

# Data preparation for seer fish stock assessments (Indo-Pacific king mackerel and narrow-barred Spanish mackerel)

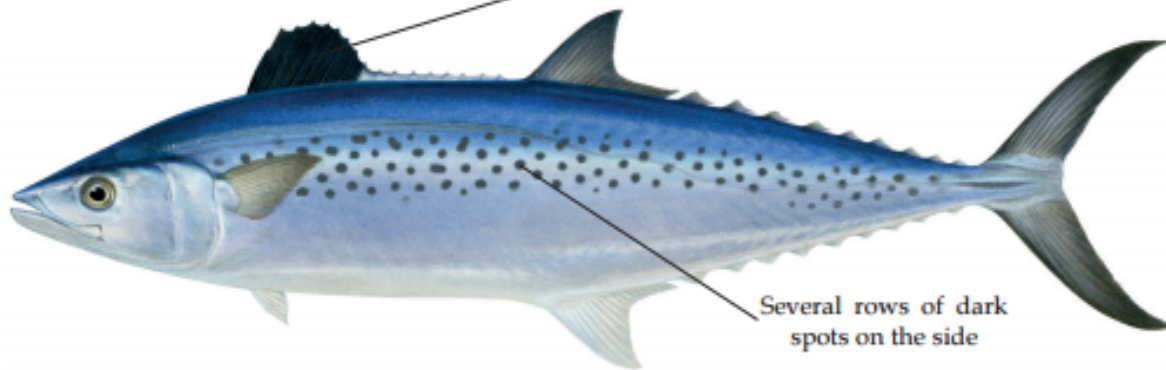
Tom Nishida (Resource Person)

## Indo-Pacific king mackerel

*Scomberomorus guttatus*

J - タイワンサワラ  
C - 长颌花鲷 / 台湾馬加鲷  
F - Thazard ponctué indo-pacifique  
S - Carite del Indo-Pacifico

First dorsal fin black up to the eighth spine and white posterior



Several rows of dark spots on the side

Max. FL: 76 cm  
Com. FL: ≤ 55 cm

## Narrow-barred Spanish mackerel

*Scomberomorus commerson*

J - ヨコシマサワラ  
C - 鲯 / 康氏馬加鲷  
F - Thazard rayé indo-pacifique  
S - Carite estriado Indo-Pacifico

Dark vertical bars on side



Lateral line bent down below end of second dorsal fin

Max. FL: 240 cm  
Com. FL: ≤ 90 cm

# Contents

- Consideration of Stock assessment method (software)



- Data requirements and submission  
(important for member countries)



- Home (office) work

# Data required by stock assessment model

	Structure	Model (example)	Data				
			Catch	CPUE	size	biology	space/tag
(1)	Catch (datapoor)	SRA	Yes	No	No	No	No
(2)	Production model	ASPIC	Yes	Yes	No	No	No
(3)	Age/size	VPA	Yes	Yes	Yes	No	No
(4)	Integrated	SCAA/SCAS	Yes	Yes	Yes	Yes	No
		SS3	Yes	Yes	Yes	Yes	Yes

As the 1<sup>st</sup> step, we will attempt the simple model (2) ASPIC

**but if we don't have CPUE → (1) SRA**

# Data required by stock assessment model

	Structure	Model (example)	Data				
			Catch	CPUE	size	biology	space/tag
(1)	Catch (datapoor)	SRA					
(2)	Production model	ASPIC					
(3)	Age/size	VPA					
(4)	Integrated	SCAA/SCAS					
		SS3					

**As the 2<sup>nd</sup> step (future), if we have catch, CPUE, size and biological data, we will attempt (3) or (4) (also for LOT+KAW)**

If we don't have CPUE,  
we will attempt the data poor approach  
**SRA (Stock Reduction Analysis)**

**What are differences  
between SRA and PM (ASPIC)**

## Differences between SRA and PM (ASPIC) (theory and Estimation )

Method==>	PM (ASPIC)	SRA (data poor)
basic model	Population growth equation (e.g. logistic curve)	
catch	available	
CPUE	available	not available
Estimation : r and K	r and K will be estimated statistically	optimum r and K will be searched by <u>simulations</u>
Estimation process	simpler	Complex ==> Highly computing intensive approach
software	available	we absolutely need to be developed

If we have CPUE,

ASPIC (as applied for LOT and KAW)



CPUE standardization (simple version for GLM is ready)

**We need further functions for GLM (interaction terms etc.)**

**In addition, we expect a lot of 0 CPUE (seer fish)**

**We need other models (Negative binominal, delta log normal...)**



Need to include additional functions + models (**further development**)

ASPIC (software are available)

After we finish either SRA or ASPIC

We need to present results

**Kobe plot (software is available)**

**Risk assessment (software needs to be developed)**



# Summary: software

	CPUE standardization	stock assessments	Kobe plot	Risk assessment
	GLM with more functions + other models (NB, DLN etc)			
SRA (Stock Reduction Analysis)	No need	(1) need to develop (\$\$\$) if we use	(3) available	(1) need to develop (\$\$\$)
ASPIC	(1) Need to develop (\$\$\$)	(2) available		

## Note

(1) SEAFDEC property (need permission from Secretariat to use)

(2) Free software : web link will be available soon

(3) Free software available <http://ocean-info.ddo.jp/kobeaspm/kobeplot/KobePlot.zip>

# How to compile and submit seer fish catch and CPUE data

Indo-Pacific King Mackerel  
Narrow-banded Spanish Mackerel

First we consider the Stock structure

**Narrow-barred Spanish Mackerel**  
*Scomberomorus commerson*

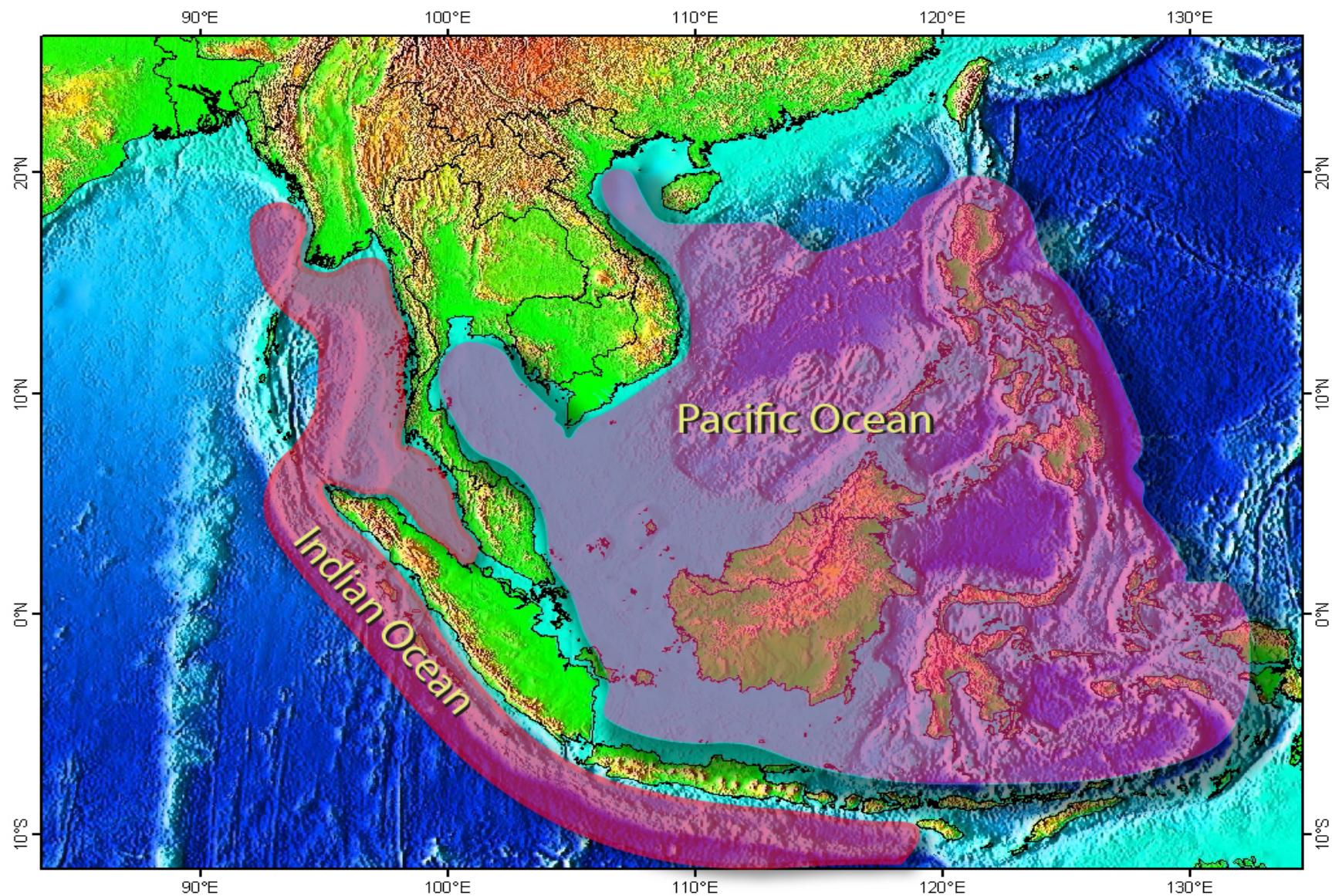


**Indo-Pacific King Mackerel**  
*Scomberomorus guttatus*





# 2 stock hypothesis (Pacific and Indian Ocean)



# Indonesia, Malaysia and Thailand: 2 data sets (Indian and Pacific)

**Pacific and Indian stocks covered by country**

	(a) Pacific stock FAO 71 area	(b) Indian stock FAO 57 area
(1) Brunei		
(2) Cambodia		
(3) Indonesia (2 stocks)		
(4) Malaysia (2 stocks)		
(5) Myanmar		
(6) Philippines		
(7) Thailand (2 stocks)		
(8) Viet Nam		

# To conduct SRA or ASPIC

We need 2 information

- |                  |                    |
|------------------|--------------------|
| (1) Global catch | both SRA and ASPIC |
| (2) Nominal CPUE | ASPIC only         |

\*\*\*\*\*

(3) (extra) Species compositions

# (1) **Global** catch

What is the global catch ?

In any Stock assessment models---

**Need total removals (catch) (same stock area)**

(all countries + all gears + all fishing areas)

to estimate  $F$  (fishing mortality)

→ **Not Good** if we use **partial** catch, i.e.,

*only some countries, some gears, some fishing areas*



# Template for data submission by excel (Example)

## Thailand/Pacific stock

Annual seer fish catch by gear and species (tons)

*0 (zero) catch are also important statistics (don't forget)*

	<b>Gear 1 (PS)</b>			<b>Gear 2 (GILL)</b>			<b>Total</b>		
year	Spanish	King	combined	Spanish	King	combined	Spanish	King	combined
2005			345			3,356			3,701
2006			123			1,123			1,246
2007			123			6,789			6,912
2008	234	0		346	987		234	987	
2009	122	456		0	298		578	754	



2014	787	324		223	1,256		1,010	1,580	
2015	0	654		788	1,298		788	1,952	


If you don't have separate catch by species  
report the combined catch (it is OK)

**Template for data submission by excel (Example)**

**Thailand/Pacific stock**

Annual seer fish catch by gear and species (tons)

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	<b>Gear 1 (PS)</b>			<b>Gear 2 (GILL)</b>			<b>Total</b>		
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2014	787	324		223	1,256		1,010	1,580	
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But if you can  
separate catch using  
species compositions,  
please do so.

Or send (detail)  
species  
compositions by year,  
season and area

## (2) Nominal CPUE

What is the nominal CPUE?

Raw (original) CPUE data

CPUE (catch and effort)

We need nominal CPUE by country, gear, area,  
year, month, day and set (boat name)  
as fine scale as possible (set by set is ideal)  
important for CPUE standardization

If you don't have set by set data, you can send  
aggregated levels of CPUE that you have...

For example CPUE **by gear, area and month**

# CPUE Example 1 (if species are separated)

0 and other catch are very important ! Don' t forget !!

You may have more than 2 types of efforts

Thailand Pacific stock Gear :G ILL Area: 5 (Gulf of Thailand)

year	month	date	boat name	set	catch (kg)			effort		
					King	Spanish	others	hours	hauls	days
1999	1	1	A	1	34	0	234	12	4	2
1999	1	1	A	2	0	0	566	23	4	4
2015	12	27	C	1	0	0	999	44	5	5
2015	12	27	C	2	0	0	234	23	3	4
2015	12	28	C	1	23	11	333	12	4	5

## CPUE Example 2 (aggregated case)

(if species are combined and if you have only monthly data → OK)

**0 and other catch are very important ! Don't forget !!**

Thailand Indian stock Gear GILL Area: 6 (Andam an)						
year	month	catch (kg)		effort		
		king+Spanish combined	others	hours	hauls	days
1999	1	34	234	12	4	2
1999	1	0	566	23	4	4
2015	12	0	999	44	5	5
2015	12	0	2334	23	3	4
2015	12	23	333	12	4	5

(3) (Extra data if available) Species compositions

Any information of Species compositions

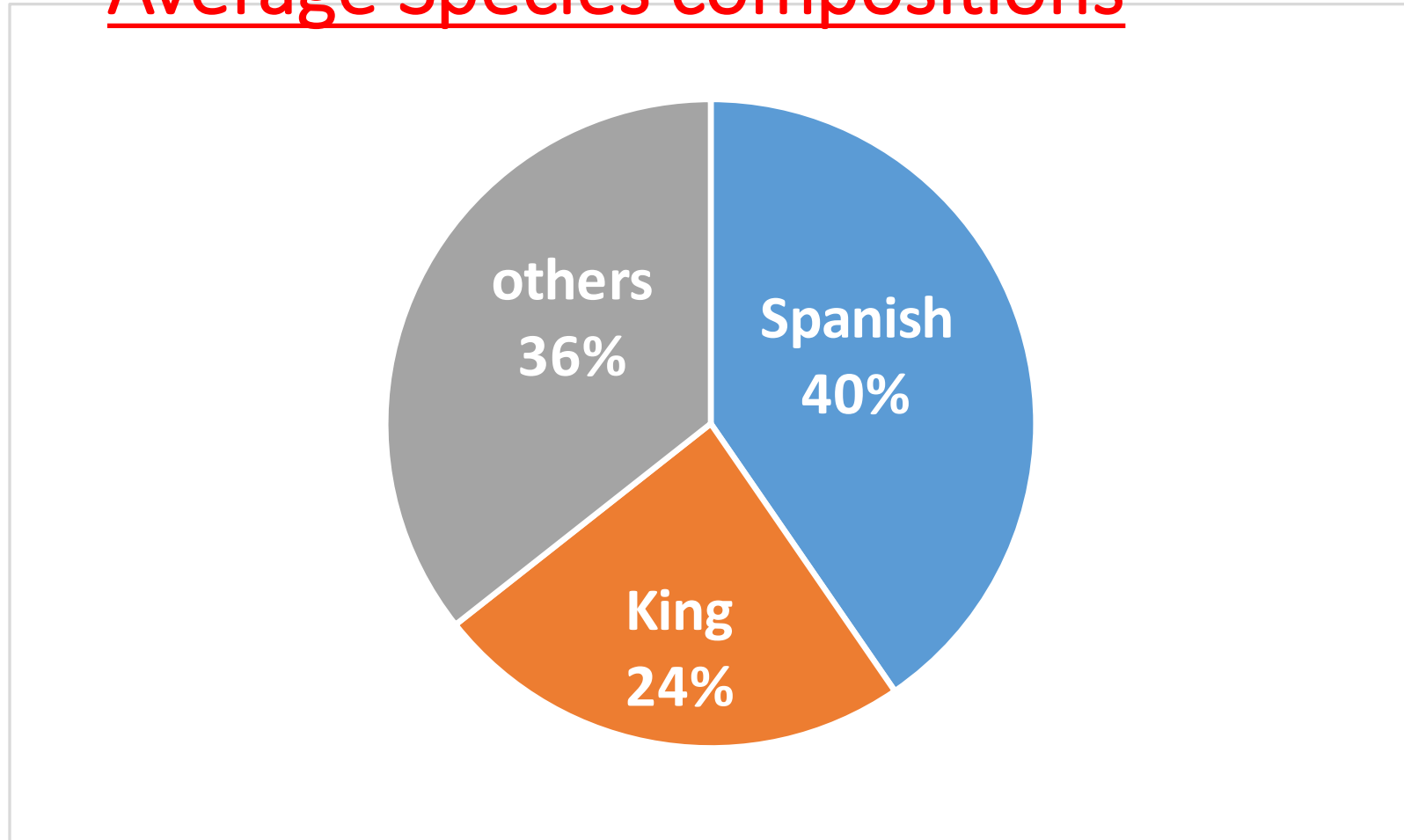
(King + Spanish + Others)

**by year, season and area (as fine scale as possible)** are important to estimate catch and CPUE by species

If you don't have fine scale information, even **coarse scale** information are also important

For example (fine scale)  
Thailand, GILL, Area 3 (Andaman Sea) (December, 2016)

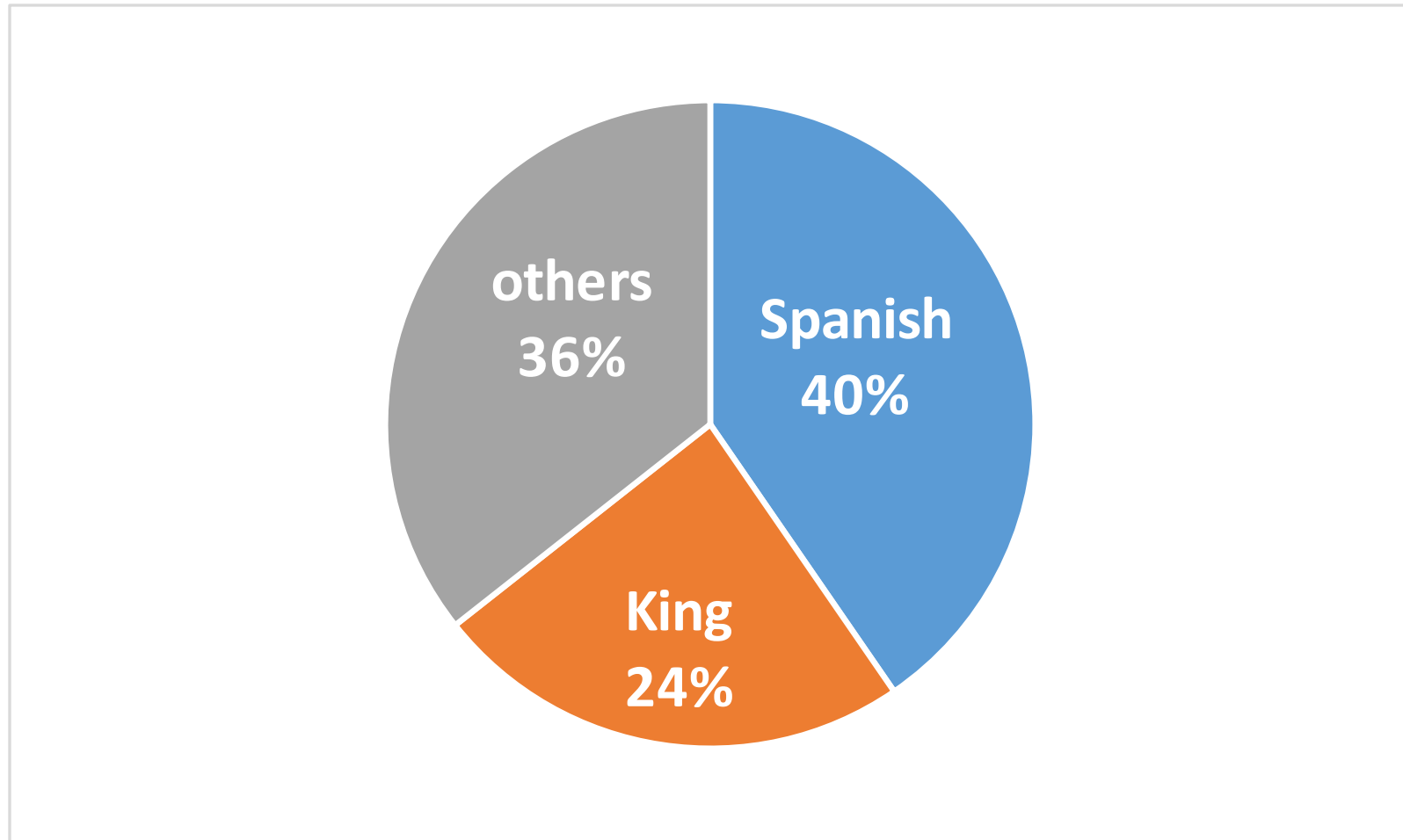
Average Species compositions





For example (highly aggregated still useful)  
but should be by gear

## Indonesia 2016 annual average species composition (PS)



# 19 Data coordinator for seer fish (I)

No	Country	stock		Coordinators	Post	Agency	e-mail
1	Brunei	1	1	Ms Noorizan Karim	Head	Department of Fisheries	noor6263@gmail.com
			2	Mr Matzaini Juna	Head		matzaini.juna@fisheries.gov.bn
			3	Muhammad Adam Ramlee	Fisheries Assistant		adam.ramlee@fisheries.gov.bn
			4				muhd.adam1804@gmail.com
2	Cambodia	1	5	Mr. Suy Serywath	Director	Fisheries Research and Development Institute, Fisheries Administration (FiA)	serywath@gmail.com
			6	Mr. Kao Monirith	Deputy Director		kaomonirith@yahoo.com
3	Indonesia	2	7	Dr Khairul Amri	Chief scientist	Research Institute for Marine Fisheries	Kh_amri@yahoo.com
			8	Mr Thomas Hidayat	Researcher		hidayatthomas245@gmail.com

# 19 Data coordinator for seer fish (II) (Yellow marker not confirmed yet)

No	Country	stock		Coordinators	Post	Agency	e-mail
4	Malaysia	2	9	Mr Samsudin Bin Basir	Chief scientist	Department of Fisheries	s_basir@yahoo.com
			10	Mr Sallehudin Jamon	Scientist		dinjamon@rocketmail.com
			11				sallehudin_jamon@dof.gov.my
5	Myanmar	1	12	Dr Htun Thein	Assistant Director	Marine Resources Survey & Research Unit, Department of Fisheries	htunthein.akyab@gmail.com
			13	Mr Nay Myo Aye	Assistant Fisheries Officer		nvnghia@rimf.org.vn
6	Philippines	1	14	Mr Noel Barut	Director	Bureau of Fisheries and Aquatic Resources (BFAR)	noel_c_barut@yahoo.com
			15	Ms Grace Lopetz	Aquaculturist II		gmvlopez@yahoo.com
7	Thailand	2	16	Ms. Suwantana Tossapornpitakkul	Fishery Biologist	Marine Fisheries Technology Research and Development Institute, Department of Fisheries	tsuwantana@yahoo.com
			17	Ms. Praulai Nootmorn	Senior Expert in Marine Fisheries		nootmorn@yahoo.com
8	Viet Nam	1	18	Mr Nguyen Viet Nghia	Deputy Director	Research Institute for Marine Fisheries	nvnghia@rimf.org.vn
			19	Mr Pham Hung	Officer	Research Institute for Marine Fisheries	hungfam83@gmail.com

<b>WORK PLAN (draft)</b>		Meetings	LOT+KAW	Seer fish (IP King + NB Spanish mackerel)	Software development			
2016	12	WS (Management + EAFM)		collection and compilation of data for stock assessments	Risk assessment	CPUE standardization	SRA (data poor stock assessments)	
2017	1				new development			
	2							
	3		LOT+KAW Risk assessment training					
	4							
	5							
	6	SWG4 (date to be decided later)						
	7				DEADLINE		add more functions (GLM) + other models	if needed
	8							
	9							
	10							
	11							
	12							
2018	1							
	2			Seer fish stock and risk assessments training				
	3							
	4							
	5							
	6	SWG5 (date to be decided later)						
	7							
	8							

# SUMMARY

*Your data are CRITICAL for stock + risk assessments and management*

step	Procedure for Stock + risk assessments (SRA and ASPIC) and management measure			
	Method =>	SRA	ASPIC	
1	DATA	Catch	Catch	CPUE
2	CPUE Standardization			software need to be enhanced
3	Stock assessments	software will be developed	ASPIC (software available)	
4	Results	Kobe plot (software available)		
5	Risk assessment	software will be developed		
6	management measures (e.g. TAC)	SEAFDEC member countries (SC=>COM) => ASEAN (if needed)		

Thank you and a happy new year !