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HERPETOFAUNA DIVERSITY IN KERINCI SEBLAT NATIONAL PARK, SUMATRA, INDONESIA. *Hellen Kurniati*.....45

MOTH (INSECTA : LEPIDOPTERA) DIVERSITY IN MONTANE GUNUNG PATUHA PROTECTED FOREST, WEST JAVA, INDONESIA. *Hari Sutrsino*.....69

BIODIVERSITAS MAMALIA DI TESSO NILO, PROPINSI RIAU, INDONESIA. *Agustinus Suyanto, Martua Hasiholan Sinaga & Achmad Saim*.....79

KOMPOSISI JENIS IKAN PERAIRAN MANGROVE PADA BEBERAPA MUARA SUNGAI DI TAMAN NASIONAL UJUNG KULON, PANDEGLANG-BANTEN. *Gema Wahyudewantoro*.....89

NOTES ON THE BIRDS COMMUNITY AT BALI BARAT NATIONAL PARK. *Hidayat Ashari*99



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Anggota Redaksi

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Zoo Indonesia adalah sebuah jurnal ilmiah di bidang fauna tropika yang diterbitkan oleh organisasi profesi keilmiah Masyarakat Zoologi Indonesia (MZI) sejak tahun 1983. Terbit satu tahun satu volume dengan dua nomor (Juni & Nopember). Memuat tulisan hasil penelitian dan tinjauan ilmiah yang berhubungan dengan aspek fauna, khususnya wilayah Indonesia dan Asia. Publikasi ilmiah lain adalah Monograph Zoo Indonesia - Seri Publikasi Ilmiah, terbit tidak menentu.

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 - h. **Daftar Pustaka**, menyajikan semua pustaka yang dipergunakan dalam naskah.

- Flannery, T. 1990. Mammals of New Guinea. Robert Brown & Associates. New York.
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- Youngson, R.W. 1970. Rearing red deer calves. Journal of Wildlife Management 34:467-470.

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ABSTRAK

Kurniati, H. 2009. Keragaman jenis Herpetofauna di Taman Nasional Kerinci Seblat, Sumatra, Indonesia. Zoo Indonesia 18(2): 45-68. *Studi komunitas herpetofauna (amfibia & reptilia) di Taman Nasional Kerinci Seblat (TNKS) dilakukan pada Januari-Maret 2005 (Fase 1), Februari-Maret 2006 (Fase 2), Januari-Maret 2007 (Fase 3) dan Februari 2008 (Fase 4). Limabelas lokasi survei dipilih yang terdiri dari enam lokasi di TNKS-Propinsi Jambi (Gunung Tujuh, Rawa Bento, Tapan, Renah Kayu Embun, Lumayang, Sungai Durian); Empat lokasi di TNKS-Propinsi Sumatra Barat (Muara Sako, Muara Kambang, Muara Labuh, Lubuk Selasih); Empat lokasi di TNKS-Propinsi Sumatra Selatan (Bukit Sulap, Bukit Seloso, Napal Licin, Hulu Sungai Rupit) dan satu lokasi di TNKS-Bengkulu (Ketenong). Ketinggian tempat semua lokasi survei adalah antara 50-2000 m dpl. Metoda yang digunakan adalah observasi visual, penyinaran, perangkap dan tangkap tangan. Sepuluh tipe habitat diidentifikasi di dalam 15 lokasi survei, yaitu hutan primer berbukit, ladang berbukit, hutan dataran tinggi berbukit, hutan dataran rendah berbukit, rawa, pemukiman, perkebunan berbukit, ladang tanah datar, hutan sekunder berbukit dan hutan terdegradasi. Total jenis yang didapat selama studi adalah 71 jenis amfibia (kodok) dan 38 jenis reptilia. Kurang dari setengah (n=45) jenis herpetofauna yang didapat dari 15 lokasi survei merupakan jenis asli hutan; 25 jenis didapatkan di habitat terganggu yang termasuk pemukiman dan ladang; 39 jenis merupakan jenis yang bertoleransi besar terhadap gangguan, yang dapat ditemukan di dalam hutan dan di luar hutan. Total jenis kodok yang telah terdeskripsi adalah 64 jenis. Kekayaan jenis kodok di TNKS sekitar 68% dari total jenis kodok di Sumatra. Hasil ini menunjukkan kekayaan jenis kodok di TNKS adalah tinggi.*

Kata kunci: *Taman Nasional Kerinci Seblat, Sumatra, herpetofauna, biodiversitas.*

ABSTRACT

Kurniati, H. 2009. Herpetofauna diversity in Kerinci Seblat National Park, Sumatra, Indonesia. Zoo Indonesia 18(2): 45-68. *A study of the herpetofauna (amphibians & reptiles) community of Kerinci-Seblat National Park (KSNP) was conducted January-March 2005 (Phase 1), February-March 2006 (Phase 2), January-March 2007 (Phase 3) and in February 2008 (Phase 4). Fifteen survey sites were selected, which consisted of six sites in KSNP-Jambi Province (Gunung Tujuh, Rawa Bento, Tapan, Renah Kayu Embun, Lumayang, Sungai Durian); four sites in KSNP-West Sumatra Province (Muara*

Sako, Muara Kambang, Muara Labuh, Lubuk Selasih); four sites in KSNP-South Sumatra Province (Sulap Hills, Seloso Hills, Napal Licin, Upper Rupit River) and one site in KSNP-Bengkulu Province (Ketenong). The elevation of the fifteen survey sites ranged from 50 m to 2000 m asl. The surveys were conducted visual observation, lighting, trapping and hand collection. Ten herpetofauna habitat types were identified within the surveyed areas there were hilly primary forest, hilly cultivated land, highland hill forest, lowland hill forest, marshland, edificarian, hilly plantation, low flatland cultivation, secondary hill forest and heavily degraded forest. A total of 71 frog species and 38 reptile species were recorded during the surveys. Less than half ($n=45$) of the herpetofauna species encountered at the fifteen survey sites were found in forested areas; 25 species were found in disturbed habitats, including cultivated land and human habitations; an additional 39 species occurred in both forest and disturbed habitat. A total of 64 frog species had been described. Species richness of frogs in KSNP was 68% of the total number of frog species described in Sumatra mainland. These results suggest that the diversity of amphibian in KSNP is high.

Keywords: Kerinci Seblat National Park, Sumatra, herpetofauna, biodiversity.

INTRODUCTION

Recent publications record that 94 species of frogs were known from Sumatra mainland, of which 21 are endemic species (IUCN 2006; Inger & Iskandar 2005). In addition, at least 72 lizard species (16 endemics) (Iskandar & Colijn, in press), 133 snakes (26 endemics) (Iskandar & Colijn 2001) and 13 species of non-marine turtles (Iskandar 2000) inhabit Sumatra. However, additional new species probably await discovery due to limited sampling efforts in many areas to date. Generally, the herpetofauna of Sumatra remains poorly studied; only certain areas have been inventoried (e.g., Leuser National Park, Mistar 2003).

Kerinci Seblat National Park (KSNP) is a huge national park, spread over c. 1,400,000 hectares (Figure 1) in 9 counties and 4 provinces: Pesisir Selatan and Solok (West Sumatra Province); Batanghari, Sorolangun Bangko and Kerinci (Jambi Province); Bengkulu Utara and Rejanglebong (Bengkulu Province); and Musi Rawas (South Sumatra Province). KSNP lies geographically between the latitude of $1^{\circ} 7' - 3^{\circ} 26'$ South, and the longitude of $100^{\circ} 31' - 102^{\circ} 44'$ East. KSNP is

part of the Barisan Mountain Range which starts from the altitude of 50m above sea level (asl) and extends to 3,805m asl. The park contains vegetation types such as lowland tropical forest (50m – 600m), highland rain forest (600m – 1,500m), mountain vegetation (1,500m – 2,500m), shrub or fern (2,500m – 2,800m) and sub-alpine vegetation (above 2,300m).

The KSNP covered 38,846 km² and contained 22,327 km² of forest in 1995, representing 57.5% of the region. A total of 1278 km² of forest was estimated to have been cleared between 1995 and 2001, as a result forest covered 21,048.7 km² in 2001, representing 54.2% of the region (Linkie 2003). The area of rain forest that still covers more than half of KSNP is important habitat for amphibians and reptiles. Many species rely on specific habitats for their survival.

The main objectives of this herpetofauna study were to contribute and consolidate information on the distribution, diversity and habitat assessment of herpetofauna in KSNP, and to furnish baseline data that may

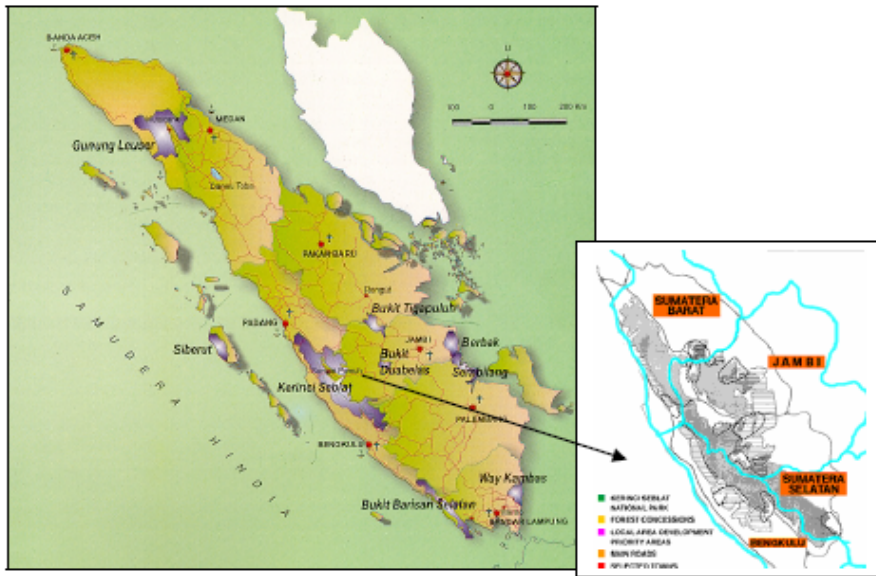


Figure 1. Location of Kerinci Seblat National Park (KSNP).

be used for management conservation of the National Park. The main activities were to survey all major habitat types and report the distribution and relative abundance of species recorded. Findings were based largely on field surveys conducted in January-March 2005, February-March 2006, January-March 2007 and in February 2008.

MATERIALS & METHODS

A. Study Areas & Habitats

Fifteen survey sites were selected (Figure 2), which consisted of six sites in KSNP-Jambi Province (Gunung Tujuh, Rawa Bento, Tapan, Renah Kayu Embun, Lumayang, Sungai Durian); four sites in KSNP-West Sumatra Province (Muara Sako, Muara Kambang, Muara Labuh, Lubuk Selasih); four sites in KSNP-South Sumatra Province (Sulap Hills, Seloso Hills, Napal Licin and Upper Rupit River); and one site in Bengkulu Province (Ketenong). Altitude of the fifteen sites ranged from 50 to 2,000 m

asl. The condition of the primary forest of KSNP in West Sumatra, South Sumatra and Bengkulu Province regions was much different compared to the forest of KSNP in Jambi Province site. Illegal logging and deforestation continue unabated, as if enforcement did not exist in the park. Logging is big business in these regions, evidently beyond the capacity of KSNP headquarters to halt or even diminish. General habitat studied in the 15 sites during the four project phases were described:

1. *Hilly primary forest*: Dense dipterocarp species including valuable timber trees such as Meranti (*Shorea* sp.) have been selectively cut in some areas. Altitude of this forest type ranges from c. 650-1,000 m asl.
2. *Highland hill forest*: Characterized by dominant laurel and oak trees. Mosses and fern festoon the trunks, limbs and branches of trees and shrubs.
3. *Lowland hill forest*: The most widespread and abundant vegetation

type, occurring from c. 500-1,000 m asl. Dipterocarpacea are the dominant trees in this forest type.

4. *Secondary hill forest*: Mainly thickets of small trees, shrubs and vines in disturbed forest where most of the mature trees have been removed.
5. *Marshland*: Wetland consisting of herbaceous and weedy areas with a few small trees.
6. *Edificarian*: Man-made structure that provide important habitat for some reptiles which associate with humans.
7. *Flat lowland cultivation*: Paddy field covers almost all of the flat lowlands inside the protected area.
8. *Heavily degraded forest* : Habitat where most trees were cleared and the land is usually prepared for cultivation.
9. *Hilly plantation*: Occurs in the park close to villages. The distance from the park border to hilly cultivated land was c. 3 km. Cacao was dominant tree species in this area whilst rubber was the second most dominant tree in this habitat.
10. *Hilly cultivated land* : Consisting of rice paddy fields, other cultivation (vegetables and fruit) and cinnamon plantations.

Amphibians and reptiles occupy a wide variety of habitats from subterranean cavities to the forest canopy. Consequently, survey sites were selected that sampled as many of the major habitat types as possible, while at the same time focusing effort on more common habitats. A brief description of sampling sites surveyed:

1. *Tapan* (GPS: S 2° 05'52.0" ; E 101° 14'57.7" ; 550 m asl).

Habitat at Tapan survey site consisted of lowland hill forest. Microhabitat types which are important to amphibians and reptiles included fast flowing streams, slow flowing streams, fallen logs and forest floor litter.

2. *Lumayang* (GPS: S 2° 17'25.3" ; E 101° 42'13.6" ; 700 m asl).

Most habitats at Lumayang consisted of hilly lowland forest, where dipterocarps are the dominant tree species. Microhabitat types for amphibians and reptiles in this area included slow flowing streams, fast flowing stream, fallen logs, forest floor litter and water-filled holes in tree trunks.

3. *Sungai Durian* (GPS: S 2° 19'0.8" ; E 101° 44'6.4" ; 700 m asl).

Habitat types at Sungai Durian survey site are similar to Lumajang survey site. Microhabitat types for amphibians and reptiles include slow and fast flowing streams, fallen logs, forest floor litter, water-filled holes in tree trunks, and temporary and permanent pools (including animal wallows). Animal wallows are very important microhabitat for some tree frogs in the forest (Inger & Stuebing 1989).

4. *Gunung Tujuh* (GPS : S 1° 42'38.5" ; E 101° 22'18.0" ; 1300-2000 m asl).

Habitat type at Gunung Tujuh survey site is highland hill forest. Microhabitat types for amphibians and reptiles in this area include herbaceous swamp, fast flowing streams, fallen logs and forest floor litter

5. *Rawa Bento* (GPS : S 1° 43'46.4" ; E 101° 20'52.2" ; 1200 m asl).

This wetland consists of grassy and weedy areas and scattered small trees. Microhabitat types for amphibians and reptiles includes ditches, sloughs and swampy areas.

6. *Renah Kayu Embun* (GPS : S 2° 09'3.4" ; E 101° 22'24.5" ; 1200-1500 m asl).

Habitat type is similar to that at Gunung Tujuh. Microhabitat types for amphibians and reptiles include grassy swamp, fast and slow flowing streams, fallen logs, temporary and permanent pools, and forest floor litter.

7. *Muara Kambang* (GPS: S 1° 38'14.1" ; E 100° 49'11.0" ; 50-300 m asl).

Habitat consists of edificarian, cultivation, secondary hill forest and heavily degraded forest. Microhabitat types important to amphibians and reptiles included houses, fast flowing river, slow and fast flowing streams, standing water (permanent and temporary pools), tree trunks, fallen logs and forest floor litter.

8. *Muara Sako* (GPS: S 2° 8'21.1"; E 101° 10'26.1" ; 70-300 m asl).

Most habitats at Muara Sako consist of edificarian, cultivation and secondary hill forest, heavily degraded forest. Microhabitat types for amphibians and reptiles in this area included habitation, fast flowing river, slow and fast flowing streams, standing water, tree trunks, fallen logs, and forest floor litter.

9. *Muara Labuh* (GPS : S 1° 22'34.2"; E 100° 58'35.5" ; 700-1,000 m asl).

Habitat types comprised of edificarian, cultivation and secondary hill forest. Microhabitat types for amphibians and reptiles in this area included human habitation, fast flowing river, slow and fast flowing streams, standing water, tree trunks, fallen logs, and forest floor litter.

10. *Lubuk Selasih* (GPS : S 1° 10'38.5"; E 100° 41'35.8" ; 1,000-1,200 m asl).

Habitat types consist of edificarian, cultivation and secondary hill forest. Microhabitat types for amphibians and reptiles in this area include house, fast flowing river, fast flowing streams, tree trunks, fallen logs, and forest floor litter.

11. *Sulap Hills* (GPS : S 3° 16'42.1" ; E 102° 51'6.3" ; 150-500 m asl).

Habitat type at Sulap Hills is hilly cultivated land. Rubber plantations are the dominant vegetation at this site. Sulap Hills was a heavily degraded forest prior to 1992, when it was planted in 1992 by an initiative of the national

park. Microhabitat types for amphibians and reptiles in this area include fast flowing streams, tree trunks and "forest" floor litter.

12. *Seloso Hills* (GPS : S 3° 15'40.3" ; E 102° 49'6.2" ; 150-500 m asl).

Habitat types observed at Seloso Hills survey site were heavily degraded forest, cultivated land and edificarian. Heavily degraded forest occurs about half way to the top of the hills. Rubber plantation is dominant vegetation in cultivated land. Microhabitat types for amphibians and reptiles include fast flowing streams, tree trunks, fallen logs, forest floor litter and temporary human shelter.

13. *Napal Licin* (GPS : S 2° 42'6.8"; E 102° 21'6.6" ; 50-400 m asl).

Napal Licin habitat consists of hilly semi-disturbed rain forest and cultivation. Microhabitats available for amphibians and reptiles include slow and fast flowing streams, temporary pools, fallen logs, water-filled holes in tree trunks, and forest floor litter.

14. *Upper Rupit River* (GPS: S 3° 01'34.4"; E 102° 36'58.7"; 100-700 m asl).

Habitat type at Upper Rupit River consists of hilly rain forest. Condition of the forest was still good. Microhabitat available for amphibians and reptiles included slow and fast moving streams, temporary pools, shallow rivers, fallen logs, and forest floor litter.

15. *Ketenong* (GPS : S 1° 39'6.6" ; E 106° 14'41.4" ; 550-800 m asl).

Habitat type at Ketenong survey site was hilly primary forest, cultivation and edificarian. The forest was relatively intact, although in some areas we found loggers who had stayed temporarily to conduct logging activities. Microhabitats available for amphibians and reptiles in Ketenong were temporary shelters, houses, slow and fast moving streams, seasonal swamp,

permanent pool, paddy field, gravelly shallow river, fallen logs, tree trunks and forest floor litter. Among the 15 study sites, only Ketenong showed evidence of illegal gold mining inside the park. The mining area was in the upper Ketenong River in hilly primary forest at c. 1000m asl. Ketenong River is the largest river in the study site. Heavy metal material from gold mining flowed down river.

B. Survey Methods

Determination of species abundance followed Buden (2000):

1. Common (at least 30 sightings/day in suitable habitat and under optimal weather conditions).
2. Fairly common (10-30 sightings/day).

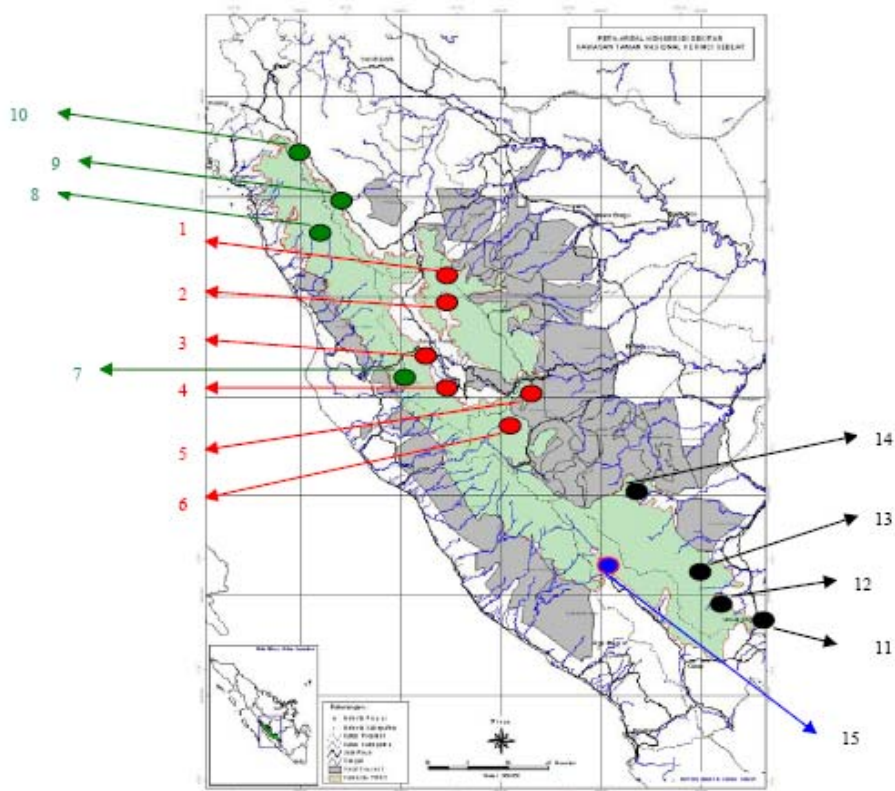


Figure 2. Study areas of amphibians and reptiles in Kerinci-Seblat National Park (red, green black and blue circles). Red circles (surveyed in 2005): sites were located in Jambi Province. (1) Gunung Tujuh; (2) Rawa Bento; (3) Tapan; (4) Renah Kayu Embun; (5) Lumayang; (6) Sungai Durian. Green circles (surveyed in 2006): sites were located in West Sumatra Province. (7) Muara Sako; (8) Muara Kambang; (9) Muara Labuh; (10) Lubuk Selasih. Black Circles (surveyed in 2007): sites were located in South Sumatra Province. (11) Sulap Hills; (12) Seloso Hills; (13) Upper Rupit River; (14) Napal Licin. Blue circle (surveyed in 2008): site was located in Bengkulu Province. (15) Ketenong.

3. Uncommon (5-10 sightings/day on most survey days).
4. Scarce (up to 5 sightings/day, but possibly unrecorded more than half of survey days)
5. Rare (under 5 sightings on most survey days).

Counts were made by slowly walking through sites of selected habitats and recording individual encounters for each species. Collecting techniques are based on intensive searching in microhabitats. Techniques used to collect specimens included:

1. *Lighting:*

This technique uses a bright flashlight to capture frogs at night. Individuals were temporarily blinded by light in their eyes, making them easy to catch.

2. *Hand Collection:*

This technique was suitable for snakes and lizards by searching microhabitats including leaf litter, tree bark and buttresses, low-lying vegetation and in or under logs.

3. *Trapping:*

Trapping was effective only for small lizards such as geckos (Gekkonidae) and skinks (Scincidae). Small rectangular pieces of wood (20 cm x 30 cm) were covered with rat glue and placed in suitable reptile habitats. Captured animals were removed from traps using cooking oil.

Photographic records of all species captured were taken in the field using professional camera. Relatively little effort was expended collecting specimens of animals that were easily identified, even at considerable distance. Greater effort was directed toward collecting specimens of individuals that were often difficult to distinguish morphologically under field conditions. All collected specimens were deposited in the Museum Zoologicum Bogoriense (MZB), Cibinong, West Java, Indonesia.

For identification purposes, amphibian taxonomy mostly followed Inger (1966), Inger & Stuebing (2005) and Mistar (2003); for lizards, geckos and skinks taxonomy was based on de Rooij (1915); snakes on de Rooij (1917), Tweedie (1983) and Stuebing & Inger (1999). Agamid identifications were based on Musters (1983) and Manthey & Schuster (1996).

Nomenclature of amphibians followed Iskandar and Colijn (2000) and for lizards and snakes, Iskandar & Colijn (2001) and Iskandar & Colijn (in press). General gekkonid identifications followed Bauer (1994). Amphibian common names followed IUCN (2006). Stuebing & Inger (1999) were followed for snakes, Manthey & Schuster (1996) for agamid lizards, and Lim & Lim (1992) and Das (2004) for geckos.

C. *Analysis*

Jaccard's Similarity Coefficient (Krebs 1989) was used to estimate similarities in species richness of amphibians between Kerinci-Seblat National Park and Gunung Leuser National Park in North Sumatra. The following formula was used:

$$S_j = a/a+b+c$$

in which:

- S_j = Jaccard's Similarity Coefficient;
 a = Number of species in sample A and sample B (joint occurrence);
 b = Number of species in sample B but not in sample A;
 c = Number of species in sample A but not in sample B.

RESULTS & DISCUSSION

Phase 1 (KSNP-Jambi Province):

Study of all undescribed specimens that collected in first phase yielded additional species list. A total of 70 species of herpetofauna were recorded during the fieldwork (January-March

2005), consisting of 53 species of amphibians (47 frogs, four of which were newly described and two remain undescribed) and 16 species of reptiles. A species list and taxonomic classification are presented in Tables 1 and 2. The Rhacophoridae (18 species; 34.0%) and Ranidae (17 species; 32.1%) dominated the frog fauna. The Microhylidae (9 species; 17.0%) and Bufonidae (7 species; 17.2%). The Megophryidae (2 species) are poorly presented with just 3.8% of the frog fauna. The new species described are: *Limnnectes acuticeps*, *L. barisani*, *L. crybetus* and *L. prajatmoi*. The number of undescribed frog species is two: a new taxon of the family Microhylidae (*Microhyla* sp.); and a new taxon of family Rhacophoridae (*Rhacophorus* sp.).

A total of 16 reptile species (5 snakes & 11 lizards) were recorded at the six sampling sites. The survey reported one family of snake (Colubridae) and 3 families of lizards (Agamidae, Gekkonidae and Scincidae). Species encountered were substantially different between sites. Survey site summaries are outline below:

1. *Tapan*: Twenty one species observed (15 amphibians & 6 reptiles). The Ranidae (9 species) was dominant at this site. The most abundant species were *R. chalconota*, *R. crassiovis* and *R. siberu*; for reptiles *Mabuya multifasciata*.
2. *Lumayang*: Thirteen species were observed (9 amphibians & 4 reptiles). The Ranidae was dominant (5 species) in this site. The most abundant species were *R. chalconota* and *R. hosii*; for reptiles *M. multifasciata* was most abundant.
3. *Sungai Durian*: Thirty two species were observed (27 amphibians & 5 reptiles). The Rhacophoridae was dominant (8 species) followed by the Ranidae (7 species) and Microhylidae (6 species). The most abundant species were *Kalophrynus*

pleurostigma, *Huia sumatrana*, *L. kuhlii*, *R. chalconota* and *R. hosii*.

4. *Gunung Tujuh*: Thirty four species were observed (27 amphibians & 7 reptiles). The Rhacophoridae was dominant (12 species). The most abundant species were *Microhyla superciliaris*, *Fejervarya cancrivora*, *F. limnocharis*, *L. barisani*, *R. chalconota*, *R. crassiovis*, *R. nicobariensis*, *Philautus aurifasciatus*, *Polypedates leucomystax* and *Rhacophorus achantharrena*; and for reptiles *M. multifasciata* and *M. rudis*.
5. *Rawa Bento*: Six species of amphibians were observed. The Ranidae was dominant (4 species). The most abundant species were *F. cancrivora*, *F. limnocharis*, *R. chalconota*, *R. nicobariensis*, *P. leucomystax* and *R. bifasciatus*.
6. *Renah Kayu Embun*: Sixteen species were observed (13 amphibians & 3 reptiles). Among amphibians the Ranidae and Rhacophoridae were dominant (7 & 6 species respectively). The most abundant amphibians were *R. chalconota*, *R. crassiovis*, *R. nicobariensis*, *P. aurifasciatus*, *P. leucomystax*; and for reptiles *M. multifasciata* and *M. rudis* were the most recorded species.

Phase 2 (KSNP-West Sumatra Province):

The total of 46 species of herpetofauna (29 amphibians & 18 reptiles) were encountered during Phase 2 fieldwork, (Tables 1 & 2). Once again the Ranidae dominated the frog fauna with 8 species (64.3%). The Bufonidae and Rhacophoridae were represented with 4 species (16.0%). The Megophryidae (1 species) and Microhylidae (1 species) were poorly represented with only 3.6% of the frog fauna. Of the unidentified frog species that found in Muara Labuh survey site has been described as new species by McLeod and Ahmad (2007). The name of the new species is *Theloderma licin*.

A total of 18 reptile species (6 snakes & 12 lizards) were recorded during the survey at four sampling sites. One snake family (Colubridae) and 5 lizard families (Varanidae, Agamidae, Lacertidae, Gekkonidae and Scincidae) were recorded. Species encountered at each site are summarized below:

1. *Muara Kambang* : Twenty nine species observed (17 amphibians & 12 reptiles). The Ranidae was dominant (12 species) at this site. The most abundant amphibians were *F. limnocharis*, *L. shompenorum*, *R. chalconota* and *R. nicobariensis*. *M. multifasciata* was the most commonly encountered reptile.
2. *Muara Sako* : Thirty three species observed (19 amphibians & 14 reptiles). The Ranidae was dominant (12 species) at this site. The most abundant species amphibians were *F. limnocharis*, *L. shompenorum*, *R. chalconota* and *R. nicobariensis*. *M. multifasciata* was the most commonly encountered reptile.
3. *Muara Labuh* : Thirty one species observed (19 amphibians & 12 reptiles). The Ranidae was dominant (12 species) at this site. Most abundant amphibians were *Bufo asper*, *M. heymonsi*, *F. limnocharis*, *R. raniceps*, and *R. nicobariensis*. *M. multifasciata* and *M. rudis* were the most abundant reptiles.
4. *Lubuk Selasih* : Eighteen species observed (15 amphibians & 3 reptiles). The Ranidae was dominant (12 species) at this site. The most abundant amphibians were *B. juxtasper*, *R. hosii* and *R. kampeni*. The most commonly encountered reptiles were *M. multifasciata* and *M. rudis*.

Phase 3 (KSNP- South Sumatra province):

Fifty species were encountered during Phase 3 fieldwork (January-March 2007); consisting of 27 species of

amphibians. Detailed of the lists are presented in Tables 1 and 2. The Ranidae once again dominated the frog fauna 13 species (50.0%). The other families consisted of 7 species (26.9%) of Bufonidae, 4 species (15.4%) of Microhylidae and 3 species (11.5%) of Rhacophoridae.

Twenty-three reptile species (6 snakes, 16 lizards & 1 freshwater turtle) were recorded at the 4 survey sites. The survey reported 2 families of snake (Colubridae & Elapidae), 4 families of lizard (Agamidae, Lacertidae, Gekkonidae & Scincidae) and 1 family of Trionychidae. Species encountered were substantially different among habitat types at the four survey sites. Sampling site summaries are outlined below:

1. *Sulap Hills* : Nineteen species were recorded (12 amphibians & 7 reptiles). The Ranidae (7 species) was dominant at this site. No species was abundant, however *L. blythii* was common. *M. multifasciata* was a common reptile at this site. *B. claviger*, an endangered frog species in Sumatra, was observed and collected at this site. According to IUCN (2006), this species was previously known only from northern Bengkulu Province, where it occurs in lowland forest. At Sulap Hills, however, *B. claviger* was found at a slow-moving stream in a rubber plantation.
2. *Seloso Hills* : Seventeen species were recorded (11 amphibians & 6 reptiles). The Ranidae was dominant (7 species) in this site. No species was abundant, *M. multifasciata* was a commonly encountered reptile at this site.
3. *Napal Licin* : Thirty four species were recorded (18 amphibians & 16 reptiles). The Ranidae and Agamidae were dominant (11 & 5 species, respectively) at this site. The most abundant species were

L. kuhlii, *R. raniceps* and *Methaphrynella pollicaris* (amphibians) and *M. multifasciata* (reptiles).

4. *Upper Rupit River* : Twenty nine species were recorded (16 amphibians & 13 reptiles). The Ranidae and Scincidae were dominant (8 & 4 species, respectively) in this site. The most abundant amphibians were *Leptophryne borbonica*, *L. kuhlii* and *R. hosii*. *M. multifasciata* was the most commonly encountered reptile.

Phase 4 (KSNP-Bengkulu Province):

Thirty-five species were found at the Ketenong survey site consisting of 23 amphibians and 12 reptiles. A species list is presented in Tables 1 and 2. The Ranidae dominated the frog fauna (15 species, 65.2%). The other families were represented by Megophryidae (1 species, 4.3%), Bufonidae (3 species, 13.0%), of Microhylidae (2 species, 8.7%), and of Rhacophoridae (2 species, 8.7%). Additional species recorded during Phase 4 were *Occidozyga sumatrana* (a frog), *Sphenomorphus sanctus* (a lizard) and *Siebenrockiella crassicolis* (a turtle).

Twelve reptile species (2 snakes, 8 lizards, 2 freshwater turtles) were recorded during the survey. The survey consisted 1 families of snake (Colubridae), 3 families of lizard (Agamidae, Gekkonidae and Scincidae) and 2 families of turtle (Trionychidae and Geoemydidae). The most abundant species recorded at the Ketenong survey site was the frog *R. chalconota* and *R. nicobariensis*; for reptiles *M. multifasciata*.

Implications

Herpetofauna studies at 15 KSNP survey sites documented a substantial diversity of amphibians and reptiles. A total of 71 amphibians (65 previously described species, 4 species newly

described, 2 undescribed species) and 38 reptiles (35 described species, 3 undescribed species) were recorded.

Comparing relative diversity among habitats (Table 3) shows that less than half of the herpetofauna species encountered in the fifteen survey sites were found in forested areas (45 species; 41.3%); 25 species (22.9%) were found in disturbed habitats, including cultivated land and human habitations; an additional 39 species (35.8%) occurred in both forest and disturbed habitat. Although 41.3% of the species were restricted to the forest, many species of amphibians and reptiles that have wide ecological tolerance use disturbed habitats as temporary residences. However, they still require forested areas as their primary habitat and significant changes occurred when forest was removed or severely impacted. Demise of numerous species can be quickly brought about by desiccation, lethal temperatures and loss of prey items (Stuebing & Inger 1999). Classification of these groups is based on an amphibians and reptiles lifestyles. Details of their lifestyles are explained below:

1. Forest species

None of the amphibians or reptiles can tolerate much habitat change. Forest modifications can produce changes in microclimate, soil moisture and habitat complexity. Of particular importance is land drainage for reservoirs and other developments, frequently resulting in removal of breeding sites and fragmentation of populations (Gardner 2001). Although the details of amphibian lifestyle vary widely, these forest species exhibit four major behaviors (Inger & Stuebing 1989):

1. *Frogs that never leave the stream bank.* Frogs using this strategy include *L. borbonica*, *L. kuhlii*, *L. blythii*, *R. picturata*, *R. siberu*, *R. kampeni*, *R. crassiovis* and *Huia* spp

which live in similar microhabitats such as strong moving streams or slow moving water. These species also include frog species (e. g., *Microhyla* spp confined to animal wallows in the forest.

2. *Frogs found along stream banks, but live away from water as juveniles.* Froglets hop into peripheral forest often moving several hundred meters away from streams where they feed and grow. As they approach adult size, they return to a stream where they remain to breed and feed for the rest of their lives. Frogs with this life cycle include *R. hosii* and *L. crybetus*.
3. *Frogs that use streams only for breeding.* Adult frogs from this group live on the forest floor among leaf litter for most their life. They return to a stream at intervals only for breeding. These frogs include species such as *Megophrys* spp and *K. pleurostigma*.
4. *Forest frogs wander widely through the forest at all ages, and are seen along stream banks occasionally.* Most of these types of frogs lay eggs in small pools of water in the forest floor. However, some use water-filled tree holes and a few species even lay their eggs under forest floor litter where there is no standing water, but humidity is high. Species that use this microhabitat for breeding include *Ansonia* spp, *L. microdiscus* and *Pelophryne brevipes*. Pools on the forest floor form when a large tree falls pulling its root mass out of the soil, or in mud wallows produced by forest pigs. Three frog species descend to deposit their foam nest at the edge of such pools or attach them to low overhanging vegetation. Frog species exhibiting these behaviors include *Phrynella pulchra*, *Nyctixalus pictus*, *P. otilophus* and *Rhacophorus* spp.

2. Non-forest species

This species group closely associates with humans and is almost entirely dependent on human disturbance to create a preferred environment condition (i. e., open spaces, disturbed ground and standing water). When humans build a village or housing or create a paddy field or fishpond, this removes forest, new climates and an instant increase in daily temperature. The increase in sunshine results in a faster drying of small pools of rainwater. These changes make it impossible for many forest species to exist. Most amphibians and reptiles are very sensitive to high temperature; direct exposure to sunshine can kill them in a few minutes. Rapid drying of rain pools can lead to the death of an entire clutch of forest tadpoles, which usually takes several weeks to complete their development.

Cultivated land usually becomes suitable habitat for some species include paddy fields, gardens, houses and fishponds. On a positive note, when humans make a flooded paddy field or ditch, they also make a fine breeding place for frogs and, therefore, a place where prey for snakes is abundant. Most of non-forest species seem to require to opening up or clearing of forest before they can find suitable habitat and they seem unable to invade forest.

3. Generalist

This species group consists of amphibians and reptiles with broad ecological tolerance. They are classified as forest or non-forest species. Some of these species are not truly at home in the forest including *R. chalconota* and *P. leucomystax*. They do well in cultivation and penetrate the edge of rainforest. Thirty-nine species of

herpetofauna were encountered at survey sites have a broad ecological tolerance, they occur in both forest and disturbed habitat (Table 3). It was found that 35.8% of the species were not restricted to forest. Many amphibians and reptiles use disturbed habitats as temporary residence. However, they still require forested areas as their primary habitat and the significant changes occurring when forest is removed or severely impacted can quickly bring about the demise of numerous species through desiccation, lethal temperatures and loss of prey items (Stuebing & Inger 1999).

Comparison of frog species richness (Table 4) using Jaccard's Similarity Coefficient index yielded a value of 0.53 between KSNP and Gunung Leuser National Park (GLNP) in north Sumatra. This suggests that occurrence of amphibians in KSNP and GLNP was quite different. The KSNP value refer to species which are restricted to Central Sumatra region, included *Ansonia cf glandulosa*, *A.leptopus*, *R. crassiovis*, *R. angulirostris*, *R. achantharrhena*, *R. bifasciatus*, *R. catamitus*, *R. modestus*, *R. poecilonotus*; and also referred to the species which are restricted to the South Sumatra region, including *L. macrodon* and *B. claviger* (IUCN 2006; van Kampen 1923). However those species have not been recorded in North Sumatra region. A total of 64 described frog species are found in KSNP (Table 4). Analysis of frog species richness in KSNP resulted in a value of 68% of total described frog species in Sumatra mainland. These results suggest that the diversity of amphibians in KSNP is high.

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A. Amphibians

Table 1. List of amphibians species recorded at 15 survey sites in KSNP (Jambi, West Sumatra, South Sumatra and Bengkulu Provinces), Sumatra. (+) species found; (-) species not found; (*) species not found; (**) species endemic to Sumatra; (**) species has been described by Djoko Iskandar. Ta: Tapan; Lu: Lumayang; SD: Sungai Durian; GT: Gunung Tujuh; RB: Rawa Bento; RKE: Renah Kayu Embun; MK: Muara Kambang; MS: Muara Sako; ML: Muara Labuh; LS: Lubuk Selasih; SuH: Sulap Hill; SeH: Seloso Hill; NL: Napal Licin; URK: Upper Rupit River; KT: Ketenong.

Classification and Species list	Sites Jambi Province						Sites West Sumatra Province						Sites South Sumatra Province				Site Bengkulu Province	Abundance status
	Ta	Lu	SD	GT	RB	RKE	MK	MS	ML	LS	SuH	SeH	NL	URR	KT			
Class Amphibia																		
Order Anura																		
Family Megophryidae																		
<i>Megophrys nasuta</i>	+	+	+	-	-	-	+	+	+	-	-	-	-	-	+		Uncommon	
<i>Megophrys aceras</i>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-		Rare	
<i>Megophrys paratella</i>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-		Common	
Family Bufonidae																		
<i>Ansonia</i> cf																		
<i>glandulosa</i> *	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-		Rare	
<i>Ansonia leptopus</i>	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-		Scarce	
<i>Bufo asper</i>	+	+	+	-	-	-	+	+	-	+	+	+	+	+	+		Common	
<i>Bufo claviger</i> *	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-		Rare	
<i>Bufo divergen</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-		Scarce	
<i>Bufo juxasper</i>	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-		Common	
<i>Bufo melanostictus</i>	-	-	-	+	-	-	+	+	-	+	+	+	+	-	+		Common	
<i>Bufo parvus</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-		Rare	
<i>Pelophryne brevipes</i>	-	-	+	-	-	-	-	-	-	-	-	-	+	+	-		Rare	
<i>Leptophryne borbonica</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	+	+		Common	

Classification and Species list	Sites Jambi Province				Sites West Sumatra Province				Sites South Sumatra Province				Site Bengkulu Province	Abundance status
Family Microhylidae														
<i>Kalophrynus pleurostigma</i>	-	+	-	-	-	-	-	-	-	-	-	-	+	Common
<i>Kaloula baleata</i>	-	+	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Microhyla borneensis</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	Common
<i>Microhyla heymonsi</i>	-	-	+	+	+	+	+	+	+	+	+	+	+	Common
<i>Microhyla palmipes</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	Uncommon
<i>Microhyla superciliosus</i>	-	+	+	-	-	-	-	-	-	-	-	-	-	Common
<i>Microhyla</i> sp.	-	+	-	-	-	-	-	-	-	-	-	-	-	Rare
<i>Metaphrynella cf pollicaris</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Metaphrynella sundana</i>	-	+	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Phrynella pulchra</i>	-	+	-	-	-	-	-	-	-	-	-	-	-	Uncommon
Family Ranidae														
<i>Fejervarya cancrivora</i>	-	-	+	+	+	+	+	+	+	+	+	+	+	Common
<i>Fejervarya limnocharis</i>	-	-	+	+	+	+	+	+	+	+	+	+	+	Common
<i>Huia modiglianii*</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Huia sumatrana*</i>	+	+	+	-	-	-	-	-	-	-	-	-	+	Common
<i>Limnonectes acuticeps**</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	Rare
<i>Limnonectes batisani**</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	Common
<i>Limnonectes blythii</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	Fairly common
<i>Limnonectes crybetus**</i>	-	-	+	-	-	-	-	-	-	-	-	-	+	Common

Classification and Species list	Sites Jambi Province								Sites West Sumatra Province				Sites South Sumatra Province				Site Bengkulu Province	Abundance status		
	+	+	+	+	+	-	-	+	+	+	+	+	+	+	+	+			+	+
<i>Limnonectes kuhlii</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Limnonectes laticeps</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Scarce
<i>Limnonectes macrodon</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Scarce
<i>Limnonectes microdiscus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Uncommon
<i>Limnonectes paramacrodon</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Limnonectes prajitnoi**</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Scarce
<i>Limnonectes shopenorum</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Occidozyga laevis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Rare
<i>Occidozyga sumatrana</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Uncommon
<i>Rana chalconota</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Common
<i>Rana crassiovis*</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Rana erythraea</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Uncommon
<i>Rana hosii</i>	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	Common
<i>Rana kampeni*</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Rana nicobariensis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Rana nigrovittata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Scarce
<i>Rana picturata</i>	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Rana raniceps</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Rana siberu*</i>	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Common
Family Rhacophoridae																				
<i>Nyctixalus pictus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Rare
<i>Philautus aurifasciatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Philautus cornutus*</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Uncommon
<i>Polypedates leucomystax</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Common

Classification and Species list	Sites Jambi Province						Sites West Sumatra Province				Sites Sumatra Province				Site Bengkulu Province	Abundance status	
	-	-	+	+	-	+	-	-	+	-	-	-	-	-			-
<i>Polypedates macrotis</i>	-	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	Fairly common
<i>Polypedates otitophus</i>	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	Scarce
<i>Rhacophorus achantharrhena</i> *	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Rhacophorus angulirostris</i>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Rhacophorus appendiculatus</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Rhacophorus barsani</i> *	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	Scarce
<i>Rhacophorus bifasciatus</i> *	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Rhacophorus catamitus</i> *	-	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	Common
<i>Rhacophorus cyanopunctatus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	Rare
<i>Rhacophorus modestus</i> *	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	Scarce
<i>Rhacophorus nigropalmatus</i>	-	-	+	-	-	-	-	-	-	-	-	-	-	-	+	-	Uncommon
<i>Rhacophorus pardalis</i>	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	Rare
<i>Rhacophorus poecilonotus</i> *	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Uncommon
<i>Rhacophorus prominans</i>	+	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	Common
<i>Rhacophorus reinwardtii</i>	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	Scarce
<i>Rhacophorus</i> sp1	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	Rare
<i>Thelodroma licin</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Rare
Number of species	15	9	27	27	6	13	17	19	19	15	12	11	18	15	23		

B. Reptiles

Table 2. Total list of reptiles species found in at 15 survey sites in KSNP (Jambi, West Sumatra, South Sumatra and Bengkulu Provinces), Sumatra. (+) species found; (-) species not found; (*) species endemic to Sumatra; (**) species has been described by Djoko Iskandar. Ta: Tapan; Lu: Lumayang; SD: Sungai Durian; GT: Gunung Tujuh; RB: Rawa Banto; RKE: Renah Kayu Embun; MK: Muara Kambang; MS: Muara Sako; ML: Muara Labuh; LS: Lubuk Selasih; SuH: Sulap Hill; SeH: Seloso Hill; NL: Napal Licin; URR: Upper Rupit River; KT: Ketenong

Classification and Species list	Sites Jambi Province					Sites West Sumatra Province					Sites South Sumatra Province					Site Bengkulu Province		Abundance status
	Ta	Lu	SD	GT	RB	RKE	MK	MS	ML	LS	SuH	SeH	NL	URR		KT		
Class Reptilia																		
Order Ophidia (Snakes)																		
Family Colubridae																		
<i>Ahaetulla prasina</i>	-	-	-	-	-	+							+				Rare	
<i>Aplopeltura boa</i>	+	-	-	-	-	-								+			Rare	
<i>Asthenodipsas malaccanus</i>	-	-	+	-	-	-											Scarce	
<i>Boiga dendrophila</i>	-	-	-	-	-	-		+								+	Rare	
<i>Boiga cynodon</i>	-	-	+	-	-	-		-					+				Rare	
<i>Chrysopelea paradisi</i>	-	-	-	-	-	-		-					+				Rare	
<i>Dendrelaphis pictus</i>	-	-	-	-	-	-	+										Scarce	
<i>Lepturophis borneensis</i>	-	-	-	-	-	-		-						+			Rare	
<i>Liopeltis balioideirus</i>	-	-	-	-	-	-		-	+								Rare	
<i>Ptyas korros</i>	-	-	-	+	-	-		-									Scarce	
<i>Ptyas mucosus</i>	-	-	-	-	-	-		+									Rare	
<i>Rhabdophis chrysargus</i>	+	-	+	-	-	-		+									Uncommon	
<i>Rhabdophis trianguligerus</i>	-	-	-	-	-	-		+	+							+	Uncommon	
Family Elapidae																		
<i>Ophiophagus hannah</i>	-	-	-	-	-	-		-						+			Rare	
Order Lacertilia (Lizards)																		
Family Varanidae																		
<i>Varanus salvator</i>	-	-	-	-	-	-		+									Uncommon	

Classification and Species list	Sites Jambi Province							Sites West Sumatra Province							Sites South Sumatra Province			Site Bengkulu Province	Abundance status	
Family Agamidae																				
<i>Aphaniotis acutirostris</i>	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	Fairly common
<i>Bronchocelea cristatella</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	Rare
<i>Dendragama boulangeri*</i>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Fairly common
<i>Draco melanopogon</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	Fairly common
<i>Draco sumatranus*</i>	+	+	-	-	-	-	-	+	+	-	-	-	-	-	+	+	-	+	+	Common
<i>Draco sp</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	Rare
<i>Gonocephalus grandis</i>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Rare
<i>Lophocalotes ludekingi*</i>	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Uncommon
Family Lacertidae																				
<i>Tachydromus sexlineatus</i>	-	-	-	-	-	-	-	+	-	-	-	-	-	-	+	+	-	-	-	Common
Family Gekkonidae																				
<i>Cyrtodactylus marmoratus</i>	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	Fairly common
<i>Cyrtodactylus sp1</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	Rare
<i>Cyrtodactylus sp2</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	Rare
Gekko gecko	-	+	-	-	-	-	-	+	+	-	-	-	-	-	+	+	-	-	-	Common
Gekko monachus	-	-	-	-	-	-	-	+	+	-	-	-	-	-	+	+	-	+	+	Rare
<i>Gehyra mutilata</i>	-	-	-	-	-	-	-	+	+	-	-	-	-	-	+	+	-	+	+	Common
<i>Hemidactylus frenatus</i>	-	+	-	-	-	-	-	+	+	-	-	-	-	-	+	+	-	+	+	Common
Family Scincidae																				
<i>Dasia olivacea</i>	-	-	-	+	-	-	-	+	+	-	-	-	-	-	+	+	-	+	-	Fairly common
<i>Mabuya multifasciata</i>	+	+	-	+	-	-	-	+	+	-	-	-	-	-	+	+	-	+	+	Common
<i>Mabuya rudis</i>	-	-	-	-	-	-	-	+	+	-	-	-	-	-	+	+	-	+	+	Common
<i>Mabuya rugifera</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	Scarce
<i>Sphenomorphus sanctus</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	Uncommon
Order Testudinata (Turtles)																				
Family Trionychidae																				
<i>Amyda cartilaginea</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	Rare
Family Geomydidae																				
<i>Siebenrockiella crassicolis</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Rare
Number of species	6	4	5	7	0	3	12	14	13	3	7	6	16	13	-	-	-	+	+	Rare

Table 3. Major herpetofauna habitats and species in Kerinci Seblat National Park (Jambi, West Sumatra, South Sumatra and Bengkulu Provinces), Sumatra.

Habitat type		Forest species	Non-forest species	Generalist
Terrestrial		<u>Amphibia:</u> <i>Megophrys aceras</i> <i>Megophrys paralella</i> <i>Megophrys nasuta</i> <i>Kalophrynus pleurostigma</i> <u>Reptile:</u> <i>Asthenodipsas malaccanus</i> <i>Mabuya rugifera</i>	<u>Amphibia:</u> <i>Bufo melanostictus</i> <u>Reptile:</u> <i>Hemidactylus frenatus</i> <i>Gehyra mutilata</i> <i>Rhabdophis trianguligerus</i> <i>Tachydromus sexlineatus</i>	<u>Amphibia:</u> <i>Bufo parvus</i> <u>Reptile:</u> <i>Ptyas mucosus</i> <i>Ptyas korros</i> <i>Rhabdophis chrysargus</i> <i>Liopeltis balioideirus</i> <i>Ophiophagus hannah</i> <i>Varanus salvator</i> <i>Cyrtodactylus marmoratus</i> <i>Cyrtodactylus sp1</i> <i>Cyrtodactylus sp2</i> <i>Mabuya multifasciata</i> <i>Mabuya rudis</i>
Aquatic	Strong moving water	<u>Amphibia:</u> <i>Leptophryne borbonica</i> <i>Huia modiglianii</i> <i>Limnonectes acuticeps</i> <i>Limnonectes blythii</i> <i>Limnonectes prajattoi</i> <i>Rana picturata</i> <i>Rana siberu</i>		<u>Amphibia:</u> <i>Bufo asper</i> <i>Bufo juxasper</i> <i>Huia sumatrana</i> <i>Rana hosii</i> <i>Limnonectes macrodon</i> <i>Rana crassiovis</i> <i>Rana kampeni</i>
	Slow moving water	<u>Amphibia:</u> <i>Bufo divergen</i> <i>Limnonectes crybetus</i> <i>Limnonectes laticeps</i> <i>Limnonectes kuhlii</i> <i>Rana nigrovittata</i> <i>Rana raniceps</i> <u>Reptile:</u> <i>Lepturophis borneensis</i>	<u>Amphibia:</u> <i>Bufo claviger</i> <i>Fejervarya cancrivora</i> <i>Fejervarya limnocharis</i> <i>Limnonectes barisani</i> <i>Limnonectes paramacrodon</i> <i>Limnonectes shompenorum</i> <i>Rana erythraea</i>	<u>Amphibia:</u> <i>Rana chalconota</i> <u>Reptile:</u> <i>Amyda cartilaginea</i> <i>Siebenrocciella crassicolis</i>
	Standing water	<u>Amphibia:</u> <i>Microhyla sp</i> <i>Phrynella pulchra</i> <i>Metaphrynella cf pollicaris</i> <i>Metaphrynella sundana</i> <i>Limnonectes microdiscus</i> <i>Occidozyga laevis</i>	<u>Amphibia:</u> <i>Microhyla heymonsi</i> <i>Rana nicobariensis</i> <i>Occidozyga sumatrana</i>	<u>Amphibia:</u> <i>Kaloula baleata</i> <i>Microhyla borneensis</i> <i>Microhyla palmipes</i> <i>Microhyla superciliaris</i>

Habitat type	Forest species	Non-forest species	Generalist
Arboreal	<p><u>Amphibia:</u> <i>Ansonia leptopus</i> <i>Ansonia cf glandulosa</i> <i>Pelophryne brevipes</i> <i>Nyctixalus pictus</i> <i>Philautus aurifasciatus</i> <i>Philautus cornutus</i> <i>Polypedates otilophus</i> <i>Rhacophorus appendiculatus</i> <i>Rhacophorus barisani</i> <i>Rhacophorus modestus</i> <i>Rhacophorus nigropalmatus</i> <i>Rhacophorus cyanopunctatus</i> <i>Rhacophorus sp 1</i> <i>Theloderma lacin</i></p> <p><u>Reptile:</u> <i>Aphaniotis acutirostris</i> <i>Draco sp.</i> <i>Aplopeltura boa</i> <i>Boiga cynodon</i> <i>Gonocephalus grandis</i></p>	<p><u>Amphibia:</u> <i>Rhacophorus achantharrhena</i> <i>Rhacophorus angulirostris</i> <i>Rhacophorus bifasciatus</i> <i>Rhacophorus catamitus</i> <i>Rhacophorus poecilonotus</i></p> <p><u>Reptile:</u> <i>Chrysopelea paradisi</i> <i>Gekko gekko</i> <i>Draco sumatranus</i> <i>Bronchocella cristatella</i></p>	<p><u>Amphibia:</u> <i>Rhacophorus pardalis</i> <i>Rhacophorus prominans</i> <i>Rhacophorus reinwardtii</i> <i>Polypedates leucomystax</i> <i>Polypedates macrotis</i></p> <p><u>Reptile:</u> <i>Ahaetulla prasina</i> <i>Boiga dendrophila</i> <i>Dendrelaphis pictus</i> <i>Dendragama boulengeri</i> <i>Lophocalotes ludekingi</i> <i>Dasia olivacea</i> <i>Spenomorphus sanctus</i> <i>Gekko monarchus</i> <i>Draco melanopogon</i></p>
Number of species	45	25	39

Table 4. List of species of frogs occurring in Sumatra mainland, Kerinci Seblat National Park (KSNP) and Gunung Leuser National Park. (+) species present; (-) species absent.

Described frog species of Sumatra mainland Source: -www.globalamphibians.org -Inger & Iskandar (2005)	Frog species in Gunung Leuser National Park Source: Mistar (2003)	Frog species in KSNP Jambi & West Sumatra Provinces Source : Current study
Class Amphibia		
Order Anura		
Famili Megophryidae		
<i>Leptobrachium abboti</i>	-	-
<i>Leptobrachium hasseltii</i>	-	-
<i>Leptobrachium hendricksoni</i>	+	-
<i>Megophrys aceras</i>	+	+
<i>Megophrys nasuta</i>	+	+
<i>Megophrys paralella</i>	-	+
Family Bufonidae		
<i>Ansonia glandulosa</i>	-	+
<i>Ansonia leptopus</i>	-	+
<i>Bufo asper</i>	+	+
<i>Bufo biporcatus</i>	-	-
<i>Bufo claviger</i>	-	+
<i>Bufo divergen</i>	-	+
<i>Bufo juxasper</i>	+	+
<i>Bufo melanostictus</i>	+	+
<i>Bufo parvus</i>	+	+
<i>Bufo quadriporcatus</i>	+	-
<i>Bufo sumatranus</i>	-	-
<i>Leptophryne borbonica</i>	+	+
<i>Pedostibes hosii</i>	+	-
<i>Pelophryne brevipes</i>	+	+
<i>Pseudobufo subasper</i>	-	-
Family Microhylidae		
<i>Caluella volzi</i>	-	-
<i>Kalophrynus minusculus</i>	-	-
<i>Kalophrynus pleurostigma</i>	+	+
<i>Kalophrynus punctatus</i>	+	-
<i>Kaloula baleata</i>	+	+
<i>Kaloula pulchra</i>	+	-
<i>Metaphrynella pollicaris</i>	-	+
<i>Metaphrynella sundana</i>	+	+
<i>Microhyla achatina</i>	-	-
<i>Microhyla berdmorei</i>	+	-
<i>Microhyla borneensis</i>	-	+
<i>Microhyla heymonsi</i>	+	+
<i>Microhyla ornata</i>	+	-
<i>Microhyla palmipes</i>	+	+
<i>Microhyla superciliaris</i>	+	+
<i>Micryletta inornata</i>	-	-
<i>Phrynella pulchra</i>	+	+

Described frog species of Sumatra mainland Source: -www.globalamphibians.org -Inger & Iskandar (2005)	Frog species in Gunung Leuser National Park Source: Mistar (2003)	Frog species in KSNP Jambi & West Sumatra Provinces Source : Current study
Family Ranidae		
<i>Fejervarya cancrivora</i>	+	+
<i>Fejervarya limnocharis</i>	+	+
<i>Huia modiglianii</i>	-	+
<i>Huia sumatrana</i>	+	+
<i>Limnonectes blythii</i>	+	+
<i>Limnonectes kuhlii</i>	+	+
<i>Limnonectes laticeps</i>	-	+
<i>Limnonectes macrodon</i>	-	+
<i>Limnonectes malesianus</i>	+	-
<i>Limnonectes microdiscus</i>	-	+
<i>Limnonectes paramacrodon</i>	-	+
<i>Limnonectes shompenorum</i>	+	+
<i>Limnonectes tweediei</i>	-	-
<i>Occidozyga baluensis</i>	-	-
<i>Occidozyga laevis</i>	-	+
<i>Occidozyga lima</i>	+	-
<i>Occidozyga sumatrana</i>	+	+
<i>Rana baramica</i>	+	-
<i>Rana chalconota</i>	+	+
<i>Rana crassiovis</i>	-	+
<i>Rana debussy</i>	-	-
<i>Rana erythraea</i>	+	+
<i>Rana glandulosa</i>	+	-
<i>Rana hosii</i>	+	+
<i>Rana kampeni</i>	+	+
<i>Rana luctuosa</i>	-	-
<i>Rana nicobariensis</i>	+	+
<i>Rana nigrovittata</i>	+	+
<i>Rana persimilis</i>	-	-
<i>Rana picturata</i>	+	+
<i>Rana raniceps</i>	-	+
<i>Rana siberu</i>	+	+
Family Rhacophoridae		
<i>Nyctixalus pictus</i>	+	+
<i>Philautus aurifasciatus</i>	+	+
<i>Philautus cornutus</i>	-	+
<i>Philautus similis</i>	-	-
<i>Polypedates colletti</i>	+	-
<i>Polypedates leucomystax</i>	+	+
<i>Polypedates macrotis</i>	+	+
<i>Polypedates otlophus</i>	+	+
<i>Rhacophorus achantharrhena</i>	-	+
<i>Rhacophorus angulirostris</i>	-	+
<i>Rhacophorus appendiculatus</i>	+	+

Described frog species of Sumatra mainland Source: -www.globalamphibians.org -Inger & Iskandar (2005)	Frog species in Gunung Leuser National Park Source: Mistar (2003)	Frog species in KSNP Jambi & West Sumatra Provinces Source : Current study
<i>Rhacophorus barisani</i>	-	+
<i>Rhacophorus bifasciatus</i>	-	+
<i>Rhacophorus catamitus</i>	-	+
<i>Rhacophorus cyanopunctatus</i>	-	+
<i>Rhacophorus modestus</i>	-	+
<i>Rhacophorus nigropalmatus</i>	+	+
<i>Rhacophorus pardalis</i>	+	+
<i>Rhacophorus poecilonotus</i>	-	+
<i>Rhacophorus prominanus</i>	+	+
<i>Rhacophorus reinwardtii</i>	+	+
<i>Theلودerma asperum</i>	-	-
<i>Theلودerma horridum</i>	-	-
<i>Theلودerma leporosum</i>	-	-
<i>Theلودerma licin</i>	-	+
Number of species	52	64

DAFTAR INDEKS
Zoo Indonesia 2009, Volume 18, Nomor 1 & 2

- Amfibia; 45
 Ashari, H; 99
 Bali Barat National Park; 99
Barbodes collingwoodii; 21
 Biodiversitas; 45, 69, 79
 Birds; 99
 Brachyura; 1
 Cyprinidae; 21
 Diapari, D; 33
Dotilla myctiroides; 99
 Ekologi; 79
Esacus neglectus; 99
Euhampsonia roepkei; 41
 Gadag; 33
 Gobiidae; 89
 Gunung Botol; 69
 Gunung Halimun-Salak; 41
 Gunung Kendeng; 69
 Gunung Patuha; 69
 Haryono; 2 1
 Herpetofauna; 45
Huia modiglianii; 9
Huia sumatrana; 9
 Ikan; 21, 89
 Kalimantan Tengah; 21
 Kelimpahan; 21
 Keanekaragaman; 79
 Kerinci Seblat; 45
 Kodok; 9
 Kurniati, H; 9, 45
 Lutung kelabu; 33
 Lutjanidae; 89
 Maksiliped; 1
 Mamalia; 79
 Mangrove; 89
 Murniati, D.C; 1
 Ngengat; 69
 Pegunungan Muller; 21
 Pratiwi, A.N; 33
Rasbora volzi; 21
 Reptile; 45
 Riau; 79
 Saim, A; 79
 Serranidae; 89
 Sinaga, M.H; 79
 Sumatra; 9, 45
 Sutrisno, H; 41, 69
 Suyanto, A; 79
 Ujung Kulon; 89
 Tesso Nilo; 79
 Tingkah laku makan; 33
 Tjakradidjaja, A.S; 33
Trachypithecus cristatus; 33
Uca spp.; 1
 Wahyudewantoro, G; 89
 Wirdateti; 33