

EXECUTIVE SUMMARY

High Conservation Value (HCV) assessment for Ulu Kalumpang Forest Reserves Complex Sustainable Forest Management Project Area (UKFRC) were carried out 12–17th October 2014 and 7–12th December 2015. The main objective of this assessment is to enhance relevant information on the HCV elements within the UKFRC project area. The assessment was carried out by a multidisciplinary team with experienced assessors from various fields. Generally, there were 4 HCV elements which were elaborated for UKFRC area and they overlap each other almost 100 % (Box 1 & Map 1). Thus, demarcation of boundary for every HCV elements to be redundant in the field but informative signage should be established in many strategic areas that frequently communed by member of public. Appropriate management and monitoring actions have been recommended and discussed with the management team of UKFRC for further actions to be undertaken.

The entire project area is gazetted as protected areas (HCV 1.1). All reserves contained endemic, endangered or prohibited species of flora and fauna (HVC 1.2 & 1.3). One of the forest unit, Madai-Baturong FR, contains important large nesting habitat of for troglifauna especially in the limestone karst system. Through the analysis of the many species recorded, 97% of the species have yet to be assigned IUCN status and not much research work has been conducted on such species, especially within the flora group. Therefore, by looking at the current condition of the UKFRC area, it is essential for actions to be taken in setting the entire area for conservation, consisting of lowland forest below 200 m in elevation and freshwater swamp habitats with the aim to preserve the species diversity and also taking into account of species that are unique to particular forest types (HCV 3). It is recommended that further studies should be done in understanding and documenting the rich flora and fauna diversity within UKFRC area.

On a landscape level (HCV 2), Ulu Kalumpang, Mt Wullersdorf and Madai-Baturong FRs, including Tawau Hills Park, do not only provide habitats for the fauna but also acts as a transient wildlife migratory pathway between the southeast forested area into the greater central forest area in Ulu Segama Malua project area through Sabah Softwood Sdn Bhd agroforestry area.

Most of UKFRC boundaries are commonly shared with oil palm estates, local communities and other stateland. Thus, periodic patrolling and surveillance is required adamantly. The Sustainable Forest Management (SFM) Division of Sabah Forestry Department has prepared a Forest Fire Management Plan to develop and manage the detection, prevention and eradication of forest fire in the UKFRC. A 100 m band inside PSSFM boundary that possessed very low vegetation structure should be identified and carried out extensive forest restoration activities with the objective to provide barriers from fire from adjacent areas. This is in line with the main objective of the project area management plan to enhance forest structural condition and tree diversity through various activities, design specifically for conservation purposes, especially on forest restoration and the silvicultural treatment on schedule blocks which were mentioned in the FMP.

Box 1: The followings are the findings of HCV elements in Ulu Kalumpang Forest Reserves Complex Sustainable Forest Management Project Area and the management and monitoring recommendations for each HCV.

HCV	Findings	Management Prescription	Monitoring
1.1	Ulu Kalumpang and Mt Wullersdorf are Class I Protected Forest, whereas Kalumpang and Madai-Baturong are Class VI	<ul style="list-style-type: none"> Conduct periodic patrolling and surveillance in all accessible HCV areas to curb illegal activities such 	<ul style="list-style-type: none"> Periodic monitoring and control should be carried out to prevent encroachment in all accessible HCV attributes.

	Virgin Jungle Reserve. The entire UKFRC is categorised as HCV 1.1.	as encroachment and poaching.	Any signs of encroachment should be reported and dealt with immediate actions.
1.2	The presence of high number of high conservation significant fauna and flora from both past research findings and the recent HCV assessment may conclude that UKFRC is an important natural plant habitat or for wildlife nesting and foraging habitats.	<ul style="list-style-type: none"> • Establish a long term biodiversity monitoring system for critical forest ecosystem, flora and fauna. • Migratory pathway of key wildlife species, i.e. Bornean pygmy elephant, tembadau and other keystone species on accessible roads, along streams or wildlife trails in the project area should be marked on the map. In addition, clear signage should be installed on strategic location to inform road, trail and river users to ensure wildlife are able to use them for movement within and between forest reserves. 	<ul style="list-style-type: none"> • Periodical monitoring of forest ecosystem health once every three years by conducting re-enumeration of all the trees in the permanent sample plots to obtain indication of changes in tree structure and species assemblages (HCV 1.2, 1.3, 2 & 3). • Periodical monitoring of endangered, and endemic fauna species will be practiced using appropriate methodology. Any changes in terms of population count or migratory pathways observed by either researchers or ground staffs, the management team must be alerted. Similarly, this monitoring prescription also applies to endangered and endemic plant that are recorded in the PSPs or nature trails (HCV 1.2, 1.3 & 2).
1.3	The presence of high number of endemic fauna and flora from both past research findings and the recent HCV assessment may conclude that this FMU unit is an important natural plant habitat or for wildlife nesting and foraging habitats.	<ul style="list-style-type: none"> • Establish a long term biodiversity monitoring system for critical forest ecosystem, flora and fauna. • Migratory pathway of key wildlife species, i.e. Bornean pygmy elephant, tembadau and other keystone species on accessible roads, along streams or wildlife trails in the project area should be marked on the map. In addition, clear signage should be installed on strategic location to inform road, trail and river users to ensure wildlife 	<ul style="list-style-type: none"> • Periodical monitoring of forest ecosystem health once every three years by conducting re-enumeration of all the trees in the permanent sample plots to obtain indication of changes in tree structure and species assemblages (HCV 1.2, 1.3, 2 & 3). • Periodical monitoring of endangered, and endemic fauna species will be practiced using appropriate methodology. Any changes in terms of population count or migratory pathways

		are able to use them for movement within and between forest reserves.	observed by either researchers or ground staffs, the management team must be alerted. Similarly, this monitoring prescription also applies to endangered and endemic plant that are recorded in the PSPs or nature trails (HCV 1.2, 1.3 & 2).
1.4	The limestone karst in Madai-Baturong FR is an important nesting site for swiftlet, bats and other troglofauna. The lowland mixed dipterocarp and limestone vegetation is categorised as HCV 1.4 to protect troglofauna habitat.	<ul style="list-style-type: none"> • Conduct periodic patrolling and surveillance in all accessible HCV areas to curb illegal activities such as encroachment and poaching. • 	<ul style="list-style-type: none"> • Periodic monitoring and control should be carried out to prevent encroachment in all accessible HCV attributes. Any signs of encroachment should be reported and dealt with immediate actions.
2	The management indicates that Ulu Kalumpang, Mt Wullersdorf and Madai-Baturong forest reserves are categorised as HCV 2 due to their location to form part of continuous forested landscape to support high conservation value species in Sabah, eg. Pygmy elephant, orang utan, tembadau, etc.	<ul style="list-style-type: none"> • Conduct periodic patrolling and surveillance in all accessible HCV areas to curb illegal activities such as encroachment and poaching. • Migratory pathway of key wildlife species, i.e. Bornean pygmy elephant, tembadau and other keystone species on accessible roads, along streams or wildlife trails in the project area should be marked on the map. In addition, clear signage should be installed on strategic location to inform road, trail and river users to ensure wildlife are able to use them for movement within and between forest reserves. 	<ul style="list-style-type: none"> • Periodic monitoring and control should be carried out to prevent encroachment in all accessible HCV attributes. Any signs of encroachment should be reported and dealt with immediate actions. • Periodical monitoring of forest ecosystem health once every three years by conducting re-enumeration of all the trees in the permanent sample plots to obtain indication of changes in tree structure and species assemblages (HCV 1.2, 1.3, 2 & 3). • Periodical monitoring of endangered, and endemic fauna species will be practiced using appropriate methodology. Any changes in terms of population count or migratory pathways observed by either researchers or ground staffs, the management team must be alerted. Similarly, this monitoring

			<p>prescription also applies to endangered and endemic plant that are recorded in the PSPs or nature trails (HCV 1.2, 1.3 & 2).</p> <ul style="list-style-type: none"> • Long term monitoring of the FMUs landscape using remote sensing technology to be conducted once every five years to detect changes within the reserve and also vicinity areas. If threats are detected, precautionary approach will be taken and potential mitigation measures will be incorporated in the management plan
3	<p>The management indicates that the forested areas below 200 m a.s.l of seasonal freshwater swamp and mixed dipterocarp, including association of limestone vegetation and kerangas forest with the mixed dipterocarp forest within UKFRC are important forest ecosystem and categorised as HCV 3</p>	<ul style="list-style-type: none"> • Establish a long term biodiversity monitoring system for critical forest ecosystem, flora and fauna. 	<ul style="list-style-type: none"> • Periodical monitoring of forest ecosystem health once every three years by conducting re-enumeration of all the trees in the permanent sample plots to obtain indication of changes in tree structure and species assemblages (HCV 1.2, 1.3, 2 & 3).
4.2	<p>All areas with slopes $>25^\circ$ and 30 m riparian buffer strips should be categorised as HCV 4.2 for their importance in erosion control.</p>	<ul style="list-style-type: none"> • No major infrastructure development on erosion risk area. 	<ul style="list-style-type: none"> • Ensure no major infrastructure to be developed in high erosion risk area.
4.3	<p>A 100 m band of moderate to high forest structure inside the project area that border local communities land and oil palm estate are categorised as HCV 4.3</p>	<ul style="list-style-type: none"> • The Forest Fire Management Plan has to be updated periodically (HCV 4.3). Identification of low vegetation structure that is susceptible to catch fire, i.e. grasslands and shrubs along the 100 m band inside the FMU boundaries is crucial. The identified vegetation will be planned for restoration activities. 	<ul style="list-style-type: none"> • Ensure that all fire prevention procedures (monitoring, fire drills, public awareness campaign and etc) to be practiced on a regular basis (at least once a year) especially during the drought season.

