Conservation Supervisor, presented a research paper on the "Activity Patterns of Small Carnivores in Peat Swamp Forest Sites at Kampar Peninsula and Padang Island, Sumatra."
6. Towards a Haze-Free Southeast Asia: Mobilizing Resources for Sustainable Land Management, November 26, 2024, in Jakarta. Brad Sanders participated in a policy dialogue hosted by the ASEAN Secretariat and CIFOR, the Center for International Forestry Research and World Agroforestry, addressing issues related to fire management and sustainable financing for restoration.

Dian Novarina, Director of PT Gemilang Cipta Nusantara (RER) concession, shared RER's unique approach to production forest management at COP 29 UNFCCC in Baku, Azerbaijan.

CASE STUDY

RER Conservation Supervisor Honored at 10th Asian Wetland Symposium

RER is proud to announce that Dian Andi Syahputra, a dedicated member of our conservation team since 2018, received recognition at the 10th Asian Wetland Symposium (AWS), held in the Philippines from November 25-28, 2024. The gathering, which happens every 3 years, unites stakeholders from 18 Asian nations, including government representatives, NGOs, experts, local communities, and the public. The 2024 edition was themed "Wetland-based Solutions".

Dian's expertise in Sumatran peat swamp ecology was showcased in his presentation to the Wetland Biodiversity Session titled: "Activity Patterns of Small Carnivores in Peat Swamp Forest Sites at Kampar Peninsula and Padang Island, Sumatra." Drawing from RER's extensive camera-trapping research conducted between 2020 and 2023, his presentation described the vital ecological roles played by these under-studied species in peat swamp ecosystems. The study revealed consistent nocturnal activity patterns for three small carnivores within RER: the Small-toothed palm civet (*Arctogalidia trivirgata*), Malay civet (*Viverra tangalunga*), and Sunda leopard cat (*Prionailurus javanensis*).

Competing with presenters from nations such as the Philippines, Korea, Japan, and Malaysia, Dian's mammal-focused research stood out. His comprehensive methodology and unique subject matter generated considerable enthusiasm, highlighting the growing recognition of the importance of mammal species within wetland ecosystems.

At the conclusion of the symposium, Dian was awarded the "Best Presenter".

Dian Andi Syahputra, RER Conservation Supervisor, was awarded the prestigious title of "Best Presenter" during the symposium.

The RER Conservation Supervisor presented a research paper titled 'Activity Patterns of Small Carnivores in Peat Swamp Forest Sites at Kampar Peninsula and Padang Island, Sumatra.

FINANCIAL SUMMARY

In USD ('000)

No	Description	2013-2019	2020	2021	2022	2023	2024
1	Employees	4,305	1,214	1,176	1,254	1,479	**1,804**
2	Total Operational & Overhead Costs	4,414	959	1,468	1,390	1,564	**1,618**
3	Legal and License Costs	8,150	237	179	183	208	**199**
4	Partnerships*	5,002	154	430	336	230	**1,138**
5	Advisory Board	190	-	-	64	63	**60**
6	Capex	2,691	1,953	110	483	225	**438**
Total		**24,752**	**4,517**	**3,364**	**3,710**	**3,769**	**5,257**

* Dependent on the phasing of the implementation of agreed activities

Serkap River vegetation

www.rekoforest .org
OfficialRER
RER_Riau
RER_official
Restorasi Ekosistem Riau (RER)