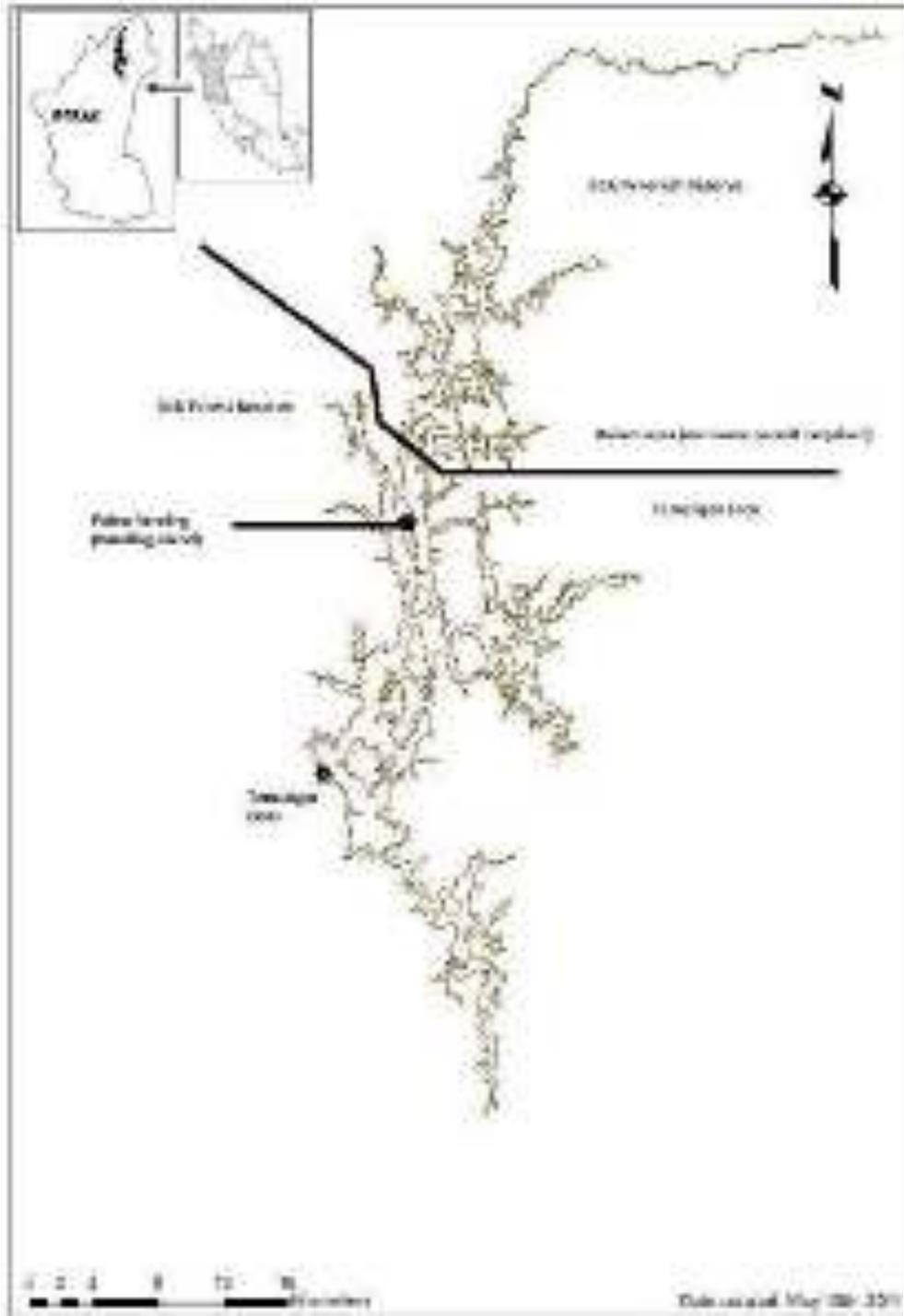




ROYAL BELUM – TEMENGOR 2015/16 SCIENTIFIC EXPEDITION

DR. ZARUL HAZRIN HASHIM
School of Biological Sciences
Universiti Sains Malaysia
11800 USM, Penang



Temengor Reservoir

- Tasik Banding ?
- 2nd largest man-made lake in the Peninsular Malaysia
- Completed in 1977
- Surface area = 152 km²
- Mean depths = 40 m
- Maximum depth = > 80 m
- Belum Forest Reserve
- Temengor Forest Reserve
- Grik Forest Reserve



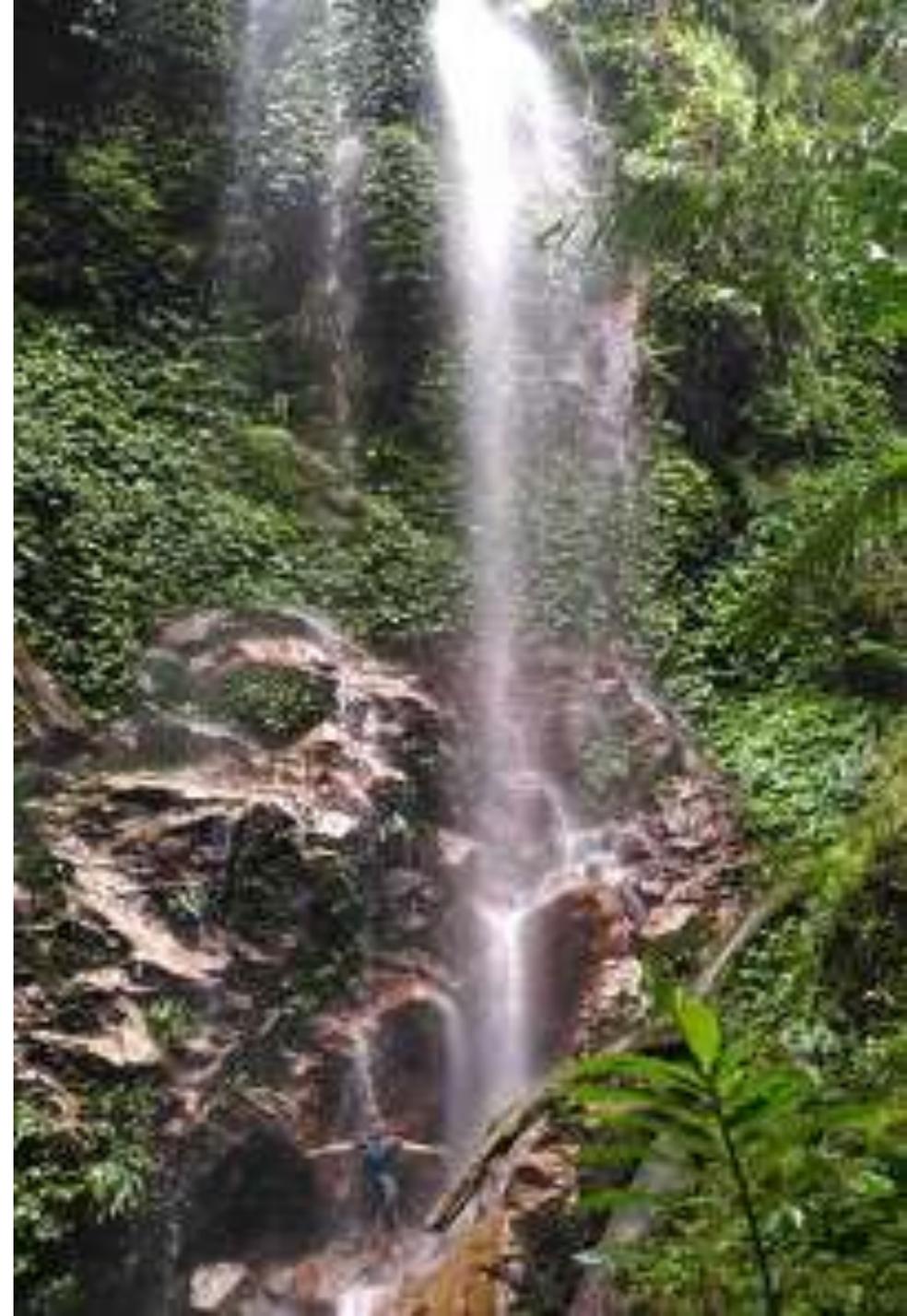
Belum-Temengor Research Consortium

- formed by a group of researchers/lecturers from School of Biological Sciences
- Goal:
 - to explore and to discover the biodiversity of Royal Belum and Temengor forests.
 - to protect the *copyright* of the discoveries,
- Temengor FR: 9th – 13th November 2015
- Royal Belum: 1st – 5th February 2016
- 60 participants (staffs and students)



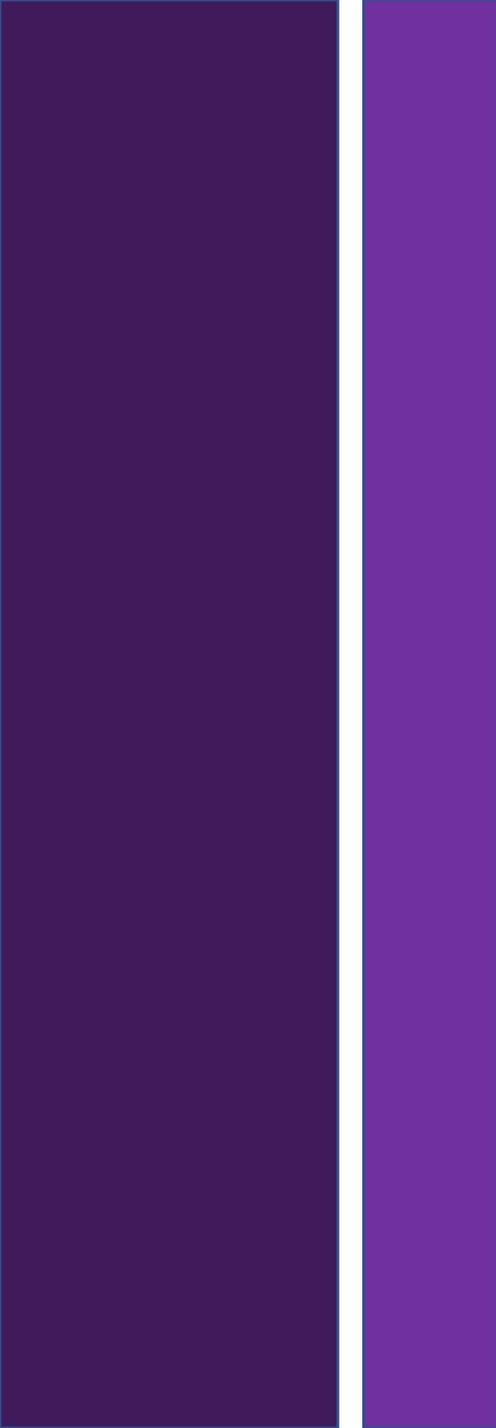
Research Conducted

- River fish diversity
- Reservoir fish diversity
- Lianas and rattan
- Small mammals and reptiles
- Soil analysis
- Fish parasites
- Microbes
- Fungi
- Fish genetics (barcoding)
- Aquatic insects
- Terrestrial insects (spider)
- Phytoplankton





VIDEO PLAYBACK



The Fishes

FISH OF TEMENGOR LAKE



Channa micropeltes
(Toman)



*Puntioplites
bulu*

(Tengalan)



*Osphronemus
goramy*

(Kalui)



*Hampala
macrolepidota*

(Sebarau)





*Notopterus
notopterus*

(Selat)



*Cyclocheilichthys
apogon* (Temperas)

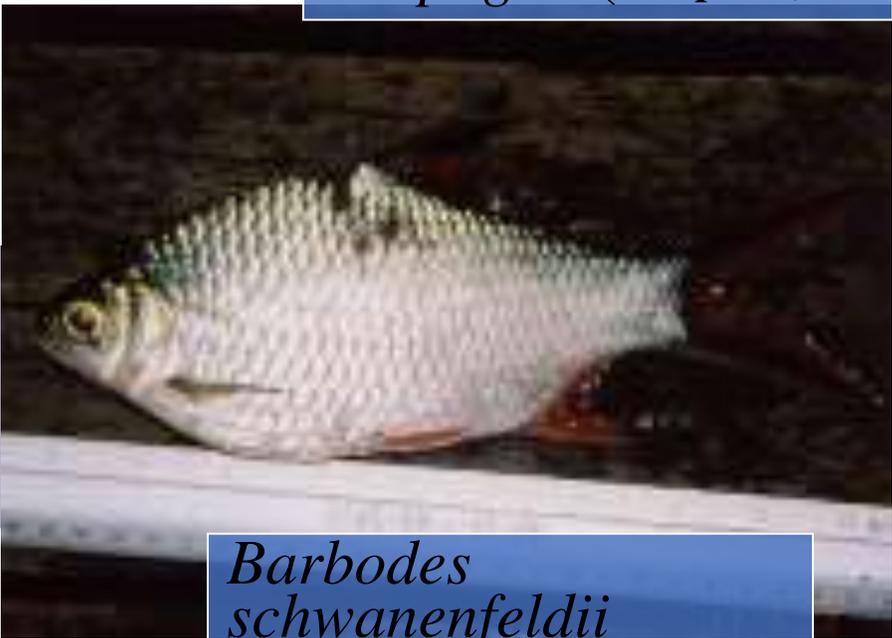


*Hampala
macrolepidota*

(Sebarau)



*Osteochilus
hasseltii*



*Barbodes
schwanenfeldii*



Mystacembelus spp.
(Tilan)

Tor tambroides
(Kelah)



Cichla ocellaris
(Raja) ; Invasive sp.

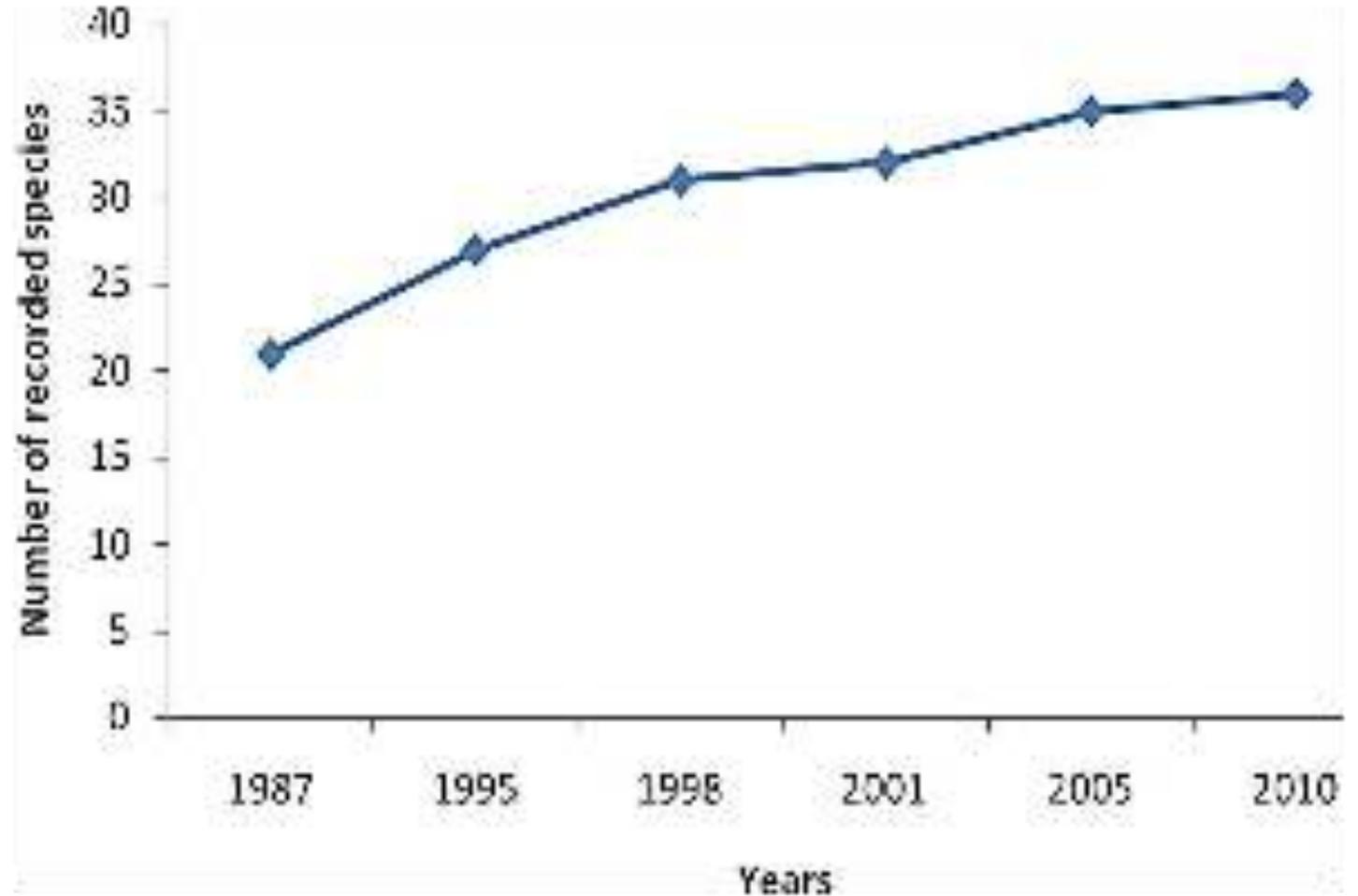
Probarbus jullienii
(Temoleh)



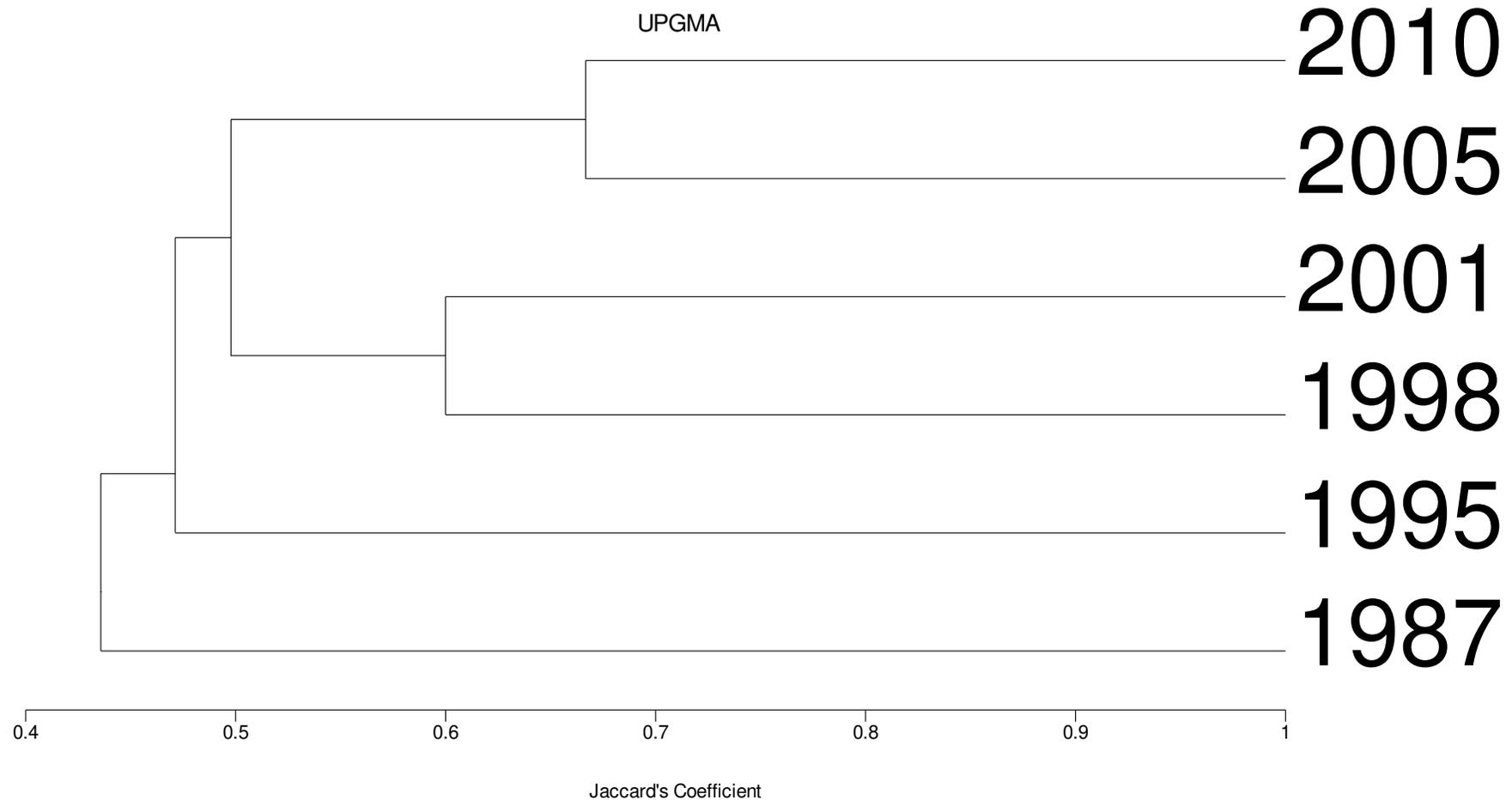
Increment of number of fish recorded in the past 30 years in Temengor Reservoir based on catch using various sizes of gill nets and sampling gears.

Years presented were based on the recent study (2010) and the publication year of the following studies, Khoo et al. (1987), Zakaria and Lim (1995), Sha

h and Ali (*unpublished*; referred as 1998), TNBR (*unpublished*; referred as 2001) and Zainudin 2005.



Cluster analysis using Jaccard's coefficient and UPGMA clustering strategy to determine similarity among the years.





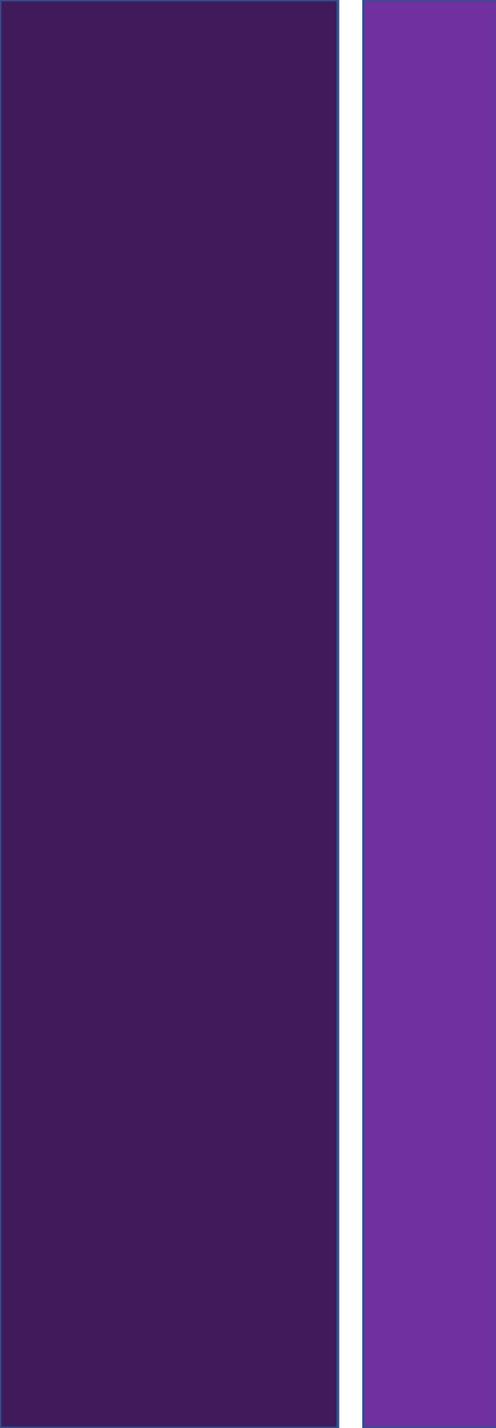
Late 70s / Early 80s



Facts – based on research conducted

- WQ = Class I; stable and consistency
- Epilimnion: 0-6 m; Metalimnion: 6-12 m; Hypolimnion: 12 m- bottom
- Total fish sp. = 36; **1 invasive sp.**
- Total fish sp. @ 2012 = 19 ;
- **Sp. Loss = 17 (could be more now...)**
- **% of changes in fish sp. = 50% in 30 years**
- **Habitat degradation, over-fishing**





Threats









Automatic Change Detection of Belum-Temengor Forested Area using Multitemporal SAR Images

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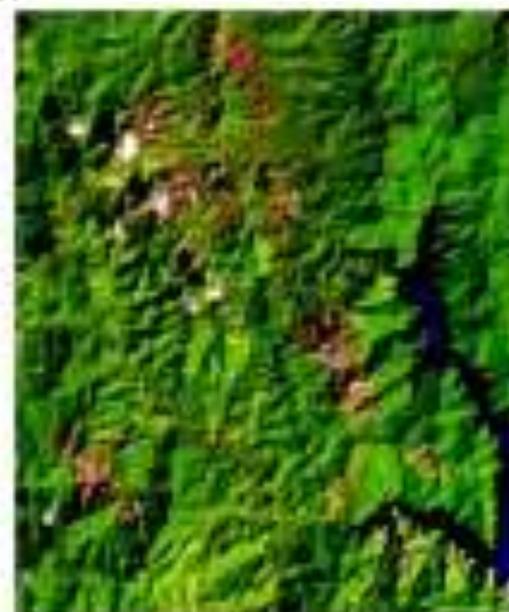
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(a)



(b)

Fig. 4. SPOT-5 images showing bright patches of forest clearance due to logging, indigenous settlement and small agriculture. (a) Data obtained in Apr. 2005. (b) Data obtained in Jan. 2007.



OUR APPRECIATION GOES TO:



KEMENTERIAN AIR, TANAH & SUMBER ASLI (KATS)

THANK YOU