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UNIVERSITI MALAYSIA  
SARAWAK



# Asian Arowana Status in Sarawak, Borneo

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What *Tor* is this?



Where is the current distribution of *S. formosus*  
in Sarawak?



**Goldee: 2012 ~ 2017**

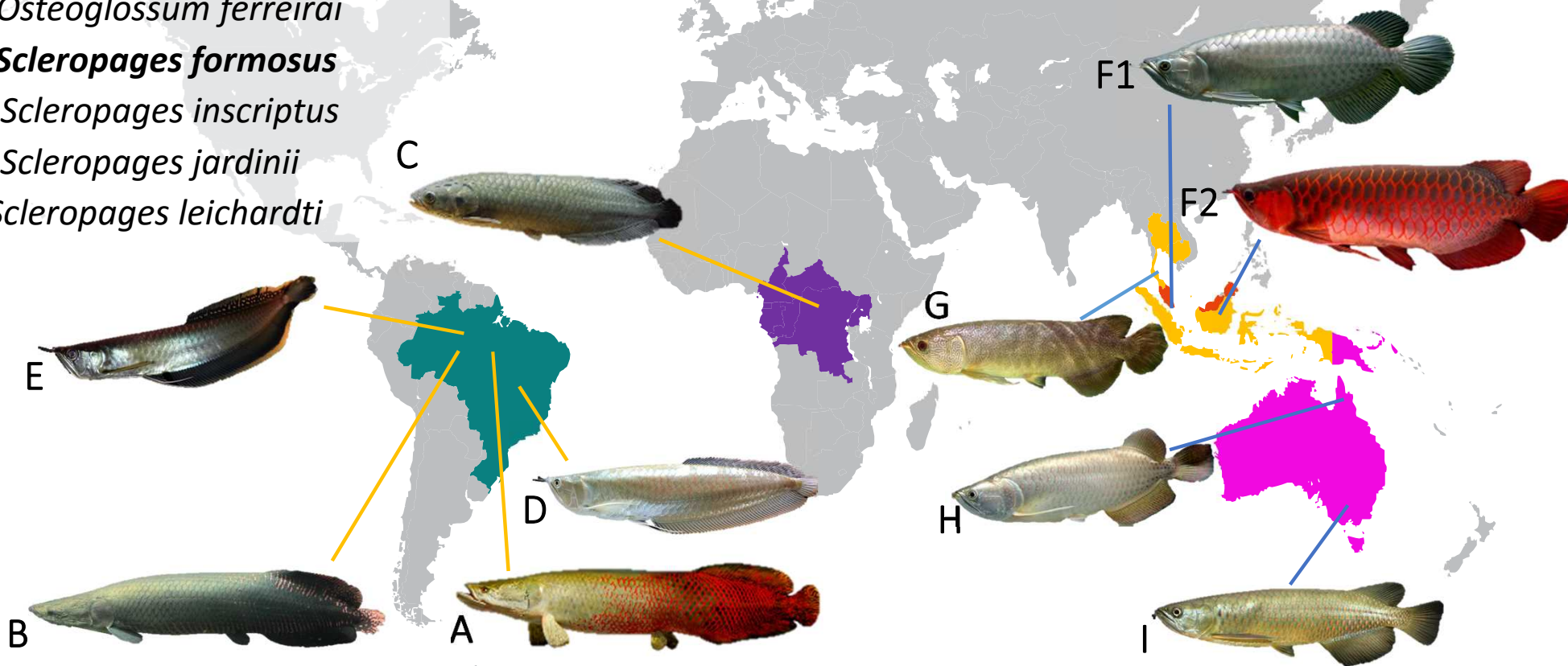
# Introduction

- *Scleropages formosus* – Asian Arowana, Kelisa, Siluk
- Long time ago... early Cretaceous, Asian arowana diverged from the Australasian arowanas (Kumazawa & Nishida, 2000)



# Nine members of *Osteoglossidae* family

- A - *Arapaima gigas*
- B – *Arapaima leptosoma*
- C - *Heterotis niloticus*
- D - *Osteoglossum bicirrhosum*
- E - *Osteoglossum ferreirai*
- F - ***Scleropages formosus***
- G - *Scleropages inscriptus*
- H - *Scleropages jardinii*
- I - *Scleropages leichardti*

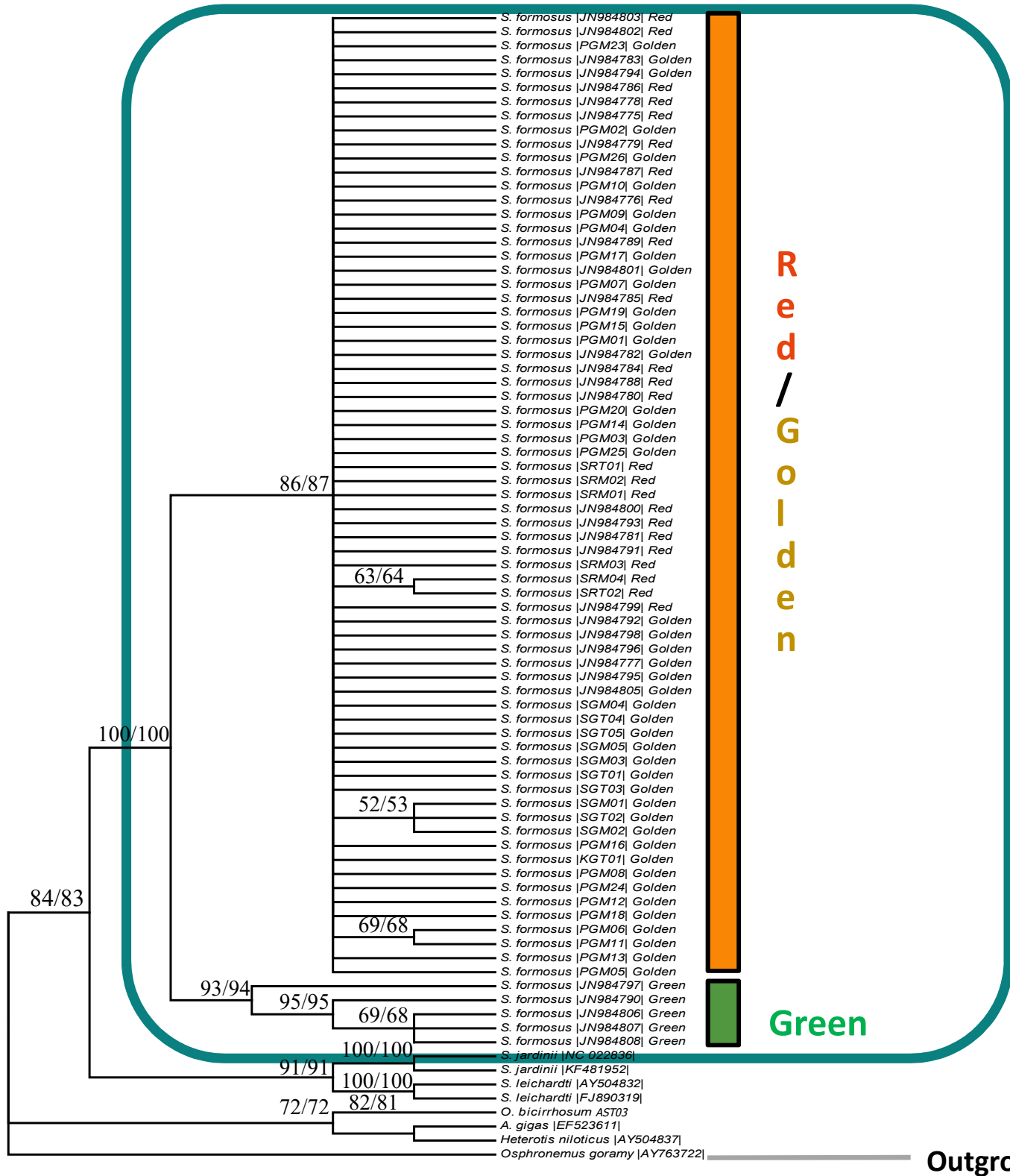


# Three Colour Variety of Asian Arowana

Variety/ Type	Price per individual (15 - 20 cm) (RM)	Price per individual (>40 cm) (RM)
<b>Gold arowana</b>		
Malaysian Gold	1,500 – 3,000	12,000 – 14,000
Gold Blue Base	1,500 – 3,000	12,000 – 14,000
Highback Golden	500 – 1,000	6,000 – 8,000
<b>Red arowana</b>		
Chili Red	1,200 – 2,200	12,000 – 14,000
Super Red	1,000 – 2,000	10,000 – 12,000
Banjar Red	150 – 200	2,000 – 2,500
<b>Green arowana</b>		
	50 – 100	1,500 – 1,800
<b>Amazon Silver arowana</b>	40 – 60	500 – 1000



Source: Department of Fisheries Malaysia (2012)



Red / Golden

Green

- 16S NJ and ME phylogenetic tree
- Green arowana separated in other clade
- Need protection for the conservation of Biodiversity

Outgroup

# Background

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1

Population status of *S. formosus* in Sarawak relatively unknown

2

Green type in Sarawak

3

The wild population might be too small

4

Extinct in the wild?

- Habitat loss
- Hunting pressure, accidental caught
- Discrimination of aquaculture preference



- IUCN Red List of Threatened Species – ‘Endangered’
- CITES – Appendix I
- The one and only bony fish Protected in Sarawak



In addition, the final chapter is a summary of who should do what to implement the Master Plan, and a proposed timetable. The chapter gives full references to the relevant point in the main text. The final chapter can be used on its own for easy reference by implementing agencies.

### 1.3 DEFINITION OF WILDLIFE

For the purposes of this document, wildlife is defined as all vertebrates excluding fish which occur in the wild state in Sarawak or elsewhere in the world. This means that it includes all wild species of mammals, birds, reptiles and amphibians.

### 1.4 WHY IS A MASTER PLAN FOR WILDLIFE NEEDED?

Close to the Equator, and with a high rainfall year-round, Sarawak has an ideal climate for plants and animals to flourish. Thus, it has amongst the highest biodiversity per unit area in the world. In its 124,450 km<sup>2</sup>, Sarawak has about 185 species of mammals (Payne et al., 1985), 530 species of birds (MacKinnon and Philipps, 1993), 166 species of snakes, 104 of lizards and 113 of amphibians (Anon., 1985).

A large proportion of Sarawak's animals are unique to Borneo and do not occur in mainland South-east Asia. These include approximately 19% of the mammals, 6% of the birds, 20% of the snakes and 32% of the lizards.

	SPECIES 1	SPECIES 2	SPECIES 3	SPECIES 4	SPECIES 5
Family name:	OSTEOGLOSSIDAE				
Genus name:	SCLEROPAGES				
Species:	FORMOSUS	INSCRIPTUS	AUREUS	LEGENDREI	MACROCEPHALUS
Subspecies:	N/A				
Taxonomic Reference:	<a href="http://www.fishbase.org/summary/Scleropages-formosus.html">http://www.fishbase.org/summary/Scleropages-formosus.html</a> <i>Scleropages formosus</i> (Müller & Schlegel, 1844) <i>Scleropages inscriptus</i> (Roberts, 2012) <i>Scleropages aureus</i> (Pouyaud et al. 2003) <i>Scleropages legendrei</i> (Pouyaud et al. 2003) <i>Scleropages macrocephalus</i> (Pouyaud et al. 2003)				
Common Names:	ASIAN AROWANA DRAGON FISH ASIAN BONYTONGUE KELESA MALAYAN BONYTONGUE	INDIA AROWANA/ DRAGONFISH	GOLD & RED- TAILED GOLDEN AROWANA/ DRAGON FISH	RED AROWANA/ DRAGON FISH	SILVER AROWANA/ DRAGON FISH
Genetically-Modified Organism (GMO)	The Species are not genetically-modified and are a naturally occurring species in Asia.				

**PROTECTED WILD LIFE OF SARAWAK**  
**DON'T hunt, kill, keep, sell or eat!**

**Penalty:**  
**Maximum fine of RM10,000 and one year jail.**

For inquiry or report of any offence and further clarification, please contact:  
 SARAWAK FORESTRY  
 Protected Areas and Biodiversity Conservation  
 Level 12, Office Tower, Hock Lee Centre, Jalan Dutuk Abang Abdul Rahim, 93450 Kuching, Sarawak, Malaysia.  
 General line: 082-348001 Toll free line: 1-800-88-2526 Fax: 082-341550 Website: www.sarawakforestry.com

# Distribution in Sarawak

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1

Sungai Raso, Lundu area; Arowana Fish Survey in the Lundu-Sematan - FDS unpublished report, 1992

2

Samunsam River; FRST, UNIMAS Samunsam Expedition – unofficial report, 1997

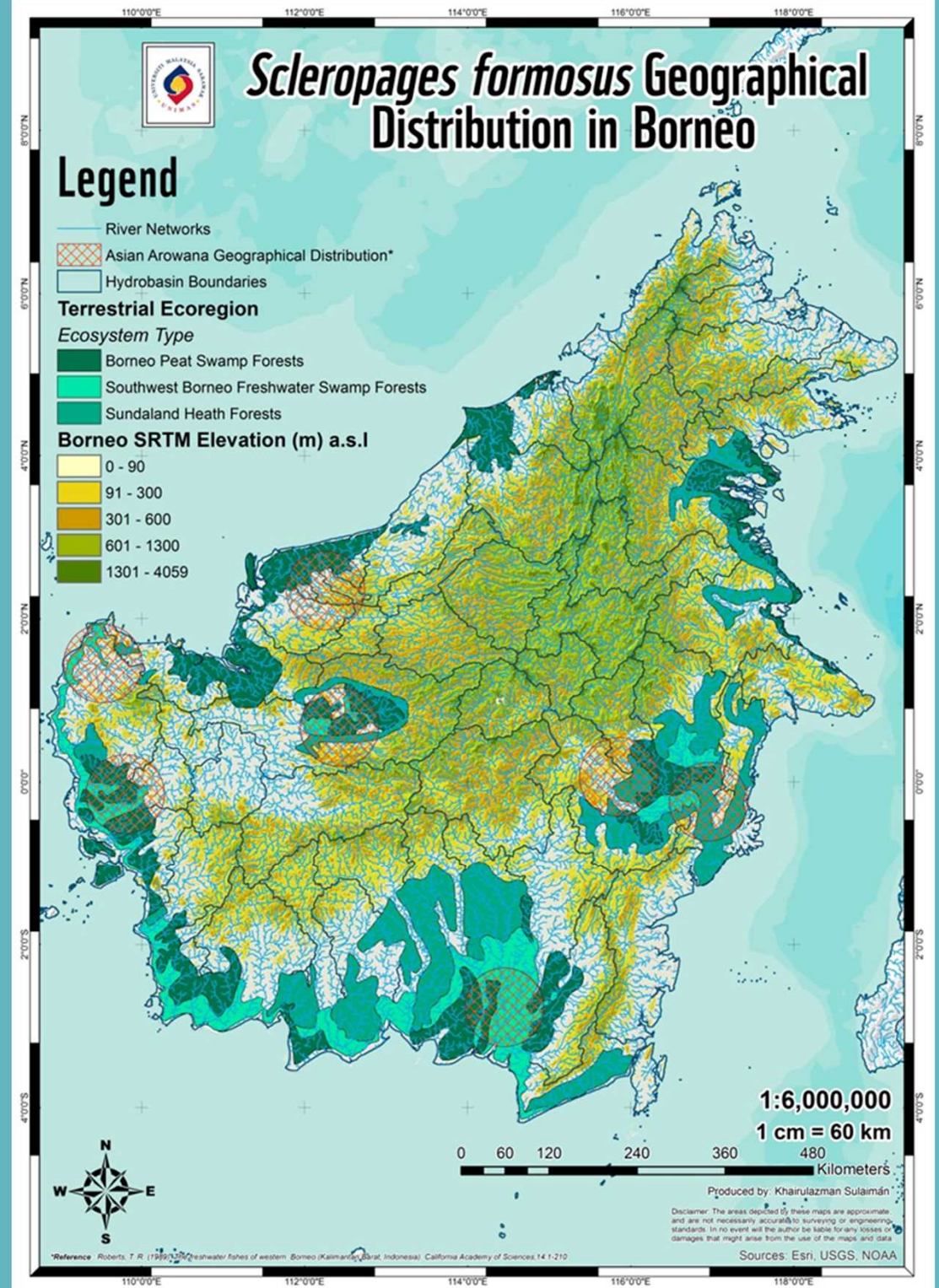
3

Sungai Kenyana, Mukah area – Hasanaliza, 2013

4

Sungai Kubud, Bintulu area - FDS unpublished report  
Tasik Kinyu, Bintulu area - Blog

# Potential distribution



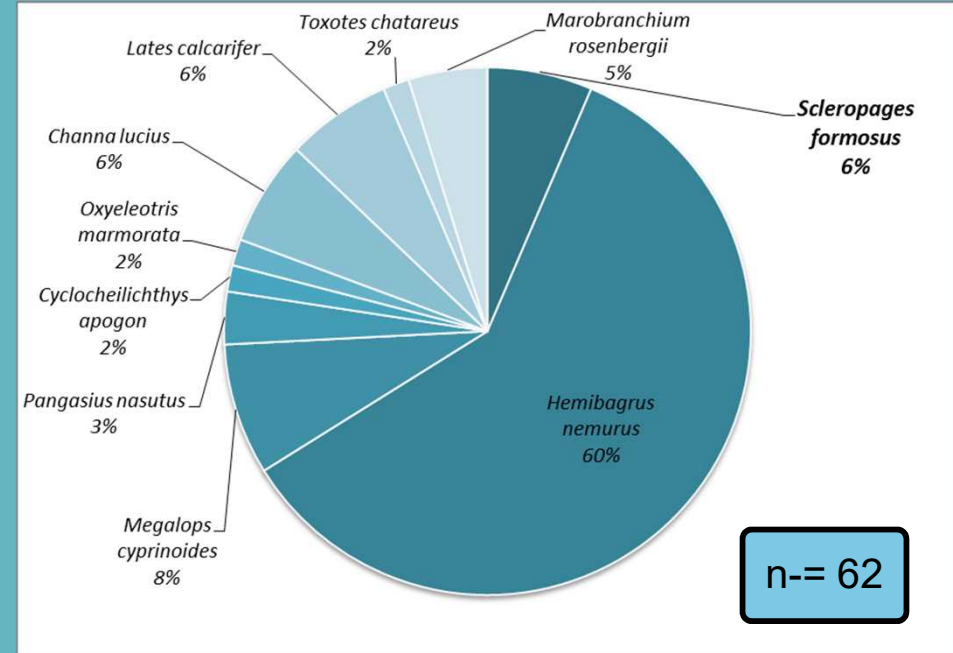


Samunsam Wildlife Sanctuary is the last stronghold of the Asian Arowana habitat in Sarawak. The present report finding shows that the Asia Arowana is relatively rare with 6% encounter rate within five times of visits and mixed sampling technique and efforts. The water quality of Samunsam River however is still pristine with most *in-situ* parameter falls within Class I and Class II of National water Quality Standards for Malaysia.

## Asian Arowana Research at Samunsam Wildlife Sanctuary Status Report

September 2017

# Samunsam WS



# Kenyana



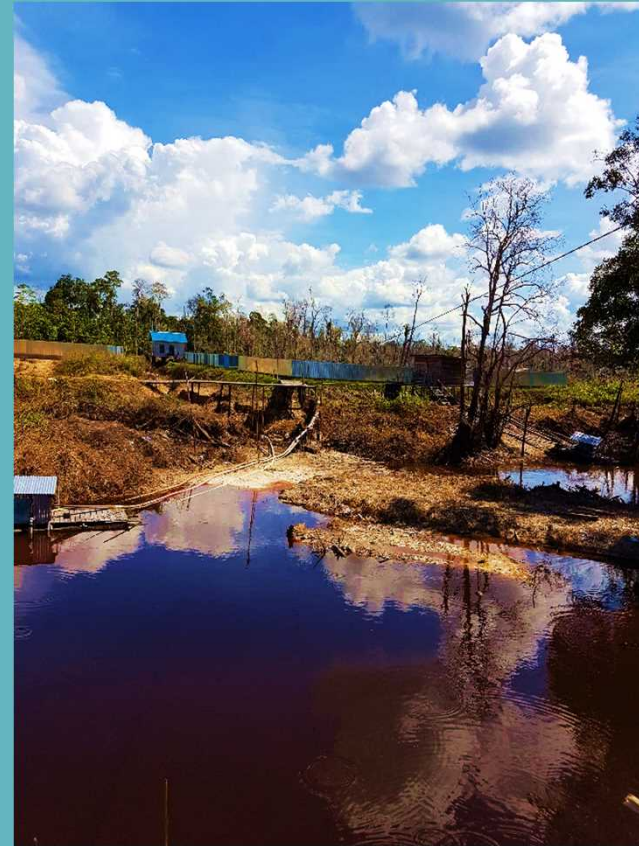
# Ulu Kapuas

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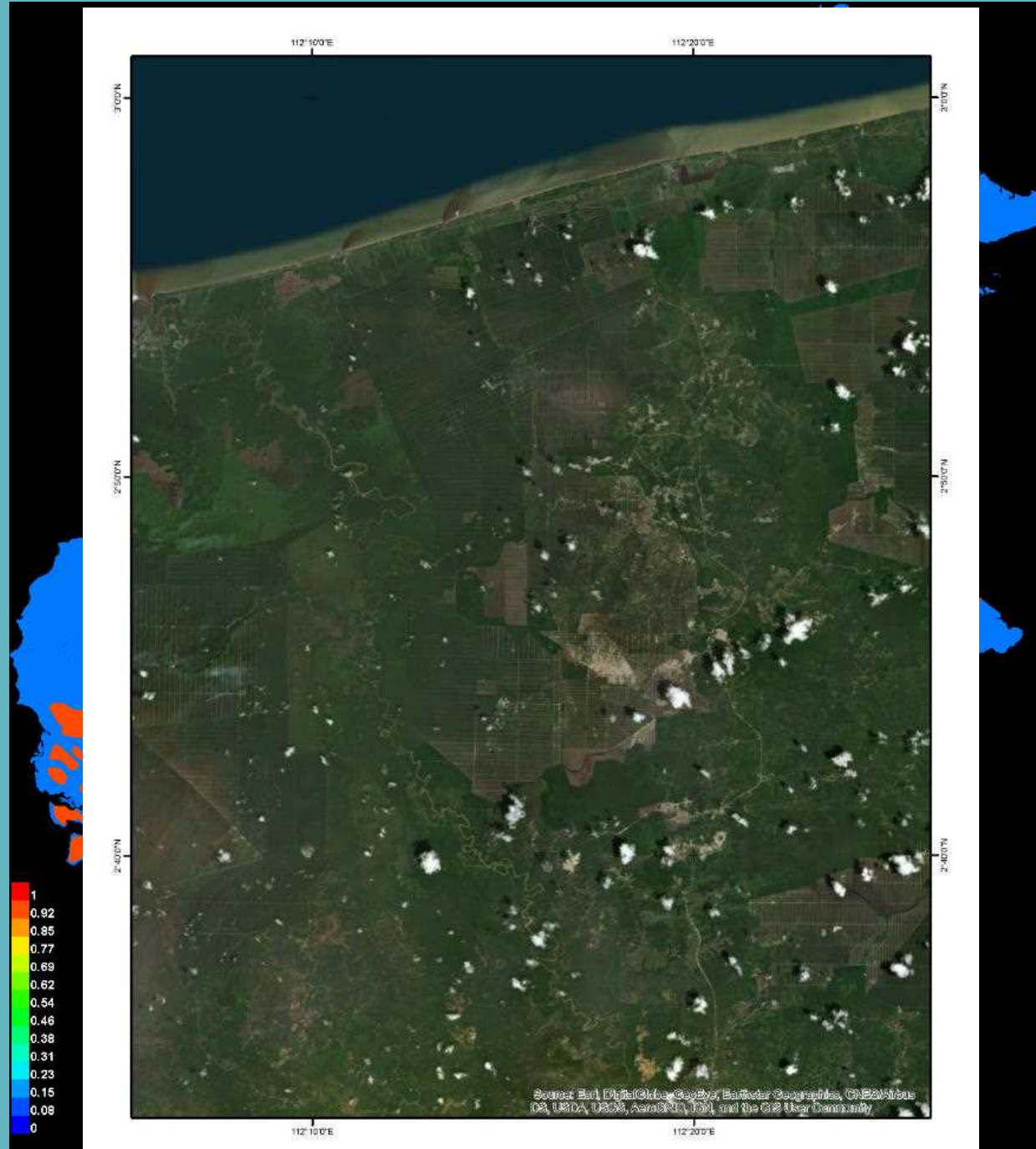


# Ulu Kapuas

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# Future Projection?







Current logging practices

deforestation

Land and water resources development works

Agricultural development schemes

Agricultural activities

Use of rivers as means of transport

**Habitat loss and degradation**

Dam construction e.g. for HEP generation, irrigation

Overfishing pressure

Destructive & abusive fishing method

Advent of cash economy – supply and demand

**Fish stocks in natural water bodies**

Free and easy access to resources

Lack of regulation and awareness

People's attitude

Drop in CPUE

Drop in number of big-sized individuals

Drop in quality

Drop in relative abundance

**Decline and results**

Relative increase in neglected species

Relative increase in small-sized species and individuals

Increasing scarcity of certain species from certain river system

**Impacts**

Loss of species diversity and genetic material

Ecological imbalance

Diminish in traditional protein and income

Breakdown of the rural social structures and traditional ways of life

**Some major causes and impacts of decline of the indigenous Freshwater Fishes of Sarawak (FDS, unpublished)**

Malnutrient, health problems, reduced quality of life

# Recommendation

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1

Protection of fish + management of habitat – Legislative: SFO, 2003 & WPO, 1998

2

Enhancement of protection through frequent patrolling

3

Collaboration and funding? - More survey, more data?

4

3E - Education, Enforcement, Engagement (with local people)

5

Systematic captive breeding - reintroduction of fish stock

6

Standardize the method for fish assessment - guide



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# Thank you

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