



Summary of the findings

SURVEY OF FOREST QUALITY, FLORA & FAUNA, AND PEAT SOILS IN KAMPAR PENINSULA AND PADANG ISLAND FOREST AREAS, RIAU, SUMATRA

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This study deals with ecological condition of peat swamp forests in Kampar Peninsula and Padang Island (Pulau Padang) in the province of Riau, Sumatra, Indonesia. It was conducted to produce basic data to help decision making regarding the faith of these forests. A current issue threatening their existence is an expansion plan of Riau Andalan Pulp and Paper (RAPP), part of an Indonesian-owned pulp and paper company, APRIL. APRIL plans to convert much of the forests in these areas into acacia plantation that would feed its pulp mill. The present study focuses on the planned expansion area of APRIL (fig. 1).

The research was conducted between December 2004 and February 2005. The team leader of ecological research was Mr. Jonotono, MSi, a professional forester with extensive experience of forests in Riau. Besides the ecological rapid survey dealt with in this paper, also a study of social conditions and attitudes towards the APRIL expansion plan covering 11 villages that would be affected was conducted by the Jikalahari team.

Methods

The main method of gathering data on forest structure and plant species was by making study plots. Location of these plots was chosen before entering the forest based on satellite images; the plots were chosen so that they would represent average forests in the assessed areas. Number of seedlings and trees were counted and the volume of the larger trees (of 20 cm in diameter or more) assessed from 20 m × 20 m study plots or their subplots (26 plots made in Kampar Peninsula, 10 in Padang Island). The methodology is described in detail appendix 1; plot locations and measurements are summarized in appendix 2. All the larger tree species that could be identified were recorded. The method used is a standard procedure by foresters in Indonesia in rapid assessments of forest quality and commercial potential. Measurements of peat thickness were made on 59 locations using a bore — including the vegetation plots and 23 additional points without forest cover mostly in Padang Island. Structure of the forests was observed outside the study plots as well, and information on fauna and flora was collected from local people.

This study is a rapid survey, but it nevertheless provides detailed data, gives a general picture of the condition of forests in the area, and makes management recommendations possible.

Results of vegetation survey in the peat swamp forests

Both the Kampar Peninsula –area (fig. 2 & 3) and Padang Island (fig. 4) are covered with peat swamp forest and with a zone of mangrove forests on the sea coast. The study area of Kampar peninsula remains by and large forested, roadless area, whereas in Padang Island significant deforestation and road construction has occurred. The vegetation study plots in both areas were situated in logged-over areas. The forests were still in relatively good condition ecologically despite continuing illegal logging in the area. Various tree species typical to climax peat

swamp forest are still found and possess a high economic value as timber. The list of tree species recorded in the study plots are given in tables 1 and 2.

In Kampar Peninsula study plots, with a joint area of 1 ha, 35 species of trees were recorded. In Padang Island 26 species of trees were found in the study plots totalling 0.4 ha. This agrees well with a previous study by Jonotero (2004), in which 76 species of tree were recorded from the adjoining Pelalawan peat swamp area. In the Kampar area they include such protected species as *Gonystylus bancanus*, *Dyera costulata* and *Crystostachys renda*. According to the global red list of endangered trees, six tree species classified as endangered were found and in addition one nearly threatened and one conservation dependent. *Shorea platycarpa* found in the Kampar study plots is classified as critically endangered globally. Important fruit-producing trees for animals include *Tetramerista glabra*, *Dialium induum* and *Durio carinatus*.

According to the government policy, only forest areas with a timber potential under 20 m³/hectare should be converted into timber plantations. The average timber potential was clearly higher in the study area than this figure, 74 m³/ha and 75 m³/ha for Kampar Peninsula and Padang Island respectively, including many economically important species. This means that forests in these areas are viable and should be maintained as natural forests and not converted to other uses.

The crown coverage varied but was in average 40%. According to information by the locals, about six kilometers inland of the Kampar Peninsula very good quality forests exist (for instance from point N 00⁰ 44' 19,0": E 102⁰ 35' 56,5 " inland). This is supported by the fact that no rivers flow through this area and it is thus uninhabited and not easily accessible.

Fauna

The lists of fauna recorded either by the team directly or based on data from the locals are given in tables 3 and 4. They include such globally endangered species as critically endangered Sumatran tiger (*Panthera tigris sumatrensis*) with frequent sightings from the locals, clouded leopard (*Neofelis nebulosus*), Indian tapir (*Tapirus indicus*) and pig-tailed macaque (*Macaca nemestrina*). Also endangered and CITES I classified golden arowana fish (*Scleropages formosus*) was reported to be present in the area. Villages close to forest areas that have experienced recent conversion report problems of animal pests, for instance pigs, monkeys and tigers, entering villages and destroying cultivations and livestock. Conversion of large tracts of the forests would probably cause more such pest problems as these animals lose their natural habitat and are forced out of the forest.

Peat

The peat thickness was recorded from 59 points (see appendix 2, fig. 1-4). The pH varied from between 3,5 and 5. The thickness varied from 0 to over 4,5 meters. In general it was over three meters. Areas with thinner peat soil were situated mostly very close to the sea or river shore. These results are consistent with a peat thickness map of Wetlands International (fig. 5 & 6) except for Padang Island, where higher values were obtained in this study. This kind of deep peat soils are ecologically fragile, prone for degradation and generally poor for agricultural or plantation development. Since Indonesian law states that areas with a peat soil thicker than 3 meters should be protected as peat swamp protection forests, it is obvious that these areas should be given a protection status which excludes any conversion.

In case the areas of deep peat soils dry up as a result of extensive forest degradation, conversion and canal construction, the risk of fire becomes large. In Padang Island, where such degradation has happened at parts, locals have lost much of their crops to fires (e.g. at N 01⁰10'09,3 : E 102⁰27'08,3"). Falling water levels will also prevent cultivation of sago palm, an important crop for the local population.

Mangrove

A belt of mangroves 50-500 meters wide exists along the sea coast. However, due to extensive logging large trees are mostly lacking there. Tree species are typical of mangroves in Indonesia including *Avicenna officinalis*, *Sonneratia alba*, *Bruguiera* spp. and *Xylocarpus* spp. The logging and conversion of mangroves should be put into halt, since mangroves serve many important ecological functions. They act for instance as spawning grounds for fishes and protect cultivation of locals from intrusion of sea water.

Illegal logging and road construction

Illegal logging is rampant in the area. Loggers take out ramin, meranti, kempas, punak, mendarahan, balam, medang, mersawa and sindur from the area using canals. However, due to government attempts to eradicate illegal logging, the intensity of these activities is decreasing.

At the port construction site owned by RAPP (coordinate N 00⁰49'21,8" : E 102⁰23'57,3"), roads and canals have been built along the riverside. This has apparently facilitated locals to burn forests on the right and left side of the road, possibly to establish fields. The canals are also used to transport logs cut by the locals. Unfortunately, neither government nor RAPP has solved this problem. Similarly in Padang Island, roads constructed by an oil company (PT. Kondur Petroleum) have caused forest fires directly as well as indirectly by drying and opening up the forest areas and facilitating access of outsiders (for instance at N 01⁰01'51,8 : E 102⁰19'43,0").



Conclusions

1. In general, the peat soil in the studied areas is thicker than three meters.
2. The forest condition and tree potential are relatively good.
3. There is still high diversity of flora and fauna.
4. There is great deal of intensive and destructive activity going on in the forests such as illegal logging, land fire and other activities.

Recommendations

1. These forest areas should be preserved as natural forests to function as protected peat swamp forests and wildlife reserves.
2. Swift action should be taken to rehabilitate damaged, deforested areas.
3. Strict sanctions should be imposed towards those companies that break the law and cause forest destruction in the area; all illegal, forest-destroying activities should be stopped.



Table 1. Trees found at Kampar Peninsula study plots.

Botanical name	Vernacular name	Family	IUCN status
<i>Aglaia rubiginosa</i>		Meliaceae	NT
<i>Alstonia pneumatophora</i>	pulai rawa	Apocynaceae	LC/NA
<i>Anisoptera costata</i>	mersawa	Dipterocarpaceae	EN
<i>Artocarpus</i> sp	terap	Moraceae	
<i>Calophyllum soulatri</i>	bintangur	Guttiferae	LC/NA
<i>Camptosperma coriaceum</i>	terentang	Anacardiaceae	LC/NA
<i>Cratoxylum arborescens</i>	gerunggang	Guttiferae	LC/NA
<i>Dacryodes</i> sp	kedongdong	Burseraceae	
<i>Dialium induum</i>	kuranji	Leguminosae	LC/NA
<i>Durio carinatus</i>	durian burung	Bombacaceae	LC/NA
<i>Dyera costulata</i>	jelutung	Apocynaceae	LC/NA
<i>Diospyros</i> sp	arang-arang	Ebenaceae	
<i>Eugenia</i> sp	jambu-jambu	Myrtaceae	
<i>Ganua mottleyana</i>	bengku	Sapotaceae	LC/NA
<i>Gonystylus bancanus</i>	ramin	Thymeleaceae	VU
<i>Horsfieldia grandis</i>	mendarahan	Myristicaceae	LC/NA
<i>Knema</i> sp	mendarahan	Myristicaceae	
<i>Koompassia malaccensis</i>	kempas	Leguminosae	CD
<i>Litsea</i> sp	medang	Lauraceae	
<i>Macaranga hypoleuca</i>	mahang	Euphorbiaceae	LC/NA
<i>Melanorhoea wallichii</i>	rengas	Anacardiaceae	LC/NA
<i>Mizzetia</i> sp	pisang-pisang	Annonaceae	
<i>Myristica iners</i>		Myristicaceae	LC/NA
<i>Palaquium burkii</i>	balam	Sapotaceae	LC/NA
<i>Palaquium sumatranum</i>	balam	Sapotaceae	LC/NA
<i>Parartocarpus venenonus</i>		Moraceae	LC/NA
<i>Santiria laevigata</i>	lalan	Burseraceae	LC/NA
<i>Shorea ovalis</i>	meranti merah	Dipterocarpaceae	LC/NA
<i>Shorea platycarpa</i>	meranti merah	Dipterocarpaceae	CR
<i>Shorea teysmaniana</i>	meranti rawa	Dipterocarpaceae	EN
<i>Shorea uliginosa</i>	meranti merah	Dipterocarpaceae	VU
<i>Swintonia penangiana</i>	rengas	Anacardiaceae	LC/NA
<i>Tetramerista glabra</i>	punak	Theaceae	LC/NA
<i>Vatica pauciflora</i>	resak rawa	Dipterocarpaceae	EN
<i>Xylopia</i> sp	pisang-pisang	Annonaceae	



Table 2. Trees found at Padang Island study plots.

Botanical name	Vernacular name	Family	IUCN status
<i>Aglaia rubiginosa</i>		Meliaceae	NT
<i>Alstonia pneumatophora</i>	pulai rawa	Apocynaceae	LC/NA
<i>Artocarpus</i> sp	terap	Moraceae	
<i>Calophyllum soulatri</i>	bintangur	Guttiferae	LC/NA
<i>Camptosperma coriaceum</i>	terentang	Anacardiaceae	LC/NA
<i>Cratoxylum arborescens</i>	gerunggang	Hypericaceae	LC/NA
<i>Dacryodes</i> sp	kedongdong	Burseraceae	
<i>Dialium induum</i>	kuranji	Leguminosae	LC/NA
<i>Dyospiros</i> sp	arang-arang	Ebenaceae	
<i>Eugenia</i> sp	jambu-jambu	Myrtaceae	
<i>Horsfeldia grandis</i>	mendarahan	Myristicaceae	LC/NA
<i>Knema</i> sp	mendarahan	Myristicaceae	
<i>Koompassia malacensis</i>	kempas	Leguminosae	CD
<i>Litsea</i> sp	medang	Lauraceae	
<i>Macaranga hypoleuca</i>	mahang	Euphorbiaceae	LC/NA
<i>Melanorhoea wallichii</i>	rengas	Anacardiaceae	LC/NA
<i>Mizzetia</i> sp	pisang-pisang	Annonaceae	
<i>Myristica iners</i>		Myristicaceae	LC/NA
<i>Palaquium burkii</i>	balam	Sapotaceae	LC/NA
<i>Palaquium sumatranum</i>	balam	Sapotaceae	LC/NA
<i>Parartocarpus venenonus</i>		Moraceae	LC/NA
<i>Santiria laevigata</i>	lalan	Burseraceae	LC/NA
<i>Shorea teysmaniana</i>	meranti rawa	Dipterocarpaceae	EN
<i>Shorea uliginosa</i>	meranti merah	Dipterocarpaceae	VU
<i>Tetramerista glabra</i>	punak	Theaceae	LC/NA
<i>Xylopia</i> sp	pisang-pisang	Annonaceae	

Table 3. List of animals recorded from Kampar Peninsula. *-marked were observed by research team directly.

Local name	English name	Scientific name	IUCN status
Harimau	Sumatran tiger	<i>Panthera tigris sumatrensis</i>	EN (species) CR (subspecies)
Beruang putih dada	Sun Bear	<i>Helarctos malayanus</i>	DD
Harimau dahan	Clouded leopard	<i>Neofelis nebulosa</i>	VU
Rusa	Rusa deer	<i>Cervus timorensis</i>	LC/NA
Ular sanca	Reticulated python	<i>Python reticulatus</i>	LC/NA
Babi hutan	Wild pig	<i>Sus scrofa</i>	LC/NA
Monyet ekor panjang*	Long-tailed macaque	<i>Macaca fascicularis</i>	NT
Beruk*	Pig-tailed macaque	<i>Macaca nemestrina</i>	VU
Siamang *	Siamang	<i>Hylobates syndactylus</i>	LC/NA
Kancil *	Lesser mousedeer	<i>Tragulus javanicus</i>	LC/NA
Burung Enggang*	Rhinoceros hornbill	<i>Buceros rhinoceros</i>	NT
Burung Murai batu *			
Burung murai daun*			
Burung Raja udang*	Stork-billed kingfisher	<i>Pelargopsis capensis</i>	LC/NA
Burung balam*			
Burung elang*			
Burung punai tanah*			
Burung gagak*			
Ikan gabus*	A species of snakehead	<i>Channa spp.</i>	LC/NA
Ikan arwana	Golden arowana	<i>Scleropages formosus</i>	EN
Ikan tomang*			
Ikan baung *	Southeast Asian river catfish	<i>Mystus nemurus</i>	LC/NA
Ikan sepat*	A species of gourami	<i>Trichogaster spp.</i>	LC/NA
Ikan lais*			
Buaya air asin *	Saltwater crocodile	<i>Crocodylus porosus</i>	LC/NA

Table 4. List of animals recorded from Pulau Padang. *-marked were observed by research team directly.

Local name	English name	Scientific name	IUCN status
Beruang madu	Sun bear	<i>Helarctos malayanus</i>	DD
Ular sanca	Reticulated python	<i>Python reticulatus</i>	LC/NA
Babi hutan	Wild pig	<i>Sus scrofa</i>	LC/NA
Monyet ekor panjang*	Long-tailed macaque	<i>Macaca fascicularis</i>	NT
Beruk*	Pig-tailed macaque	<i>Macaca nemestrina</i>	VU
Burung Murai batu *			
Burung murai daun*			
Burung Raja udang*	Stork-billed kingfisher	<i>Halcyon capensis</i>	LC/NA
Burung balam*			
Burung elang*			
Burung punai tanah*			
Burung gagak*			
Ikan gabus*			
Ikan sepat			

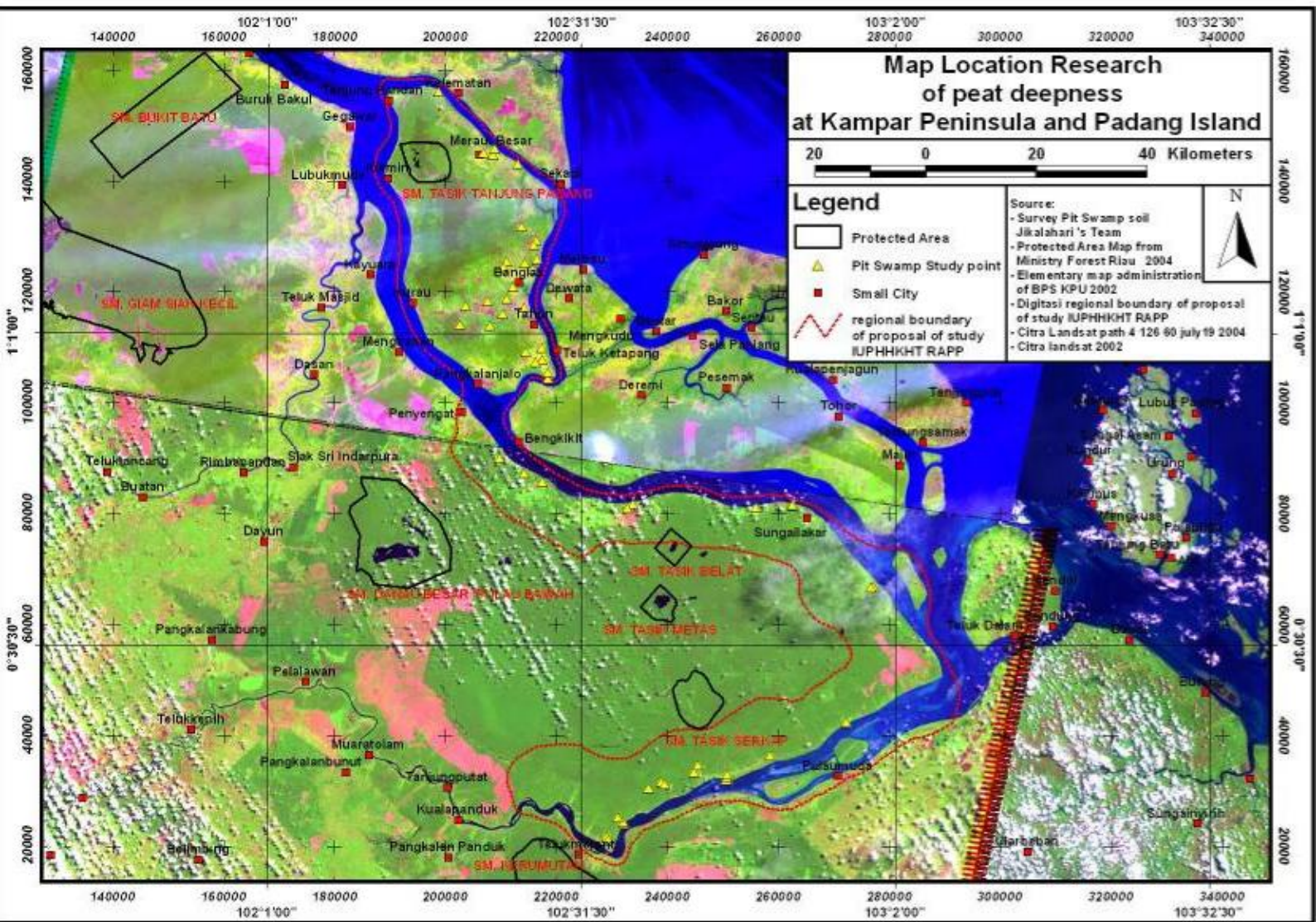


Figure 1. A satellite image –based map of Kampar Peninsula and Padang Island, with APRIL’s concession marked with red line. Yellow triangles are peat measurement points. Dark green is natural forest, light green secondary forest or bush, yellow open areas, pink recent land clearing and blue water. The large clearing in the left is APRIL’s previous concession area Pelalawan, cleared between 2002 and 2004.



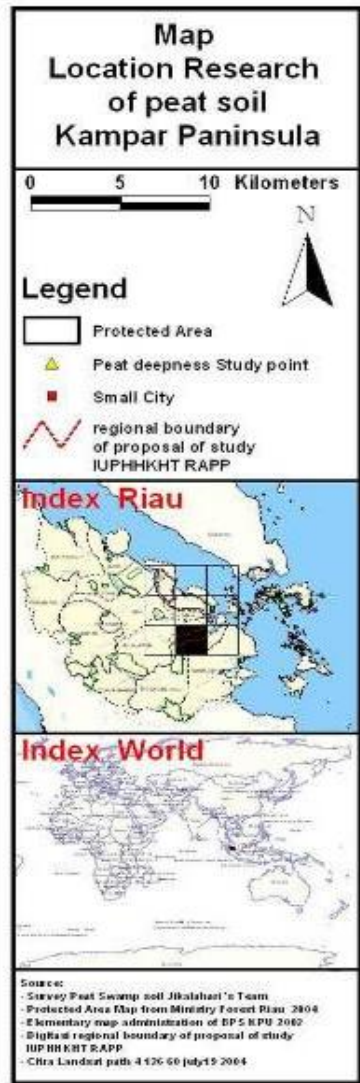
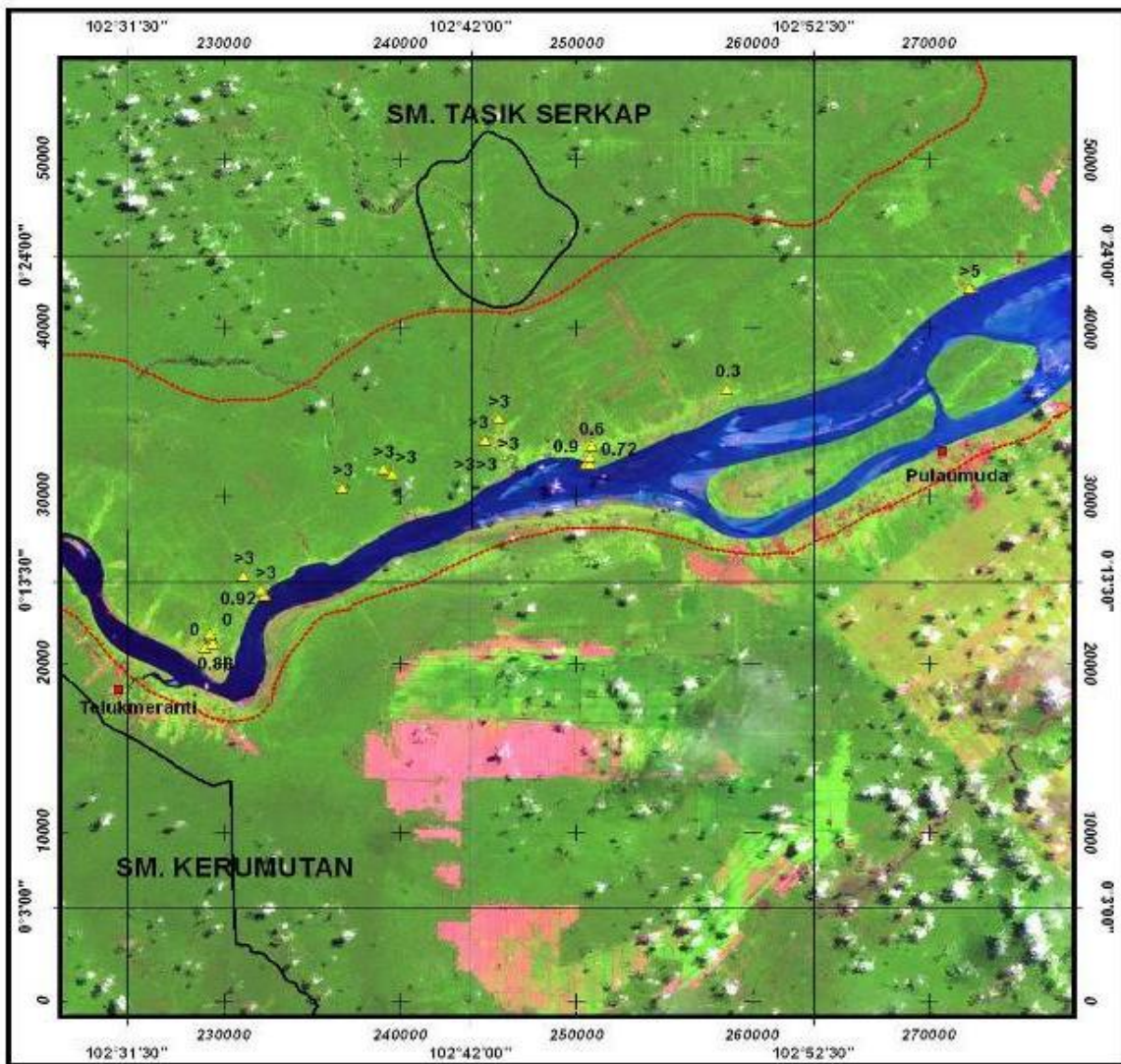


Figure 2. A satellite image –based close-up map of southern Kampar Peninsula, with APRIL’s proposed concession marked with red line. Yellow triangles are peat measurement points given with measured peat thickness.



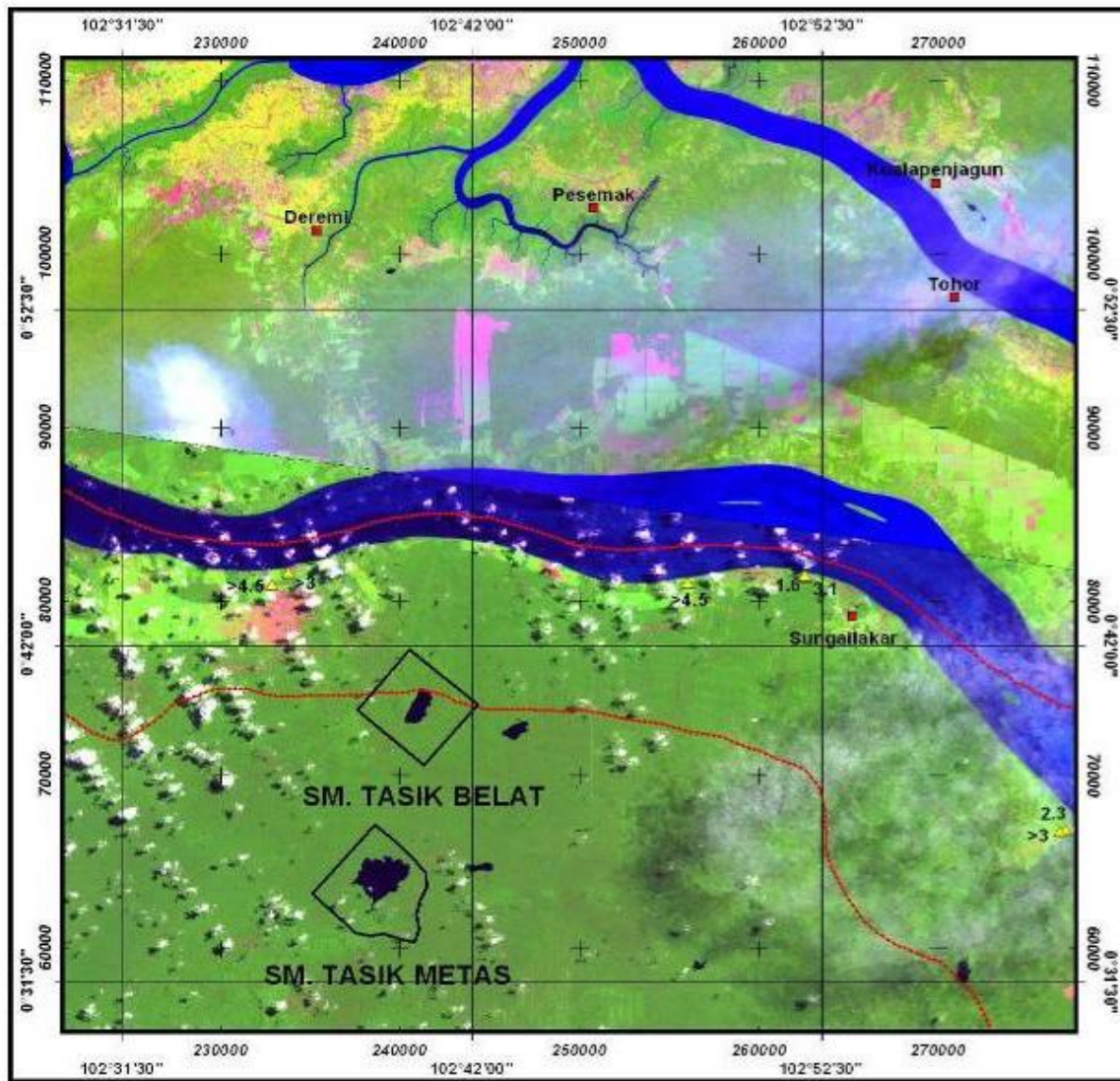


Figure 3. A satellite image –based close-up map of northern Kampar Peninsula, with APRIL’s proposed concession marked with red line. Yellow triangles are peat measurement points given with measured peat thickness.

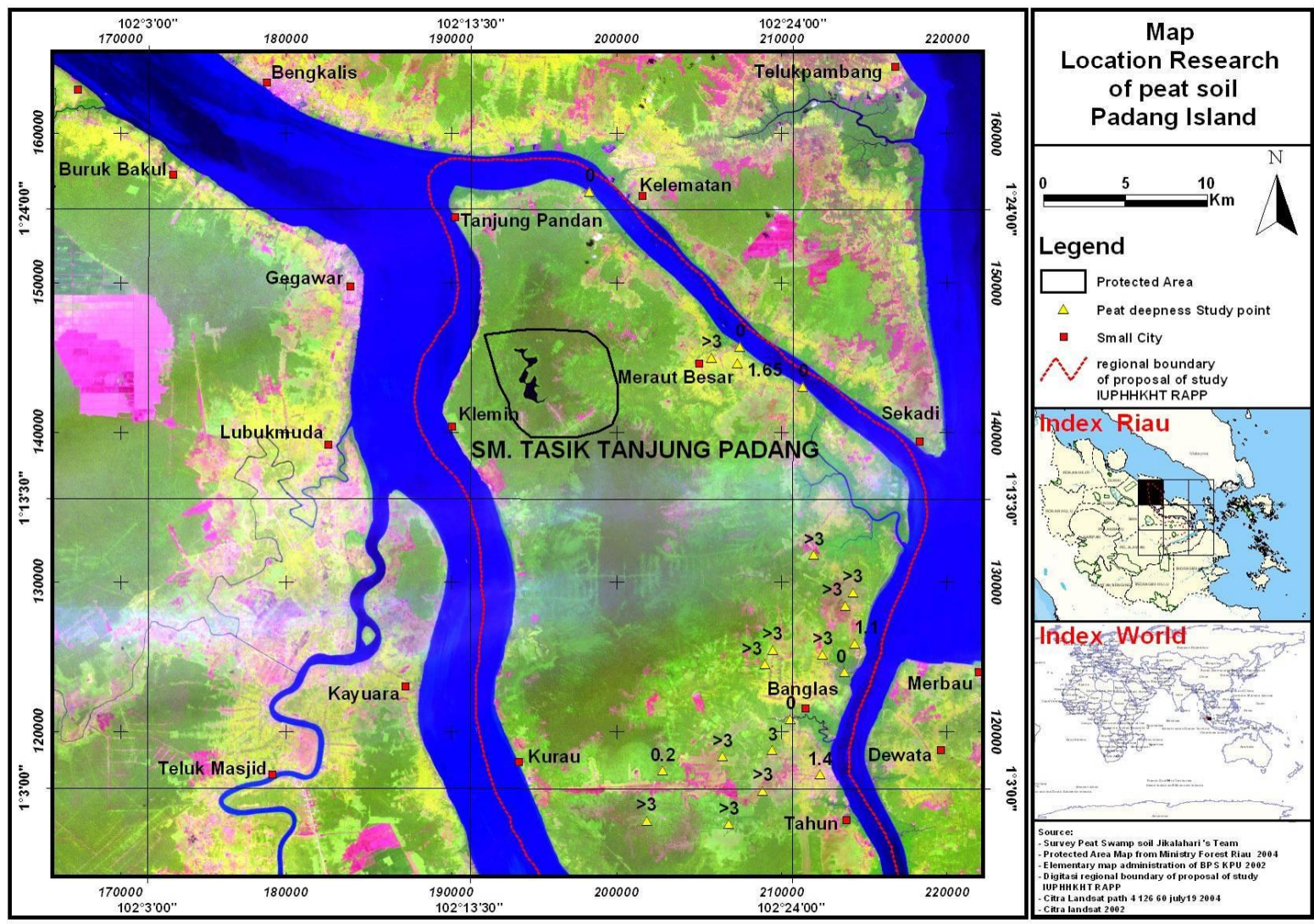


Figure 4. A satellite image –based close-up map of Padang Island, with APRIL’s proposed concession marked with red line. Yellow triangles are peat measurement points given with measured peat thickness.



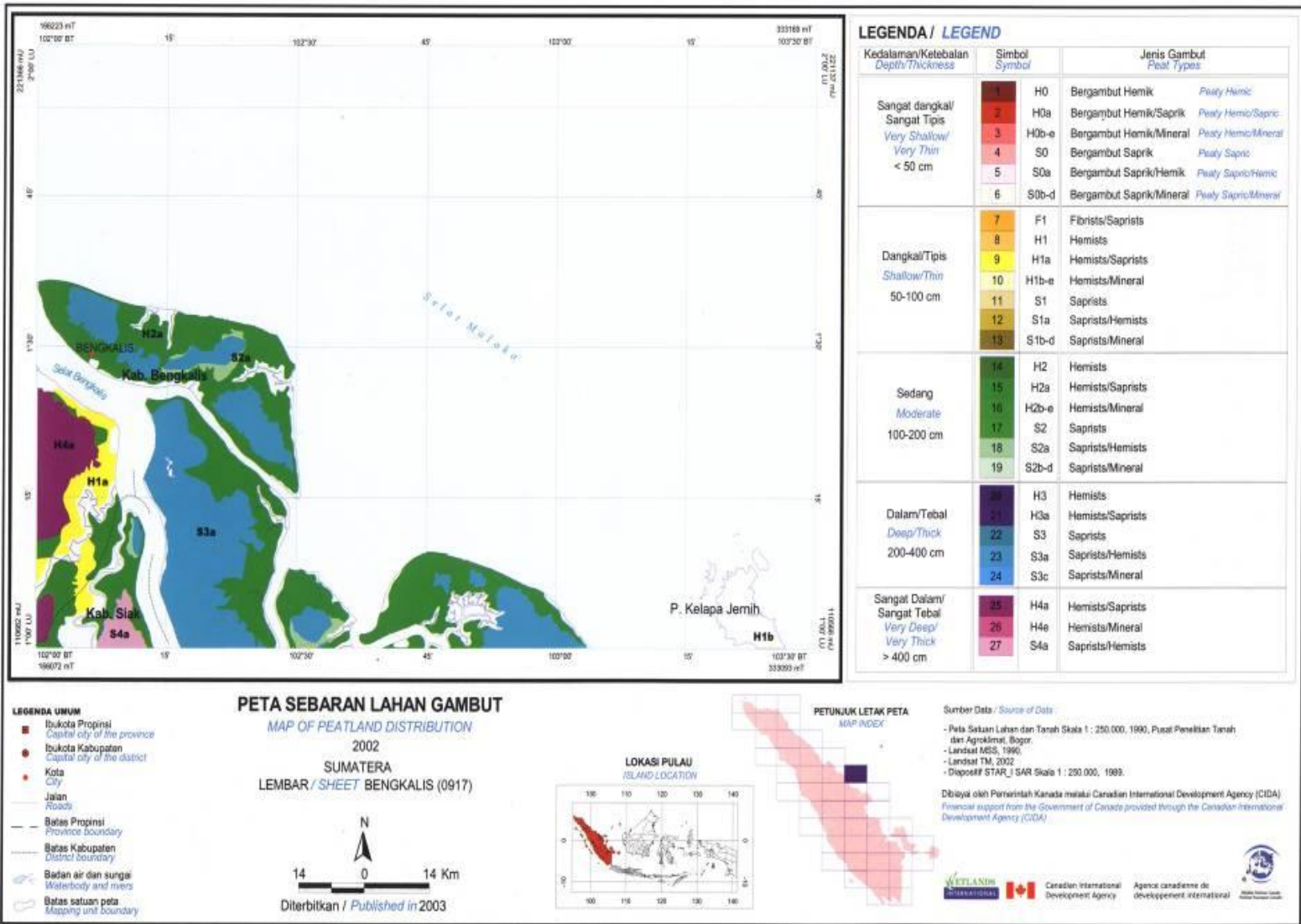


Figure 5. A peatland distribution map of Padang Island showing peat soil thickness and peat quality by Wetlands International 2002.

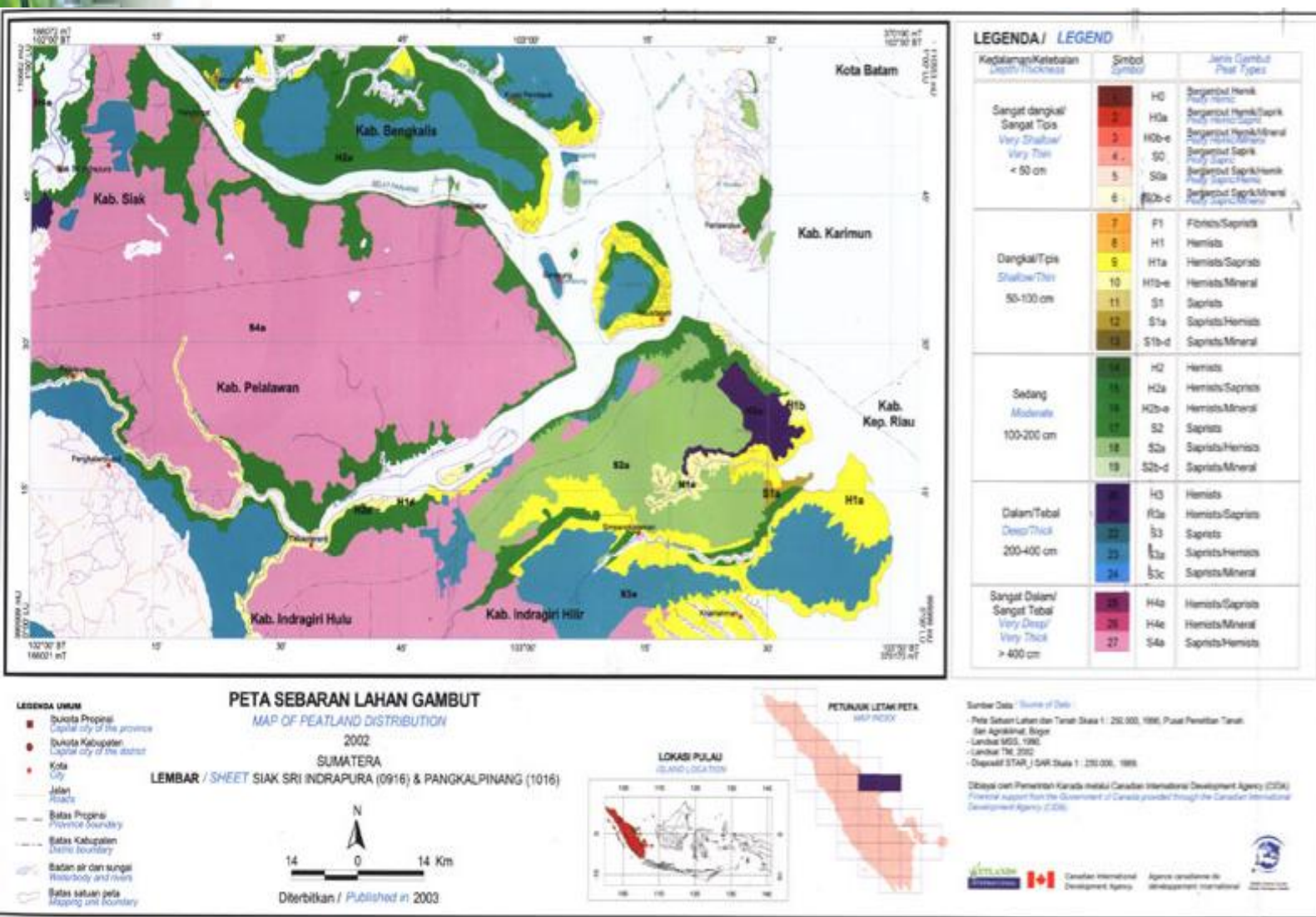


Figure 6. A peatland distribution map of Kampar Peninsula showing i.a. peat thickness by Wetlands International 2002. Violet colours represent very thick peat soils (>400 cm), green moderately thick peat (100-200 cm).