Frog and reptile considerations for BioRA

Hoang Minh Duc, PhD

An overview of Herpetofauna in Lower Mekong Countries

- Species composition
- Distributions of herpetofauna in LMB
- Key habitats
- Main relationships with the flow of sediments and water
- Main threats
- Unknowns in terms of life histories
Species composition

• Amphibian of Lower Mekong Basin Countries
  – “The herpetofauna has received relatively little scientific attention, and the existing information does not reflect the true diversity of the group within the region.” (MRC, 2005: 109)
  – By 2005, 250 amphibian species and 650 reptile species have been recorded for four LMB countries

• Current knowledge:
  – Amphibian: 316 species, 5 EN, 14 VU (AmphibiaWeb)
  – Reptile: 686 species (Reptile Database)
  ❖ Very little information is available specifically on the Mekong system

Species composition

• Amphibian of Lower Mekong Basin Countries
  Number species and Sorensen Similarity Index of Amphibian

<table>
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<tr>
<th>Country</th>
<th>Cambodia</th>
<th>Laos</th>
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www.mrcmekong.org
Species composition

- Reptile of Lower Mekong Basin Countries

Number species and Sorensen Similarity Index of Reptile

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Distributions of herpetofauna in LMB

- Geographical distribution
  According to MacKinnon (1997), the Indochina Bio-unit was split to 4 units:
  - Coastal Indochina
  - South China
  - Annamites Mountain
  - Indochina (inland plains and valleys of MK River, upper catchment of Chao Phraya River and Salween River and extending to Himalaya foothill)
Distributions of herpetofauna in LMB

• **Geographical distribution**

  Subregions of Indochina (Bain and Hurley, 2011)
  – Northwest Upland
  – North Annamites
  – Upper Mekong Lowland
  – Southern Lao Lowland
  – Southern Lao Upland
  – Central Annamites
  – Southern Annamites
  – Interior Cambodian Lowland

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Distributions of herpetofauna in LMB

- Longitudinal and lateral distributions

Key habitats

- Evergreen forest (lowland and upland)
- Riparian/gallery forests
- Wetlands
- Aquatic habitats
Major habitat preference of Amphibians

- Forest
- Savannah
- Grassland
- Shrubland
- Secondary terrestrial habitats
- Flowing freshwater
- Marsh/swamp
- Still open freshwater
- And semi aquatic habitats

Number of species

Main relationships with the flow of sediments and water

- Water-dependant species
  - Most amphibians rely on freshwater habitat
  - Several families of reptiles (e.g. Acrochordidae, Homalopsidae, Geoemydidae, ...)

- Prefer living in area with
  - Still open / low flowing freshwater
  - Low water-level fluctuation
  - Low sediment flow (low level of water contamination)
Main threats

• Habitat loss
  – Conversion of grassland to paddyfield, aquaculture land; coastal forest to aquaculture land.
  – Forest encroachment
  – Infrastructure development (roads, irrigation systems, ...)
  – Hydropower development

Main threats

• Human exploitation
  – Foods (most kind of frogs, snakes and some lizards)
  – Skins (Pythons, Monitors, Crocodiles)
  – Traditional medicine (snakes, turtles)
Main threats

- Pollution
  - Sediments
  - Pesticides
  - Fertilizers
  - Organic matter
  - Heavy metals, and
  - Petrochemicals

Main threats

- Infectious disease
  - e.g. Chytridiomycosis disease on Amphibian caused by the fungus *Batrachochytrium dendrobatidis (Bd)*?

Fisher et al. (2009)
Main threats

• Climate change
  – Habitat disconnectivity
  – Temperature increase and problem of top-mountain species, especially frogs in cloud forests
  – Climate change also affects host-parasite relationships (chytrid fungus - *Batrachochytrium dendrobatidis*)

Unknowns in terms of life histories

• Little is known about life histories of most amphibian and reptile species
  – Mating and breeding season?
  – Nesting place of turtles?