Day 4

- Review Day 3
- Introduction data type [1] (no scenario)
- Exercise
- Homework

Left-over & other issues (Day 3)

We had so many discussion
including personal discussions
(off the main session)

Very useful➔ introduce (summary)
(for record)

Installation problems solved, but WHY?

Cause of the problem ➔ Buddhist year OK!

⇩

But why CPUE standardization & Kobe I+II

➔ Work OK even Buddhist year.

⇩

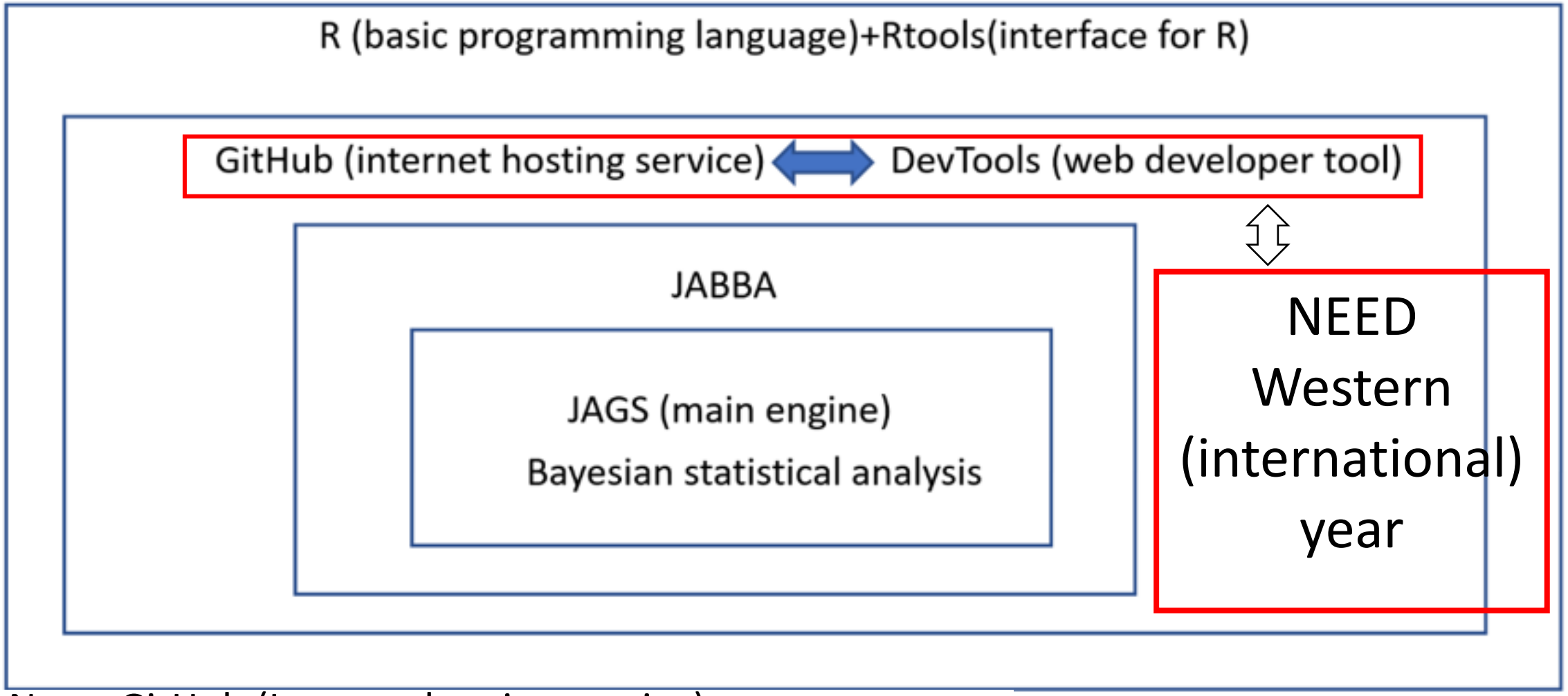
JABBA links to Github and other its related internet system

(see next)

(Professor Wang)

That is why need the western year

Schematic diagram of JABBA components and their relations



Note: GitHub (Internet hosting service)
JAGS (Just Another Gibbs Sampler)

Again, un-expected event➔ 1st (Sri Kanka) Internet environment

- Use fiber optic internet (WIFI)
- Do not use a proxy internet (proxy server) (Lan cable)

➔ Sometimes its security system is too strong to install

(not possible to install).

Took 3 days to solve ➔ also in Thai 3days again

This is life ➔ But good experience (future)

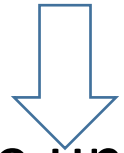
Single vs. multi species (JABBA)

Some participants are interesting

Theoretically single species (original JABBA)

Same species group (Lizardfish)

May OK if managements for aggregate species



But large uncertainties

Stock status among 6 species are different

(Need caution)

Single vs. multi species (JABBA)

Some participants are interesting

Theoretically single species (original JABBA)

⇩

For different genius (species) group

(crazy example➔ tuna & mackerel together)

⇩

NO managements possible

(No meaning)

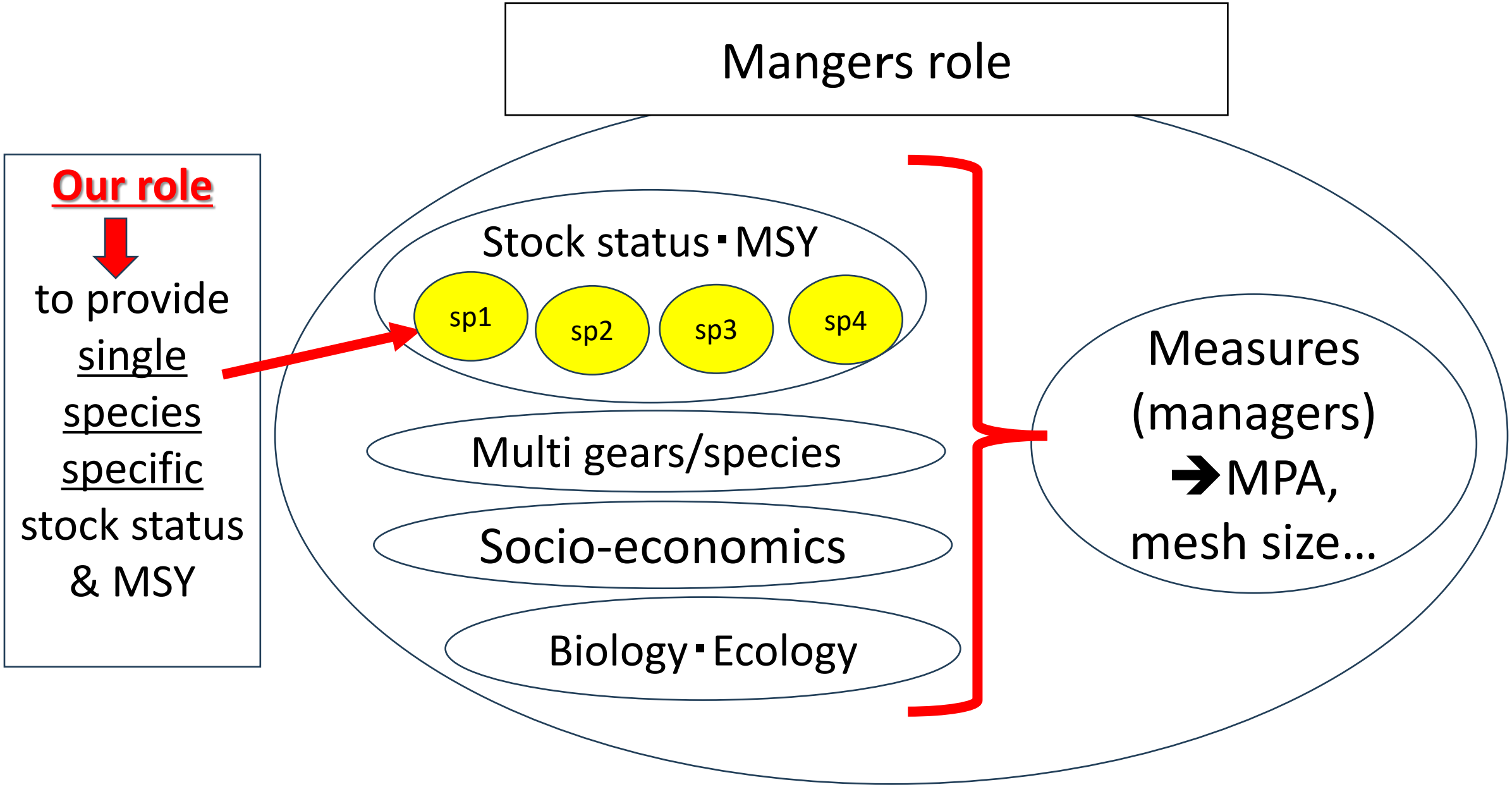
Single vs. multi species (JABBA)

Some participants are interesting

Theoretically single species (original JABBA)

Conclusion

Depending on management objectives


Mangers role
Our role
to provide
single
species
specific
stock status
& MSY
Stock status・MSY
sp1
sp2
sp3
sp4
Multi gears/species
Socio-economics
Biology・Ecology
Measures
(managers)
➔MPA,
mesh size…

JABBA application

JABBA software → for program blind users

⇩

Users know R & can manipulate

→ Use Original JABAA

⇩

Very impressed

Puy san can do it using original JABBA →very GOOD

(also, she can use software if needed)

Another issues (software)

Selection form (14)

Next version includes

Kobe plot (to evaluate sensitivity)

r (to evaluate if estimated r is close to actual r ➔ FishBase)

Additional screening ➔ good to find real BEST results

Another issues (software)

Selection form (14)

Next version includes

Kobe plot (to evaluate sensitivity)

r (to evaluate if estimated r is close to actual r ➔ FishBase)

Additional screening ➔ good to find real BEST results

Another issues (software)

Selection form (14)

Currently equal weighting (all are 1)

But some diagnostics more important

⇩

higher weighting (for example 2)

More realistic selection ➔ good results

⇩

Thanks Dr Supapong suggestions

Other issues (software)

SEMI-Automated Selection form (14)

⇩

Now copy & paste

⇩

Software can do it (not all) (like ASPIC results)

So, users can **speed up analyses**

Can do more work (or rest)

⇩

[MENU] will consider (software engineer)

⇩

Thanks suggestion (Nipa san)

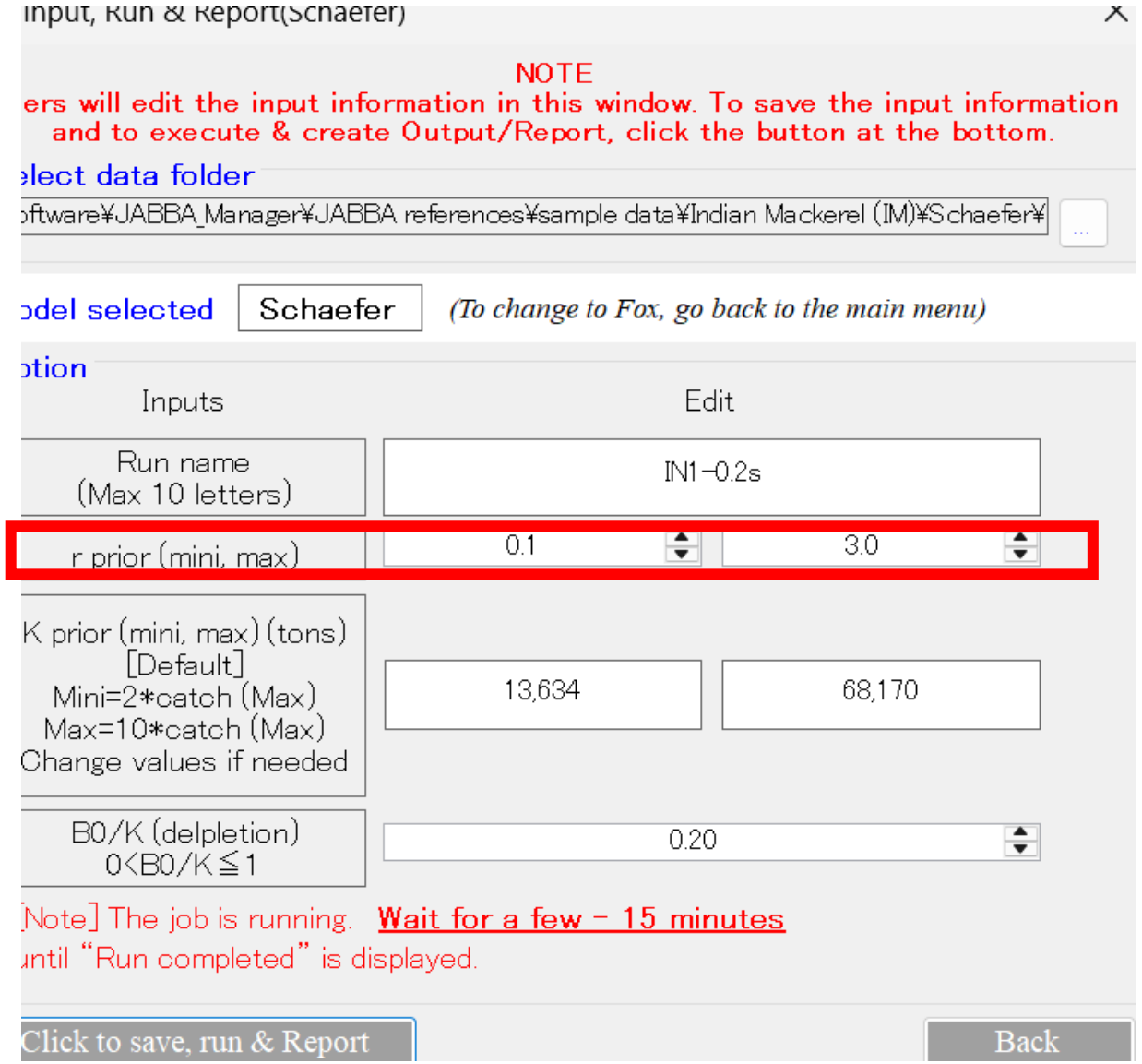
Other issues (software) r

Current prior
r (default)
0.1~3 too wide

Prior actual r (0.8)
(FishBase or other info.)
0.5~1.2

⇩

Much Quicker
better results?
(to be investigated)



Selection form

Currently

Selection form (5)　(Quick diagnostics) (base case)

⇩

Selection form (14) (Detail diagnostics)(base case & sensitivity）

****

Another idea

Use only Selection form (14)

Good idea but takes time for base case

But if SEMI automated Selection form (14) ➔ Maybe possible

⇩

[MENU] examine & compare 2 approach (thanks for Dr Supapong)

Data issue (demersal survey)

Research nominal CPUE (1972~2023) available

(annual statistical bulletin)

(aggregated & annual nominal CPUE➔ one data)

⇩

Can be used for JABBA

(Aggregated species demersal fish SA)

⇩

Need QC (if useful)

Thanks Puy san for the information

B1/K (depletion) prior vs. posterior

Puy san (original JABBA)➔Lizardfish (aggregated)

Prior 0.5 and posterior 0.64

Can get the different values (Good)

Our software

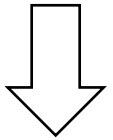
Prior=posterior(same value) (Further investigation)

Results (SU & Lizardfish) are similar (can we see?)

Can we borrow Puy san data, results & Codes

But the benefit of scenario approach

In case the data is short & data are MG



Can **confirm** the best results from the scenarios

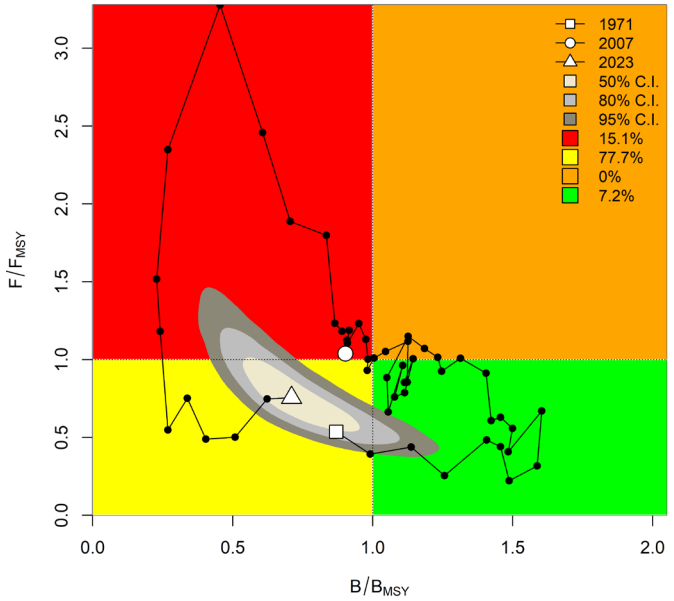
Wide range search

[MENU] will investigate further
comparing to results of original JABBA

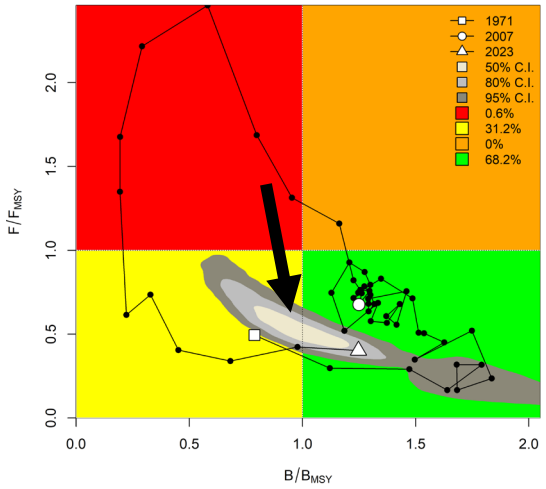
SU (software)

Short mackerel ➔ final selection
Selection form (14)

0.4s



My results ➔ not correct
(use different CPUIE)



JAM & NIPA
Kobe plot NG
2023 not on the **top**
of banana

0.3s

JAM & NIPA
(Final) ➔ similar to TB
(more discussion Day 5)

Need Kobe plot in
Selection form (14)

CPUE f1 f2 f3

Selection form (5)➔ Whole search work. Red Box ➔ exploratory runs.
Green BOX (good runs) is the final stage runs🡐 we will practice

Source	Period		fleet	n=	Gear	Kg per	r2 (%)	Strategy	1st (individual CPUE)										2nd (average)					
								Serial #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
								Scenario #	1	2	3	4	5	6	1	2	3	4	5	6	7	8	9	10
								depletion	0.6	0.6	0.6	0.2	0.4	0.4	0.4	0.4	0.2	0.2	0.4	0.4	0.6	0.6	0.8	0.8
								Model s(Schaefer) f(Fox)	s	s	s	s	s	f	s	s	s	f	s	f	s	f	s	f
								run ID	SM-ID1-0.6s	SM-ID2-0.6s2	SM-ID3-0.6s3	SM-ID4-0.2s	SM-ID5-0.4s	SM-ID6-0.4f	SM-AV1-0.4s	SM-AV2-0.4s2	SM-AV3-0.2s	SM-AV4-0.2f	SM-AV5-0.4s	SM-AV6-0.4f	SM-AV7-0.6s	SM-AV8-0.6f	SM-AV9-0.8s	SM-AV10-0.6f
Statistical Division	1971~1994	q12	fleet1	24	PT	haul	-16	Assignment of CPUE																
	1995~2023	q3	fleet2	21																				
	2016~2023	q3	fleet3	21	MEGL	day	-21																	
Port sampling	2016~2023	q4	fleet4	8	OBT	day	-3																	
Diagnoses & Results								Kobe plot	ok	ok	ok	ok	ok	ng	ok	ok	ng	ng	ok	ok	ok	ok	ok	ok
								CPUE	ng	ng	ng	ng	ng	ng	ng	ng	ok	ok	ok	ok	ok	ok	ok	ok
								Retrospective analyses	ok	ok	ok	ok	ng	ng	ok	ok	ng	ng	ok	ok	ok	ok	ok	ok
								Convergence	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ng	ok	ok	ok	ok
								retro&hind (Table)	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok
								Results	ng	ng	ng	ng	ng	ng	ng	ng	ng	ng	ok	ng	ok	ok	ok	ok

f1

F2 (Avegare)

f3

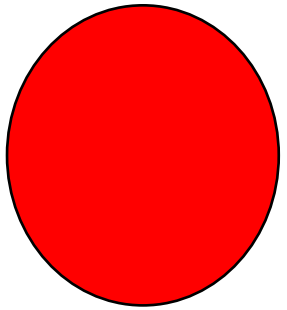
ASPIC vs JABBA (Simple summary)
Green OK and Orang NG

	ASPIC	JABBA	
Estimation method	traditions least mean square	Bayesian approach (MCMC)	Space State (integrated statistical modelling) (better approach)
local minimum (wrong answer)	YES	NO (Convergence test)	
observation error	YES	YES	
Model error	NO	YES	

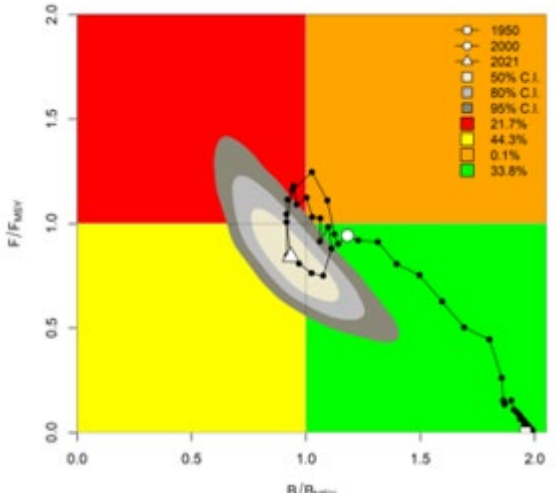
Thanks Jam san for your Question

How to make average for 2 different CPUE

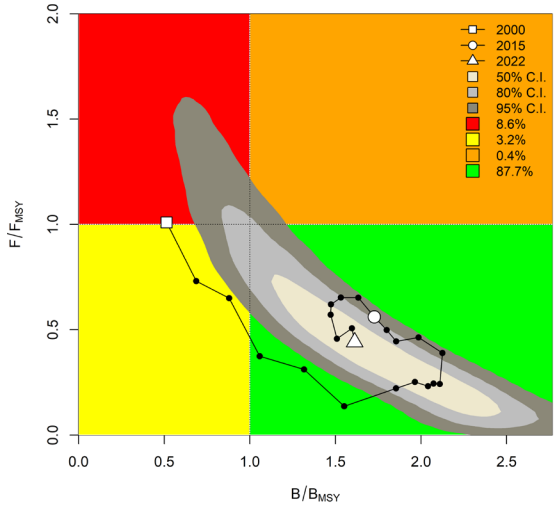
To be presented tomorrow



About banana shape

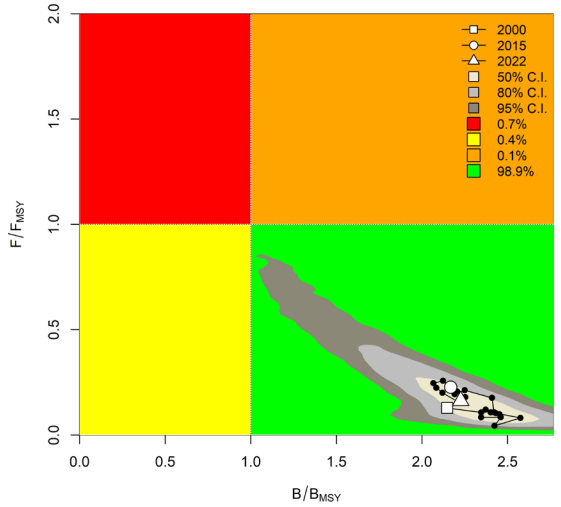


Beautiful (less uncertainties)

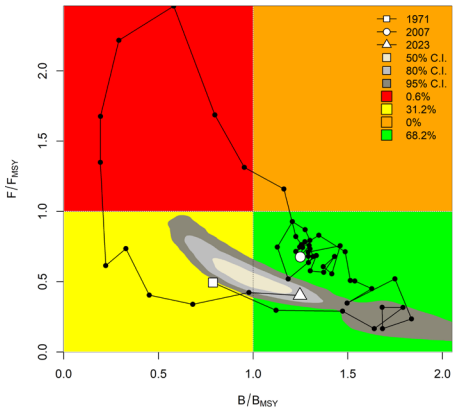


Beautiful (more uncertainties)

NG



Too optimistic Banana (NG) Noy alloy



Final year not top of uncertainties BANANA Split by 2

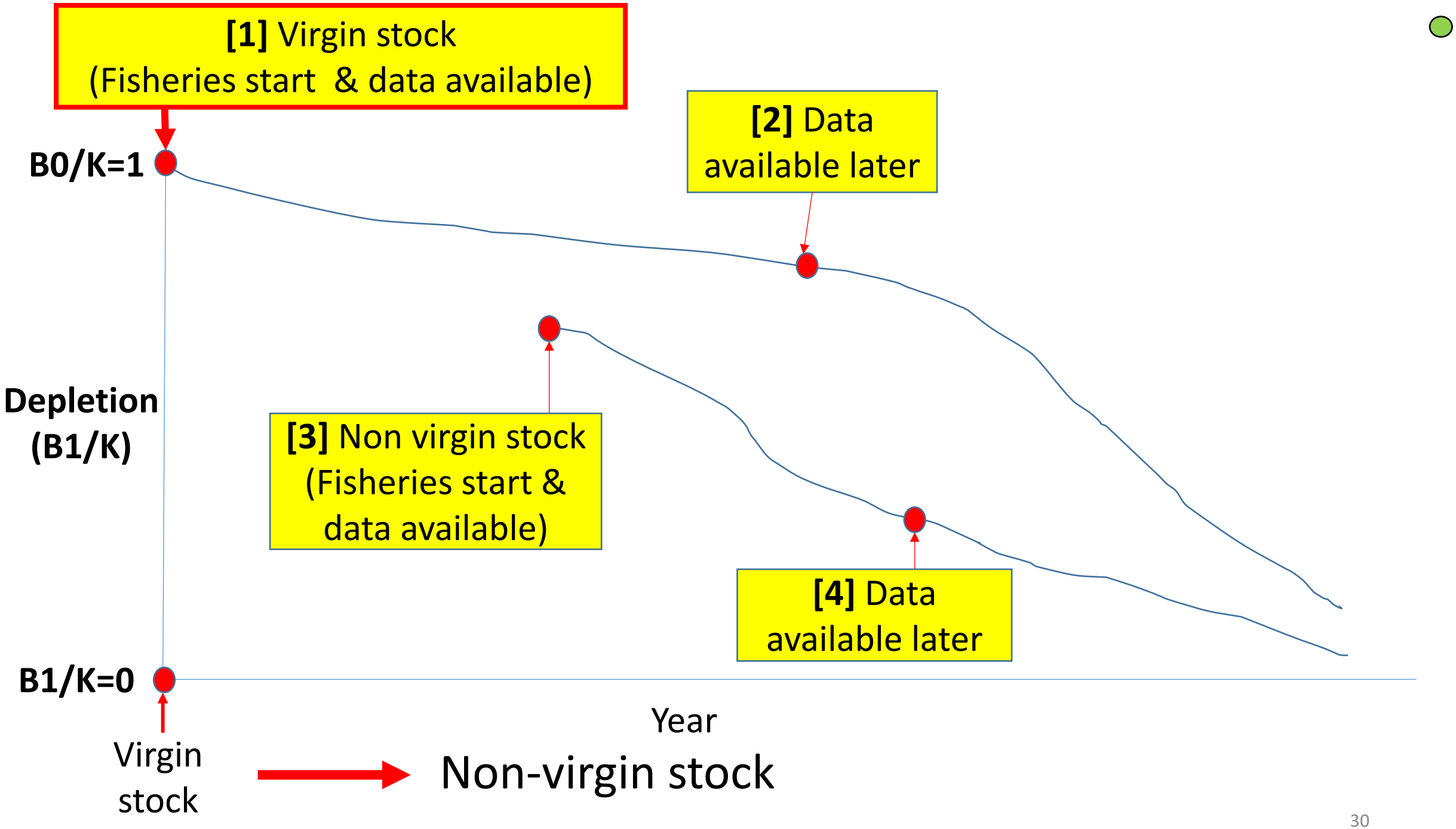
Thanks for ALL for many good suggestions

We are improving
For next JABBA versions

Good discussion & feedback

Day 4 (now)

- Introduction data type [1] (no scenario)
- Exercise
- Homework


[1] Virgin stock
(Fisheries start & data available)
[2] Data
available later
B0/K=1
Depletion
(B1/K)
[3] Non virgin stock
(Fisheries start &
data available)
[4] Data
available later
B1/K=0
Year
Virgin
stock
Non-virgin stock

Indian Ocean swordfish (SWO)

Manual Page 68~112

This is much simpler as no scenarios needed

Direct (normal) method

Start 10:50 AM

2 Exercise UNTIL 2PM

(1) Short mackerel
Continue & complete

(2) SWO (Schaefer＋FOX) **(B0/K)Depletion=1**
SWO_1S➔Remove 2 CPUE)➔ SWO_2S
SWO_1F➔ Remove 2CPUE➔ SWO_2F
Selection form (14) select the better one (SWO_2S or SWO_2F)
No scenario (0.2 0.4 0.6 0.8) needed
➔follow Manual (page 68~112)

Send results by e-mail
aco20320@par.odn.ne.jp

DAY 5

Lizardfish (SU) Group					Short mackerel (SM) Group					
Submission of the Report (deadline)		5/23 (Fri) at ~~Noon(12)~~			Submission of the Report (deadline)		5/23 (Fri) at ~~Noon(12)~~			
Presentation		5/23（PM）	*No presentation (Report only)*		Presentation		5/23（PM）	*No presentation (Report only)*		
Contents		Assigned for			Contents		Assigned for			
(1) JABBA	SU	Weerapol	Khajitpan	JAM YEEN AU	(1) JABBA	SM	Puy	Nipa	Wiparat	KIE DOOK
(2) CPUE standardization	MEGL(day)(STAT) OBT(day)(Port sampling) PT(haul)(STAT)				(2) CPUE standardization	OBT(day)(Port sampling) PS(day)(STAT) PT(hr)(STAT)				
Submit your report by Noon (12) 5/23 (Fri)	To Tom Nishida aco20320@par.odn.ne.jp									

New Dead line 1PM

(3) (for ALL) submit SWO works

Presentation schedule (30 minutes inc. QA)		
date & time	WG	Presenter
5/23 (Fri) PM 1~3	SM	Puy
	Demersal (SU)	Weerapol
	SM	Nipa

Day 5 PM start 2:45

- ~~Submission of your report (by 1PM)~~
- ~~Presentation~~
- Future plan
- Sum-up WS2
- Post test

Acknowledgments การแสดงความยอมรับ

DOF DG

Bancha Sukkaew

Supervisors

Amnuay Kongprom (ex-Division Director)

Pavarot Noranarttragoon

Coordinator

Weerapol Thitipongtrakul

Resource Person

Supapong Pattarapongpan(SEAFDEC/TD)

ALL Participants

Short mackerel WG members

Orawan Prasertsook

Nipa Kulanujaree

Weerapol Thitipongtrakul

Demersal fish WG members

Weerapol Thitipongtrakul

Carp WG members

Nipa Kulanujaree

Wiparat Thong-ngok

Kajitpan Jarernnate

Thanks for delicious BENTO (弁当）every day

Kids Bento
(Japan)

Many thanks, JAM san
for your kind hospitality
& camera-woman

Future plan

We will **not** have workshop in the future because

(1) The interval (1~1.5 years) is too long (not big progress).

(2) 1 week (long) ➔ participants Busy (lot of their works)

(3) Need budget $$$

We might have a workshop for **BIG events** like

SEAFDEC, IOTC or Sri Lanka **joint workshop** etc.

Future plan

Online and/or short visit (un-official)
On-line (2 times/month) (few hours)

Other core persons & Supapong can join if they are interesting and the schedule is OK.

We plan to publish our work
to **Fish for the People (SEAFDEC)**

Subject to change by progress
Should be flexible

(Carp WG to be considered later)

year	month	WG & Core scientists	
		demersal WG	SM WG
		Weerapol	Puy
			Nipa
			Weerapol
2025	6	SU	
	7		
	8		
	9		
	10		
	11		
	12		
2026	1		SM
	2		
	3		
	4		
	5		
	6		
	7	Threadfin breams Nemipterus hexodon (NH)	
	8		
	9		
	10		
	11		
	12		

Left-over (Day 4) Scaled average

If you have 2 different standardized CPUE (different magnitudes) like 7.46 vs. 0.53 (2001)

How to make average

Simple Average =(7.46+0.53)/2=4.00

does not make sense

How to do ??

Original Scale

Scaled as Ave=1

	A	B	C	D	E	F	G
1		standardized CPUE(A)	standardized CPUE (B)		Scaled standardized CPUE(A)	Scaled standardized CPUE(B)	Simple Average
2	2001	7.46	0.53		2.27	1.67	1.97
3	2002	7.13	0.43		2.17	1.33	1.75
4	2003	3.48	0.30		1.06	0.92	0.99
5	2004	2.71	0.19		0.83	0.58	0.70
6	2005	4.05	0.33		1.23	1.04	1.14
7	2006	3.87	0.37		1.18	1.14	1.16
8	2007	2.31	0.27		0.71	0.83	0.77
9	2008	1.59	0.25		0.48	0.77	0.63
10	2009	2.90	0.26		0.88	0.82	0.85
11	2010	2.50	0.23		0.76	0.72	0.74
12	2011	2.49	0.20		0.76	0.63	0.69
13	2012	2.13	0.21		0.65	0.65	0.65
14	2013	2.45	0.25		0.75	0.79	0.77
15	2014	1.93	0.30		0.59	0.95	0.77
16	2015	2.54	0.28		0.77	0.86	0.82
17	2016	2.97	0.28		0.90	0.88	0.89
18	2017	2.47	0.27		0.75	0.83	0.79
19	2018	3.19	0.35		0.97	1.10	1.04
20	2019	3.19	0.32		0.97	0.99	0.98
21	2020	2.34	0.24		0.71	0.75	0.73
22	2021	4.35	0.50		1.32	1.56	1.44
23	2022	2.54	0.32		0.77	1.00	0.89
24	2023	4.94	0.70		1.51	2.18	1.84
25	Ave	3.28	0.32		1	1	1.00

E
Scaled standardized
=b2/b25

Scaled average (same scale)

Sum up session
(Important points)

For details of other points

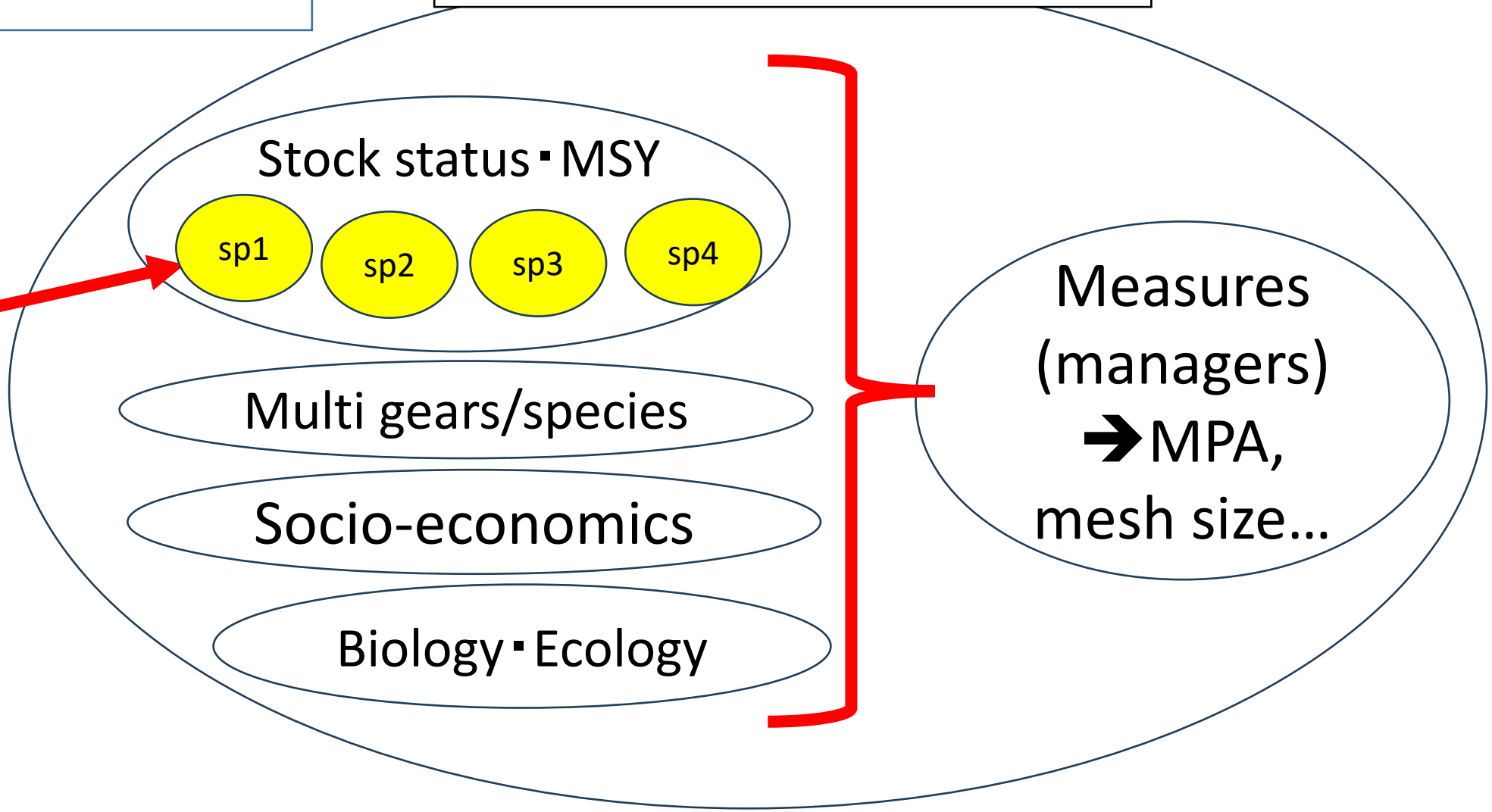
see training PowerPoints

Most important point
Objective WS

[DOF] Role

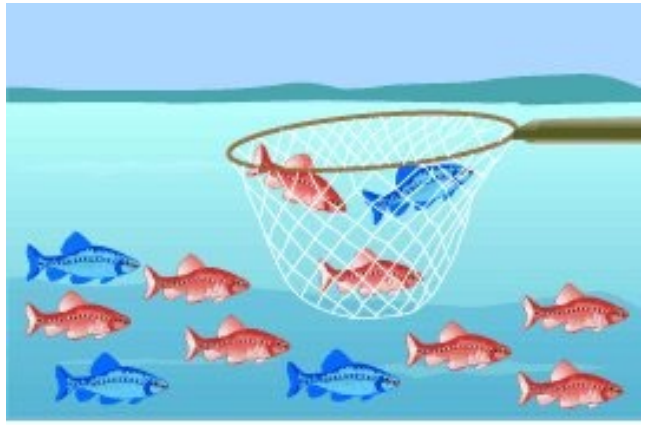
[MENU]

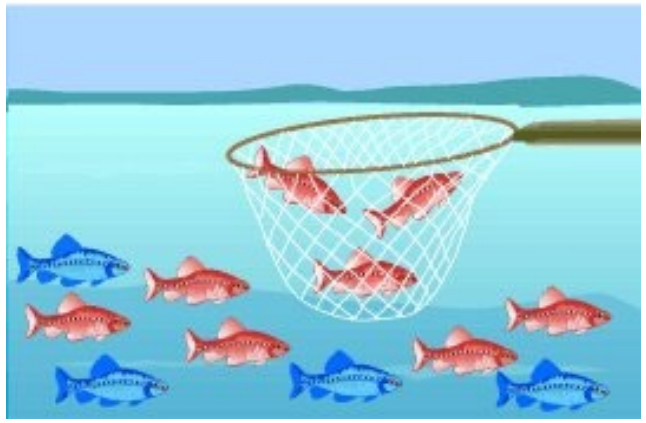
to provide
single
species
specific
stock status
& MSY

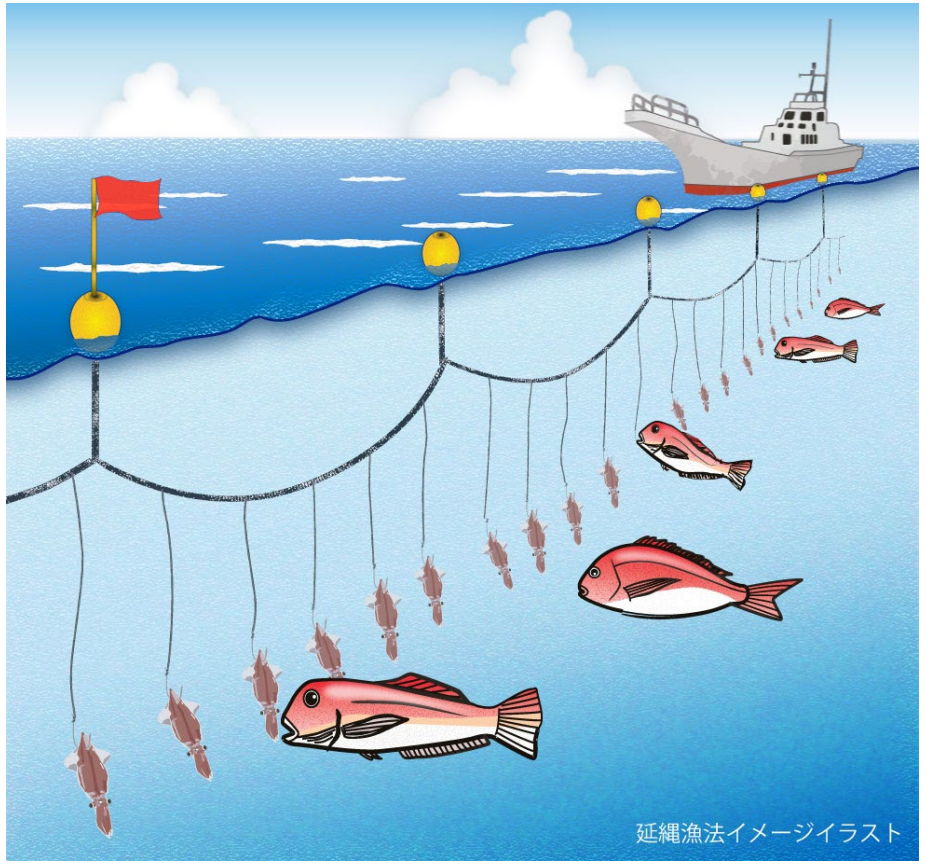


Good standardized CPUE (high $-r^2$) for JABBA

Simple Random sampling (SRS)



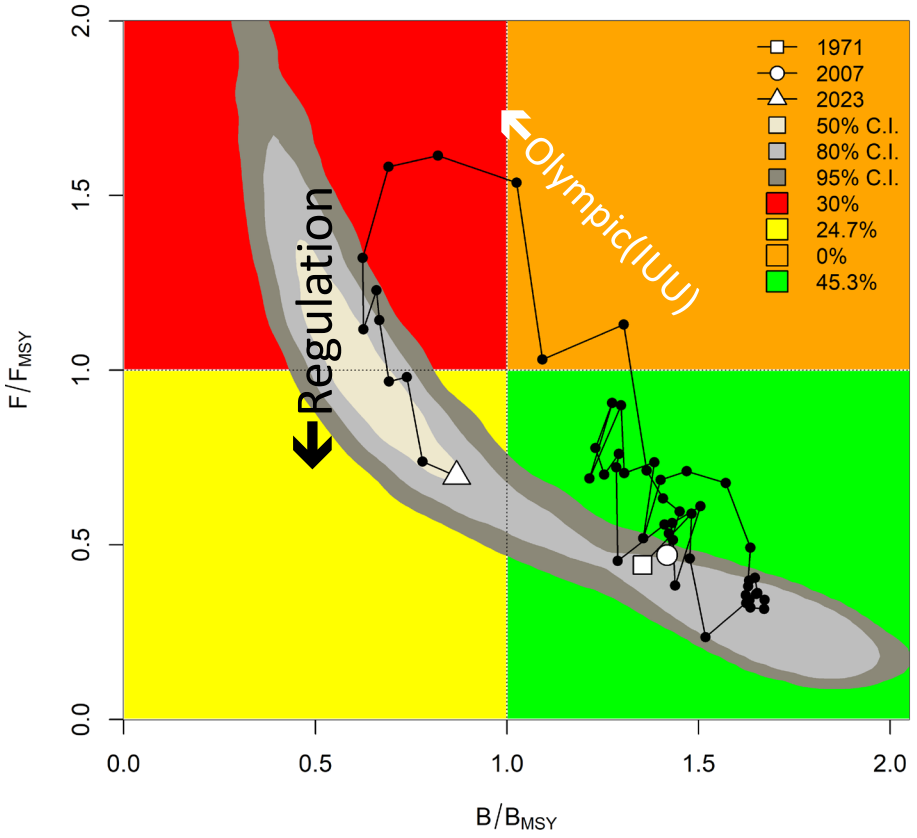




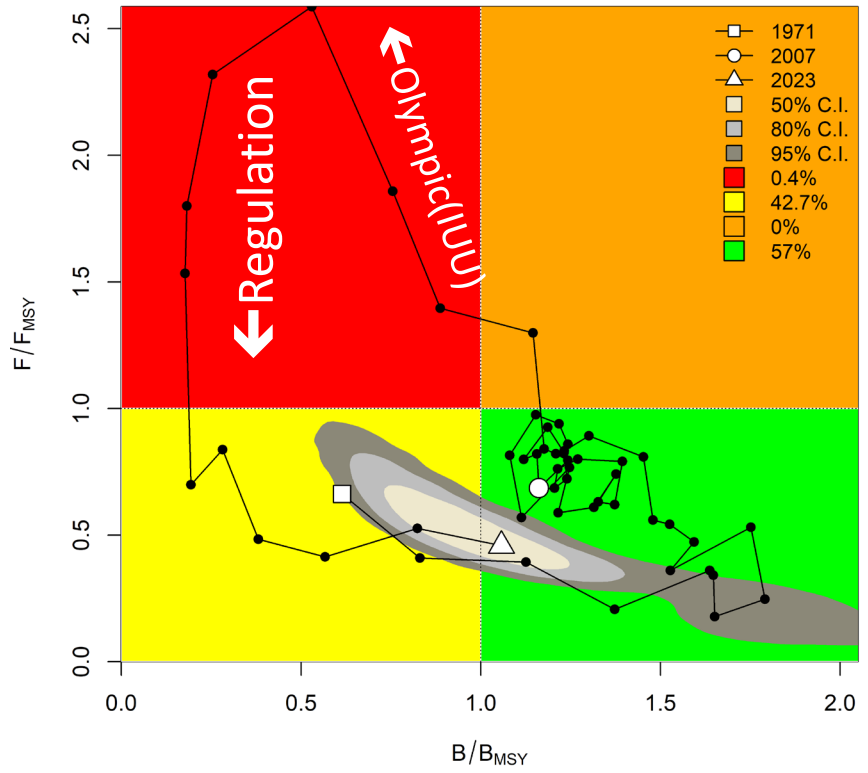
Main fisheries gears are not always provide good CPUE (if no SRS)

Stock status Trial OK

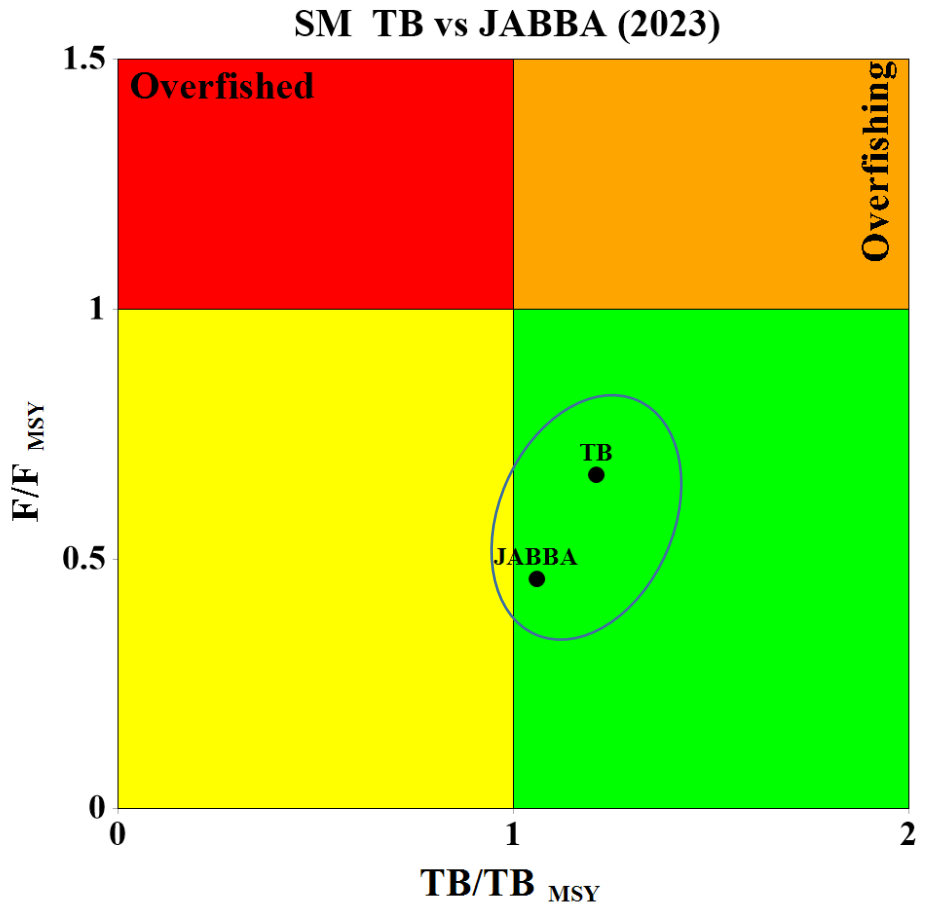
SU

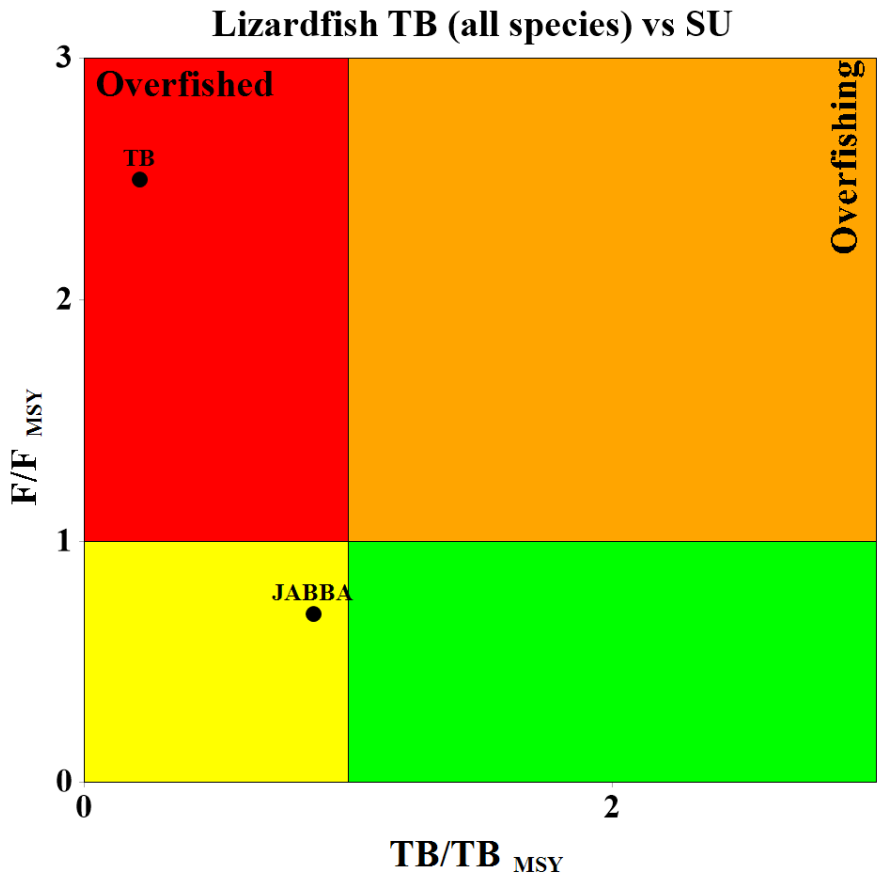


SM



Comparison TB (1 yr) (2023) vs JABBA (53 yrs)(1971~2023)





Very close ➔ GOOD

Species different (6 vs 1)
TB too pessimistic (over-estimated)

Thompson & Bell Model

One year data (size)

⇩

Stock status

(largely influenced by size)

⇩

Uncertainties

(Different by year)

⇩

suggests JABBA (53 years) (robust) ➔ **slowly**

Type 3 : Data rich type with catch, CPUE & Prior

	Data type	Information	Name (main data)	Data period	Reference Point (RP) (MSY, Fmsy, TBmsy, target & limit RP)	Models & Application (examples)	Implementation (R, code, package) (examples)
TYPE 1	Qualitative	Parameters	No data			● ERA (Ecosystem Risk Assessment) ● PSA (Productivity Susceptibility Analysis)	✓ R ✓ Package
TYPE 2	Quantitative	✓ Real data ✓ Parameter valuses ✓ Priors (Bayesian approach)	Data Poor (length)	Shorter (< a few years)	Some available only for short period (snap shot SA)	● Length based models (ELEFAN, FiSAT, Y/R, S/R, LBSPR, Thompson & Bell)	✓ R ✓ Package (FAO & others)
			Data Poor (cach)	Longer (> 10 years pre-ferable)	Some available (relative & subject to assumptions)	● Delpetion rate assumed (CMSY & OCOM) ● Depletion rate not assumed (ORCS & SSCOM) ● Robin-hood methods	
TYPE 3			Data Rich (catch; CPUE; biological paramter values; and/or priors)		Robust & Reliable	● Surplus Production models (SPM) (ASPIC, SPiCT & JABBA) ● Age/size structured model (VPA, ASPM, SCAA, SCAS) ● Integrated models (SS, CASAL)	✓ Own codes (SS) ✓ R (JABBA) ✓ MENU driven (JABBA_Manager)

Nishida (2025)

JABBA software

- Basically OK
- Need some improvement

  ➔ Selection form (Weighting, Kobe plot, r, etc.)

  Semi-Automated diagnostics (like ASPIC)
- Scenario approach ➔ OK ➔ Search wider range ➔ reliable
- DOF are welcome to use (work together for proper usage)

ASPIC automatic output listing ➔ Great

	A	B	C	D	E	F	G	H	I
1	Time	0h2m	No of jobs	162	Average	0.0180	Min/job	1.08	Sec/job
2	Parameters	Model	B1/K	q	MSY	K			
3	Range (step)	Fox and Schaefer	0.8-1 by 0.1	0.003-0.005 by 0.001-3	3-15 by 5	23-170 by 60			
4	Flag (0: fixed / 1: estimate)		1	1	1	1			
5	Weight unit (1,000 tons)								

Run time information

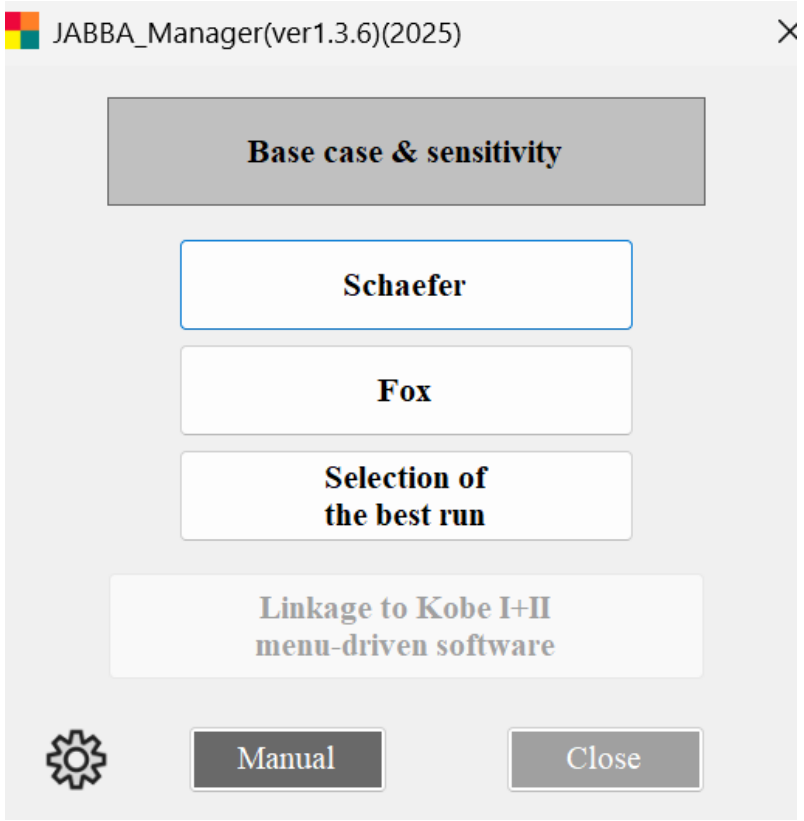
Information for the batch job

See the next slide, how to decide the best parameters using results.

	Combination									Results															
9	No	B1/K	MSY (min)	MSY (start)	MSY (max)	K(min)	K(start)	K(max)	q	R2	RMS	r [Est]	Model	B1/K [Est]	MSY [Est]	K [Est]	q [Est]	Current catch	TBmsy [Est]	TB [Est]	Fmsy [Est]	B/Bmsy [Est]	F/Fmsy [Est]	note
10	13	0.8	3	8	15	23	83	170	0.003	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
11	14	0.8	3	8	15	23	83	170	0.004	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
12	15	0.8	3	8	15	23	83	170	0.005	0.524	0.175	0.3432	Schaefer	0.113	9.533	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
13	16	0.8	3	8	15	23	140	170	0.003	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
14	17	0.8	3	8	15	23	140	170	0.004	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
15	18	0.8	3	8	15	23	140	170	0.005	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
16	22	0.8	3	13	15	23	83	170	0.003	0.524	0.175	0.3436	Schaefer	0.113	9.534	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
17	23	0.8	3	13	15	23	83	170	0.004	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
18	24	0.8	3	13	15	23	83	170	0.005	0.524	0.175	0.3436	Schaefer	0.113	9.534	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
19	25	0.8	3	13	15	23	140	170	0.003	0.524	0.175	0.3436	Schaefer	0.113	9.534	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
20	26	0.8	3	13	15	23	140	170	0.004	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.52	31.7	0.172	0.473	2.58	ASPIC ended normally.
21	27	0.8	3	13	15	23	140	170	0.005	0.524	0.175	0.3436	Schaefer	0.113	9.534	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
22	40	0.9	3	8	15	23	83	170	0.003	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
23	41	0.9	3	8	15	23	83	170	0.004	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
24	42	0.9	3	8	15	23	83	170	0.005	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.51	31.69	0.172	0.473	2.58	ASPIC ended normally.
25	43	0.9	3	8	15	23	140	170	0.003	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
26	44	0.9	3	8	15	23	140	170	0.004	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
27	45	0.9	3	8	15	23	140	170	0.005	0.524	0.175	0.3432	Schaefer	0.113	9.533	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
28	49	0.9	3	13	15	23	83	170	0.003	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
29	50	0.9	3	13	15	23	83	170	0.004	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
30	51	0.9	3	13	15	23	83	170	0.005	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.52	31.7	0.172	0.473	2.58	ASPIC ended normally.
31	52	0.9	3	13	15	23	140	170	0.003	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
32	53	0.9	3	13	15	23	140	170	0.004	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
33	54	0.9	3	13	15	23	140	170	0.005	0.524	0.175	0.3436	Schaefer	0.113	9.534	111	0.0066	12.79	55.52	31.69	0.172	0.472	2.58	ASPIC ended normally.
34	67	1	3	8	15	23	83	170	0.003	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
35	68	1	3	8	15	23	83	170	0.004	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
36	69	1	3	8	15	23	83	170	0.005	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.51	31.69	0.172	0.473	2.58	ASPIC ended normally.
37	70	1	3	8	15	23	140	170	0.003	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.

Converged | Not converged or Errors

Original JABBA (space-state) Complex integrated statistical model (R-codes)



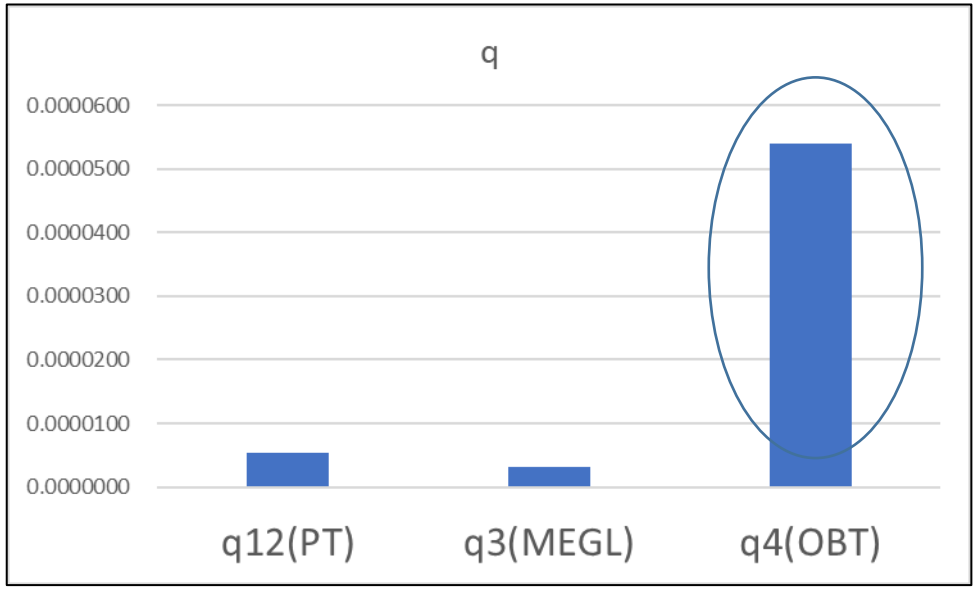
Simple, Easy & Clear for ALL

ASPIC vs JABBA ➔ should use JABBA
Green OK and Orang NG

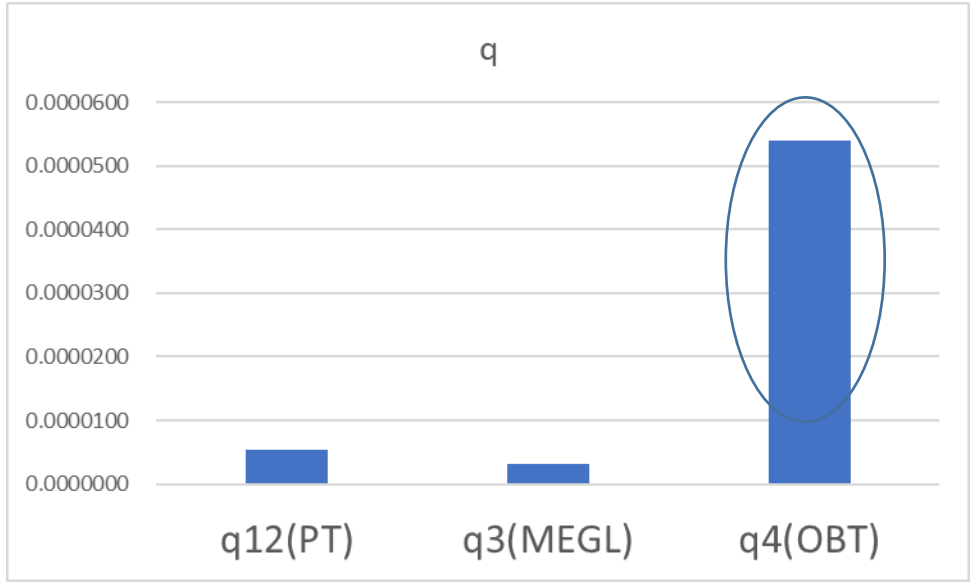
	ASPIC	JABBA	
Estimation method	traditions least mean square	Bayesian approach (MCMC)	Space State (integrated statistical modelling) (better approach)
local minimum (wrong answer)	YES	NO (Convergence test)	
observation error	YES	YES	
Model error	NO	YES	

q catchability (3 periods)

SU



SM



Basically q among gears are similar.

Big apparent ปรากฏชัด q in q4 due to sudden biomass **increase**

➔ good to incorporate JABBA (less bias)

Careful apparent ปรากฏชัด Convergence

If we miss

	Geweke.p	Heidel.p
K	0.72	0.98
r	0.03	0.07

Results OK ➔ actually NG

ASPIC Good

Inform non convergence (all the time)

ASPIC➔ 2 sheets (converged vs not converged)
➔will not use not converged results **(SAFE)**

Time	0h2m	No of jobs	162	Average	0.0180	Min/job	1.08	Sec/job
Parameters	Model	B1/K	q	MSY	K			
Range (step)	Fox and Schaefer	0.8-1 by 0.1	0.003-0.005 by 0.001-3	3-15 by 5	23-170 by 60			
Flag (0: fixed / 1: estimate)		1	1	1	1			
Weight unit (1,000 tons)								

Run time information

Information for the batch job

See the next slide, how to decide the best parameters using results.

Combination									Results													
No	B1/K	MSY (min)	MSY (start)	MSY (max)	K(min)	K(start)	K(max)	q	R2	RMS	r [Est]	Model	B1/K [Est]	MSY [Est]	K [Est]	q [Est]	Current catch	TBmsy [Est]	TB [Est]	Fmsy [Est]	B/Bmsy [Est]	F/Fmsy [Est]	note
13	0.8	3	8	15	23	83	170	0.003	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
14	0.8	3	8	15	23	83	170	0.004	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
15	0.8	3	8	15	23	83	170	0.005	0.524	0.175	0.3432	Schaefer	0.113	9.533	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
16	0.8	3	8	15	23	140	170	0.003	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
17	0.8	3	8	15	23	140	170	0.004	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
18	0.8	3	8	15	23	140	170	0.005	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
22	0.8	3	13	15	23	83	170	0.003	0.524	0.175	0.3436	Schaefer	0.113	9.534	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
23	0.8	3	13	15	23	83	170	0.004	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
24	0.8	3	13	15	23	83	170	0.005	0.524	0.175	0.3436	Schaefer	0.113	9.534	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
25	0.8	3	13	15	23	140	170	0.003	0.524	0.175	0.3436	Schaefer	0.113	9.534	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
26	0.8	3	13	15	23	140	170	0.004	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.52	31.7	0.172	0.473	2.58	ASPIC ended normally.
27	0.8	3	13	15	23	140	170	0.005	0.524	0.175	0.3436	Schaefer	0.113	9.534	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
40	0.9	3	8	15	23	83	170	0.003	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
41	0.9	3	8	15	23	83	170	0.004	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
42	0.9	3	8	15	23	83	170	0.005	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.51	31.69	0.172	0.473	2.58	ASPIC ended normally.
43	0.9	3	8	15	23	140	170	0.003	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
44	0.9	3	8	15	23	140	170	0.004	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
45	0.9	3	8	15	23	140	170	0.005	0.524	0.175	0.3432	Schaefer	0.113	9.533	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
49	0.9	3	13	15	23	83	170	0.003	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
50	0.9	3	13	15	23	83	170	0.004	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
51	0.9	3	13	15	23	83	170	0.005	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.52	31.7	0.172	0.473	2.58	ASPIC ended normally.
52	0.9	3	13	15	23	140	170	0.003	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
53	0.9	3	13	15	23	140	170	0.004	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
54	0.9	3	13	15	23	140	170	0.005	0.524	0.175	0.3436	Schaefer	0.113	9.534	111	0.0066	12.79	55.52	31.69	0.172	0.472	2.58	ASPIC ended normally.
67	1	3	8	15	23	83	170	0.003	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.52	31.7	0.172	0.472	2.58	ASPIC ended normally.
68	1	3	8	15	23	83	170	0.004	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.
69	1	3	8	15	23	83	170	0.005	0.524	0.175	0.3435	Schaefer	0.113	9.533	111	0.0066	12.79	55.51	31.69	0.172	0.473	2.58	ASPIC ended normally.
70	1	3	8	15	23	140	170	0.003	0.524	0.175	0.3433	Schaefer	0.113	9.534	111.1	0.0066	12.79	55.53	31.7	0.172	0.472	2.58	ASPIC ended normally.

Converged | Not converged or Errors

JABBA GOAL 80% OK

80% satisfaction➔ Good

100% not possible

(as no perfect CPUE & catch available)

(same as our life for happiness)

Interesting observation
Puy san's data (demersal) ➔ software (trial)

Depletion			JABBA results (saft vs Puy)
	posterior		
prior	soft	Puy	
0.5	0.63	0.65	both are similar
0.6	0.63		
0.2	0.34		

Soft (prior & posterior) (inconsistent)

➔ Need the scenario approach to search best Depletion from wide ranges of B1/K (0.2, 0.4, 0.6, 0.8)

➔ Robust approach

Finally…… Important notice…

If you use software

for practice, official report, publication etc.

We always need to work together as [MENU] responsible for proper usage & copyrights of the software.

Thanks for your cooperation

Thank you for successful WS2 by your hard work (last WS in Thailand)

- Have a good trip to Brisbane
- Have a good trip to Home

  Phuket, Rayong, จังหวัดระนอง & BKK

- See you WS3 in Japan??

  (if $$$ available)

(11~26oC) (next week)

Addendum

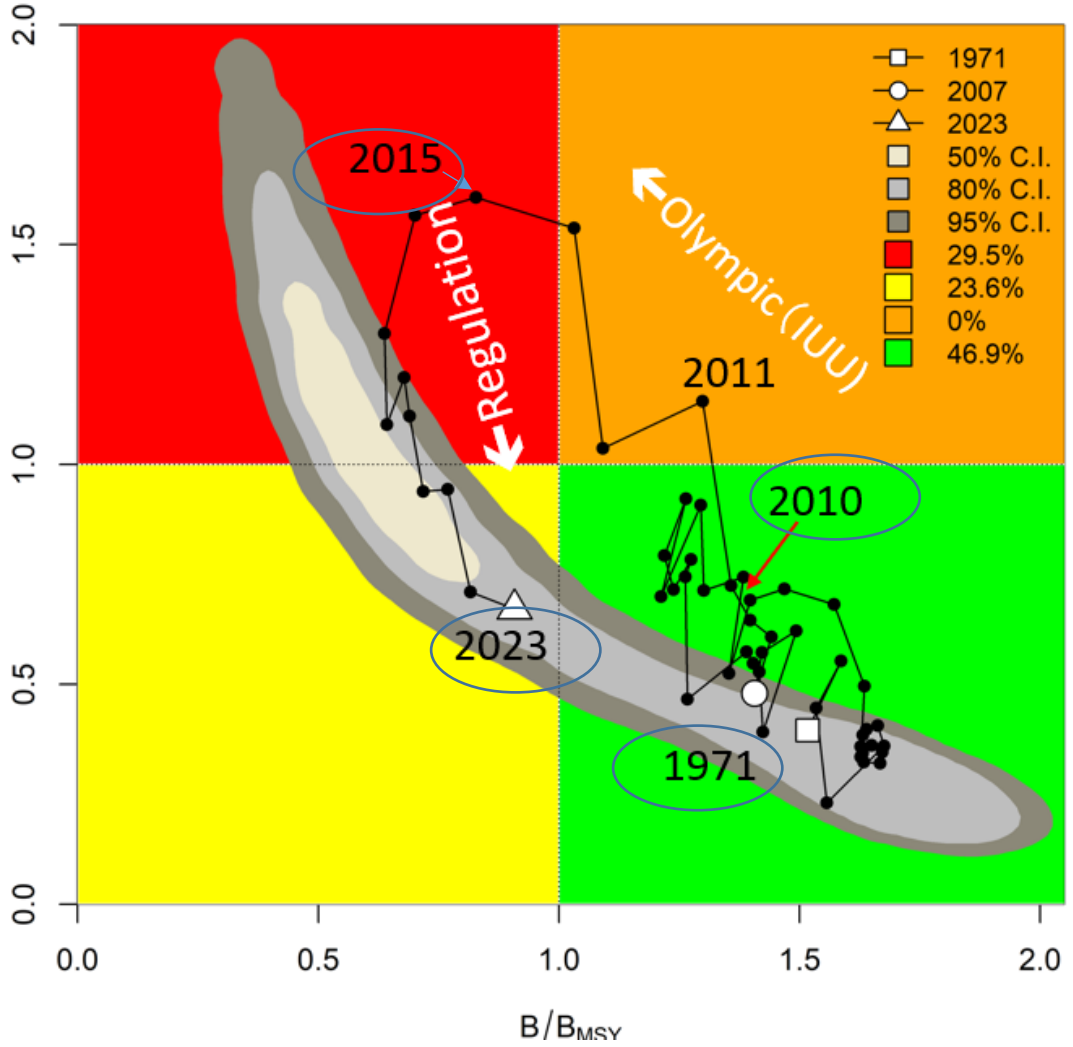
(1) Why Biomass & MSY are different (for example) from 10 years ago?
➔ because relevant results (incl. stock status) change every year.

For example(SU), Kobe plot (right).
Stock status 2023 is yellow
8 years ago (2015) was in red.

Because biomass, MSY, Stock status & others are drastically **changed** after catch drop sharply (2016~2023)

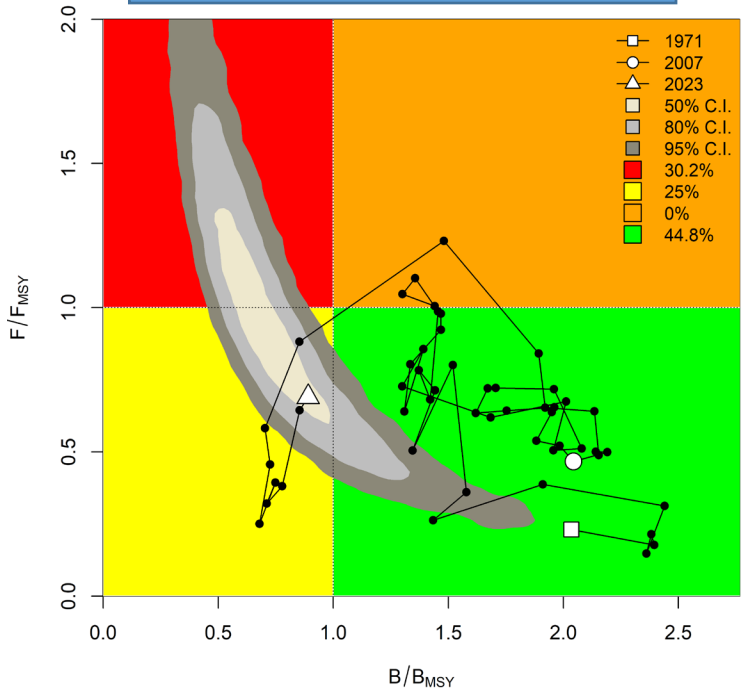
This a crazy example.

The normal example is 1971➔ 2010
Both are in green, but there are small changes (biomass, MSY etc.) EVER YEAR.

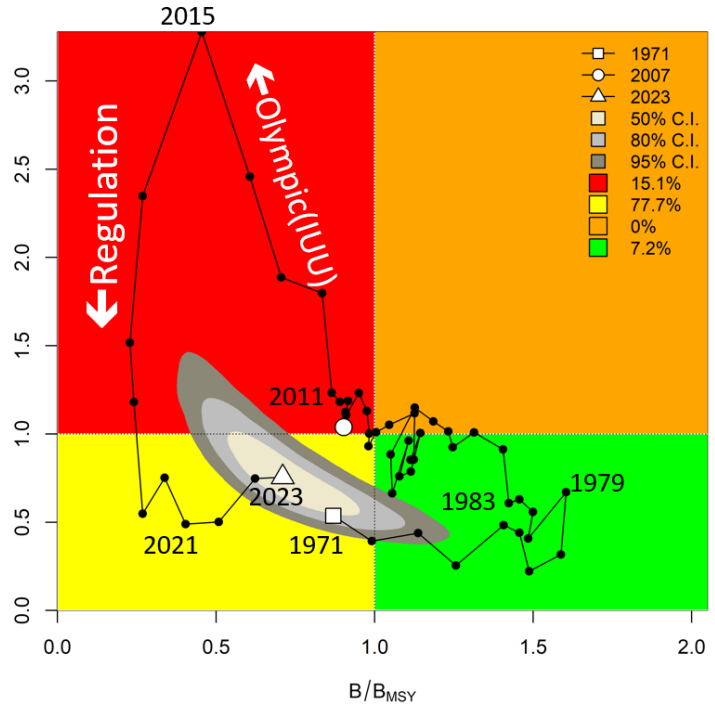


(2) SM Stock status + trajectory (homework) are different from the final one in WS2.
➔ because homework used different CPUE (for exercise) from the final one (see below)

PUY ＋Nipa (homework)
OBT+PS+PT



Final one (WS2)
OBT+PT+MEGL

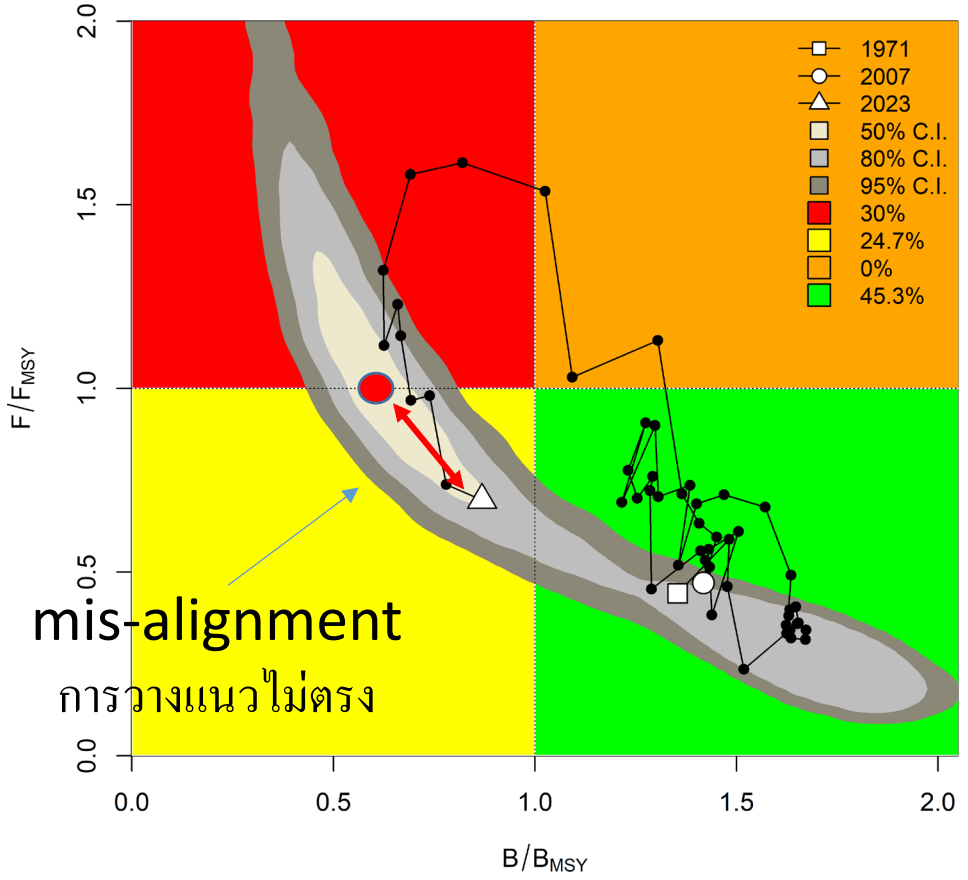


- 2 trajectories (above) are different because input CPUE (homework & final one) are **different**.
- Although trends of these 2 CPUE are actually **similar**, 2 trajectories are resulted as different.
- This means that Input CPUE are very **sensitive** to JABBA results even small changes.
- Again, INPUT CPUE are very important for JABBA, thus we need to select INPUT CPUE very **carefully.**

(3) Mis-alignment การวางแนวไม่ตรง

Sometimes JABBA stock-status point (last year) departs from the top of banana (uncertainties)

- This was discussed many times
- We need to use the perfect one.
- However, often you will not have such cases in your final candidates.
- So, we will apply 80% ism. Then, we accept even การวางแนวไม่ตรง cases.
- But you need to explain this problem in **your paper**



(4) Puy san's R based JABBA runs
This is more or less our kind request to Puy san

We are interested in prior & posterior of B1/K (depletion)

to investigate scenario approach in our software.

Can Puy san please make 2 runs (B1/K prior for 0.25 & 0.75)

and let us know posteriors using your R code with many thanks !

Prior	posterior
0.25	0.43
0.50	0.65
0.75	0.82

(5) Journals
Examples considered in Sri Lanka similar to Thai project (yellow markers)

Tentative Work Plan for Publication (2025~2028) (supervisors: Sisira+Nishida)

(yellow markers : working periods) (as of January, 2025)

WG			IM	KAW				Shark		Sardine
species			Indian Mackerel	Kawakawa				Blue shark	Silky shark	SIRM
Stocks (waters)			SL (base case only)	WIO (base case)		All IO (sensitivity)		IO		SL (base case only)
Leader (1st author)			Ayeshya	Kasun				Thejani		Kishara
Member (co-authors)			Achini	Sujeewa and Thejani				Sujeewa and Kasun		Ayeshya
Publication	IOTC			IOTC		IOTC		IOTC		
	Journal (preference)	1st	Aquatic Living Resources (France) (free)		Regional Studies in Marine Science (International)(H)		Journal of Fish Biology (UK) (H)			Thalassas (intranational) (H)
		2nd	Regional Studies in Marine Science (International)(H)		Aquatic Living Resources (France) or Turkish Journal of Fisheries and Aquatic Sciences (Free)					

Journal by 3 types cost & examples

(1) <u>Hybrid system(see next slide)</u>

- Thalassa: An International Journal of Marine Sciences"
- Regional Studies in Marine Science
- The Journal of Fish Biology
- ICES (very high level)

(2) Free cost Journal

- Indonesian Fisheries Research Journal
- Aquatic Living Resources (France)
- Turkish Journal of Fisheries and Aquatic Sciences
- Sri Lanka Journal of acoustic Sciences

(3) Low-cost Journal

- PeerJ

What is hybrid(1/2)?

- When the paper is accepted, they will ask to select the "open access" or "subscription" method in which we want to publish our paper.

- In the "open access" method, we have to pay the charge and the full paper will be freely available to readers and authors (US$2,000~4,000)

What is hybrid(2/2)?

- If we select the "subscription" option, we don't have to pay any fee but the copyright of the paper will be held by the journal for one year (for some journals it will be 2 years).

- During that period readers have to pay a fee to the journal when they need to download the paper.

- But the authors will get their copies of the full paper and we can share them upon request for non-commercial purposes.