

INTRODUCTION TO MENU-DRIVEN FISH STOCK ASSESSMENT AND MANAGEMENT DECISION TOOLS (KOBE I+II) SOFTWARE

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OBJECTIVES

The main objective of the menu-driven software is to enable users who are not familiar with programming languages such as R, to easily carry out stock assessments and Koke I+II (management decision tools) in a short time using menus (like MS Word & Excel) without any programming.

Target → Beginners (non-SA: stock assessment experts)



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- We are happy for everyone to use our software freely for their important work in fisheries managements.
- As we have many users (see page 10), we have basic rules for users to utilize our software in a harmonious and trustworthy way.
- Therefore, we continue to maintain the current **SOFTWARE COPYRIGHT AND TERMS OF USE** (see pages 5-7). Please kindly follow them.

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- (2) In the on-site training, [MENU] will provide the software and license. This is because [MENU] is responsible for ensuring that users fully understand the uses of the software and also the mechanisms of each application & input/output.
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- (6) (3)~(5) are extremely important because the results are mainly about stock assessments which will be used by managers for fisheries management. In this respect, [MENU] is responsible for the content, in order to avoid providing wrong management advice.

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IMPORTANT NOTE FOR CURRENT USERS

- Please uninstall and delete all software & obtain license and updated software and new software.
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SEVEN MENU-DRIVEN SOFTWARE SERIES (AS OF JANUARY 2025)

Тур	es	Level (for beginners)	Name	lcon	Catch	CPUE	Input infor Biology	mation Others	Features	Current version year
CPUE stand	lardization	Duriste	(1) CPUE standardization	⊅ CPUE_Manager			(*)		QC, CPUE standardization & weighed Ave of multiple CPUE by catch	ver1.3.1 2025 (2016)
	Production	Basic to Intermediate	(2) (**) ASPIC (A Stock-Production Model Incorporating Covariates)	ASPIC_Manager					Production Model (PM) incorporating observation errors	ver1.1.0 2024 (2016)
Stock	model (PM)		(3) JABBA (Just Another Bayesian Biomass Assessment)	JABBA_Manager				Prior information for input parameters	Best state space (integrated system) PM based on Bayesian approach incorporating both observation & model errors	ver1.2.0 2025 (2023)
(SA)		Advanced	(4) ASPM (Age Structured Production Model)	BatchASPM					In-between PM & age- structured model (selectivity: fixed)	ver4.0 2018 (2010)
	Age structured (integrated)		(5) SCAA (Statistical-Catch-At-Age)	ASPM and SCAA)					Catch-At-Age based age-structured model	ver4.0 2022 (2017)
	model		(6) SCAS (Statistical-Catch-At-Size)	🛃 SCAS					Catch-At-Size based age-structured model	(Under development)
Manag decision	ement n tools	Basic to Intermediate	(7) Kobe_l_lI Kobe I: Kobe plot Kobe II: Strategy matrix (risk assessment)	Kobe_]_II_Manager				Kobe I: SA results (F/Fmsy & B/Bmsy) Kobe II: Pr. violating MSY (F and Biomass) (Risk assessment)	<u>Kobe I:</u> Stock status trajectory plot Kobe II: Evaluation of the optimum catch level (TAC)	ver6.2.2 2024 (2011)

(*) Size, LW relation, Selectivity, M (natural mortality), Growth, Maturity-At-Age, Spawner-Recruit relation, Life span (Max. age), Fecundity, and others depending on the model.

(**) No more release because JABBA is recommended to use as JABBA is a much better production model than ASPIC.

Number of users : 104 (26 countries) (alphabetical order)

(Fisheries Research Institutes, Universities, Fisheries Management Agencies, and other relevant Agencies)

Algeria, Argentina, Brunei Darussalam^{*}, Cambodia^{*}, China, Indonesia^{*}, India, Iran, Japan^{*}, Korea, Kenya, Malaysia^{*}, Mexico, Myanmar^{*}, Oman, Peru, Philippines^{*}, Spain, Sri Lanka, Thailand^{*}, Trinidad and Tobago, USA, Viet Nam^{*}, Taiwan, and Turkey.

Note (*) Southeast Asian Fisheries Development Center (SEAFDEC) member countries



MENUS AND OUTPUTS (SAMPLES)

CPUE_Manager



Quality Control (ver1.3.1) (2025)



•**6**3 1000 $R^2 = 0.10378$ 500 CPUE 0 6000 8000 10000 12000 14000 16000 18000 20000 Catch

y = -0.01492698x + 418.58547

To check outliers and to evaluate the relation between CPUE and catch.

Prediction interval of the CPUE vs. Catch relation (light: 99% and dark: 95%)



R software is found.

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CPUE standardization (ver1.3.1)(2025)

	Information of 0 (zero) catch Selection of the model and Select	tion of the covariates					
CPUE_Manager(ver1.3.1)(2025)	information of o (zero) catch, selection of the model, and select	ion of the covariates.					
	Sample size (n=)						
		0 (zero) CPUE (catch) rate (red bar) = 34%					
(1) On ality Control	Year Sample size (n=)	\$ frequency distribution of nominal CPUE					
(1) Quanty Control	2000 825						
	2001 751	Select main covariates					
	2002 611	Year Prequency distribution or nominal CPUE					
(2) CPUE standardization	2003 576	Season 8					
(2) CI CE standardization	2004 646	District					
	2005 606	Second & District					
	2006 1,438	Season * District					
(3) Create a combined standardized CPUE		Select additional covariates					
(*)	2008 810						
	2009 985	BOAT Categorical					
	2010 915	Mesh size					
Manual Manual	2012 775	Continuous					
	2013 639	Continuous o					
	2014 277	depth 0 10 20 30 40 50 60					
CPUE_Manager(ver1.3.1)(2025) - X	2015 597	CPUE					
	2016 755	Select model					
CPUF standardization	2017 801	Log normal CLM: 0 (zora) CDUE (actab) rate (around 20%					
CI UE Stanuar uization	2018 439	Cog normal GLM: 0 (zero) CPUE (catch) rate < around 30%					
		• Delta type 2 steps log-normal model: 0 (zero) CPUE (catch) rate > around 30%					
Rdll Path							
C:¥Program Files¥R¥R-4.4.1¥bin¥x64¥	Note: Selection of covariates (for details, refe	er to the Manual)					
		OK Cancel					
Import the Run Create							
data							
CPUE_Manager(ver1.3.1)(2025) - × CPUE standardization Rdll Path C*Program Files #R*R-4.4.1 *bin*.64* Import the data Run Create OUTPUT	2009 383 2010 915 2011 538 2012 775 2013 639 2014 277 2015 597 2016 755 2017 801 2018 439	✓ BOAT ✓ Mesh_size Continuous ✓ Chl Continuous ✓ depth Continuous ✓ depth Continuous Select model ○ Log normal GLM: 0 (zero) CPUE (catch) rate < around 30% ④ Delta type 2 steps log-normal model: 0 (zero) CPUE (catch) rate > around 30% er to the Manual)					

CPUE standardization (ver1.3.1)(2025)



ANOVA (Analysi si	s Of Variance) tabl ignificances on 0 (z	e for delta mode ero) CPUE (1st st	el to test statistical tep)
A	djusted R ² = 0.18 AIC =	15571.68 BIC = 1585	2.74
Source	df (Degree of Freedom)	χ² (Chi square) (test statistic)	<α:Probabaility (>χ²) (*)
Year	21	97.41	0.000
Season	3	1,945.95	0.000
District	6	173.99	0.000
BOAT	3	33.28	0.000
Mesh_size	1	557.69	0.000
Chl	1	33.34	0.000
depth	1	152.72	0.000
Intercept (mean)	1	0.01	0.919

to test	ANOVA (A t statistical s	nalysis Of Va ignificances	ariance) Table on positive (n	for log norm on zero) nor	nal GLM mo ninal CPUE	del (2nd step)
		Adjusted R ² =	= 0.23 AIC = 32155	.32 BIC = 3242	0.88	
Sources	df1	df2	Type III SS (Sum of Square)	Mean Square	F (test statistic)	<a:probabaility (="">F) (*)</a:probabaility>
Model	35		3,239.09	92.55	57.17	0.000
Year	21		128.28	6.11	3.77	0.000
Season	3		28.56	9.52	5.88	0.001
District	5		2,811.57	562.31	347.34	0.000
BOAT	3		40.07	13.36	8.25	0.000
Mesh_size	1		0.04	0.04	0.03	0.874
Chl	1		77.61	77.61	47.94	0.000
depth	1		152.95	152.95	94.48	0.000
Error		9,639	15,604.62	1.62		





CPUE standardization (ver1.3.1)(2025)

Histgram of residuals (log normal GLM)

QQplot (log normal GLM)



JABBA_Manager



X

JABBA (ver1.2.0)(2025) Entry window



Input, Run & Report(Schaefer)			×
Users will edit the input info and to execute & creat	NOTE prmation in this wind e Output/Report, cl	ow. To save ick the butt	the input on at the	information bottom.
Select data folder C:¥JABBA¥(1) SWO¥SWO_2¥Sc	haefer¥			
Option Inputs		Edit		
Run name (Max 10 letters)		SWO_S		
r prior (mini, max)	0.1	×	3.0	-
K prior (mini, max) (tons) [Default] Mini=2*catch (Max) Max=10*catch (Max) Change values if needed	79,990		399,948	
B0/K (delpletion) 0 <b0 k≦1<="" td=""><td></td><td><mark> 1.00</mark></td><td></td><td></td></b0>		<mark> 1.00</mark>		
[Note] The job is running. until "Run completed" is di	<u>Wait for a few - 15</u> splayed.	minutes		
Click to save, run & Report				Back

Quick evaluation (diagnosis)



S(Schaefer)

JABBA (ver1.2.0)(2025) Selection of the best Model run

			Selectio	on of the be	est mode	l run (Scł	naefer o	r Fox) l	by 15 d	iagnos	is (Use hard	copy of 2 Rep	ports for easy p	orocess & ed	its)	
(Note) You can use this sheet to edit or the blank sheet (next sheet) Copy & paste from Reports Comments & decision	F . I		1.	2. Model Fit									3. Retros	pective		
	Evaluation	Conve (MC	ergence CMC)	2.1 CPUE r	esiduals	2.2 RMSE	2.3 P	rior to Po	osterior I	Ratio	2.4 Posterio Check	r Predictive (PPC)	analyses		analyses 4. Hindcas	
(Note) You can use this sheet to	Methods	Heidell Welcl (highe	berger & h p test r better)	95% CI band	outliers	RMSE	PPMR (I Posterior Rat	Prior to Median io)	PPVR (Post Varianc	Prior to erior e Ratio)	Average p values (compute yourself)	Visual inspection	Mohan's ρ (-0.15~2.0)	Visual inspection	MASE (smaller better)	Visual inspection
edit or the blank sheet (next sheet)	Criteria	Geweke.p (average)	Heidel.p (average)	Red band No Randomness Green band Randomness	# of outliers	Less % better fit	Averag (r, K (cc (Use th	e value o , depletio ompute b e 3rd she closer 1	of 4 para on & sign oy yourse eet to cou is better	meters na2) lf) npute)	(Use the 3rd sheet to compute) Closer to 0.5 is better	Ball like shapes & centralized are better	# of outside range (see 5th sheet) (please count) (less # better)	Smooth & no strange trends nor patterns	< 1 better	# OBS points beyond the 95% Cl band
	Output #	#	20	# 1	3	# 10	#1 (p.8)	#3 (p.9)	#:	12	# 42	# 40	# 43	# 41
	(page#)	(p	.4)	(p.6	5)	(p.7)	1st	2nd	1st	2nd	(p.	10)	(p.11)	(p.12)	(p.13)	(p.14)
	Diagnosis #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Copy & paste	Schaefer	0.27	0.25	ок	1	20.7%	0.89	0.43	0.93	0.53	0.83	not so good	0	ок	NG (1.24)	4
from Reports	Fox	0.58	0.57	ок	2	20.4%	0.84	0.43	0.93	0.52	0.87	not so good	0	ОК	NG (1.19)	4
	Better model ?	FOX	FOX	same	Schaefer	FOX	Schaefer	same	same	Schaefer	Schaefer	same	same	same	FOX	Same
	(1)	(1) The	large diff	erence is that	converge	nce (MCM	C) is twice	better	perform	ance for	Fox.					
Comments &	(2)	(2) 4 dia	agnosis fo	or Fox are bet	ter and 4 f	or Schaefe	r. But all a	are simil	ar perfo	rmances	s (except con	vergence) ar	nd the rest of 7	are same.		
(Note)You can usethis sheet toedit or theblank sheet(next sheet)Copy & pastefrom ReportsEComments &decision(Note)F	(3)	(3) As c	onvergen	ce for FOX is t	twice bett	er than Sch	aefer, wh	nile othe	rs are si	milar or	same for bot	th. Thus, Fox	is selected.			
(Note)	Referred by	"Good p	oractices	for surplus	producti	ion mode	ls" by Ko	okkalis	et al (2	024)						20

Kobe I+II Manager

Image: Nobe_I_II_Manager

Kobe I (Kobe plot) (ver6.2.2)(2024)





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Kobe I (Multi plots) (ver6.2.0)(2024)







Kobe I (Multiple comparisons) (ver6.2.0)(2024)







Kobe_l_II_Manager(ver6.2.2)(2024) × Kobe I (Kobe plot) (Stock status trajectory plot) Kobe II (Risk assessment: Strategic matrix) Manual

Kobe II (Risk matrix) (ver6.2.2)(2024)

			Risk pro	bability (9	%) violating	g TB(MSY) l	evel by cat	ch level				
					Color	legend						
	Risk levels Probably		vels Low risk M lo bly 0 - 25% 25		Medium Iow risk		Medium high risk		High risk			
					25 -	50%	50 - 75%		75 - 100%			
	%	Catch (tons)	<mark>198</mark> 5	1986	1987	1988	1989	1990	1991	1992	1993	1994
	200%	40,533	42%	99%	100%	100%	100%	100%	100%	100%	100%	1009
	150%	33,778	42%	96%	99%	100%	100%	100%	100%	100%	100%	100
	100%	27,022	42%	89%	96%	99%	100%	100%	100%	100%	100%	100
K Increased from the	80%	24,320	42%	85%	93%	97%	99%	100%	100%	100%	100%	100
% Increased from the current catch level	60%	21,618	42%	79%	88%	93%	96%	98%	99%	100%	100%	100
	40%	18,915	42%	71%	80%	87%	91%	94%	96%	97%	98%	999
	30%	17,564	42%	65%	75%	82%	87%	91%	93%	95%	96%	979
	20%	16,213	42%	60%	69%	76%	81%	86%	89%	91%	92%	939
	10%	14,862	42%	54%	60%	68%	73%	77%	81%	84%	86%	889
* Current catch	0%	13,511	42%	48%	51%	56%	61%	64%	68%	72%	75%	779
	-5.6%	**12,760	42%	42%	45%	48%	51%	54%	57%	60%	62%	649
	-10%	12,160	42%	39%	41%	43%	45%	48%	50%	52%	54%	55%
	-20%	10,809	42%	30%	28%	28%	27%	26%	27%	27%	27%	279
6 decreased from the	-30%	9,458	42%	21%	15%	11%	9%	8%	8%	8%	8%	9%
current catch level	-40%	8,107	42%	10%	4%	2%	1%	1%	1%	1%	1%	1%
	-60%	5,404	42%	1%	0%	0%	0%	0%	0%	0%	0%	0%
	-80%	2,702	42%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	-100%	0	42%	0%	0%	0%	0%	0%	0%	0%	0%	0%

(Note) * Average catch for 3 last assessments years ** MSY level

