STOCK ASSESSMENT FOR ALL MENU-DRIVEN SOFTWARE DEVELOPMENT TEAM

Menu-driven software series (No. 7)

KOBE I+II MANAGER (VER6.2.1)(2024)

Kobe I (Kobe plot) and Kobe II (Strategy diagram) (General use^(*)) [management decision making tools]

Manual

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(*) This software is for the <u>general use</u> for Kobe I+II. Kobe I+II <u>customized</u> for ASPIC_Manager & JABBA_Manager are available within their software.

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ACRONYMS

ASPIC	A Stock-Production Model Incorporating Covariates
ASPM	Age-Structured Production Model
В	Total biomass or Spawning Stock Biomass (Normally it refers to Total
	Biomass. In this manual, TB is used for Total Biomass)
B _{MSY}	Total biomass or Spawning Stock Biomass at MSY
CI	Confidence Interval
F	Fishing mortality
F _{MSY}	Fishing mortality at MSY
ICCAT	International Commission for the Conservation of Atlantic Tunas
IOTC	Indian Ocean Tuna Commission
JABBA	Just Another Bayesian Biomass Assessment

LRP	Limit Reference Point
MCMC	Markov Chain Monte Carlo methods
MSY	Maximum Sustainable Yield
RFMO	Regional fisheries management organization
SB or SSB	Spawning biomass
SB_{MSY} or SSB_{MSY}	Spawning stock biomass at MSY
SCRS	Standing Committee on Research and Statistics (ICCAT)
SS3	Stock Synthesis II
TRP	Target Reference Point
ТВ	Total Biomass
TB _{MSY}	Total Biomass at MSY
WPM	Working Party on Methods (IOTC)
WPTT	Working Party on Tropical Tunas (IOTC)

About (1/5)

Kobe I & II menu-driven software (version 6.2.1) → Management decision making tools

Kobe I+II : Recommended by 5 tuna-RFMO meetings

Kobe I: 2007 (Kobe, Japan) Kobe II: 2009 (Barcelona, Spain)

(Note 1) This software is for the <u>general use</u> for Kobe I+II.
(Note 2) Kobe I+II <u>customized</u> for ASPIC_Manager & JABBA_Manager
are available within their software.



Sub menus

Kobe_I_II_Manager(ver6.2.0)(2024)

Kobe I (Kobe plot)

Single trajectory with a confidence surface

Single or Multi trajectories (no confidence surface)

Multiple comparisons among stock status points

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Kobe_I_II_Manager(ver6.2.1)(2024)

Kobe II

Strategic matrix is available in ASPIC Manager and JABBA Manager About (2/5)

Kobe I (Kobe plot)

Stock status trajectory plot representing historical stock statuses (based on stock assessment results)

> X axis: Biomass ratio (B/B_{MSY}) Y axis: F ratio (F/F_{MSY})





Kobe II (Strategy matrix)

Probabilities violating MSY levels (Biomass & F) (next 10 years) By different catch level (based on risk assessment results)

→ Basic information for management (example, TAC)

				Risk pro	obability (9	6) violating	g TB(MSY) l	evel by cat	ch level				
ADOUT			1			Color	legend	I		I			
(4/5)		Risk levels		Low risk		Mec low	dium ^y risk	Medium high risk		High risk			
		Prob	ably	0 - 1	25%	25 -	50%	50 -	75%	75 - 3	100%		
							Ι					, ,	
		%	Catch (tons)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Koho II		200%	40,533	42%	99%	100%	100%	100%	100%	100%	100%	100%	100%
NUDE II		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%
	% Increased from the	80%	24,320	42%	85%	93%	97%	99%	100%	100%	100%	100%	100%
• • • • •	current catch level	60%	21,618	42%	79%	88%	93%	96%	98%	99%	100%	100%	100%
Strategy _	-	40%	18,915	42%	71%	80%	87%	91%	94%	96%	97%	98%	99%
07	-	30%	17,564	42%	65%	75%	82%	87%	91%	93%	95%	96%	97%
Matrix –	-	20%	16,213	42%	60%	69%	76%	81%	86%	89%	91%	92%	93%
		10%	14,862	42%	54%	60%	68%	73%	77%	81%	84%	86%	88%
(_)	* Current catch	0%	13,511	42%	48%	51%	56%	61%	64%	68%	72%	75%	77%
	_	- <mark>5.6%</mark>	**12,760	42%	42%	45%	48%	51%	54%	57%	60%	62%	64%
	_	-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%	27%
	% 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

				Risk pr	obability (%	6) violating	g TB(MSY) l	evel by cat	ch level				
About													
ADUUL						Color	legend						
(5/5)		Risk	levels	Low risk		Medium Iow risk		Medium high risk		High risk			
		Prot	bably	0 -	0 - 25% 25 - 50%		50 - 75%		75 - 100%				
		%	Catch (tons)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Koha II		200%	40,533	36%	41%	85%	97%	100%	100%	100%	100%	100%	100%
NODE II	-	150%	33,778	36%	41%	79%	94%	99%	100%	100%	100%	100%	100%
		100%	27,022	36%	41%	71%	87%	95%	98%	99%	100%	100%	100%
	% Increased from the	80%	24,320	36%	41%	66%	83%	91%	96%	98%	99%	100%	100%
• •	current catch level	60%	21,618	36%	41%	61%	77%	87%	93%	96%	98%	99%	99%
Strategy		40%	18,915	36%	41%	57%	70%	80%	87%	91%	94%	95%	97%
07		30%	17,564	36%	41%	54%	67%	75%	82%	87%	91%	93%	95%
Matrix	_	20%	16,213	36%	41%	52%	61%	70%	77%	81%	86%	89%	90%
I VIGCI IX		10%	14,862	36%	41%	49%	56%	63%	69%	75%	79%	82%	84%
(TD)	* Current catch	0%	13,511	36%	41%	47%	51%	56%	60%	64%	68%	71%	74%
(10)	_	-5.60%	**12,760	36%	41%	45%	47%	50%	54%	57%	59%	62%	64%
	_	-10%	12,160	36%	41%	43%	45%	47%	50%	52%	53%	56%	58%
	_	-20%	10,809	36%	41%	40%	39%	37%	37%	37%	37%	37%	38%
	% decreased from the	-30%	9,458	36%	41%	35%	31%	29%	27%	24%	23%	22%	21%
	current catch level	-40%	8,107	36%	41%	32%	26%	19%	16%	14%	13%	12%	11%
	_	-60%	5,404	36%	41%	26%	13%	8%	6%	6%	6%	6%	6%
	-	-80%	2,702	36%	41%	19%	6%	3%	3%	3%	3%	3%	3%
		-100%	0	36%	41%	12%	2%	1%	1%	1%	1%	1%	1%

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

2. REQUIREMENTS FOR PC AND IMPORTANT REMARKS (1/3)

(1) Requirements for PC

- Operation System: MS window 10 or 11 and <u>NOT applicable for MAC (apple) PC</u>.
- 64bit PC.
- RAM: minimum 2GB.
- Basic software (Word, Excel and Notepad)
- R programming language for window (R-4.3.1-win) needs to be installed in advance. Its size is 80MB (zipped) and 180MB (unzipped).
- To make smooth operations, users need at least 30% of empty space of the hard disk.

2. REQUIREMENTS FOR PC AND IMPORTANT REMARKS (2/3)

(2) Important remarks (sample data)
 This manual uses the sample data for demos.
 Users can also use the sample data for practice.
 Location of the sample data (sample data folder)

D	>	PC >	Wind	ows (C:)	>	ESL Soft	ware	>	Kobe <u>-</u>	_I_II_M	anager	>	Kobe_I_II Sa	ample da	ata
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	💌 Ko	be I (3) M	ulti comp	parison san	nple		2024	/01/1	5 10:28		Micr	osoft	: Excel ワーク		11

2. REQUIREMENTS FOR PC AND IMPORTANT REMARKS (3/3)

(2) Important remarks

Manual

This PowerPoint is the manual. Manul call button is available in some of menus.

Keep the original files (important)

Don't use original files. Make copies & use copies as work files like wk1, wk2, etc.

Operation by mouse

Manual explains operations based on "mouse".

For "touch panel" or "key board", follow corresponding manipulations.

Save

Save files frequently.

Engines (programs and applications) underpinning this software

- Microsoft Visual Studio (2019)
- Graphics: C# and. NetFrameWork4.7.2
- R-4.3.1-win (2023)

3. Installation (2 application)

Before installation, uninstall old versions (Kobe I+II and R)

(1) Kobe I+II (general use)

Please get the installation link from the [MENU] Secretariat at <u>menu.soft.SEC@gmail.com</u>

(2) R-4.3.1-win

Go to https://cran.r-project.org/bin/windows/base/

Then download from <u>Download R-4.3.1 for Windows</u> and install.

3. Installation: Kobe I (plot) & II (management tool)

Double click the zipped installer (located folder or desktop)

Users can get the download link of the software

from the [MENU] Secretariat at <u>menu.soft.SEC@gmail.com</u>

Installer (folder)

Kobe_I_II_Manager(ver6.2.1)(2024)





Installer (desktop)



3. Installation: Kobe I+II Follow 5 steps

Kobe_I_II_Manager(ver6.2.1)(2024)	Kobe_LII_Manager(ver6.2.1)(2024)
Welcome to the Kobe_I_II_Manager Installation Program This program will install Kobe_I_II_Manager on your computer.	Check the Installation information Indicate the installation information such as the destination folder.
It is strongly recommended that you exit all programs before running this installation program.	Check the installation information, then click Next when you do not need to change it. Click Back to reenter the installation information, then edit it when you need to do it.
Click Next to continue the installation. Click Cancel to quit the installation program.	Destination Folder: C:\ESL Software\Kobe_I_II_Manager Extra Menu: Create Shortcut on Desktop Create Shortcut on Desktop
WARNING: This program is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program, or any portion of it is prohibited b	
Copyright (C) 2021 Environment Simulation Laboratory Co,Ltd.	· ·
Cantan Installer Cancel	
e I_II_Manager(ver6.2.1)(2024) elect Destination Folder Set up the destination folder where the application will be installed.	[情報
Select the folder where files will be installed, then click Next.	The destination folder does not exist. Do you want to create
C:\ESL Software\Kobe_I_II_Manager Browse Default Folder	Yes No
Space Available : 449,088,090,112 byte	
Space Required : 10,789,317 byte	If the destination folder "ESL Software" exits, this window will not appear.
ntan Installer Back Next Cancel	
	=

	Users will get 4 the Kobe_I_II folder.										
Ð	>	PC >	• Winc	lows (C:)	>	ESL Sc	ftware				
	Ō		Ŕ	Î	∕√	並べ替え	ζ×				
	名前		~	ø			更新				
	Ко	be_l_ll_N	lanager				202				
be_l_ll Congra The	be_I_II_Manager(ver6.2.1)(2024) Congratulations! The application has been successfully installed.										
The application has been successfully installed.											
Clic	Click the registered icon to start the installed program.										

Finish

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[1st menu]

Kobe I (Kobe plot) Stock status trajectory plot

4. Kobe l (Kobe plot)

Stock status trajectory plot

3 sub menus

Kobe I (Kobe plot) (Stock status trajectory plot)

Kobe II (Risk assessment: Strategic matrix)

Manual

Kobe_I_II_Manager(ver6.2.1)(2024)

Kobe I (Kobe plot)

Single trajectory with a confidence surface

Single or Multi trajectories (no confidence surface)

Multiple comparisons among stock status points

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4.1 A single plot with a confidence surface

4.1 A single plot with a confidence surface

Kobe_I_II_Manager(ver6.2.1)(2024)

X

Kobe I (Kobe plot)

Single trajectory with a confidence surface

Single or Multi trajectories (no confidence surface)

Multiple comparisons among stock status points

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4.1 A single plot with a confidence surface

Preparing the data set using Excel

> B ratio = B/B_{MSY} F ratio = F/F_{MSY}

	А	В	С	D	Е
	vear	B ratio	Fratio	B ratio	F ratio
1	year	(point)	(point)	(uncertain)	(uncertain)
2	1955	1.89	0.16	0.81	1.06
3	1956	1.86	0.23	1.01	0.79
4	1957	1.81	0.18	1.31	0.55
5	1958	1.81	0.2	1.25	0.57
6	1959	1.81	0.22	1.51	0.42
7	1960	1.79	0.19	1.08	0.7
		(Omitte	d)	(Omiti	ted)
55	2008	0.78	1.05	1.16	0.64
56	2009	0.83	1.02	0.74	1.32
57	2010	0.88	0.85	1.42	0.46
58	2011	0.98	0.85	0.96	0.84
59				0.88	1.02
60				0.91	0.9
	Poir (rest as	nt estimat ults of sto sessment	res ock)	(Omi	tted)
97				0.89	0.94
98				1.12	0.67
.99				1.22	0.6
00				0.8	1.18
01				0.64	1.53
			(resu	Uncert Its of MCM	ainties IC or Boots

4.1 A single plot with a confidence surface: Importing the input (sample) data





4.1 A single plot with a confidence surface

Years of stock status points are indicated by last 2 digits of years (e.g. 11 for 2011)

> If fonts of these 2 digits are too small, make them larger using the graph setting tool (for detail, see next slide)



4.1 A single plot with a confidence surface: Making fonts (years) larger

Graph Settings	
Points and lines Trajectory, confidence surfa	ce and phase
Select Years to Display	□ Title
 ✓ 1955 ✓ 1959 ✓ 1963 ✓ 1968 ✓ 1972 ✓ 1956 ✓ 1960 ✓ 1964 ✓ 1969 ✓ 1973 	Kobe plot Font Size: 18 3 B
 ☑ 1957 ☑ 1961 ☑ 1965 ☑ 1970 ☑ 1974 ☑ 1958 ☑ 1962 ☑ 1967 ☑ 1971 ☑ 1975 	Limit Reference Point
All Years	Limit Reference Legend
Axis	X(%6): 0.6 C X: TB(limit) = 0.6 x TBmsy
Title Min. Max. Increment X: TB/TBmsy · -0.25 4.23 1	Y(%): 1.3 Y: F(limit) - 1.3 x Fmsy
Y: F/Fmsy · -0.37 2.1 1	Color: Width: 1 \$\$ Style: Solid •
Font Size: 20 3 B Reset	Font Size: 10 4 B
Change titles of XY axis to other names	Target Reference Point
□ X: □ Y:	Limit Reference Legend
Change to 20	X(%): 1.0 C X: TB(target) = 1.0 x TBmsy
Mark Size: 10 Mark Color:	$Y(\%)$: 1.0 $(Y_1 - F(target) = 1.0 \text{ x Fmsy})$
Font Size: 10 B Color:	Color: Width: 1 3 Style: Solid ·
	Font Size: 10 3 B
	OK Cancel



About graph settings

4.1 A single plot with a confidence surface : Graph settings (1st sheet: Points & lines) Most functions are self-explanatory except (1) and (2)

Graph Settings Points and lines Trajectory, confidence surfa	ace and phase
Select Years to Display 1st Year: 1955 957 1959 956 1963 956 1960 956 1961 957 1951	Title Kobe plot
$1 = \frac{1}{1000} + \frac{1}{1000} +$	Limit Reference Point X(%): 0.6 Y(%): 1.3 Y(%): 1.3 Y: F(limit) = 0.6 x TBmsy Y: F(limit) = 1.3 x Fmsy Color: Width: 1
Font Size: 20 B Reset Change titles of XY axis to other names X: Y:	Font Size: 10 B In Target Reference Point Limit Reference Legend
Mark Mark Size: 10 Color: Font Size: 10 B Color:	$X(\%)$:1.0 \bigcirc X : $TB(target) = 1.0 x TBmsy$ $Y(\%)$:1.0 \bigcirc Y : $F(target) = 1.0 x Fmsy$ Color: \bigcirc $Width$:1 \bigcirc Style:Solid \cdot Font Size:10 \bigcirc
	OK Cancel

(1) Title of XY Axis Default X: TB/TBmsy Y: F/Fmsy	Options (select from the pull dow menu) X: TB/TBms SB/SSB SB/SBms B/Bmsy	sy · F Bmsy sy c	7/Fmsy 7/Fmsy Catch/MSY
② Limit & Tar	get Reference Points (optional) oint		
X(%): 0.5 Y(%): 1.3 Color:	Limit Reference Legend \bigvee X: TB(limit) = 0.5 x TBmsy \bigvee Y: F(limit) = 1.3 x Fmsy Width: 1 \bigcirc Style: Solid \cdot Font Size: 10 \bigcirc B		See next Slide about
 ✓ Target Reference I X(%): 1.0 ♀ Y(%): 1.0 ♀ 	Point Limit Reference Legend ✓ X: TB(target) = 1.0 x TBmsy ✓ Y: F(target) = 1.0 x Fmsy		Target and Limit Reference Point
Color:	Width: 1 Style: Solid · Font Size: 10 B	I	

4.1 A single plot with a confidence surface Limit & Target Reference Point (LRP & TRP)

TRP \rightarrow MSY level (TB & F)

as the basic management reference point such as TAC

LRP are for more <u>conservative</u> management point. For example, if LRP (F) = 1.3(TRP), this means that when F > 1.3(TRP) (very high F), strong measure will be implemented (for example MPA)

Coefficients (such as 1.3) are defined by species, RFMO & country.

4.1 A single plot with a confidence surface Coefficients of Limit & Target Reference Point (LRP & TRP) Example : IOTC

Stock	Target Reference Point	Limit Reference Point
Albacore	SBMSY; FMSY	0.4*SBmsy; 1.4*Fmsy
Bigeye tuna	SBMSY; FMSY	0.5*SBmsy; 1.3*Fmsy
Skipjack tuna	SBMSY; FMSY	0.4*SBmsy;1.5*Fmsy
Yellowfin tuna	SBMSY; FMSY	0.4*SBmsy; 1.4*Fmsy
Swordfish	SBmsy; Fmsy	0.4*SBmsy; 1.4*Fmsy

See the sample Kobe plot (right) with TRP+LTP for bigeye tuna (IOTC)



4.1 A single plot with a confidence surface

Graph settings (2nd sheet) Trajectories, confidence surface and phase

Most functions are self-explanatory except ③

See next slide on explanation of ③

Graph Settings	
Points and lines Trajectory, confidence surfa	ce and phase
Trajectory Line	
Color Width 2 Style Arrow ·	Phase color
Show Plot Points Style Circle ·	
Stock status points front ·	Line width of XY axis
Show Confidence Surface	Color: Width: Style: Solid
	Phase name Label
Show Contour Labels	Overfished Horizontal
5%	✓ Overfishing Vertical ·
✓ 25% ✓ 95%	Recovering Horizontal ·
50%	Safe zone Horizontal ·
Font Size: 9 B	Font Size: 12 B
Show PieChart(% Composition of 4 phases)	Default font name:
Font Size: 10 B	Times New Roman · Apply for all
Align confidence surface	Subscript MSY position alignment
$\mathbf{X}: \begin{array}{c} 0.02 \\ \bullet \end{array} \mathbf{Y}: \begin{array}{c} 0.00 \\ \bullet \end{array} \textbf{(3)}$	Axis Label: X: -18 Y: -5
	LRP Name: X: -20 Y: 0
	TRP Name: X: -20 Y: 0
	OK Cancel

4.1 A single plot with a confidence surface

③ Subscript MSY position alignment

If locations of subscript $_{MSY}$ are a bit far away, for example, F/F $_{MSY}$ or TB/TB MSY

apply subscript $_{MSY}$ position alignment function (below by adjusting X & Y values to make it closer & normal (F/F_{MSY} or TB/TB_{MSY}).





Need many practices...



4.2 Single/Multiple Kobe plots without confidence surfaces

4.2 Single/Multiple Kobe plots without confidence surfaces (two examples)





4.2 Single/Multiple Kobe plots without confidence surfaces Preparing the data set → sample data (1970-2013) (Excel)

	1 st data set		2 nd data set		3 rd data set		
	А	В	С	D	E	F	G
1	year	TB(ratio)(1)	Fratio(1)	TB(ratio)(2)	Fratio(2)	TB(ratio)(3)	Fratio(3)
2	1970	3.740	0.028	3.130	0.005	5.310	0.000
3	1971	4.720	0.017	3.120	0.006	5.310	0.000
4	1972	6.120	0.012	2.920	0.007	5.370	0.001
5	1973	7.510	0.012	2.830	0.007	5.440	0.002
6	1974	7.810	0.024	2.130	0.011	5.410	0.004
7	1975	6.710	0.035	1.860	0.022	5.460	0.003
8	1976	5.290	0.037	1.770	0.030	5.410	0.005
9	1977	4.390	0.033	1.990	0.017	5.450	0.005
10	1978	4.090	0.037	2.170	0.012	5.390	0.006
11	1979	3.950	0.051	2.190	0.012	5.380	0.007
12	1980	3.850	0.049	1.820	0.019	5.360	0.008
13	1981	3.720	0.050	1.960	0.018	5.420	0.008
14	1982	3.650	0.048	1.890	0.024	5.360	0.011

TB ratio = TB/B_{MSY} F ratio = F/F_{MSY}

Single plot

1 data set

Multiple (3) plots 3 data sets

(Omitted)

39	2007	1.820	0.688	2.380	0.143	5.540	0.053
40	2008	1.720	0.607	2.310	0.151	5.530	0.055
41	2009	1.650	0.468	2.250	0.163	5.570	0.062
42	2010	1.650	0.629	2.190	0.163	5.560	0.114
43	2011	1.620	0.629	2.130	0.172	5.410	0.225
44	2012	1.570	0.629	2.090	0.230	5.120	0.226
45	2013	1.510	0.629	2.010	0.274	4.830	0.289



4.2 Single/Multiple Kobe plots without confidence surfaces Initial default plots (2 examples)





4.2 Single/Multiple Kobe plots without confidence surfaces Editing the initial default plot using Graph Setting





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4.2 Single/Multiple Kobe plots without confidence surfaces Graph settings (1st sheet: Points & lines) Most functions are self-explanatory except ① and ②

Graph Settings Points and lines Trajectory confidence surfs	ice and phase		
Select Years to Display	Title		
Ist Year: 1955 · 555 Years	Kobe plot		
$ [953] \bigcirc 1953 \bigcirc 1963 \bigcirc 1968 \oslash 1972 \\ \bigcirc 1956 \oslash 1960 \oslash 1964 \oslash 1969 \oslash 1973 \\ \bigcirc 1957 \odot 1961 \bigcirc 1964 \oslash 1969 \oslash 1973 \\ \bigcirc 1957 \odot 1961 \bigcirc 1965 \odot 1959 \odot 1973 \\ \bigcirc 1957 \odot 1961 \bigcirc 1965 \odot 1959 \odot 1973 \\ \bigcirc 1957 \odot 1961 \bigcirc 1965 \odot 1959 \odot 1973 \\ \bigcirc 1957 \odot 1961 \bigcirc 1961 \bigcirc 1962 \odot 1973 \\ \bigcirc 1957 \odot 1961 \bigcirc 1961 \bigcirc 1962 \odot 1973 \\ \bigcirc 1957 \odot 1961 \bigcirc 1961 \bigcirc 1962 \odot 1973 \\ \bigcirc 1957 \odot 1961 \bigcirc 1961 \bigcirc 1962 \odot 1973 \\ \bigcirc 1957 \odot 1961 \bigcirc 1961 \bigcirc 1962 \odot 1973 \\ \bigcirc 1957 \odot 1961 \bigcirc 1961 \bigcirc 1962 \odot 1973 \\ \bigcirc 1957 \odot 1961 \bigcirc 1961 \bigcirc 1962 \odot 1973 \\ \bigcirc 1957 \odot 1961 \bigcirc 1961 \bigcirc 1961 \bigcirc 1962 \odot 1962 \odot 1973 \\ \bigcirc 1957 \odot 1961 \bigcirc 1961 \bigcirc 1962 \odot 1962 $	2	Font Size	18 🗘 R
$\bigtriangledown 1957 \ \bigtriangledown 1961 \ \bigtriangledown 1965 \ \bigtriangledown 1970 \ \bigtriangledown 1974 \\ \bigtriangledown 1958 \ \boxdot 1962 \ \bigtriangledown 1967 \ \bigtriangledown 1967 \ \bigtriangledown 1971 \ \bigtriangledown 1975 \\ $	Limit Referen	nce Point	
All Years	X(%): 0.6	Limit Reference I	t) = 0.6 x TBmsy
TitleMin.Max.IncrementX:TB/TBmsy0.254.231	Y(%): 1.3	Y: F(limit)	= 1.3 x Fmsy
Y: F/Fmsy · -0.37 2.1 1	Color:	Width: 1	Style: Solid ·
Font Size: 20 B Reset	2	Font Size:	10 ‡
X: Y axis to other names	Target Refere	ence Point	
		Limit Reference I	Legend
Mark	X(%): 1.0	X: TB(targ	et) = 1.0 x TBmsy
Mark Size:10Mark Color: \checkmark FontSize:10 \blacksquare B Color:	Y(%): 1.0	Y: F(target) = 1.0 x Fmsy
	Color:	Font Size:	10 B
		OK	Cancel

(1) Title of XY Axis Default X: TB/TBmsy Y: F/Fmsy	Options (select from the pull dow menu)	X: TB/TBmsy · SSB/SSBmsy SB/SBmsy TB/TBmsy B/Bmsy	Y: F/Fmsy F/Fmsy Catch/MSY
---	--	---	----------------------------------

(2) Limit & Target Reference Points (optional)					
☑ Limit Reference Pe	oint				
	Limit Reference Legend				
X(%): 0.5	\checkmark X: TB(limit) = 0.5 x TBmsy				
Y(%): 1.3	\bigvee Y: F(limit) = 1.3 x Fmsy				
Color:	Color: Width: 1 Style: Solid · Font Size: 10 B				
Target Reference F	Point				
	Limit Reference Legend				
X(%): 1.0	\bigvee X: TB(target) = 1.0 x TBmsy				
Y(%): 1.0	\checkmark Y: F(target) = 1.0 x Fmsy				
Color:	Width: 1 Style: Solid ·				
	Font Size: 10 • B				

4.2 Single/Multiple Kobe plots without confidence surfaces

Graph settings (2nd sheet: Trajectories, confidence surface and phase)

Most functions are self-explanatory except ① Subscript MSY position alignment

→ see slide #31 for details

Graph Settings		
Points and lines Trajectory and Phases		
Select Scenarios to Display and the Line Colors.	Default font name:	
	Times New Roman	Apply for all
	Subscript MSY position alignment	
	Axis Label: X: 0	• Y: 0 •
Trajectory Line Width 2 Style Arrow	TRP Name: X: 0	Y: 0 V: 0
Phase color		
Line width of XY axis		
Color: Width: 5 🗣 Style: Solid -		
Phase name Label		
 Overfished Horizontal 		
Overfishing Vertical		
Recovering Horizontal •		
Safe zone Horizontal •		
Font Size: 12 B		
	ОК	Cancel

4.2 Single/Multiple Kobe plots without confidence surfaces Complete ones (two examples) (*left*: single plot and *right*: multiple plots)





4.3 Multiple comparisons

4.3 Multiple comparisons

Comparison among different stock assessment results (final year) 4 models (for example)



4.3 Multiple comparisons

Creating the (sample) input data (based on results of 4 models in the final year) (lower & upper : 80% confidence intervals **←** from xxx.fit file)

stock assessment model	TB/TB _{MSY} (point estimate)	TB/TB _{MSY} (lower)	TB/TB _{MSY} (upper)	F/ _{FMSY} (point estimate)	F/ _{FMSY} (lower)	F/ _{FMSY} (upper)
SS3	1.61	1.58	1.68	0.56	0.52	0.59
ASPIC	2.3	2.04	2.56	0.83	0.68	1
JABBA	1.57	1.36	1.82	0.49	0.35	0.66
ASPM	3.1	1.92	6.35	0.34	0.08	0.7



4.3 Multiple comparisons Initial default plots



Editing the default plot to make the final plot using graph setting functions

Axis Title Min. Max. Increment X: TB/TBmsy • 0 6.85 2 Y: F/Fmsy • -0.01 1.1 1 Font Size: 20 B Reset Change titles of XY axis to other names X: Y: Y: X Label Select Data: ASPIC • All Apply Center marker Color: Size: 5 Style: Circle • Circle line	☐ Title Comparisons among different stock assessments results Font Size: 18 Imit Reference Point X(%): 0.6 X(%): 0.6 X: SB(limit) = 0.6 x SBmsy Y(%): 1.3
Change titles of XY axis to other names X: Y: Label Select Data: ASPIC ✓ Center marker Color: Size: 5 Style: Circle line	Limit Reference Point X(%): 0.6 X(%): 1.3 Y(%): 1.3
Color: Size: 5 Style: Circle •	Color: Width: 1 🖨 Style: Solid - Font Size: 10 🖨 B
Color: Width: 2 Style: Solid Color: Width: 2 Style: Solid Color: Width: 1 Style: Solid Color: B Circle name Font Size: 12 B	Target Reference Point X(%): 1.0 X(%): 1.0 Y(%): 1.0 Y: F(target) = 1.0 x SBmsy Y: F(target) = 1.0 x Fmsy Color: Width: 1 Font Size: 10 ■

4.3 Multiple comparisons Final plot

Graph settings functions are Self-explanatory. Thus users Can learn by themselves by Practice.

But, if users have difficulties, please contact [MENU] Menu-driven stock assessment software developing team.





Comparisons among 4 different stock assessments results

5. [2nd menu] Kobe II (Strategy matrix)

5. [2nd menu] Kobe II (Strategy diagram)



Appendix A: History of development

Ver	Year	Development	Reference
1	2011	Initial version of the Kobe I+II software containing basic functions for Kobe plot & matrix.	IOTC-2011-WPTT13-45
2	2012	• Graphics were improved using TeeChart Pro.NET v2010 (© Steema Software SL) according to	IOTC-2012-WPM04-05
		requests by users.	
		 Release of two separate software for 32- and 64-bit OS PCs. 	
3	2014	 Release of one united software for both 32- and 64-bit OS PCs for window OS. 	IOTC-2014-WPTT16-53
		 Designs and functions of Kobe plot I are further improved according to requests by users. 	
		 Limit and Target reference points were added in Kobe I (plot). 	
		• Additional menu in Kobe I (plot) is added to show multiple comparisons among different stock	
		assessment results.	
		• Pie chart option is added in Kobe I (plot) to show compositions of uncertainties in 4 phases.	
4	2018	 Presentation of Kobe II (diagram) was improved according to requests by users. 	
5	2019	Kobe II for ASPIC was added.	
6.1.5	2023	• Using a new graphic engine, graphs were enhanced to look better and the process speed is	
		accelerated.	
		Kobe II for ASPIC was improved by according to requests by users.	
6.2.0	2024	 Name is changed to Kobe I+II Manager as a general integrated management decision tool 	
6.2.1		 Kobe I+II customized for ASPIC was completed separately in ASPIC_Manager (Ver1.1.0) (2024) 	

