

Conservation of Southeast Portion of North Selangor Peat Swamp Forest (Phase 2): Bukit Belata (Ext) Forest Reserve (BBEFR) and Raja Musa Forest Reserve (RMFR)

A Summary of the Semi-Annual Progress Report from June to November 2024

1. Introduction

The Global Environment Centre (GEC) successfully executed the Phase 1 Recovery Project of Bukit Belata (Extension) Forest Reserve (BBEFR) (3,140 ha) in collaboration with Prosper Capital Holdings Sdn Bhd, Selangor State Forestry Department (SSFD), and Komuniti Warisan Hutan Sungai Tenggi Selatan (KWHSTS) from March 2020 to September 2023. During the Phase 1 project implementation, a range of conservation and restoration measures have been put into action, including development of a rehabilitation plan and strategies for degraded peatland areas in BBEFR, initiation of restoration process in degraded portions of Forest Compartment (FC) FC1, FC2, FC3, FC4, FC 5, FC 24, FC 25, FC 37, and FC 38, rewetting and rehabilitation of more than 244 ha of degraded peatlands in BBEFR, prevention of fires, and establishment of an informal community-based organization called KWHSTS. However, it is crucial to maintain continuous monitoring and follow-up in order to achieve optimal results in terms of conservation and rehabilitation. In consideration of this, the Phase 2 project was initiated from October 2023 to September 2026 (3 years) to continue and expand the Recovery Project by adding 4,000 ha of the adjacent Raja Musa Forest Reserve (RMFR), resulting in a cumulative recovery project area of 7,140 hectares for both phases (see **Figure 1**). The Phase 2 project will continue the implementation of the previous conservation efforts and strengthen the involvement of stakeholders and the local community in the management of priceless North Selangor Peat Swamp Forest (BBEFR and RMFR). This brief report describes the progress of the activities conducted from June to November 2024 according to the project implementation plan.

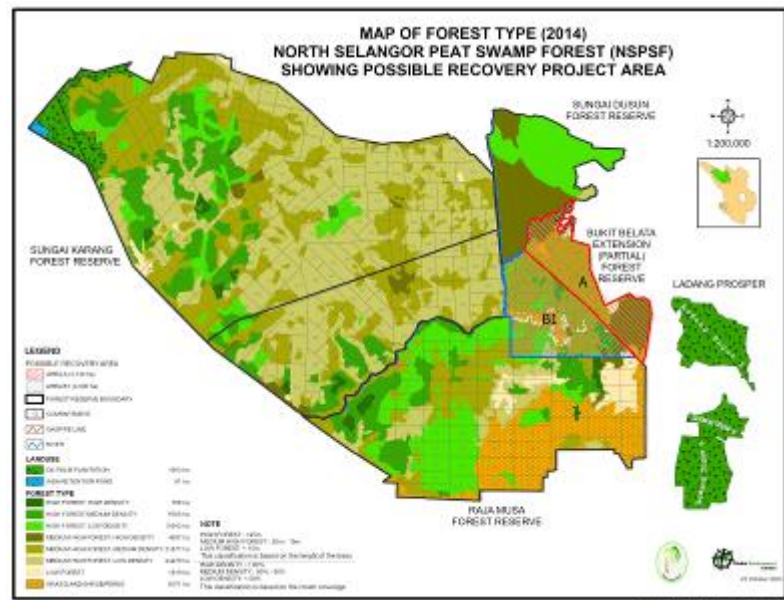


Figure 1. Phase 1 Project Site (A) and Phase 2 project site (B1+A) in relation to the location of the three nearby plantations (Ladang Tagar) partly owned by Prosper.



2. Progress of the activities according to the project implementation plan from June to November 2024

The following table outlines the progress of the activities from June to November 2024 according to the project implementation plan:

Code	Activity	Progress and accomplishment of the activities
Objective 1: To maintain and expand conservation measures for peat swamp and lowland forest at BBEFR and RMFR		
Act 1.1 & Act 1.2	<p>Undertake appropriate assessments in the expansion area in RMFR to identify issues related to peat, fire incidents, water management, biodiversity, etc. (Act 1.1)</p> <p>Undertake forest cover, status and wildlife monitoring in BBEFR and RMFR and adjacent buffer zone to assess conservation value (Act 1.2)</p>	<ul style="list-style-type: none"> Two rapid flora assessments were conducted in FC 3 (peat swamp forest) and FC 23 (lowland forest) of the BBEFR using the Quadrat System Survey methodology to document tree species diversity and conservation status. A total of 15 tree species were recorded, with key species identified include <i>Polyalthia sclerophylla</i> (Near Threatened) in FC 3 and <i>Shorea macroptera</i> (Endangered) and <i>Gluta spp</i> (Near Threatened) in FC 23, highlighting the ecological importance of these compartments for conserving species adapted to distinct soil ecosystems while supporting targeted conservation and management strategies. (Table 1; Figure 2)
Act 1.4 & Act 2.7	<p>Revegetation – tree planting using pioneer and high-quality species at the degraded areas (Act 1.4)</p> <p>Develop livelihood activities that can generate side income for KWHSTS members (Act 2.7)</p>	<ul style="list-style-type: none"> In 2024, the KWHSTS community nursery at Felda Sungai Tengi Selatan cultivated 1,450 trees, with 257 were planted in degraded areas of FC 25 in BBEFR and Dataran Alam, Felda Sungai Tengi Selatan. The nursery specializes in native species crucial for ecosystem restoration, including <i>Melicope lunu-ankenda</i> and <i>Syzygium myrtifolium</i>. The nursery's contributions support forest restoration, biodiversity conservation, and provide sustainable income opportunities for KWHSTS members through nursery maintenance and tree planting activities. (Table 2; Figure 3)
Act 1.6	<p>Undertake regular patrolling, fire prevention and water table monitoring in the project area</p>	<ul style="list-style-type: none"> From June to November 2024, KWHSTS members conducted regular patrolling and monitoring activities in BBEFR. The trained KWHSTS members maintained daily records of hydrology conditions, potential fire risks, and signs of encroachment. Canal blocks showed positive impact on water table levels: FC 3 averaged +6.9 cm, while FC 25 recorded +13.0 cm and +8.6 cm. These improved hydrological conditions, monitored through piezometers strategically placed across BBEFR and adjacent areas, enhanced peat moisture content and significantly reduced fire susceptibility. The patrol team's vigilance and systematic monitoring approach resulted in zero fire incidents and encroachment cases during this period, demonstrating the effectiveness of community-based forest protection strategies. (Figure 4)



Code	Activity	Progress and accomplishment of the activities
Objective 2: To enhance engagement of smallholders and adjacent landowners to help them improve their productivity and protect the Recovery Project site.		
Act 2.2 & Act 2.6	Carry out an assessment to explore options for welfare and livelihood enhancement in addition to the maintenance of adjacent recovery project area including non-timber forest products etc. (Act 2.2) & Register the KWHSTS officially with the Registrar of Societies (ROS) in Selangor and support operations (Act 2.6)	<ul style="list-style-type: none"> The community baseline survey for KWHSTS provides critical insights into socioeconomic conditions, livelihood challenges, and community involvement, forming a foundation for evidence-based interventions under the Phase 2 Prosper project. The survey results align project interventions with both community needs and conservation goals of BBEFR and RMFR while advancing SDGs such as poverty reduction, climate action, and biodiversity conservation. This evidence-based approach ensures measurable social impacts alongside environmental achievements. (Figure 5)
Act 2.3 & Act 2.5	Provide training based on sustainable livelihood development and management for the purpose of empowering smallholders and local communities for their active participation (Act 2.3) & Conduct stakeholder workshop (FGDs) on peatland management with SSFD, CFS CBOs and other relevant stakeholders (Act 2.5)	<ul style="list-style-type: none"> The Community Network Learning Forum held in Ipoh, Perak, empowered KWHSTS members and other CBOs with essential skills. The three-day forum engaged 25 KWHSTS members in interactive learning sessions, featuring successful case studies from established CBOs in ecotourism and conservation enterprises. Site visits to thriving community projects provided practical insights into sustainable business models and conservation strategies. (Figure 6) GEC's participation as a jury for the Jalur Gemilang Flag Display and Vegetable Gardening showcased sustainable practices in Felda Sungai Tengi Selatan. The initiative involved villagers implementing space-efficient gardening techniques, with participants demonstrating innovative approaches to organic farming and composting. The competition's evaluation criteria emphasized sustainable practices, measuring both cultivation success and environmental impact reduction.
Objective 3: To enhance stakeholder engagement and integration of the Recovery Project with the broader landscape including North Selangor Peat Swamp Forest		
Act 2.5 & Act 3.2 & Act 3.5	Conduct stakeholder workshop (FGDs) on peatland management with SSFD, CFS CBOs and other relevant stakeholders (Act 2.5) & Contribute to the development and implementation of IMP for NSPSF 2024-2033 (Act 3.2) &	<p>Stakeholder engagement enables Prosper project implementation through strategic partnerships with government agencies, securing approvals and resources for conservation initiatives.</p> <ul style="list-style-type: none"> On 1st July 2024, GEC conducted a crucial meeting with Department of Mineral and Geosciences of Malaysia's (JMG) leadership team to secure geological data for IMP NSPSF 2024-2033. The discussion covered comprehensive aspects of peatland formation, including interglacial period



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	Facilitate Junior Peatland Forest Ranger Programme with the participation of primary schools from Kuala Selangor and Hulu Selangor District - conduct a centralized training camp and a talk for JPFR schools (Act 3.5)	<p>development and stratigraphic characteristics of Malaysian peatlands. JMG Director and team shared technical insights on tube well installation, sustainable yield identification, and pumping tests, ultimately granting GEC access to their geological database through a formal online portal request.</p> <ul style="list-style-type: none"> ▪ The 2nd August 2024 meeting with Kuala Selangor District Education Officer focused on advancing environmental education through the PFR Programme. Assistant District Education Officer Pn. Farah Wahidah reviewed the programme's impact across 21 primary and secondary schools since 2021. The meeting resulted in enthusiastic endorsement for continued implementation, recognizing the programme's effectiveness in raising environmental awareness and fostering community engagement in peatland conservation. ▪ The strategic SSFD-SMPEM meeting on 5th August 2024 brought together key forestry officials to discuss IMP development and rehabilitation activities at FC 23, FC 44, and FC 52. Deputy Director En. Amsari and the SMPEM team established frameworks for district-level stakeholder engagement and planned the IFAD mid-term review visit. The discussion clarified MoU extension requirements and coordination needs for future rehabilitation activities. ▪ The 26th November 2024 consultation with Hulu Selangor District Forest Office focused on finalizing management zones for IMP NSPSF 2024-2033. District Forest Officer Pn. Veronica Justin and team reviewed field assessment findings from July 2024 and evaluated proposed management strategies. The meeting secured critical information for implementation planning and received strong endorsement for the draft management approach, reinforcing stakeholder commitment to NSPSF conservation. (Figure 7)
Act 3.1	Initiate dialogues with potential stakeholders, partners and experts on the implementation of the project activities, awareness creation activities and events.	<ul style="list-style-type: none"> ▪ On 25th June 2024, GEC contributed to the Felda Sustainable Economy Roadmap Workshop by sharing its expertise in biodiversity conservation and community engagement, highlighting the creation of green jobs through the KWHSTS community nursery and forest patrolling programs, which support forest rehabilitation and align economic development with environmental sustainability. (Figure 8)
Act 3.1 &	Initiate dialogues with potential stakeholders,	<ul style="list-style-type: none"> ▪ The RMIT student visit to FC 25, BBEFR on 28th August 2024 showcased successful peatland



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Act 3.5	<p>partners and experts on the implementation of the project activities, awareness creation activities and events. (Act 3.1) &</p> <p>Facilitate Junior Peatland Forest Ranger Programme with the participation of primary schools from Kuala Selangor and Hulu Selangor District - conduct a centralized training camp and a talk for JPFR schools. (Act 3.5)</p>	<p>rehabilitation through public-private partnership. The visit demonstrated Prosper's impact through comprehensive restoration strategies, including water monitoring systems and community patrol programs implemented by KWHSTS. Students engaged in hands-on activities like peat soil analysis, water level monitoring, and tree planting of 30 Kerdas trees. The site visit highlighted how corporate investment has accelerated conservation outcomes through technical expertise and sustainable funding. Interactive sessions showcased the FDRS system, biodiversity monitoring through camera traps, and community nursery operations, emphasizing the successful integration of corporate resources with community-led conservation approaches. (Figure 9)</p> <ul style="list-style-type: none"> ▪ On 19-20th November 2024, Monash University's visit to RMFR engaged 16 staff and 115 students in field-based learning. Students conducted peat soil assessments, hydrological monitoring, and tree planting of 120 native species. They studied water quality measurements, canal block effectiveness, and groundwater monitoring techniques. At GEC's CoSPeC, participants learned about Nature-Based Solutions and collaborative conservation efforts. This immersive experience showcased RMFR's role as a living laboratory for peatland management and climate action, blending academic learning with practical conservation approaches.
Act 3.2	<p>Contribute to the development and implementation of IMP for NSPSF 2024-2033</p>	<ul style="list-style-type: none"> ▪ The first draft of the IMP NSPSF 2024–2033 was developed and submitted to the SSFD on 8th November 2024. This comprehensive draft integrates extensive data from Prosper project Phases 1 and 2, including successful peatland rehabilitation strategies, hydrological management approaches, and community engagement models. The draft incorporates scientific findings from long-term monitoring of water tables, peat subsidence, and biodiversity indicators. Key inputs included literature reviews, field investigations, community surveys, and stakeholder consultations. The draft particularly emphasizes evidence-based management strategies drawn from successful pilot sites in NSPSF, documented fire prevention systems, and proven community-based conservation approaches. This milestone submission awaits SSFD feedback for further refinement. (Figure 10)



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Act 3.4	Provide input to the review of the Hulu Selangor District the local plan, IRBM Sungai Tengi Plan and Selangor State Forestry Department Plan	<ul style="list-style-type: none"> GEC provided significant input to the Sungai Tengi Basin IRBM Plan through two workshops, sharing comprehensive data from BBEFR and RMFR conservation efforts. Technical contributions included hydrological monitoring results, fire prevention strategies, and community-based approaches through KWHSTS. The first workshop (June 2024) focused on water supply, environmental conservation, legal frameworks, and community engagement. Discussions incorporated successful peatland management practices and buffer zone strategies from the Prosper project. The second workshop (July 2024) refined action plans with detailed budgets and KPIs, emphasizing ecosystem resilience and water quality improvements. GEC's field assessment data and restoration outcomes significantly shaped the final IRBM framework, particularly in sustainable watershed management strategies. (Figure 11)
Act 3.7	Organise tree planting event to commemorate international events (e.g. World Wetlands Day or World Environment Day) with engagement of Prosper employees	<ul style="list-style-type: none"> Prosper hosted a significant stakeholder visit to BBEFR on 11th October 2024, attended by 32 participants from Asahi Breweries, Prosper, KWHSTS, GEC, and SSFD. The site visit showcased successful 5R rehabilitation strategies implemented since 2020, highlighting improved forest cover through rewetting and community-led fire prevention. At FC 25, participants observed restoration progress, including wildlife presence evidenced by sun bear markings. The visit featured active participation through planting 45 native species and demonstrated KWHSTS's crucial role in monitoring and conservation. This engagement strengthened stakeholder relationships while emphasizing the effectiveness of community-driven peatland restoration in achieving both ecological and socioeconomic objectives at BBEFR and RMFR. (Figure 12)

3. Pictorial report of the activities implemented from June to November 2024

Table 1. Flora found in FC 3 and FC 23 of BBEFR.

No.	Local Name	Scientific Name	Forest Compartment		IUCN Status
			3	23	
Tree Species					
1.	Kelat	<i>Eugenia spp</i>	3	9	LC
2.	Medang	<i>Actinodaphne glabra</i>	1		LC
3.	Mempisang	<i>Polyalthia sclerophylla</i>	4		NT
4.	Nyatoh	<i>Sapotaceae sp.</i>	2		LC
5.	Terentang simpoh	<i>Camposperma coriaceum</i>	14		NE
6.	Damar hitam	<i>Richetia spp</i>		2	LC
7.	Kedondong	<i>Burseraceae sp.</i>		3	NE
8.	Keledang	<i>Artocarpus lanceifolius Roxb</i>		1	NE
9.	Kulim	<i>Dysoxylum spp</i>		1	LC
10.	Meranti melantai	<i>Shorea macroptera</i>		1	EN
11.	Nyatoh	<i>Sapotaceae sp.</i>		2	LC
12.	Penarahan	<i>Gymnacranthera bancana</i>		1	LC
13.	Petaling	<i>Ochanostachys amentacea</i>		1	LC
14.	Rengas	<i>Gluta spp</i>		1	NT
15.	Sesenduk	<i>Endospermum spp</i>		1	LC
Non-tree Species					
1.	Kelubi	<i>Eleiodoxa conferta</i>			NE
2.	Mengkuang	<i>Pandanus artocapus</i>	√		NE
3.	Pakis	<i>Diplazium esculentum</i>	√		LC
4.	Pakis miding	<i>Stenochlaena palustris</i>		√	LC
5.	Periuk kera	<i>Nepenthes spp</i>		√	*
6.	Pinang raja	<i>Cyrtostachys renda</i>		√	LC
7.	Rotan	<i>Calameae spp</i>		√	*
8.	Sireh hutan	<i>Piper aduncum</i>	√		LC
9.	Pepanjat	<i>Gnetum microcarpum</i>	√		LC

Note: Category IUCN Red List: Not Evaluated (NE); Least Concern (LC); Near Threatened (NT); Vulnerable (VU); Endangered (EN); Critically Endangered (CR); * Not sure because the species is not identified.



Figure 2. *On the right:* Meranti melantai (*Shorea macroptera*) with a DBH of 37.0 cm and a height of 12.0 meters. *On the left:* Sesenduk (*Endospermum spp*) with a DBH of 48.8 cm and a height of 20.0 meters both trees in FC23, BBEFR.

Table 2. Details of peat swamp forest species cultivated in the KWHSTS Nursery

No.	Species	Sown				Died	Saplings planted at FC 25, BBEFR	Saplings planted at Dataran Alam, Felda Sungai Tengi Selatan	Saplings sold as souvenirs to Felda	Total no. of balance trees in KWHSTS nursery
		Jan 2024	May 2024	Sept 2024	Dec 2024					
1	Tenggek Burung	200	200	200	100	40	70	70	10	510
2	Kelat paya	100	200		300	10	50	30		510
3	Kerdas			50			15	2		33
4	Landscape trees			100		20		20		60
Total			1,450			70	257		10	1,113
Total no. of current trees in the nursery (December 2024): 1,113										



Figure 3. The tree saplings and ornamental plants raised in KWHSTS Nursery

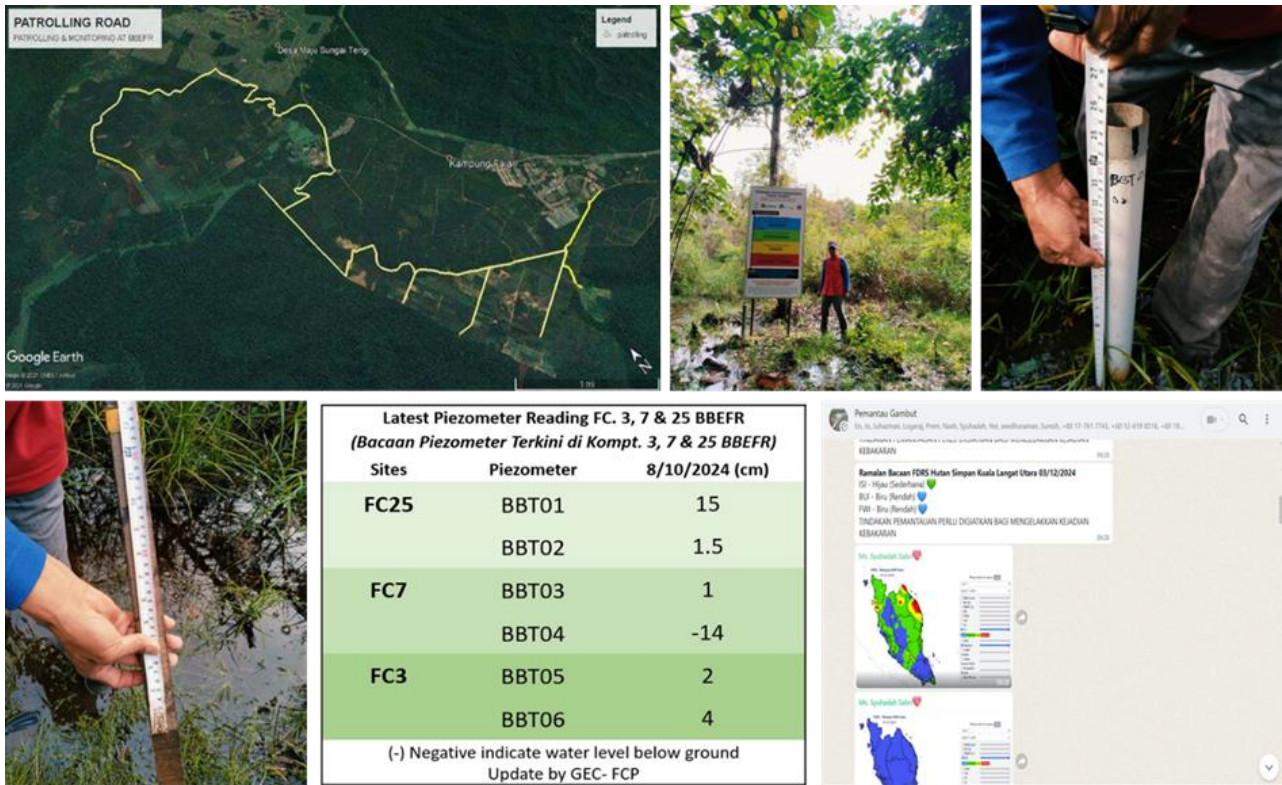


Figure 4. The patrolling of forest compartments and water table monitoring at FC 3, FC 7, and FC 25, BBEFR by the KWHSTS patrollers



Figure 5. The conducting of the community baseline survey to KWHSTS by the GEC officers



Figure 6. Community Network Learning Forum



Figure 7. Stakeholder meetings and engagements regarding the implementation of project activities



Figure 8. GEC participation during the Felda's Sustainable Economy Roadmap Workshop 2024



Figure 9. Field visit of RMIT students to BBEFR highlighting its unique mix of mineral and peat swamp forests and showcasing successful rehabilitation efforts since 2020 with local community involvement



Figure 12. Prosper stakeholder visit to FC 25, BBEFR

Note: A comprehensive progress report detailing the implementation of the aforementioned activities from June to November 2024 has been prepared and submitted to Prosper. This brief report serves as a summarized version of the full progress report.