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

April 8, 2024

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https://www.esl.co.jp/products/menu

[MENU] is supported by Environmental Simulation Laboratory (Japan)

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

Contents

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(4) If uses want to make reports and/or publish papers using this software, it is requested to work with [MENU].

ACRONYMS

ASPIC	A Stock-Production Model Incorporating Covariates
ASPM	Age-Structured Production Model
B	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
TB	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)

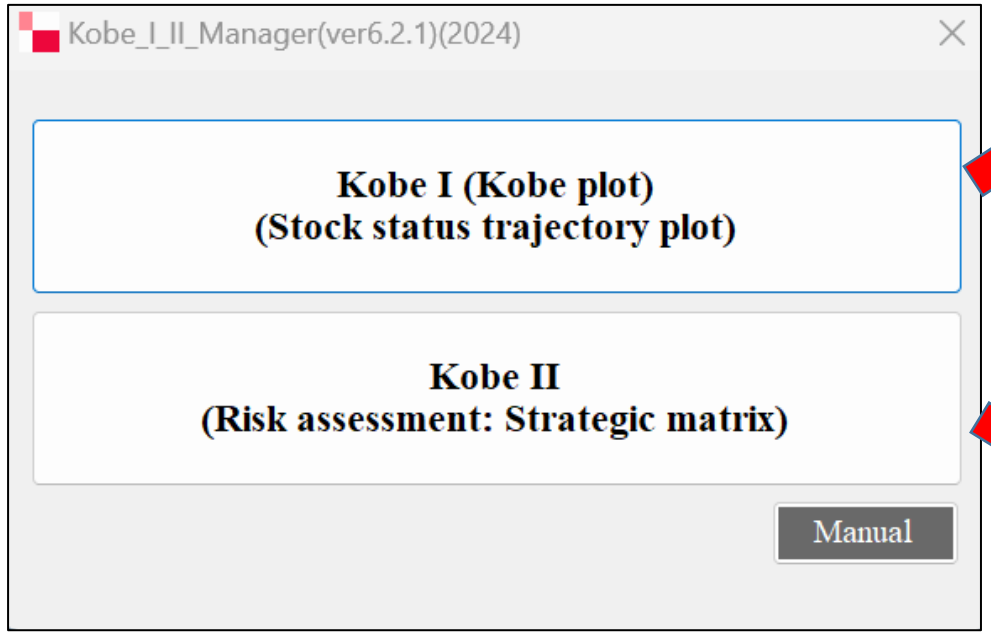
Kobe II: 2009 (Barcelona, Spain)

(Note 1) This software is for the general use for Kobe I+II.

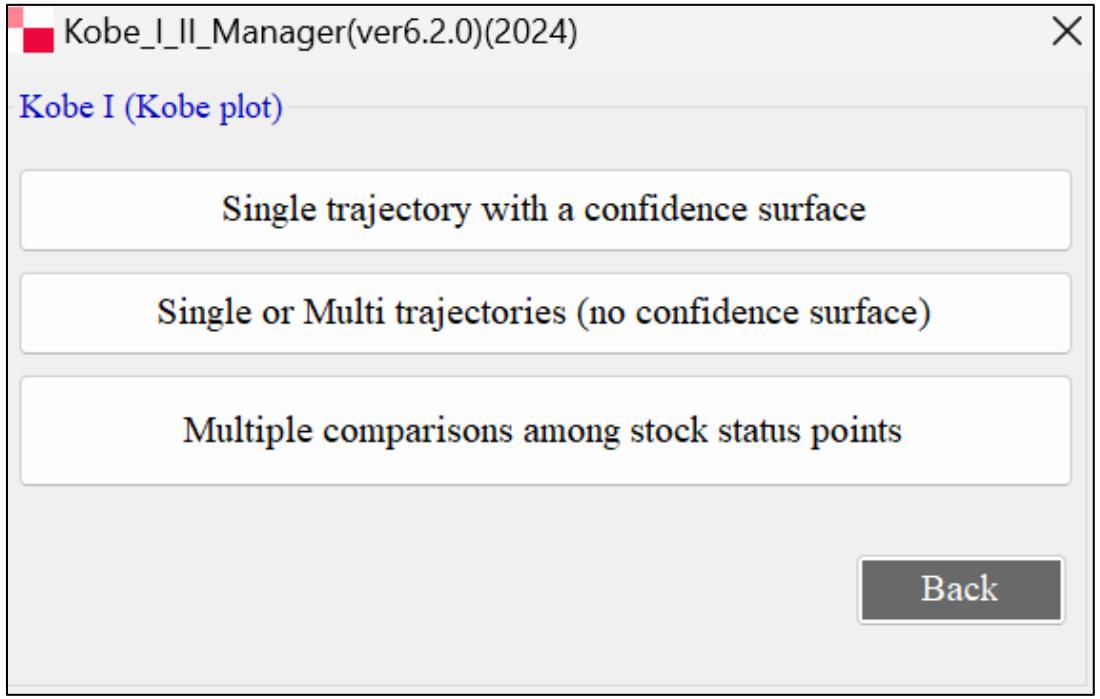
(Note 2) Kobe I+II customized for ASPIC_Manager & JABBA_Manager are available within their software.

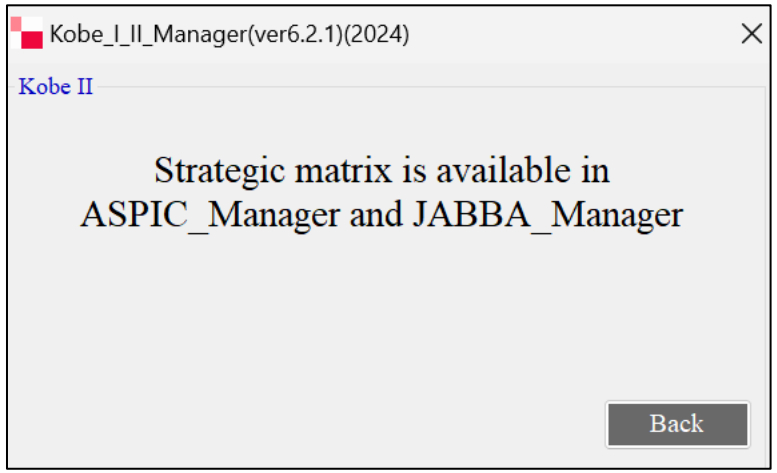
About (1/5)

Main menus (Kobe I & II)



Sub menus





About (2/5)

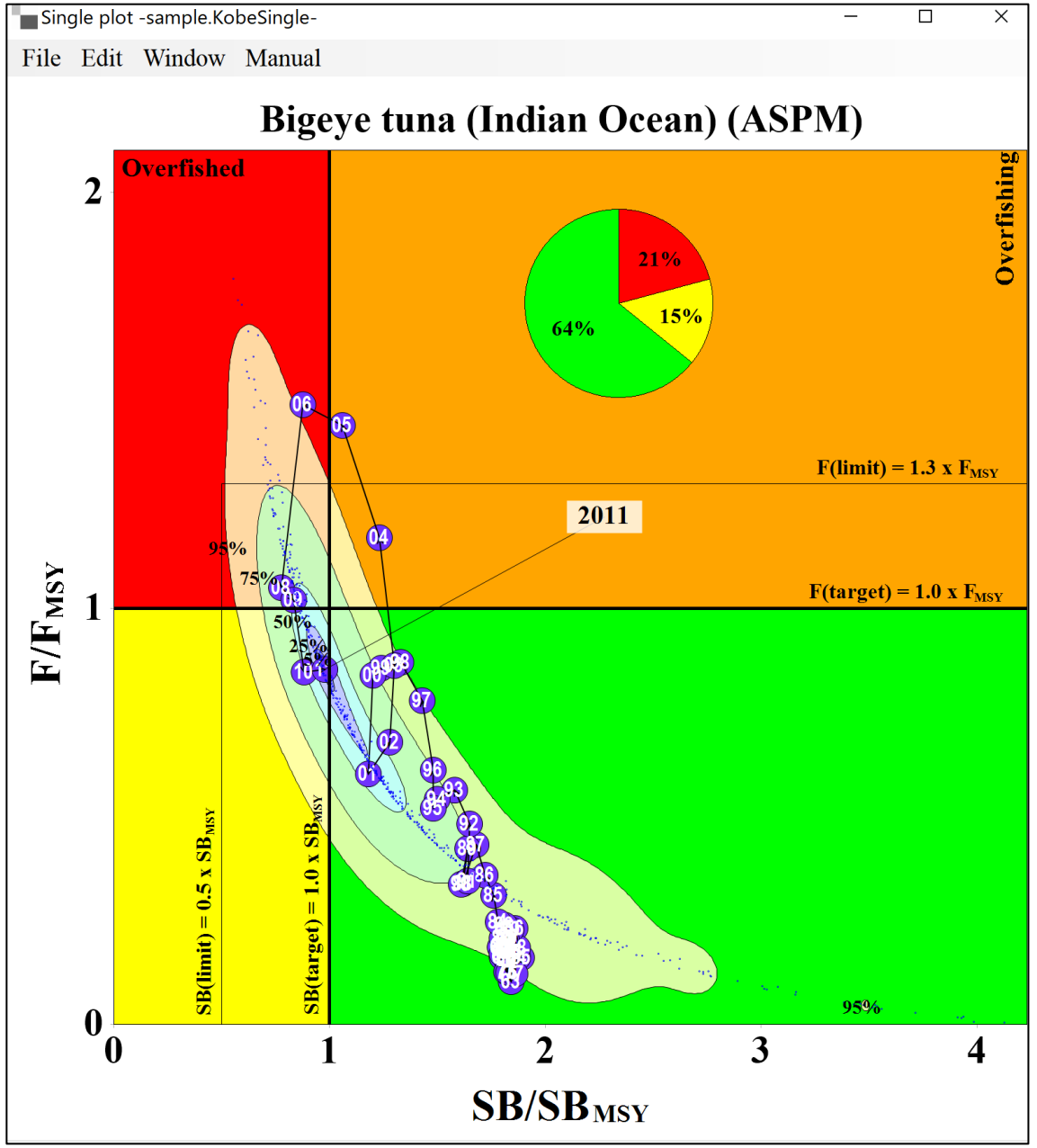
Kobe I (Kobe plot)

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})



About (3/5)

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)

About (4/5)

Kobe II

Strategy Matrix (F)

Risk probability (%) violating TB(MSY) level by catch level

Color legend				
Risk levels	Low risk	Medium low risk	Medium high risk	High risk
Probably	0 - 25%	25 - 50%	50 - 75%	75 - 100%

	%	Catch (tons)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
% Increased from the current catch level	200%	40,533	42%	99%	100%	100%	100%	100%	100%	100%	100%	100%
	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%
	80%	24,320	42%	85%	93%	97%	99%	100%	100%	100%	100%	100%
	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%	99%
	30%	17,564	42%	65%	75%	82%	87%	91%	93%	95%	96%	97%
	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%
% decreased from the current catch level	-5.6%	**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%
	-30%	9,458	42%	21%	15%	11%	9%	8%	8%	8%	8%	9%
	-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*

About (5/5)

Kobe II

Strategy Matrix (TB)

Risk probability (%) violating TB(MSY) level by catch level

Color legend				
Risk levels	Low risk	Medium low risk	Medium high risk	High risk
Probably	0 - 25%	25 - 50%	50 - 75%	75 - 100%

	%	Catch (tons)	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
% Increased from the current catch level	200%	40,533	36%	41%	85%	97%	100%	100%	100%	100%	100%	100%
	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%
	80%	24,320	36%	41%	66%	83%	91%	96%	98%	99%	100%	100%
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	20%	16,213	36%	41%	52%	61%	70%	77%	81%	86%	89%	90%
	10%	14,862	36%	41%	49%	56%	63%	69%	75%	79%	82%	84%
*** Current catch**	0%	13,511	36%	41%	47%	51%	56%	60%	64%	68%	71%	74%
% decreased from the current catch level	-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%
	-30%	9,458	36%	41%	35%	31%	29%	27%	24%	23%	22%	21%
	-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 NOT applicable for MAC (apple) PC.
- 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.

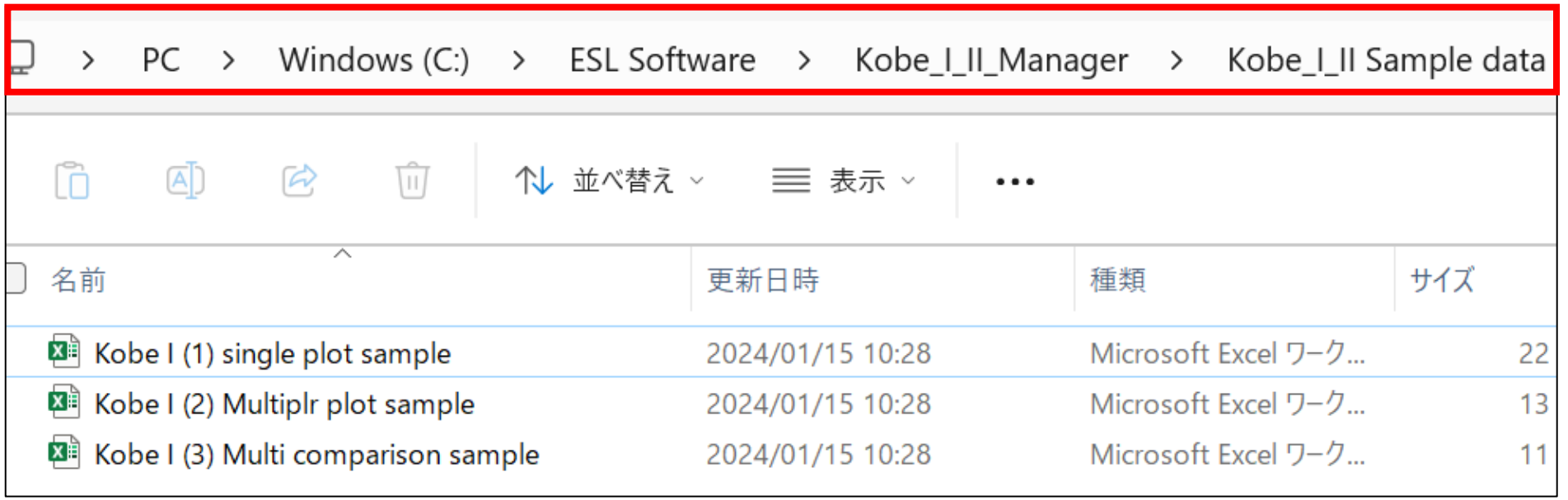
2. Requirements for PC and Important remarks (2/3)

(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)



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 menu.soft.SEC@gmail.com

(2) R-4.3.1-win

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

Then download from Download R-4.3.1 for Windows and install.

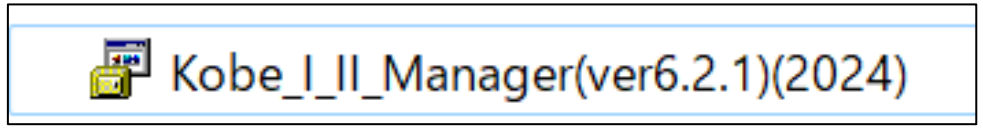
3. Installation： Kobe I (plot) & II (management tool)

Double click the zipped installer (located folder or desktop)

Users can get the download link of the software

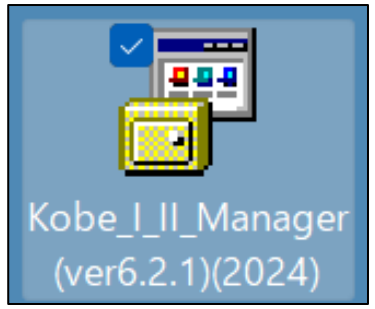
from the [MENU] Secretariat at menu.soft.SEC@gmail.com

Installer (folder)



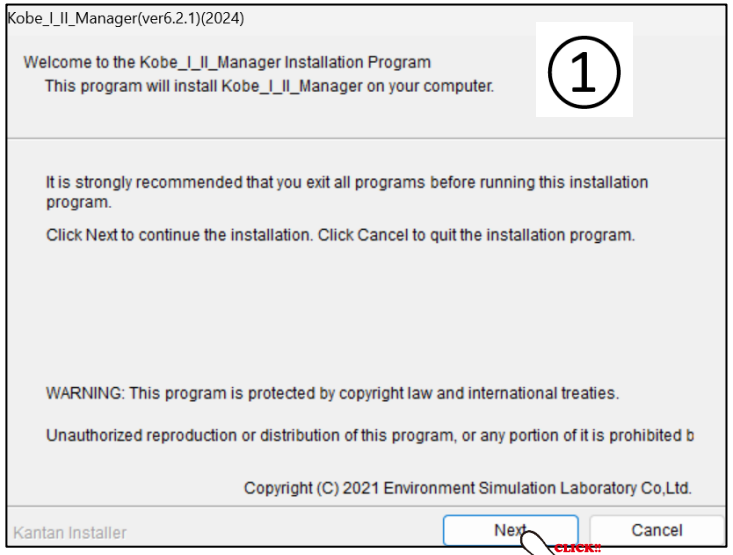
DOUBLECLICK

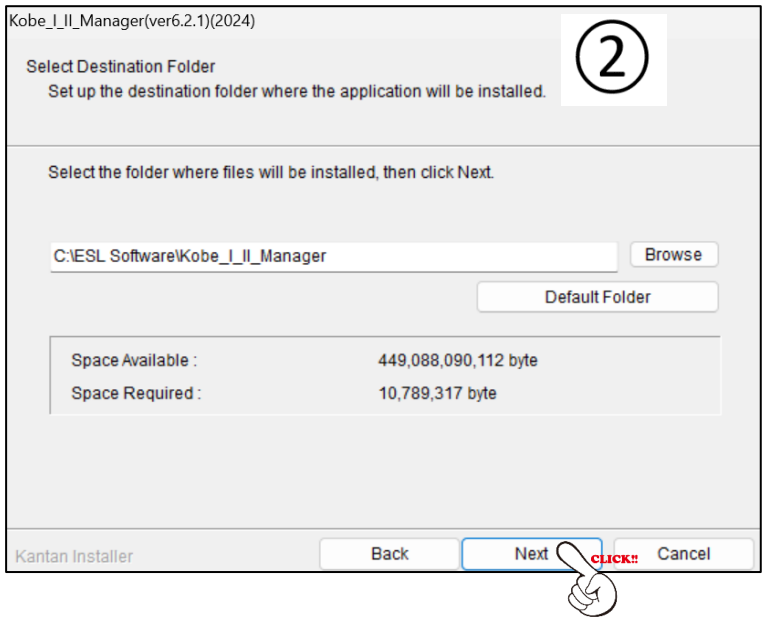
Installer (desktop)

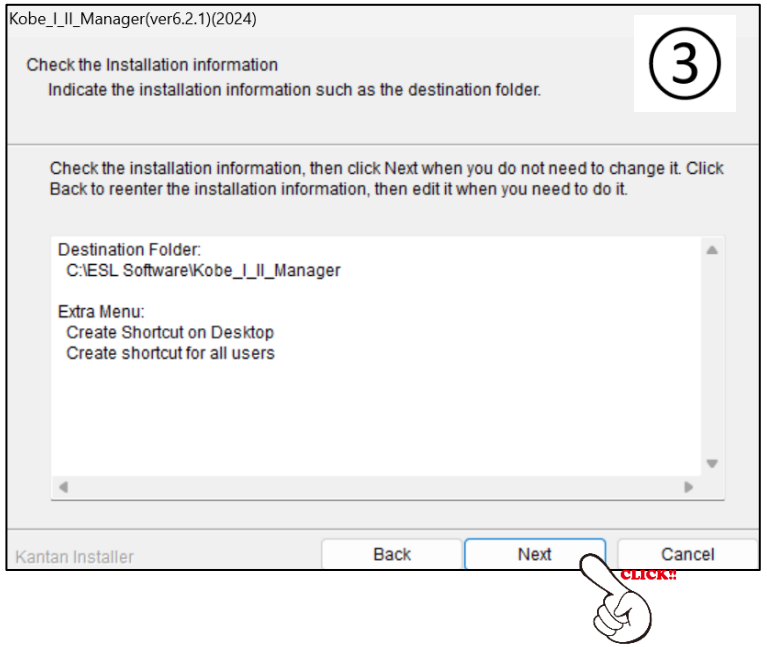


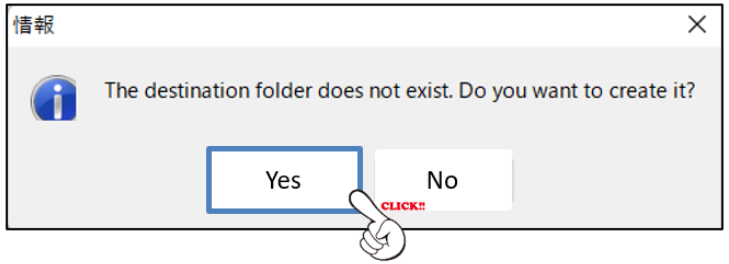
DOUBLECLICK

3. Installation: Kobe I+II　　Follow 5 steps

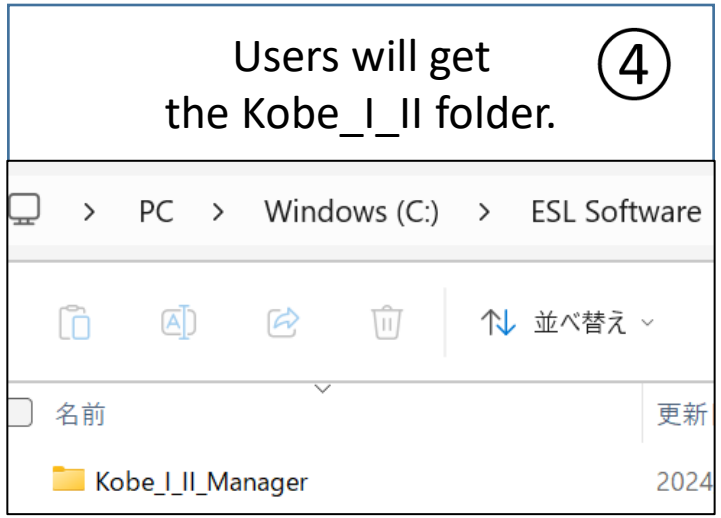


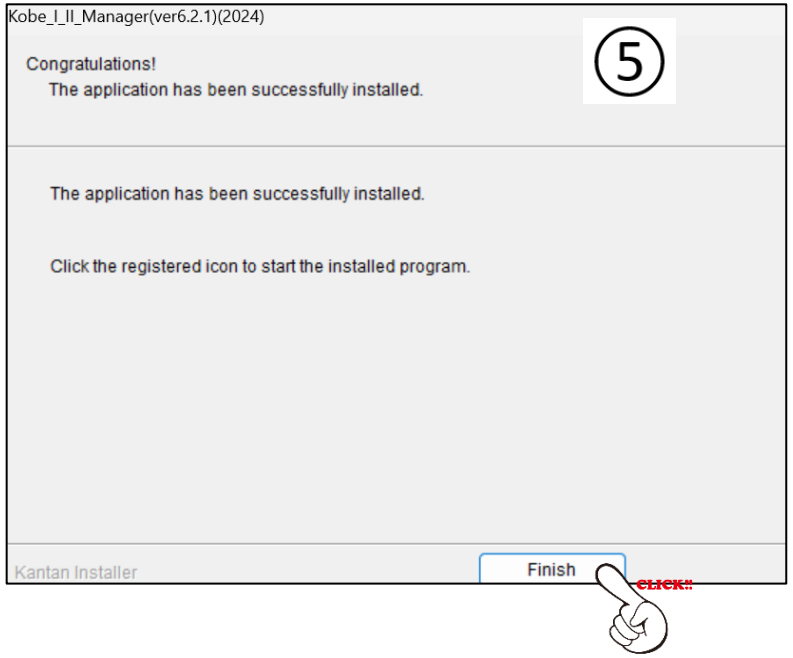




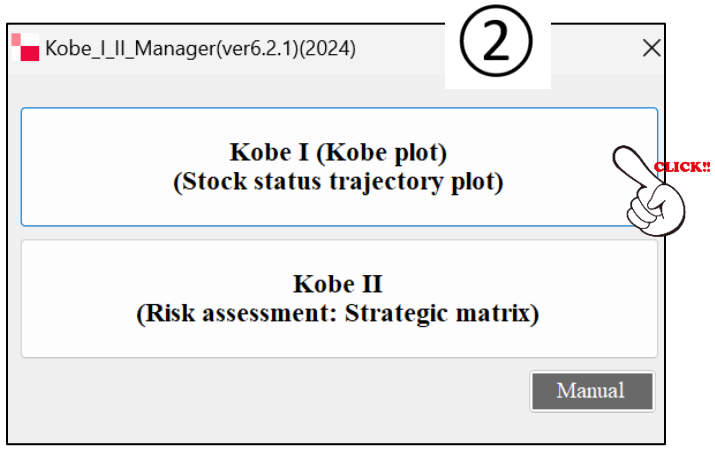


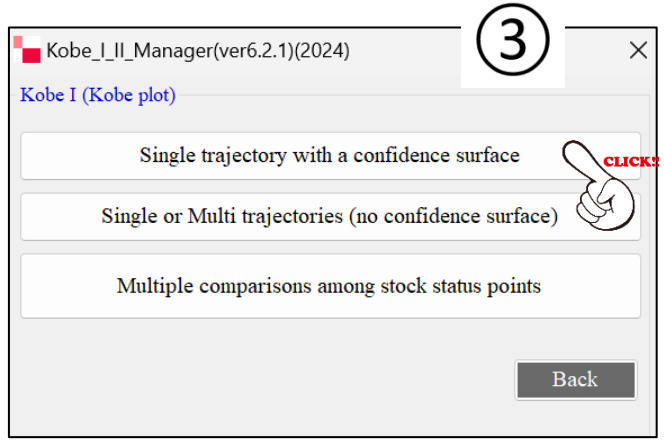
If the destination folder “ESL Software” exits, this window will not appear.

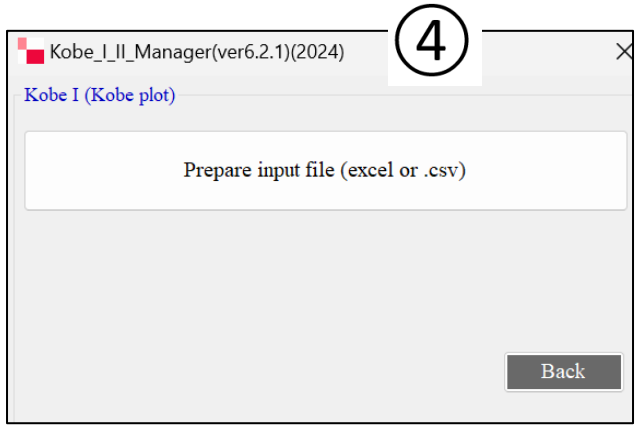


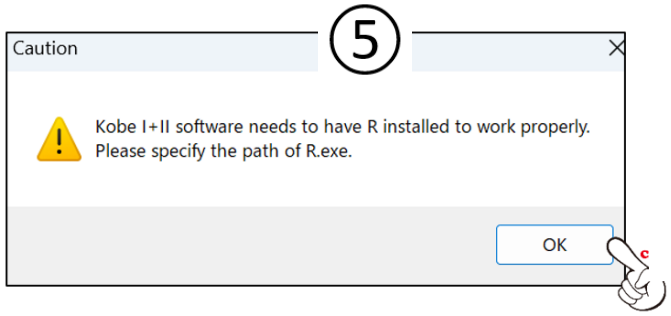


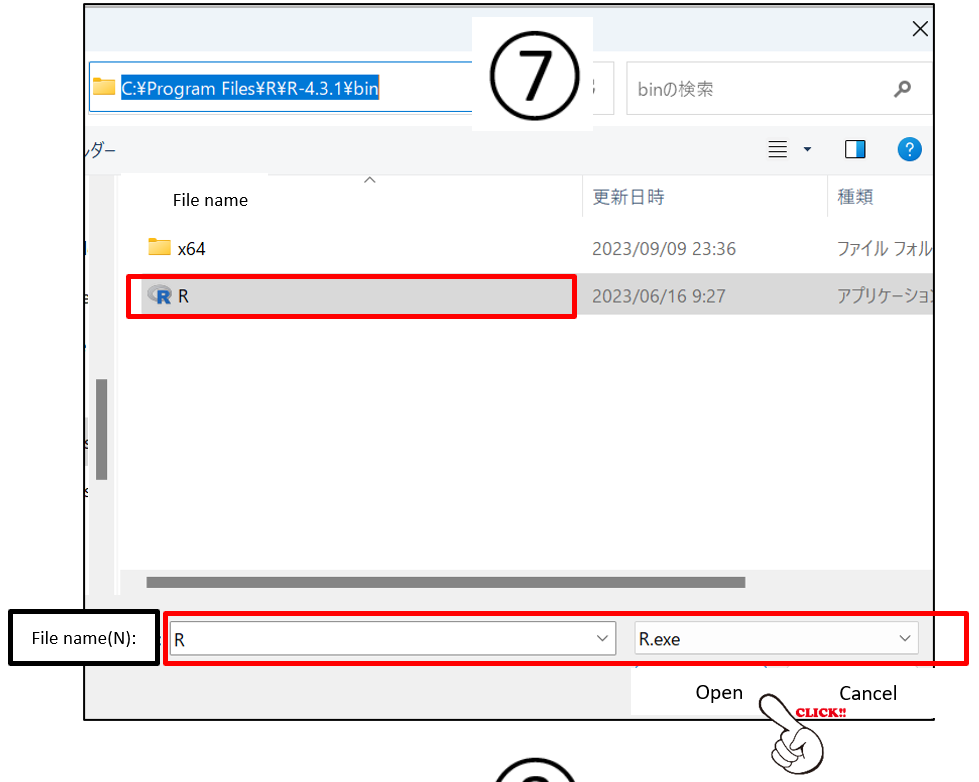
3. Installation
Linking R to Kobe I+II

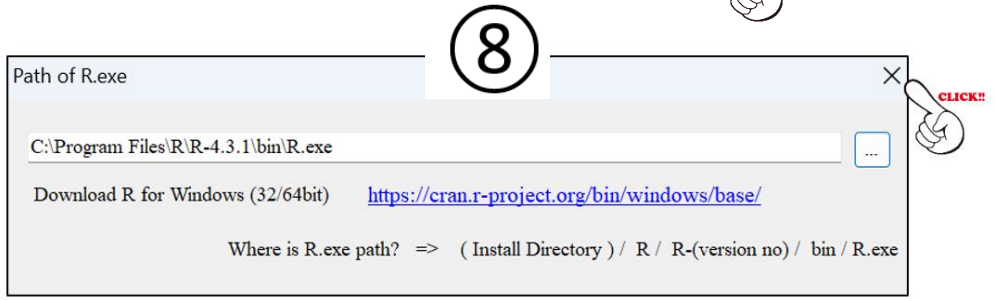












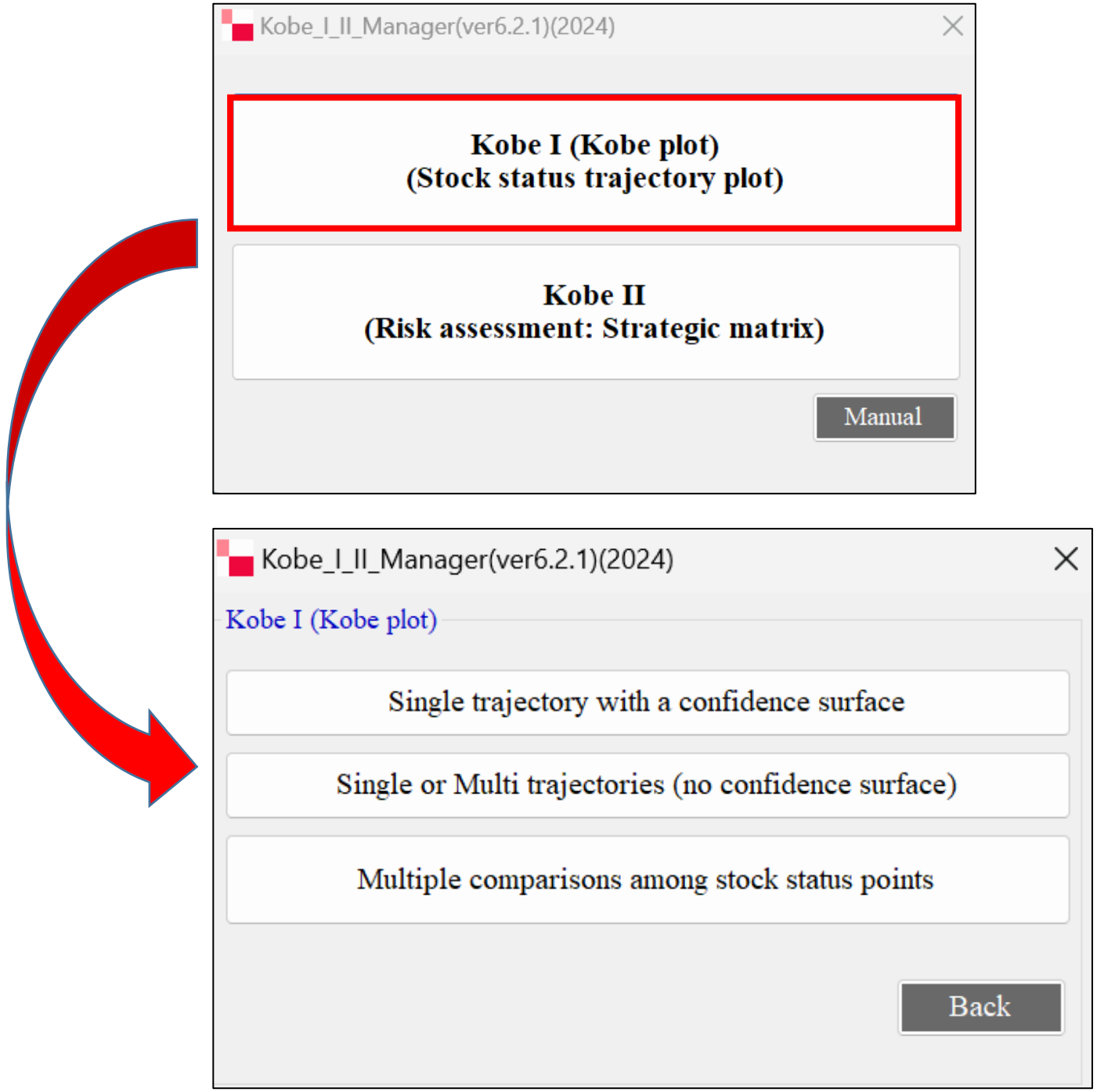
[1st menu]

Kobe I (Kobe plot) Stock status trajectory plot

4. Kobe I (Kobe plot)

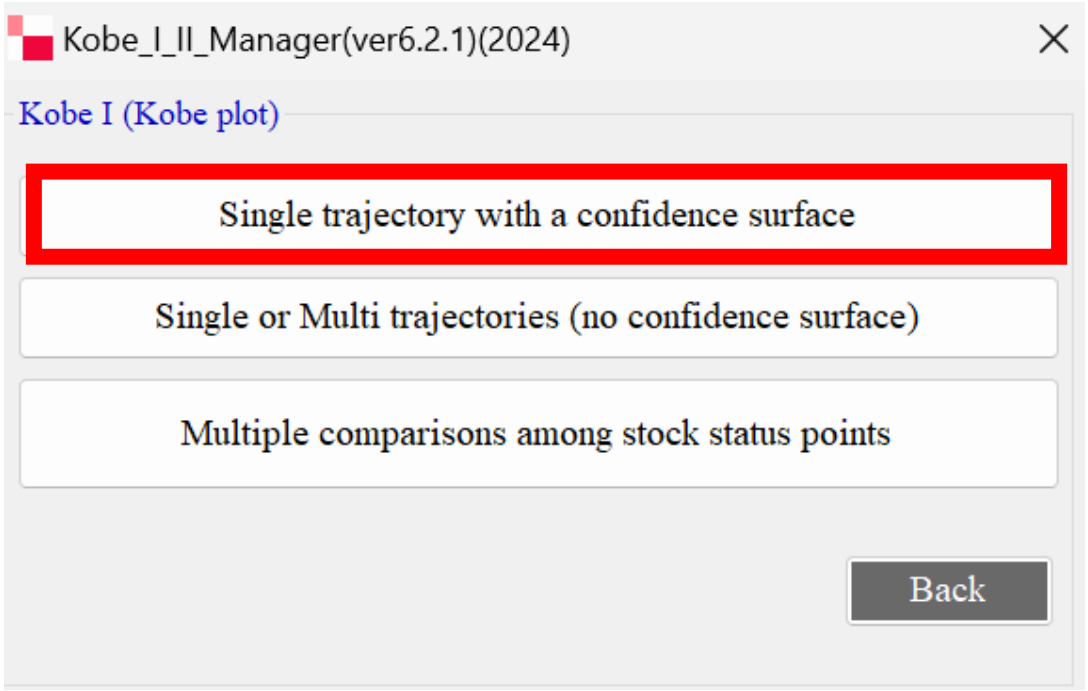
Stock status trajectory plot

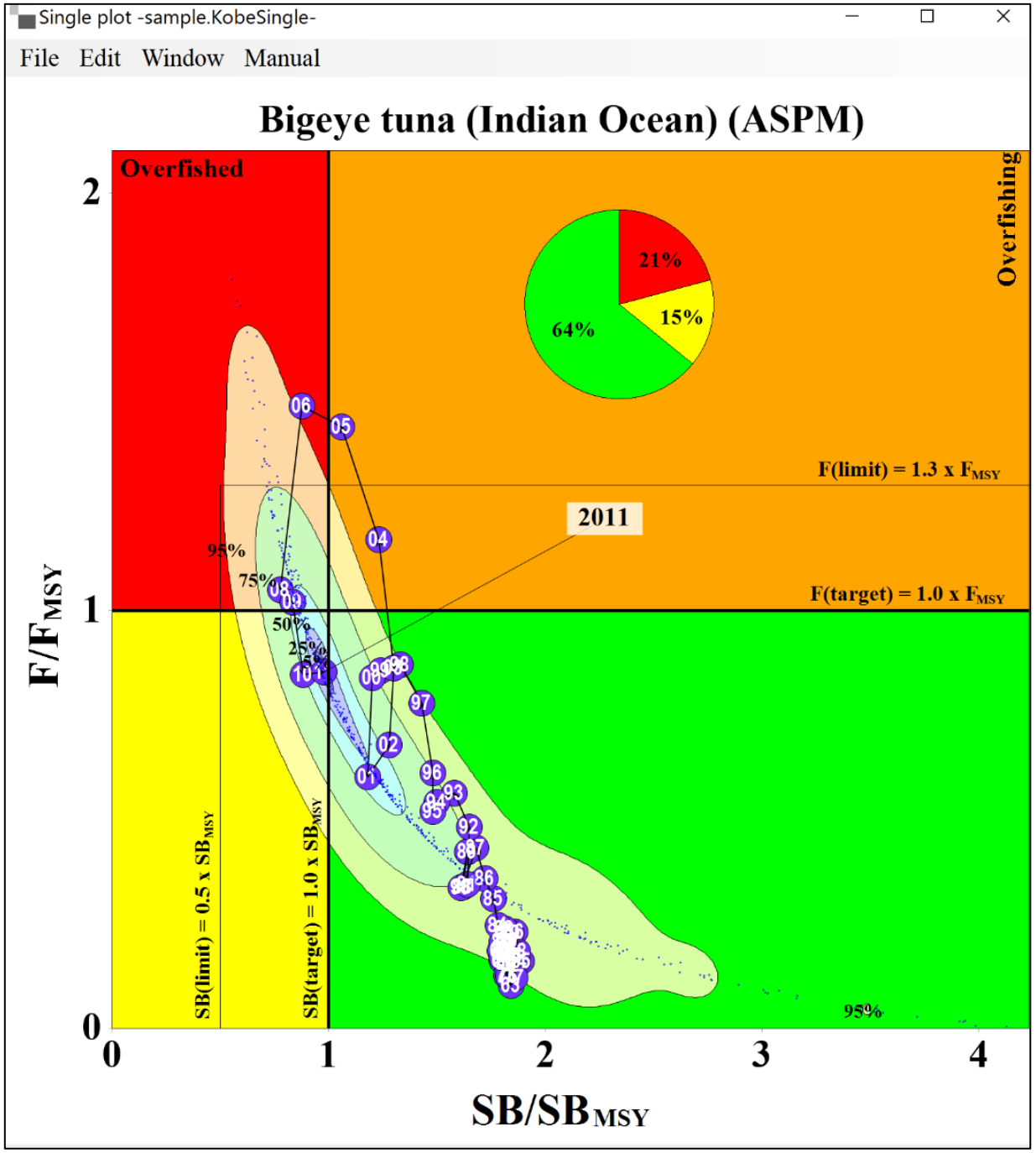
3 sub menus



4.1 A single plot with a confidence surface

4.1 A single plot with a confidence surface





4.1 A single plot with a confidence surface

Preparing the data set using Excel →

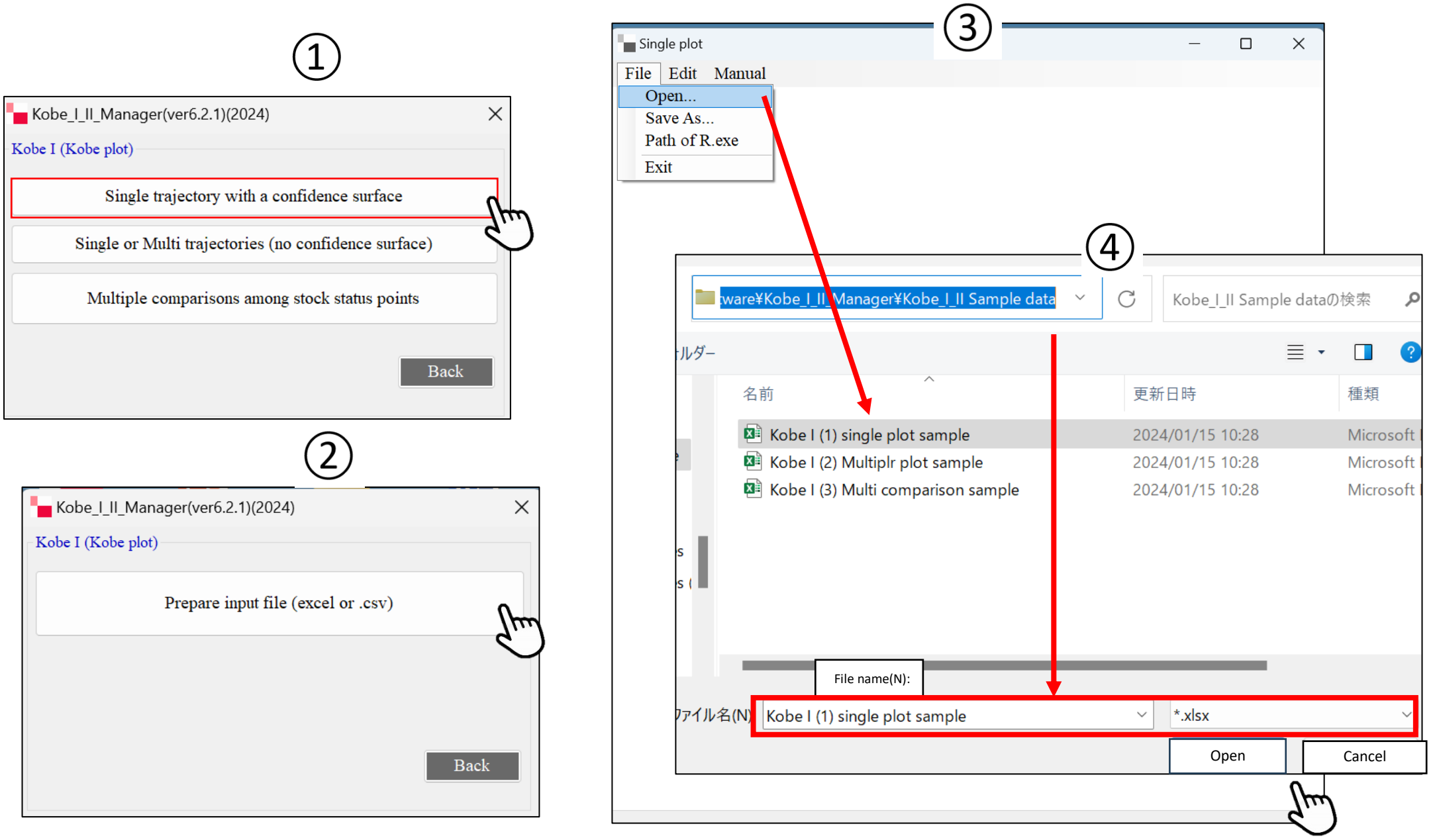
B ratio = B/B_{MSY}
F ratio = F/F_{MSY}

	A	B	C	D	E
1	year	B ratio (point)	Fratio (point)	B ratio (uncertain)	F ratio (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
		(Omitted)		*(Omitted)*	
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
				(Omitted)	
497				0.89	0.94
498				1.12	0.67
499				1.22	0.6
500				0.8	1.18
501				0.64	1.53

Point estimates (results of stock assessment)

Uncertainties (results of MCMC or Bootstrap)

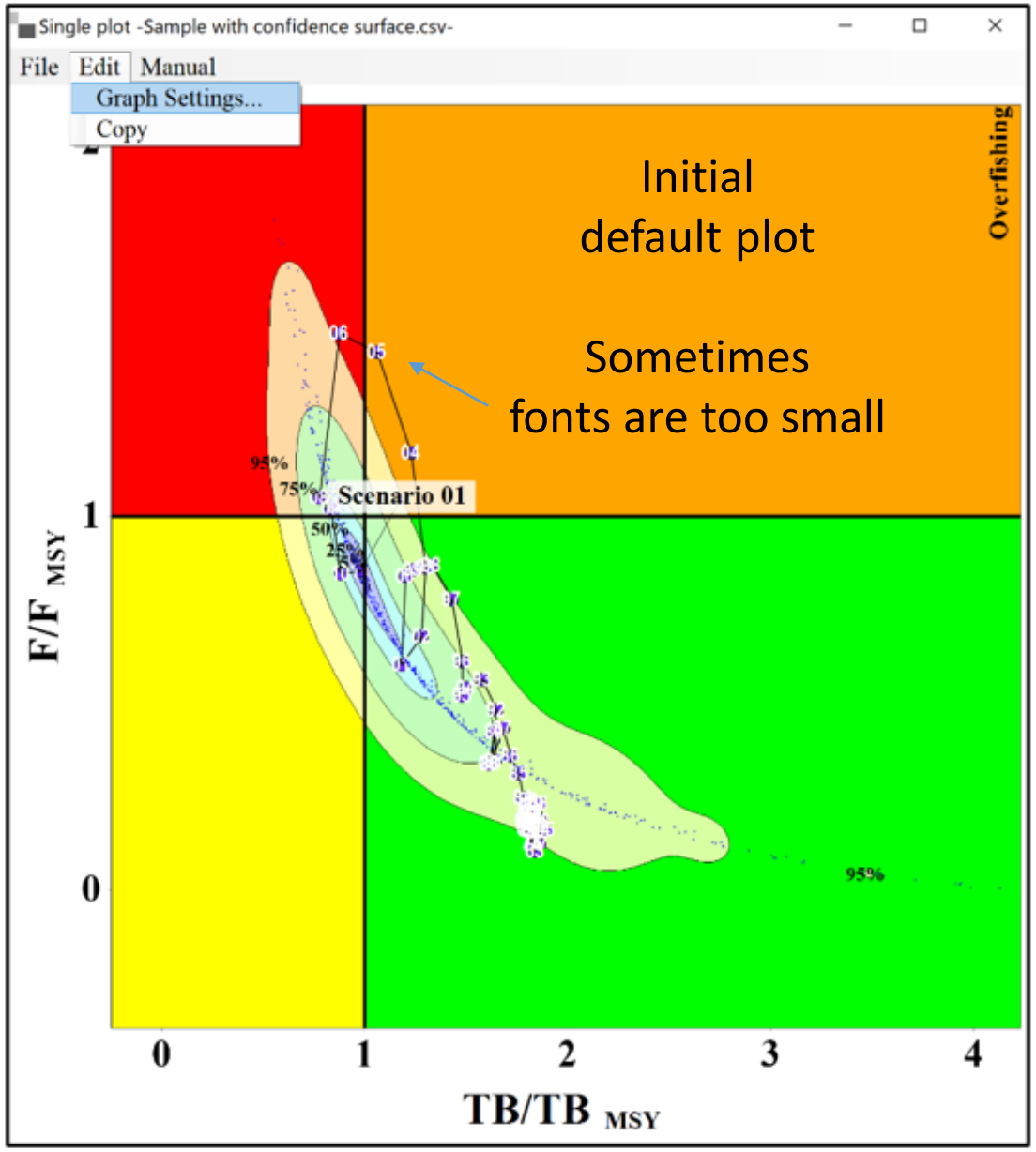
4.1 A single plot with a confidence surface: Importing the input (sample) data



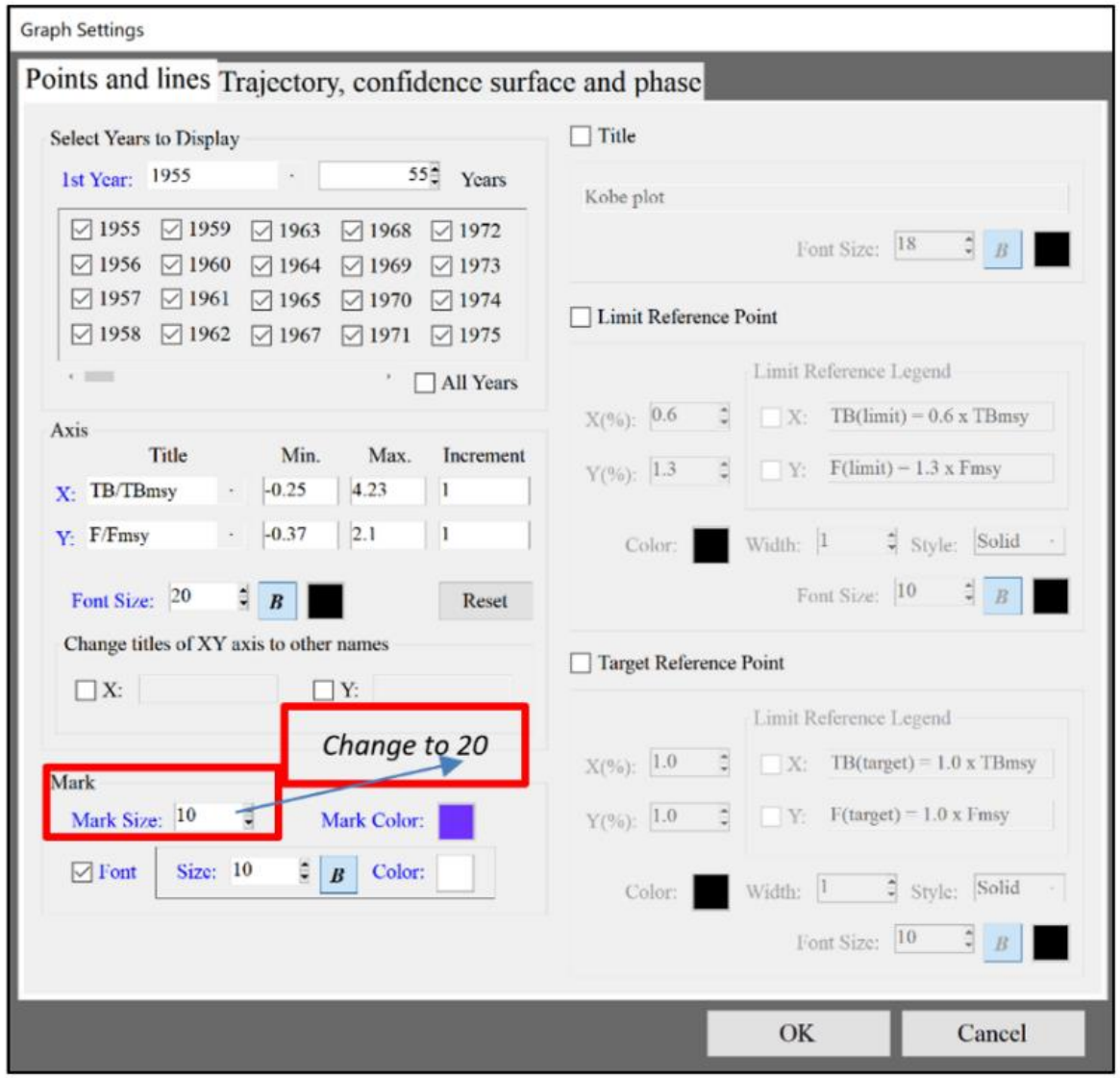
4.1 A single plot with a confidence surface

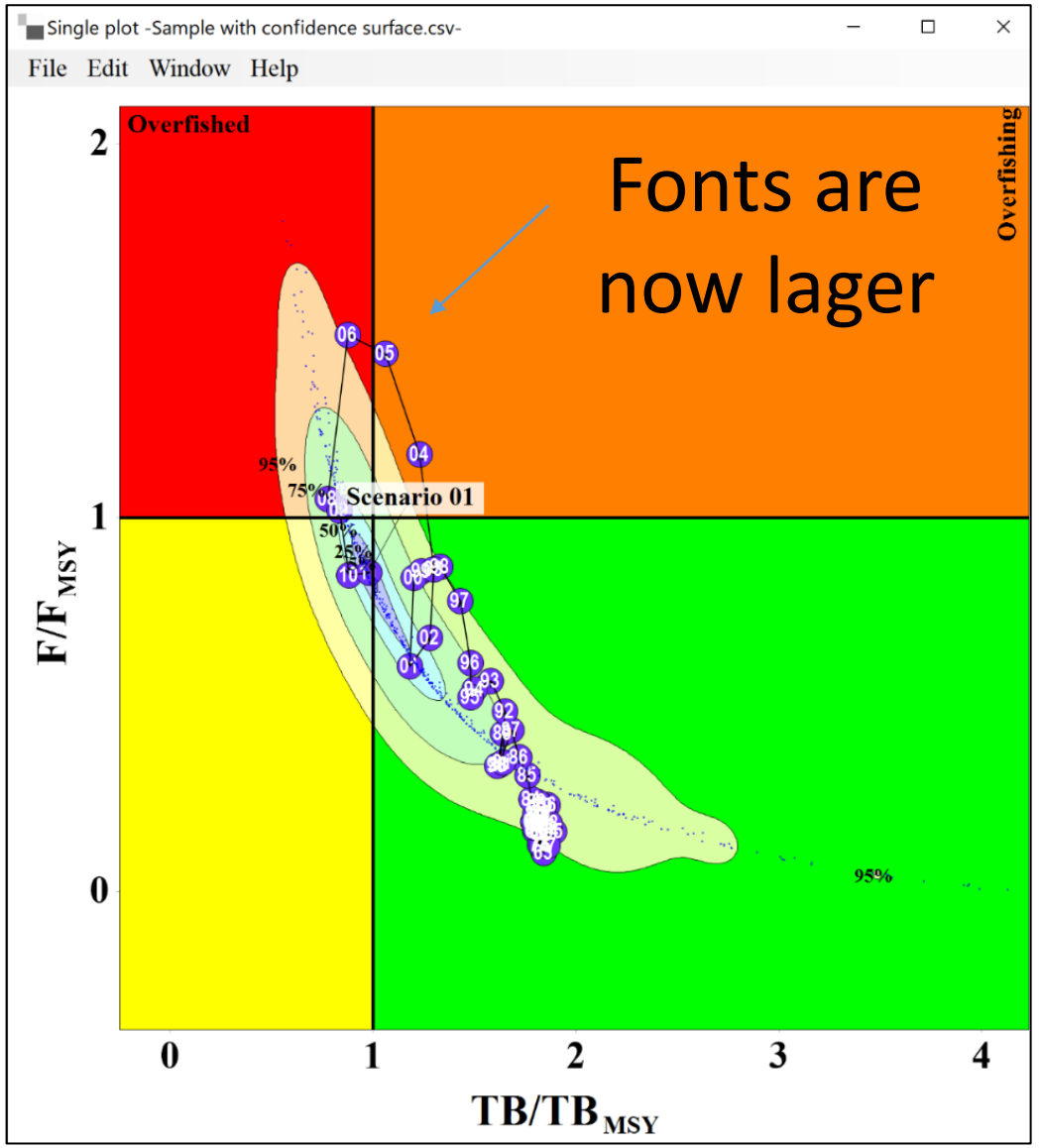
Years of stock status points are indicated by last 2 digits of years (e.g. 11 for 2011)

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

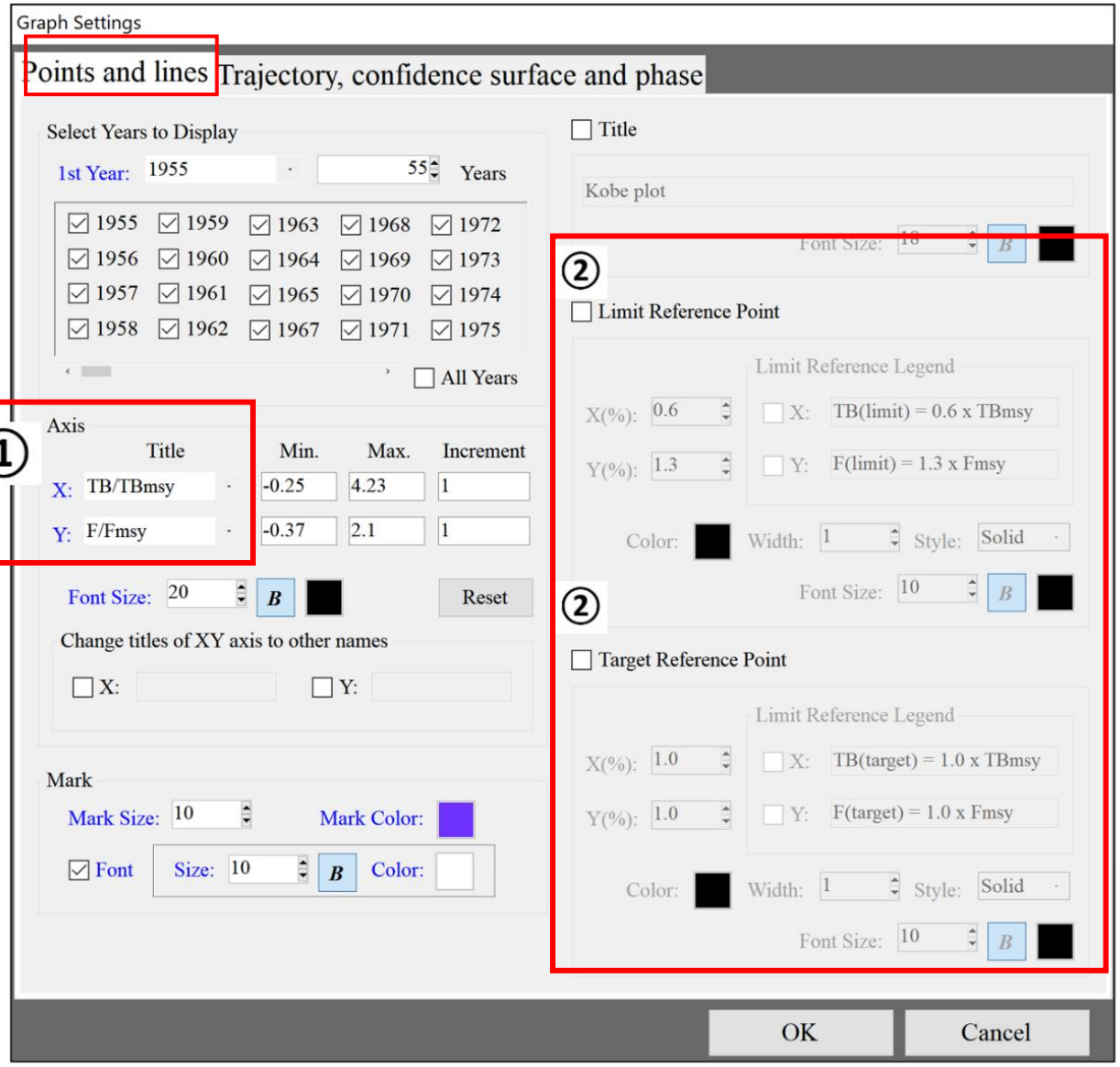


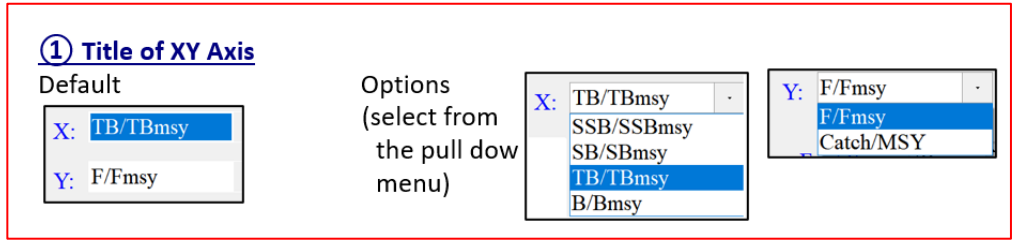


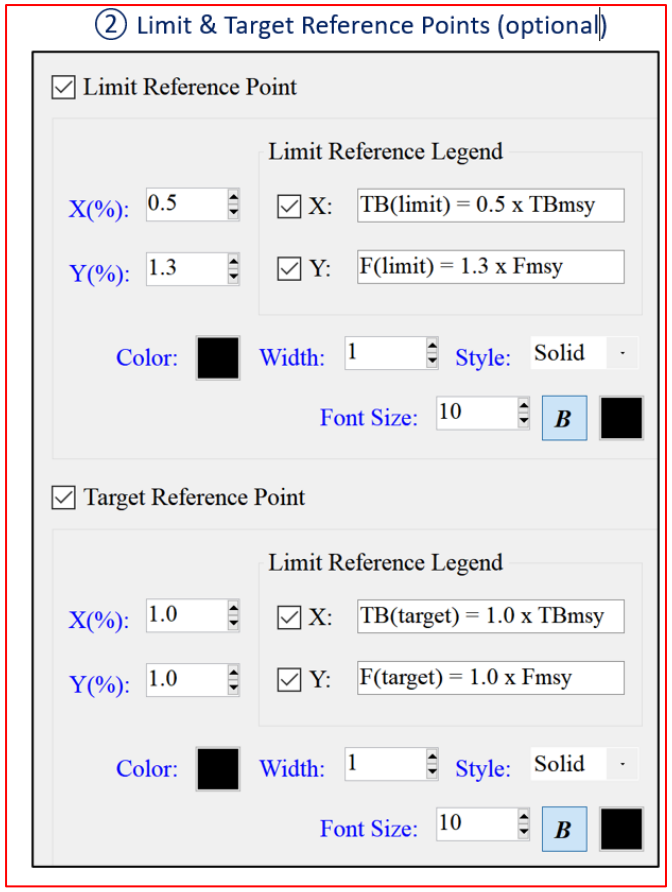
About graph settings

4.1 A single plot with a confidence surface : Graph settings (1st sheet: Points & lines)

Most functions are self-explanatory except ① and ②







See next Slide about Target and Limit Reference Point

4.1 A single plot with a confidence surface

Limit & Target Reference Point (LRP & TRP)

TRP➔ MSY level (TB & F)

as the basic management reference point such as TAC

LRP are for more conservative 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)

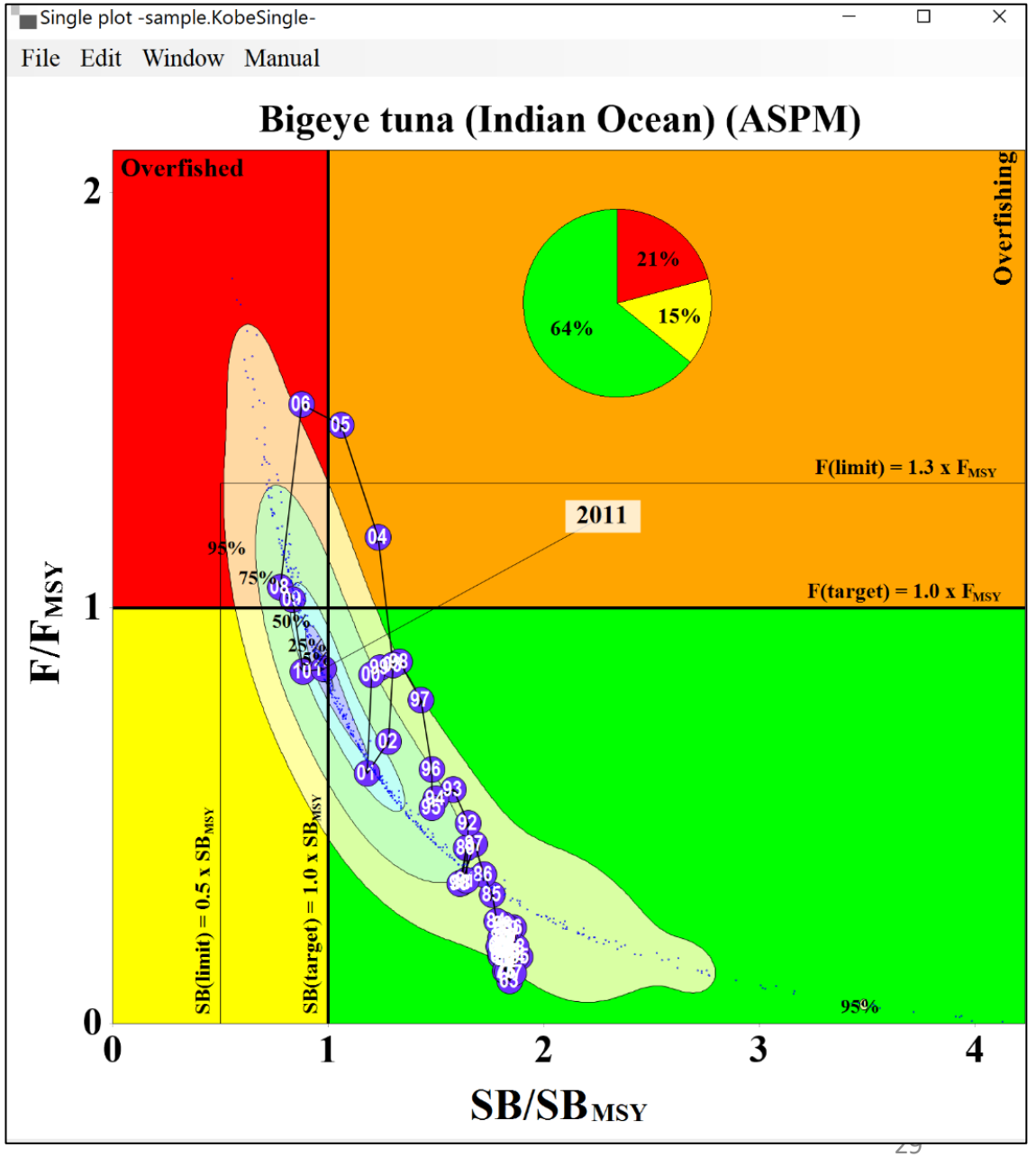
Coefficients (such as 1.3) are defined by species, RFMO & country.

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	SB_{MSY}; F_{MSY}	0.4*SB_{MSY}; 1.4*F_{MSY}
Bigeye tuna	SB_{MSY}; F_{MSY}	0.5*SB_{MSY}; 1.3*F_{MSY}
Skipjack tuna	SB_{MSY}; F_{MSY}	0.4*SB_{MSY};1.5*F_{MSY}
Yellowfin tuna	SB_{MSY}; F_{MSY}	0.4*SB_{MSY}; 1.4*F_{MSY}
Swordfish	SB_{MSY}; F_{MSY}	0.4*SB_{MSY}; 1.4*F_{MSY}

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

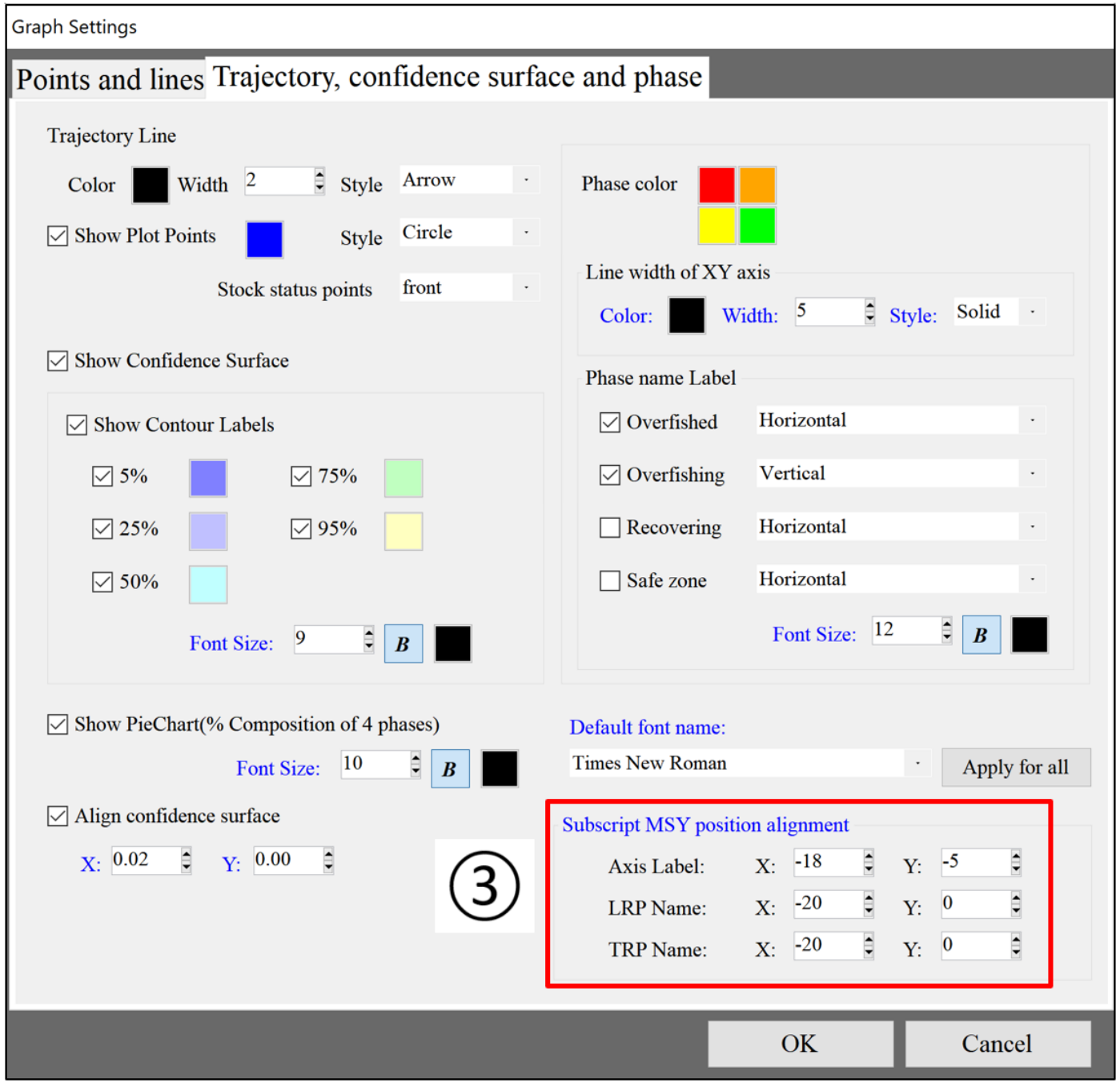


4.1 A single plot with a confidence surface

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

Most functions are self-explanatory except ③

See next slide on explanation of ③



4.1 A single plot with a confidence surface

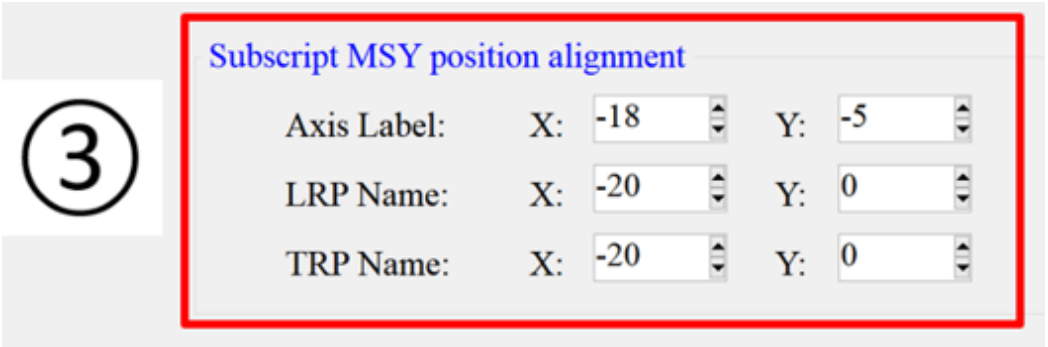
③ Subscript MSY position alignment

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}).

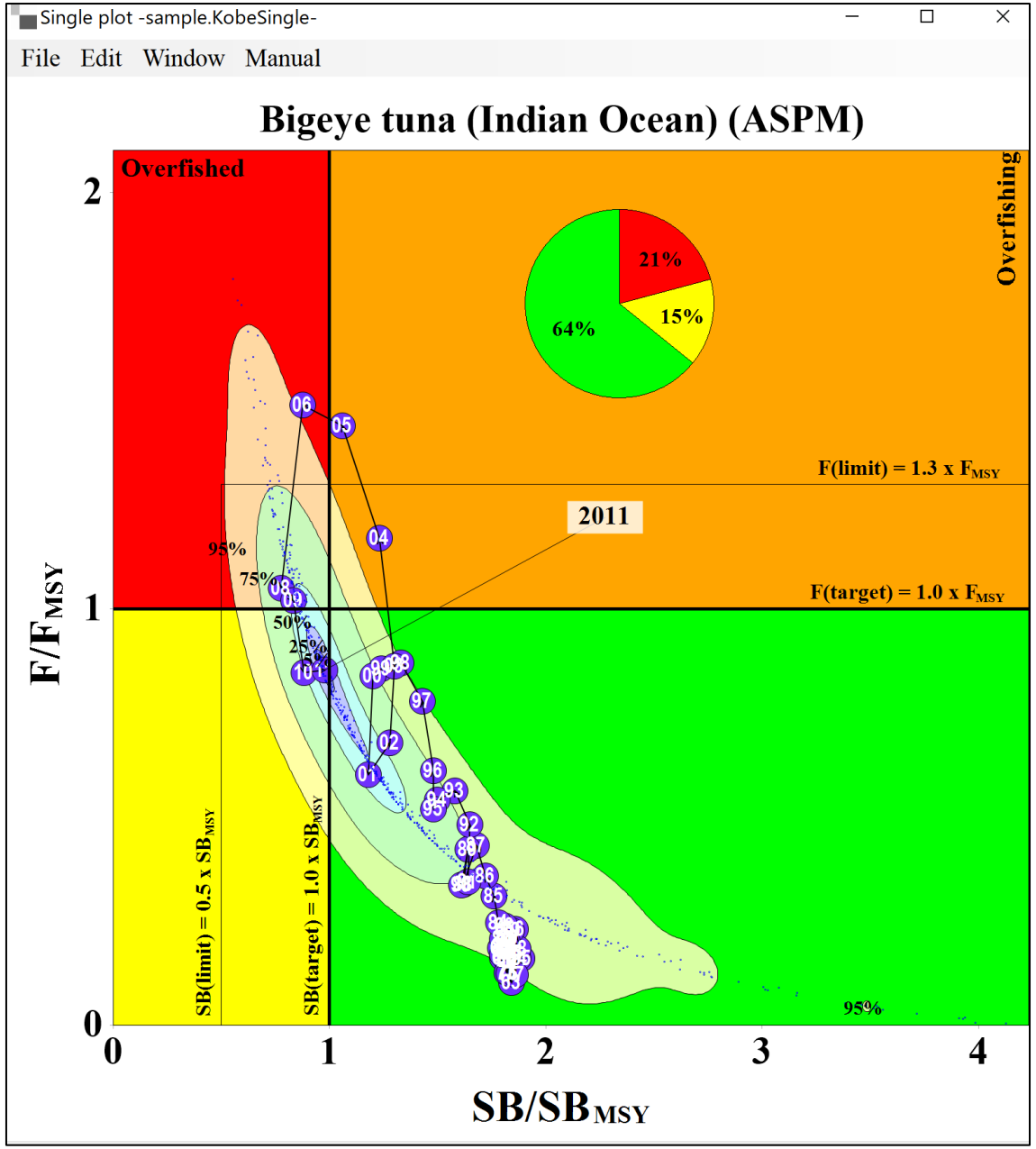


4.1 A single plot with a confidence surface

final plot →

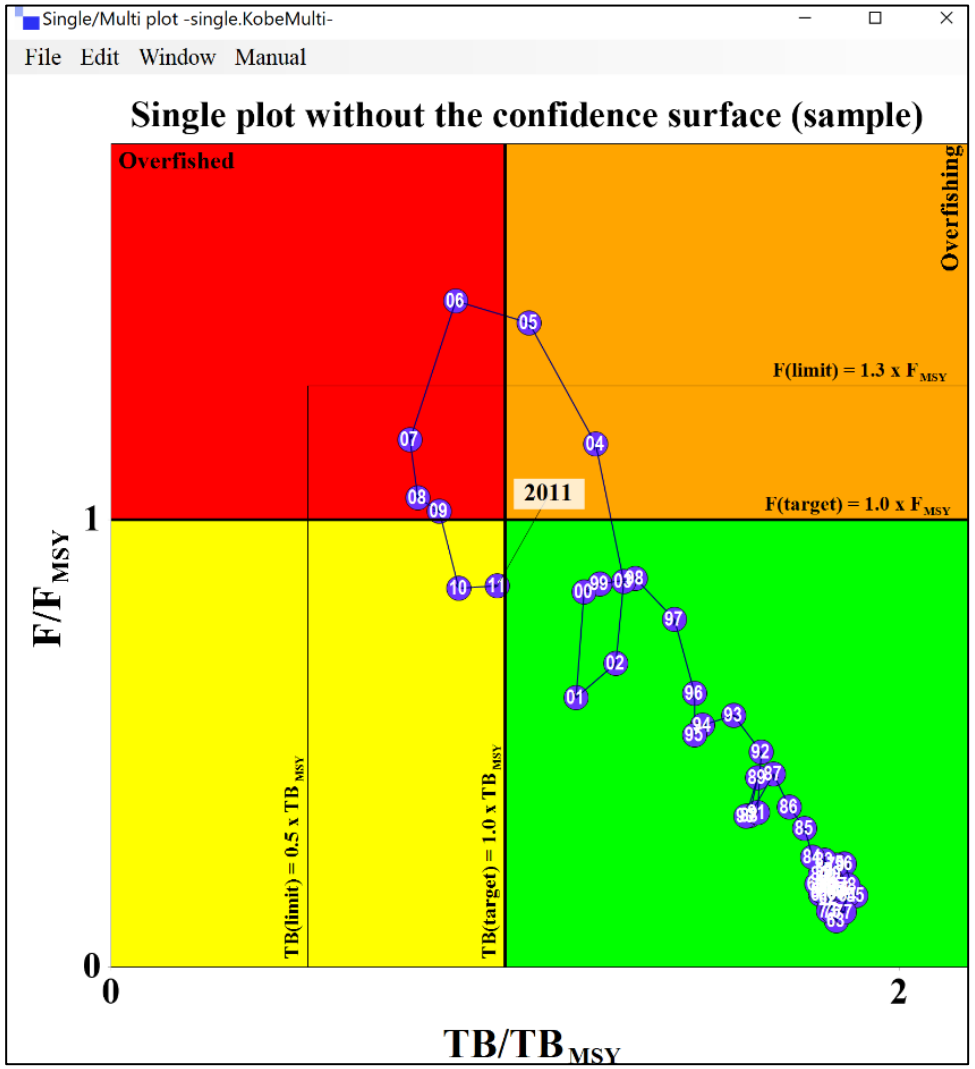
using various functions
(graph settings)
users can make plots they need

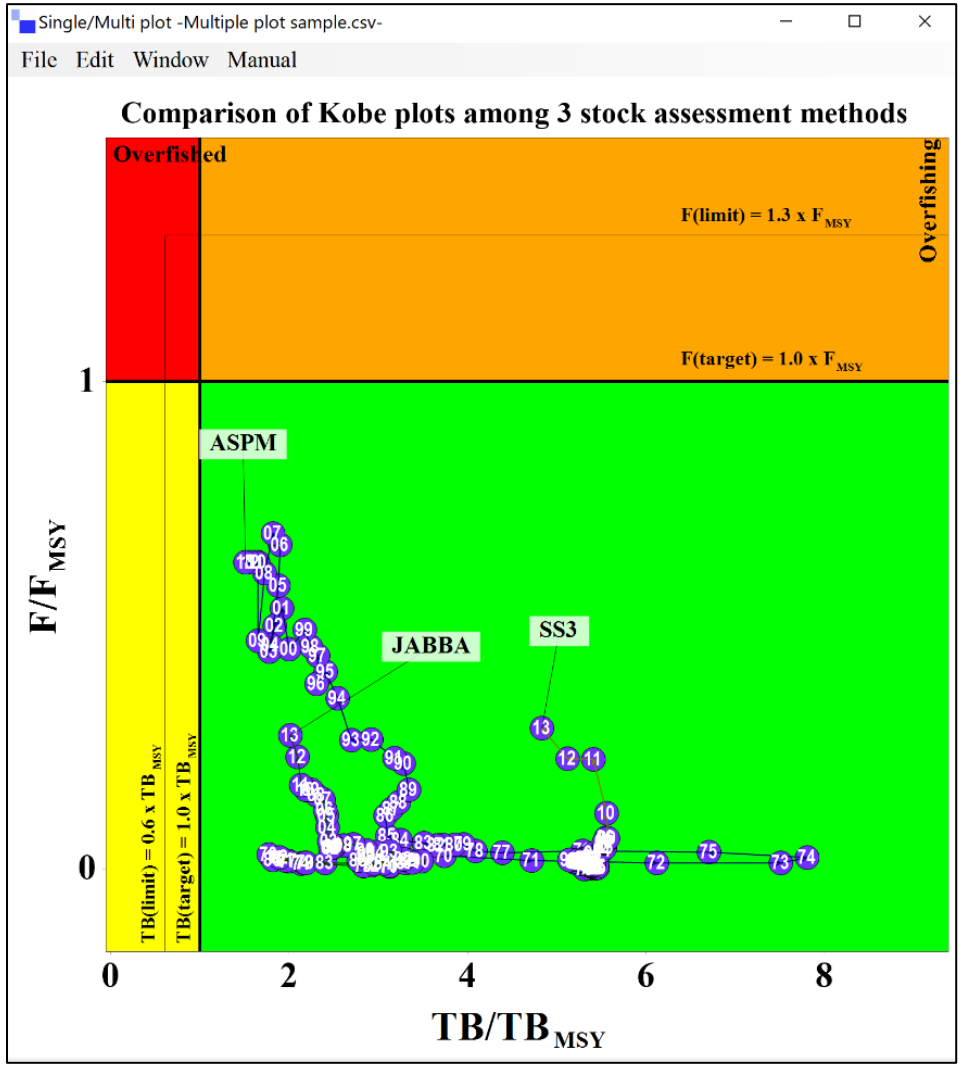
Need many practices…



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)

TB ratio = TB/B_{MSY}

F ratio = F/F_{MSY}

Single plot

1 data set

Multiple (3) plots

3 data sets

1st data set | 2nd data set | 3rd data set

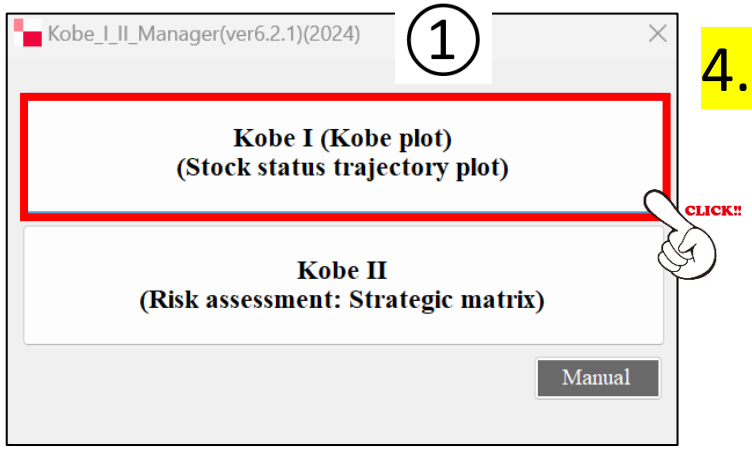
	A	B	C	D	E	F	G
1	year	TB(ratio)(1)	Fratio(1)	TB(ratio)(2)	Fratio(2)	TB(ratio)(3)	Fratio(3)
2	1970	3.740	0.028	3.130	0.005	5.310	0.000
3	1971	4.720	0.017	3.120	0.006	5.310	0.000
4	1972	6.120	0.012	2.920	0.007	5.370	0.001
5	1973	7.510	0.012	2.830	0.007	5.440	0.002
6	1974	7.810	0.024	2.130	0.011	5.410	0.004
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

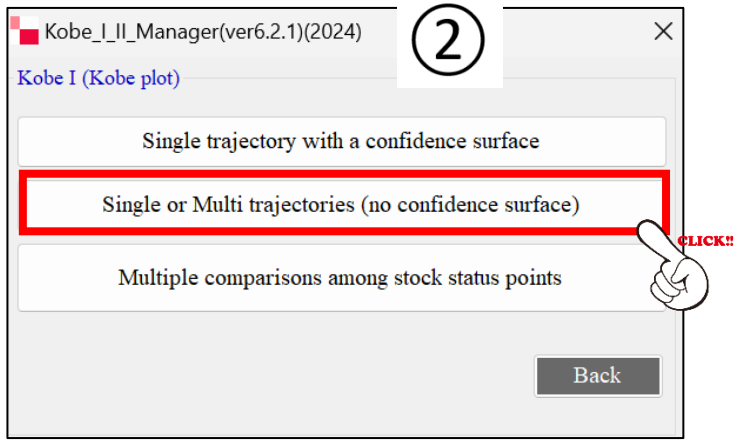
(Omitted)

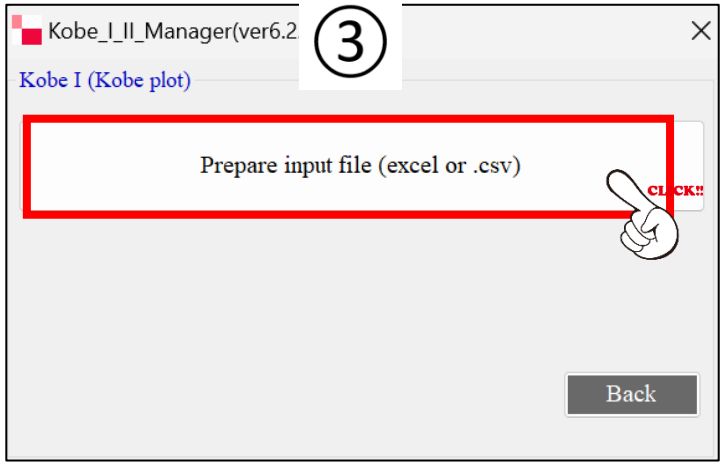
39	2007	1.820	0.688	2.380	0.143	5.540	0.053
40	2008	1.720	0.607	2.310	0.151	5.530	0.055
41	2009	1.650	0.468	2.250	0.163	5.570	0.062
42	2010	1.650	0.629	2.190	0.163	5.560	0.114
43	2011	1.620	0.629	2.130	0.172	5.410	0.225
44	2012	1.570	0.629	2.090	0.230	5.120	0.226
45	2013	1.510	0.629	2.010	0.274	4.830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

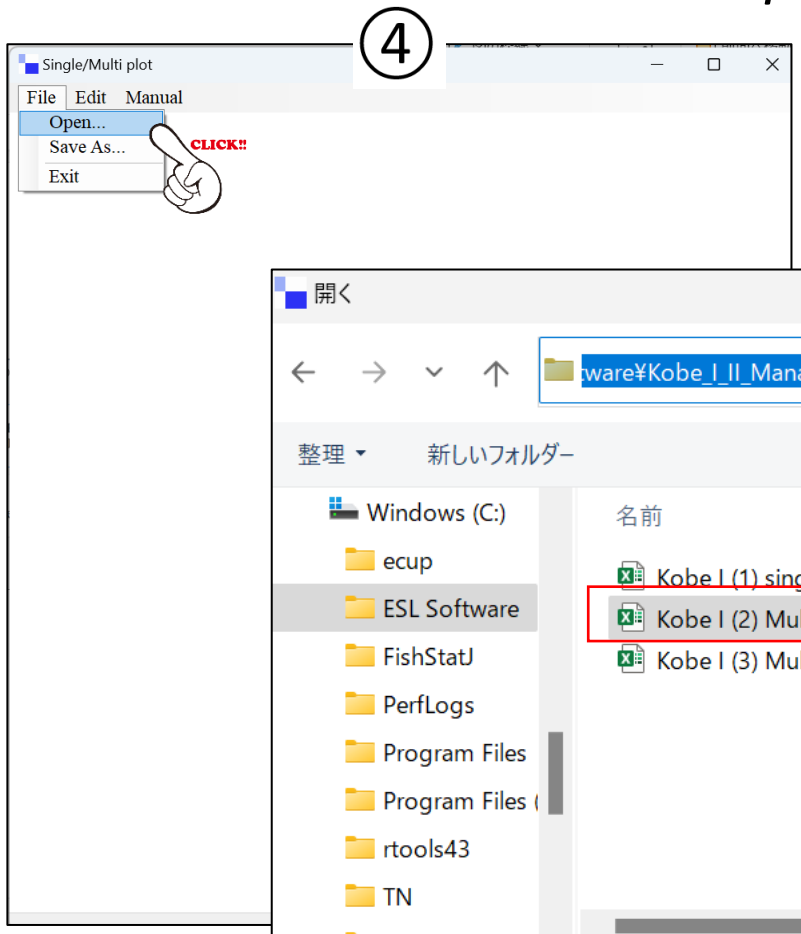
4.2 Single/Multiple Kobe plots without confidence surfaces

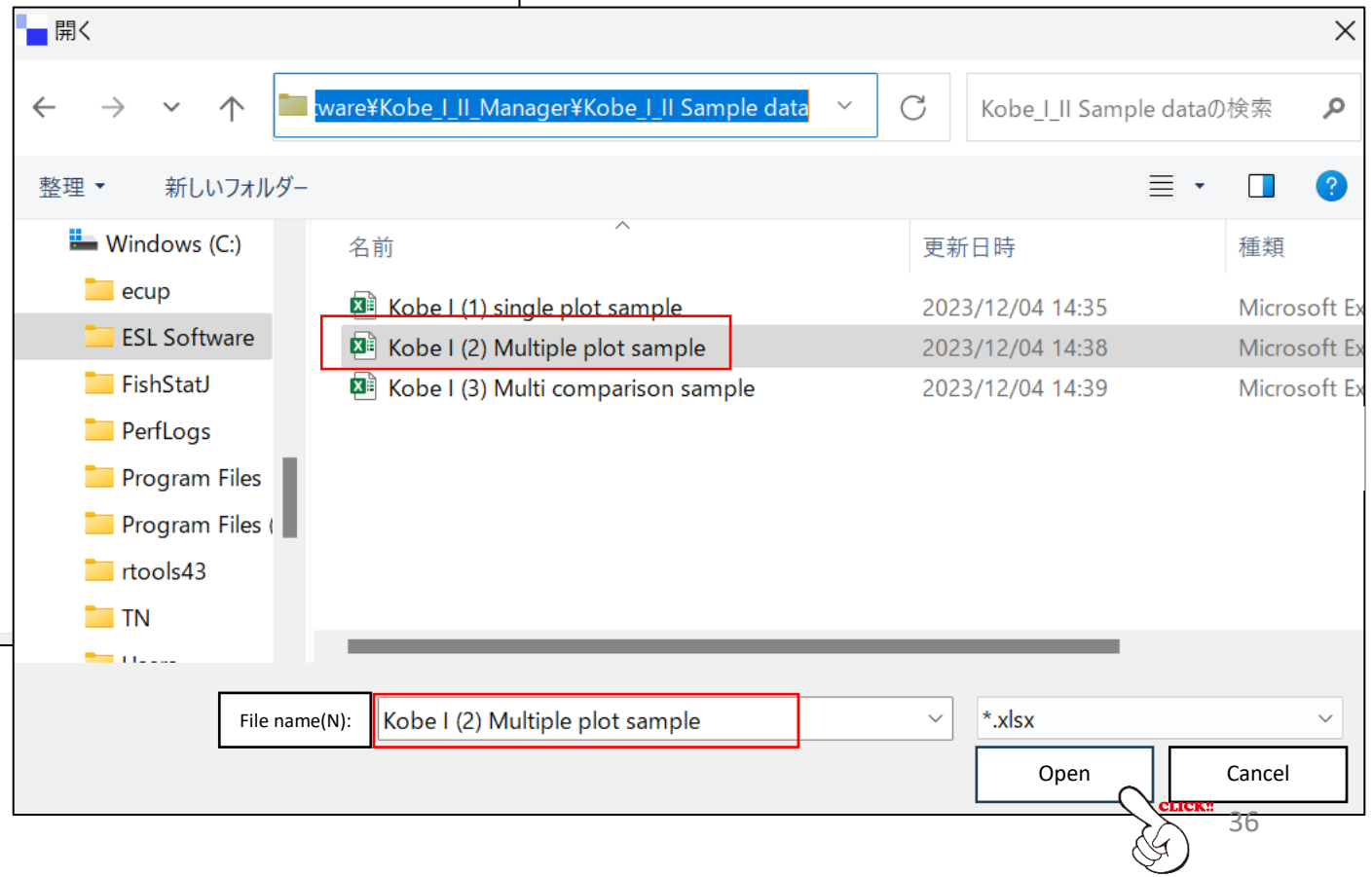
Importing the input data
sample data for multiple (3) plots





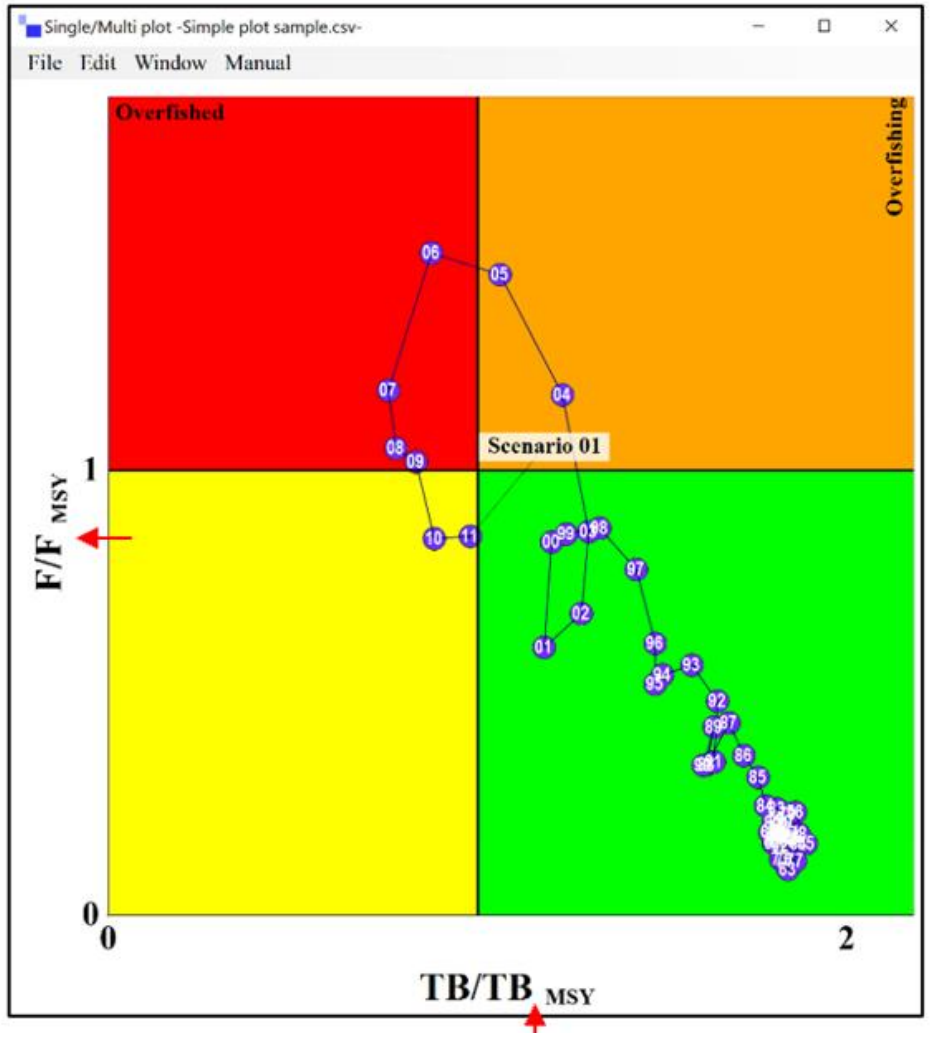


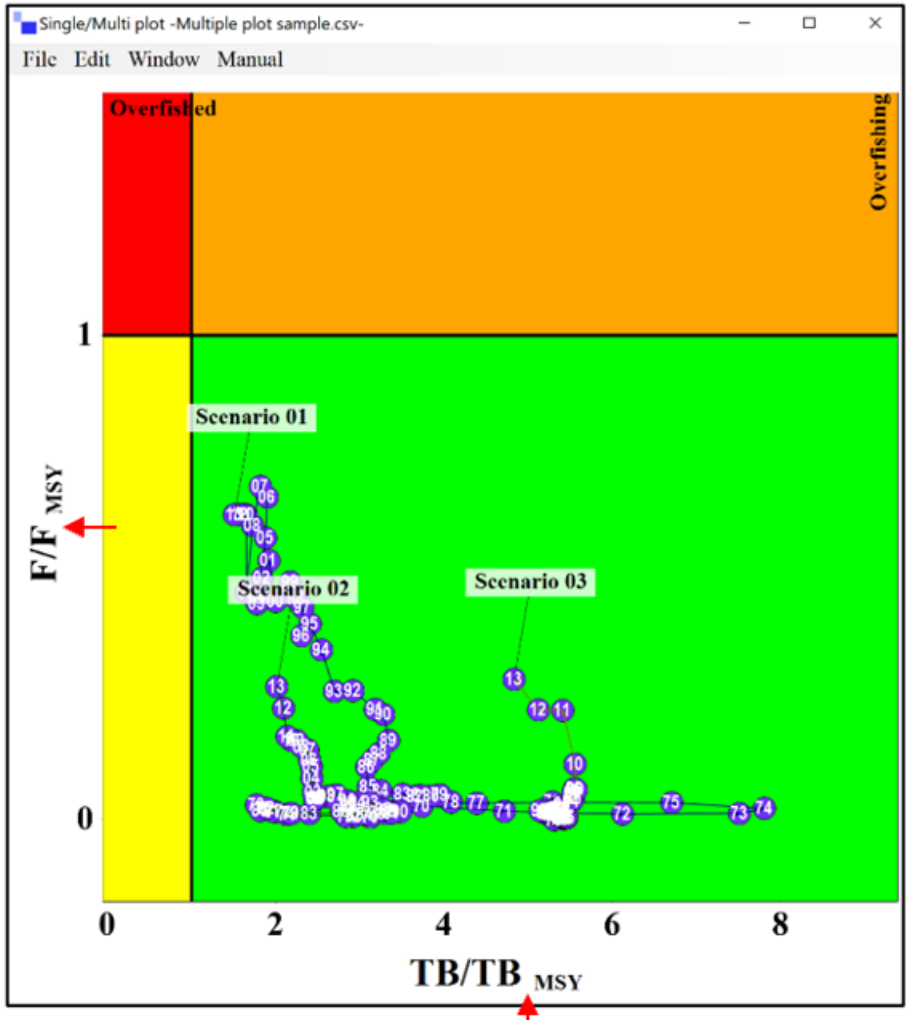




4.2 Single/Multiple Kobe plots without confidence surfaces

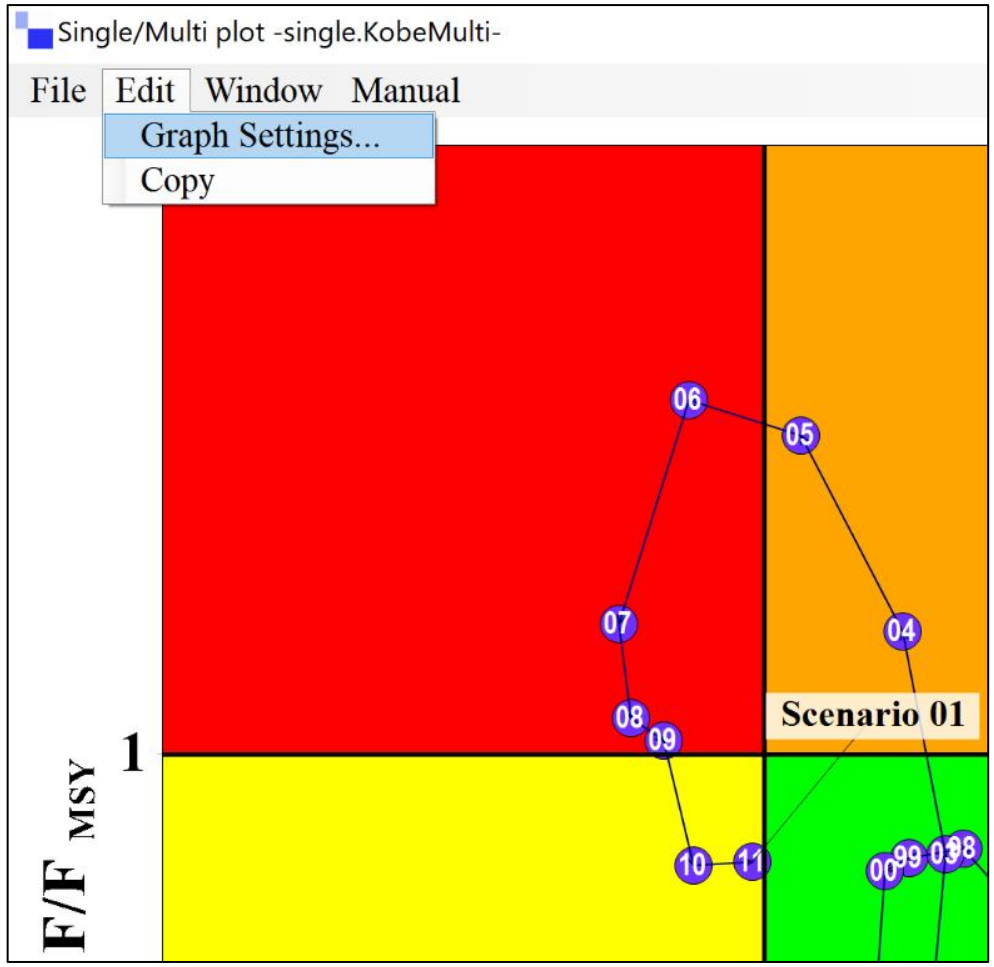
Initial default plots (2 examples)

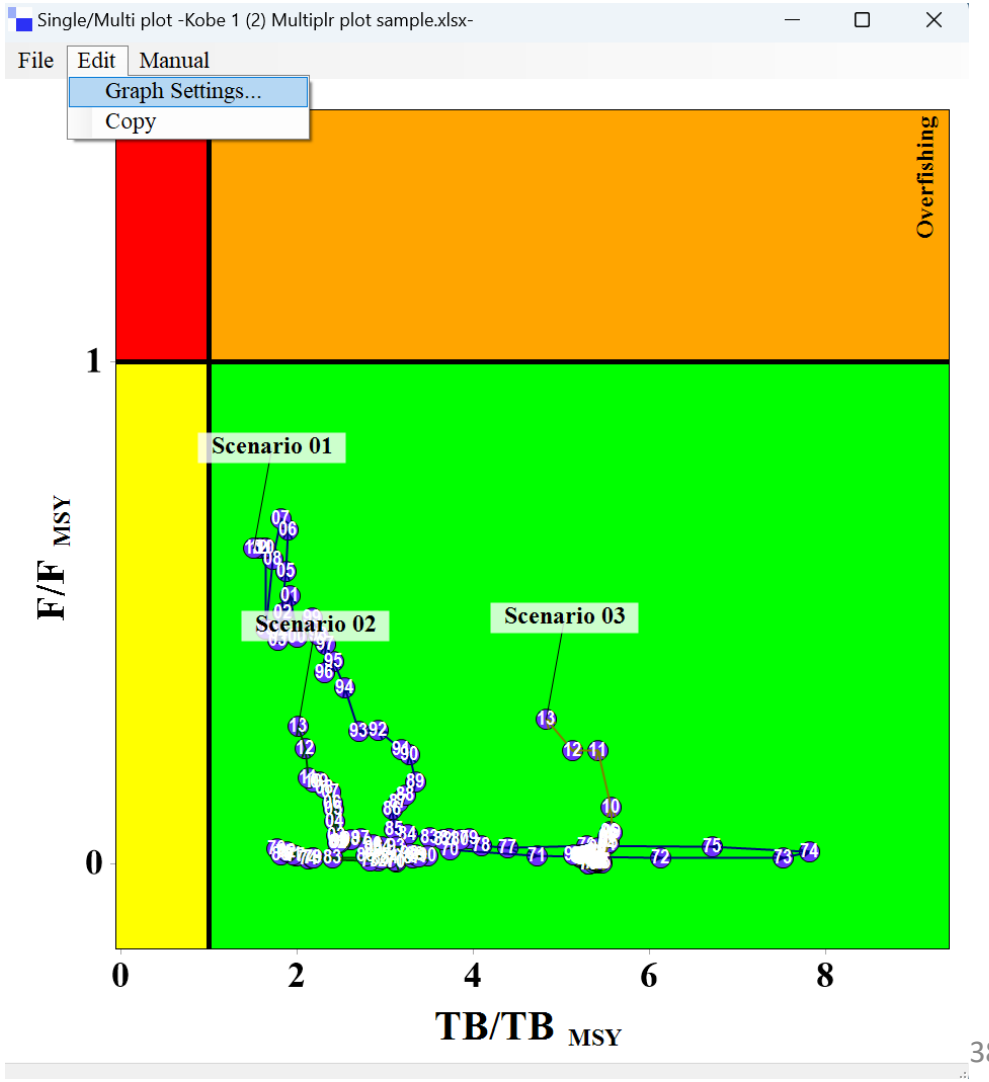




4.2 Single/Multiple Kobe plots without confidence surfaces

Editing the initial default plot using Graph Setting

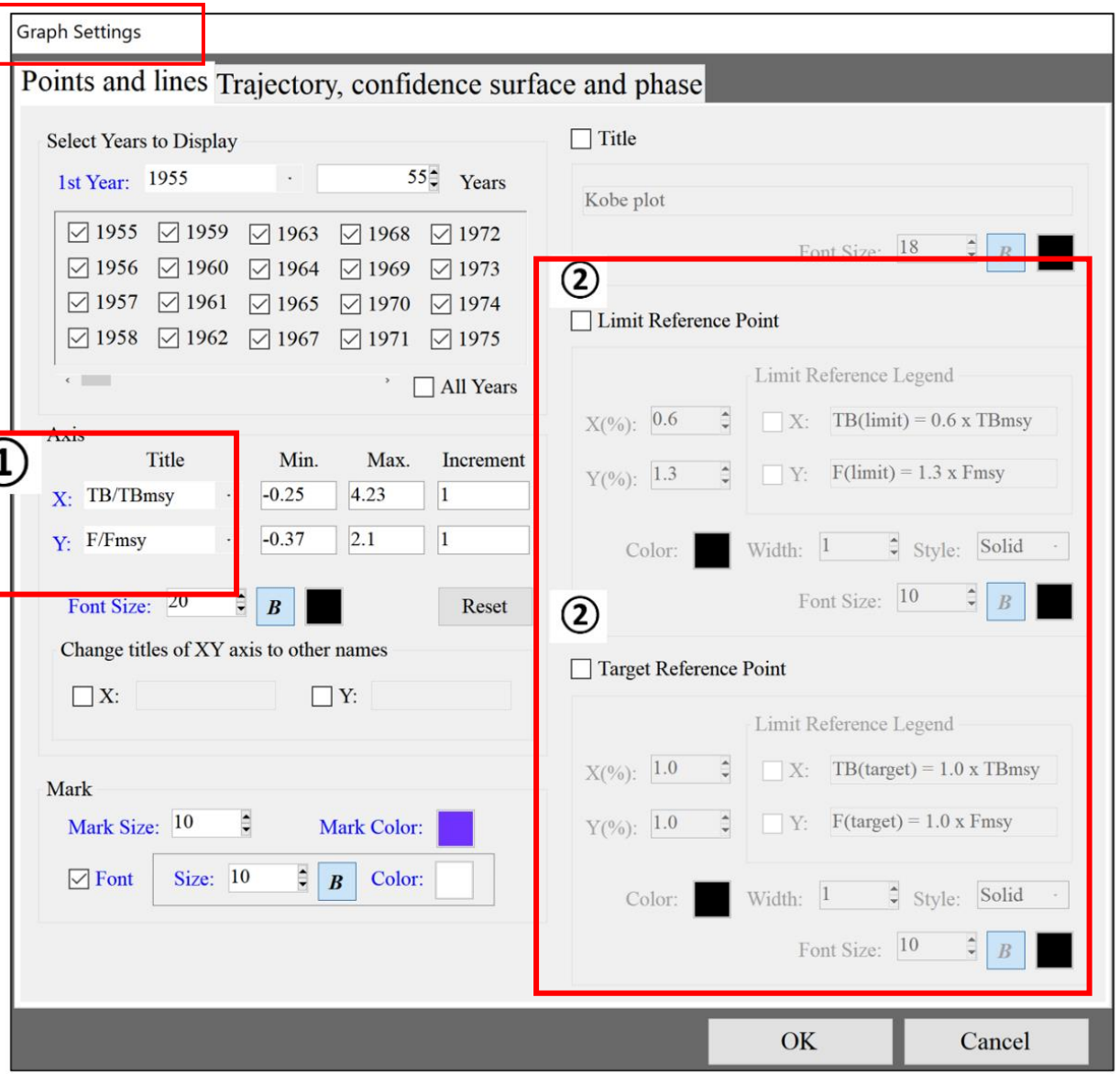




4.2 Single/Multiple Kobe plots without confidence surfaces

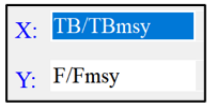
Graph settings (1st sheet: Points & lines)

Most functions are self-explanatory except ① and ②

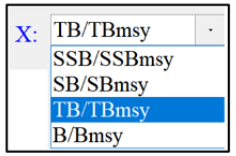


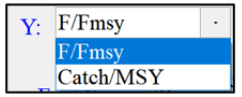
① Title of XY Axis

Default

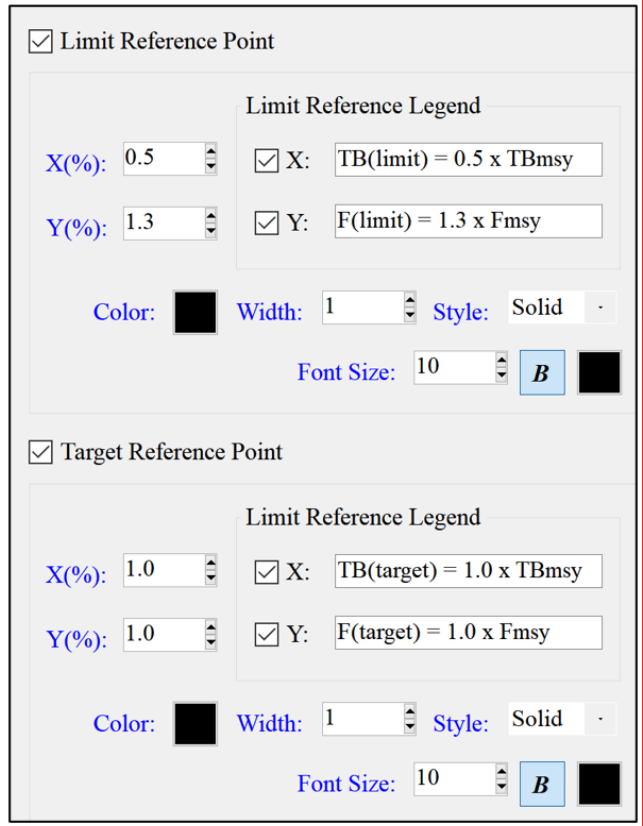


Options (select from the pull dow menu)





② Limit & Target Reference Points (optional)

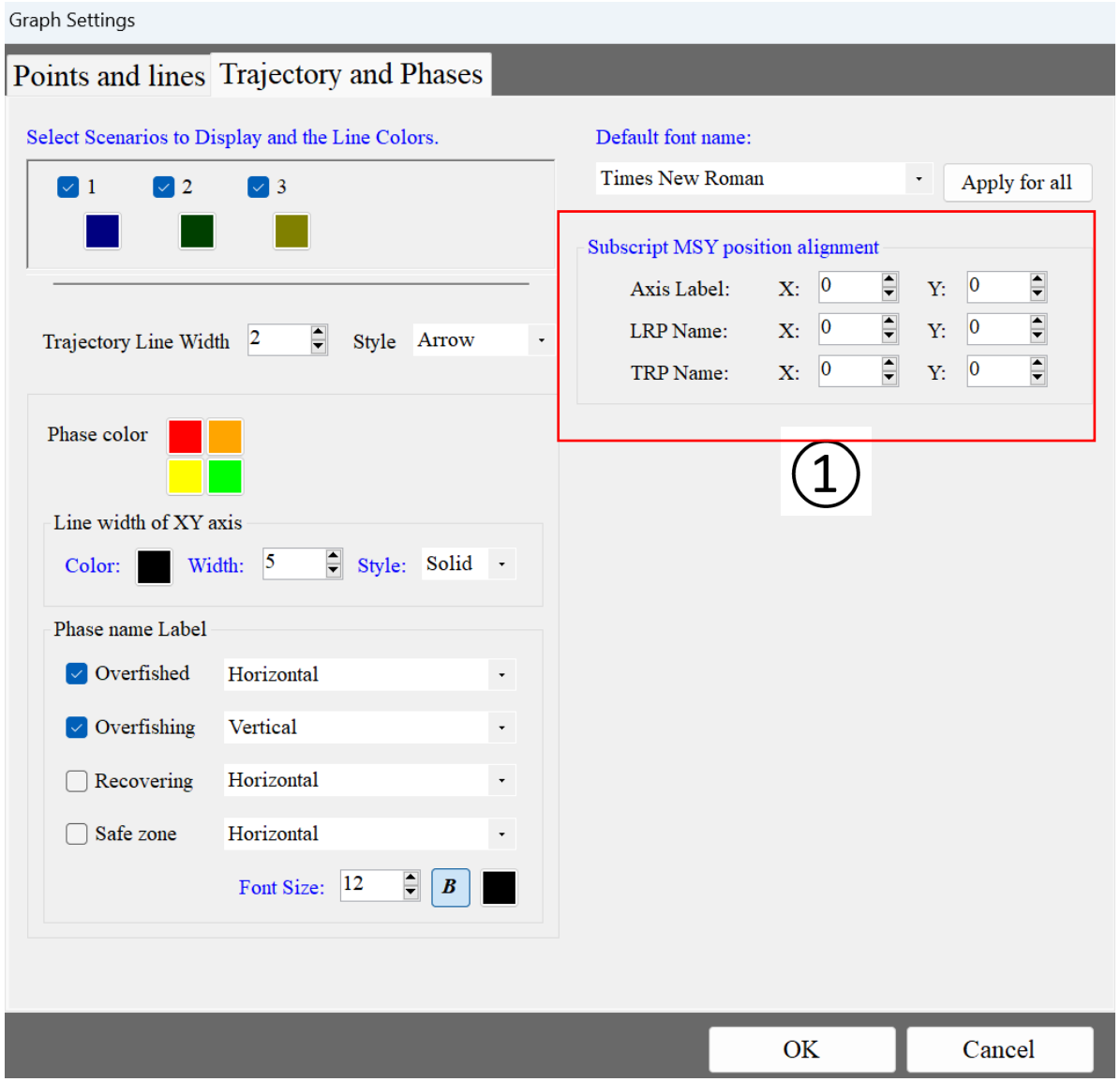


4.2 Single/Multiple Kobe plots without confidence surfaces

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

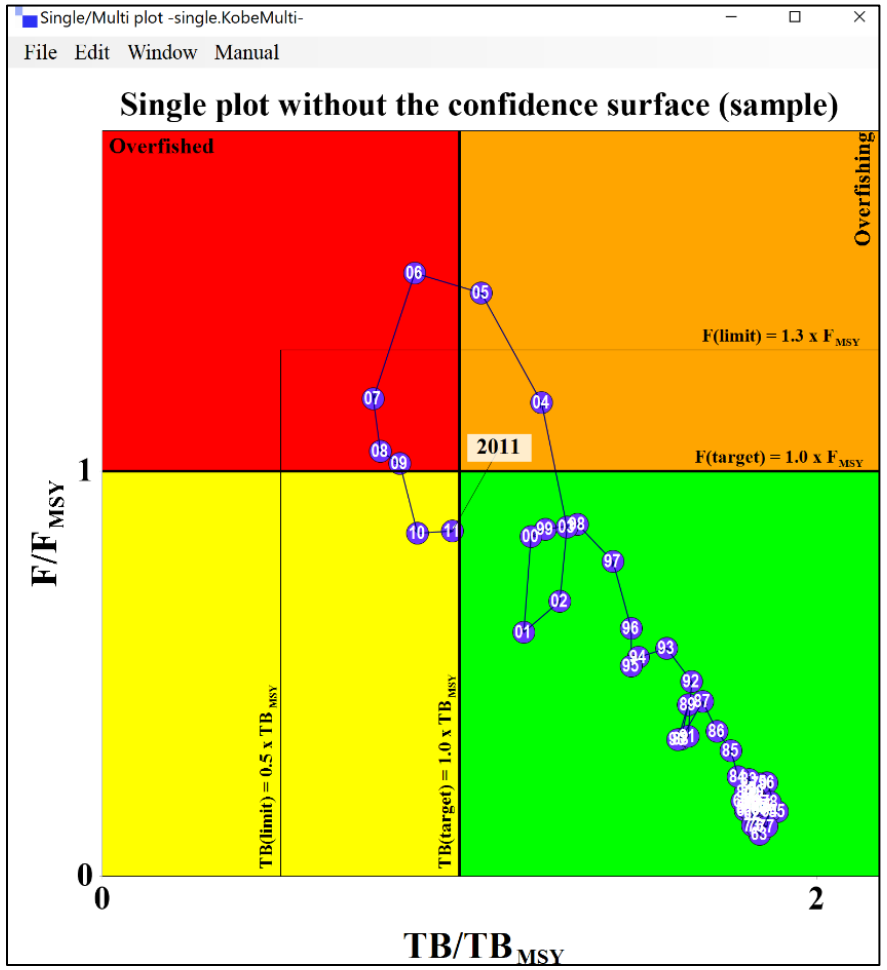
Most functions are self-explanatory except
① Subscript MSY position alignment

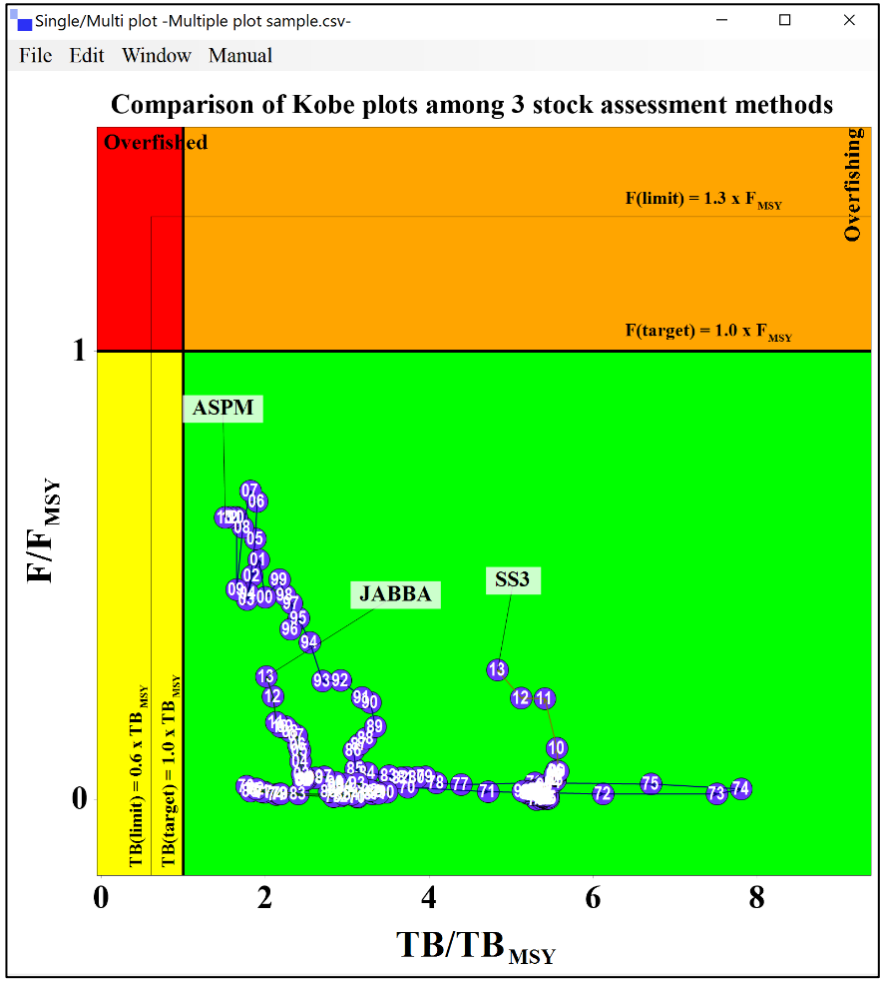
➔ see slide #31 for details



4.2 Single/Multiple Kobe plots without confidence surfaces

Complete ones (two examples) (*left*: single plot and *right*: multiple plots)

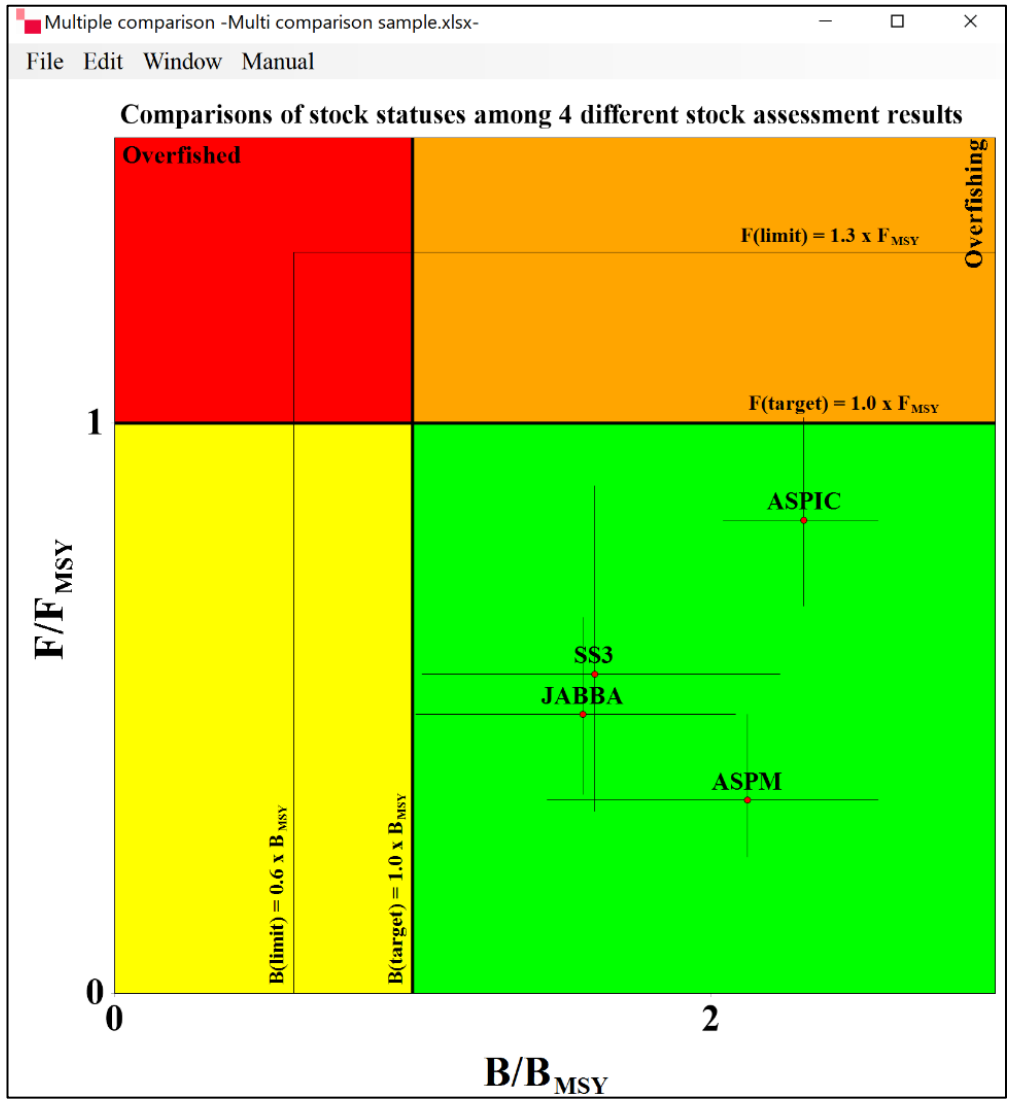




4.3 Multiple comparisons

4.3 Multiple comparisons

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



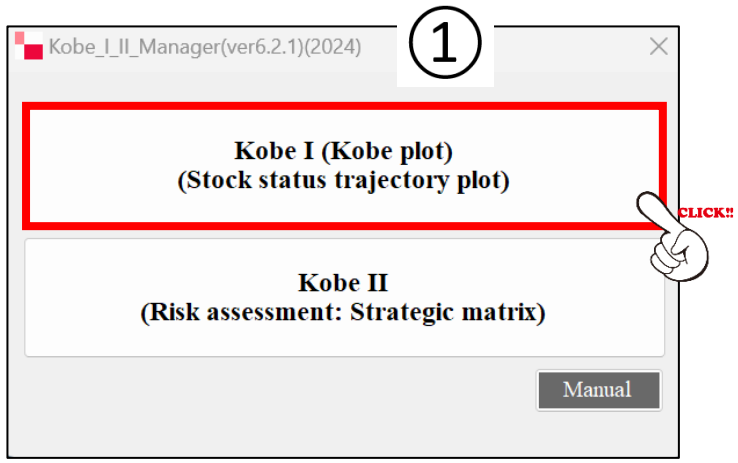
4.3 Multiple comparisons

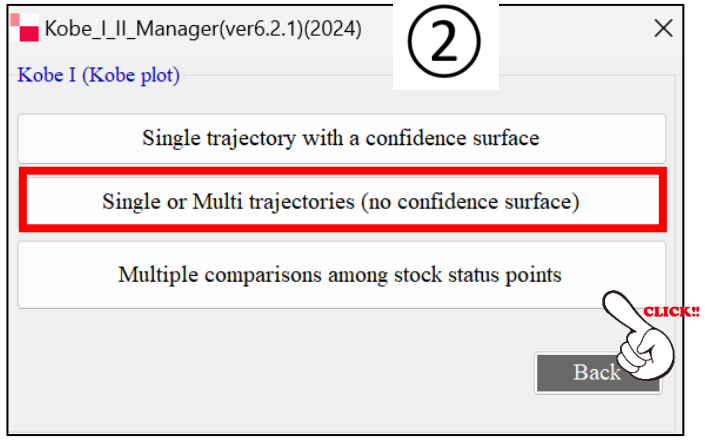
Creating the (sample) input data
(based on results of 4 models in the final year)
(lower & upper : 80% confidence intervals ← from xxx.fit file)

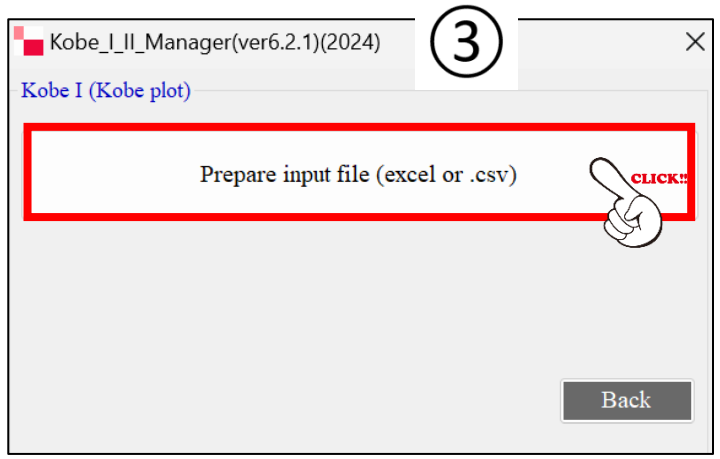
stock assessment model	TB/TB_{MSY} (point estimate)	TB/TB_{MSY} (lower)	TB/TB_{MSY} (upper)	$F/_{FMSY}$ (point estimate)	$F/_{FMSY}$ (lower)	$F/_{FMSY}$ (upper)
SS3	1.61	1.58	1.68	0.56	0.52	0.59
ASPIC	2.3	2.04	2.56	0.83	0.68	1
JABBA	1.57	1.36	1.82	0.49	0.35	0.66
ASPM	3.1	1.92	6.35	0.34	0.08	0.7

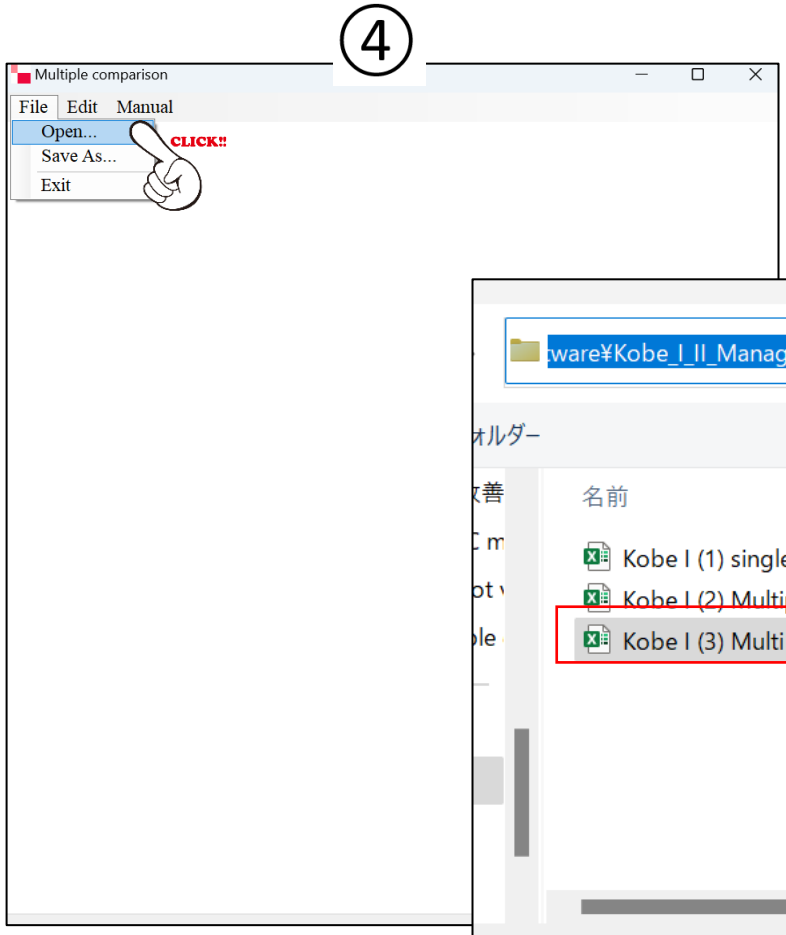
4.3 Multiple comparisons

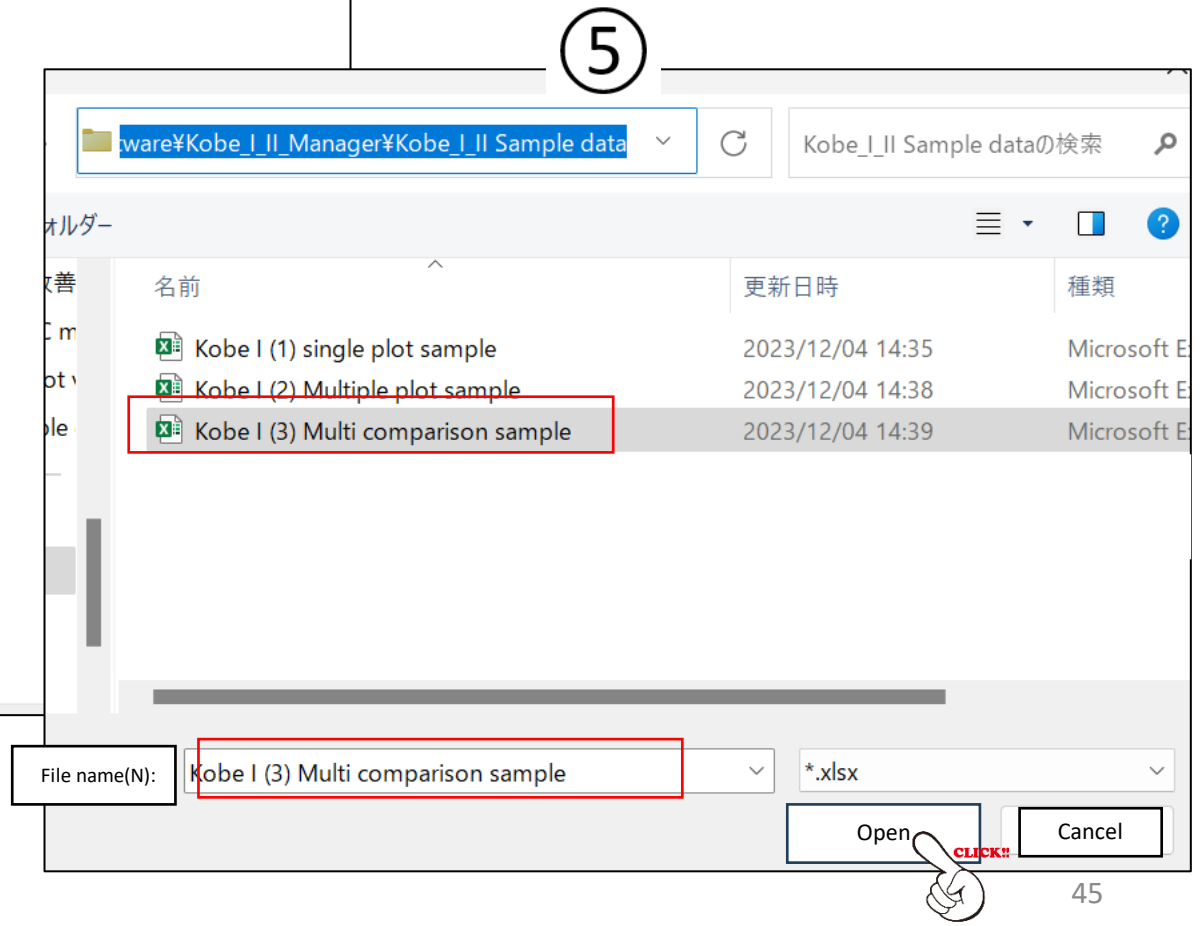
Importing the input data for the initial plot







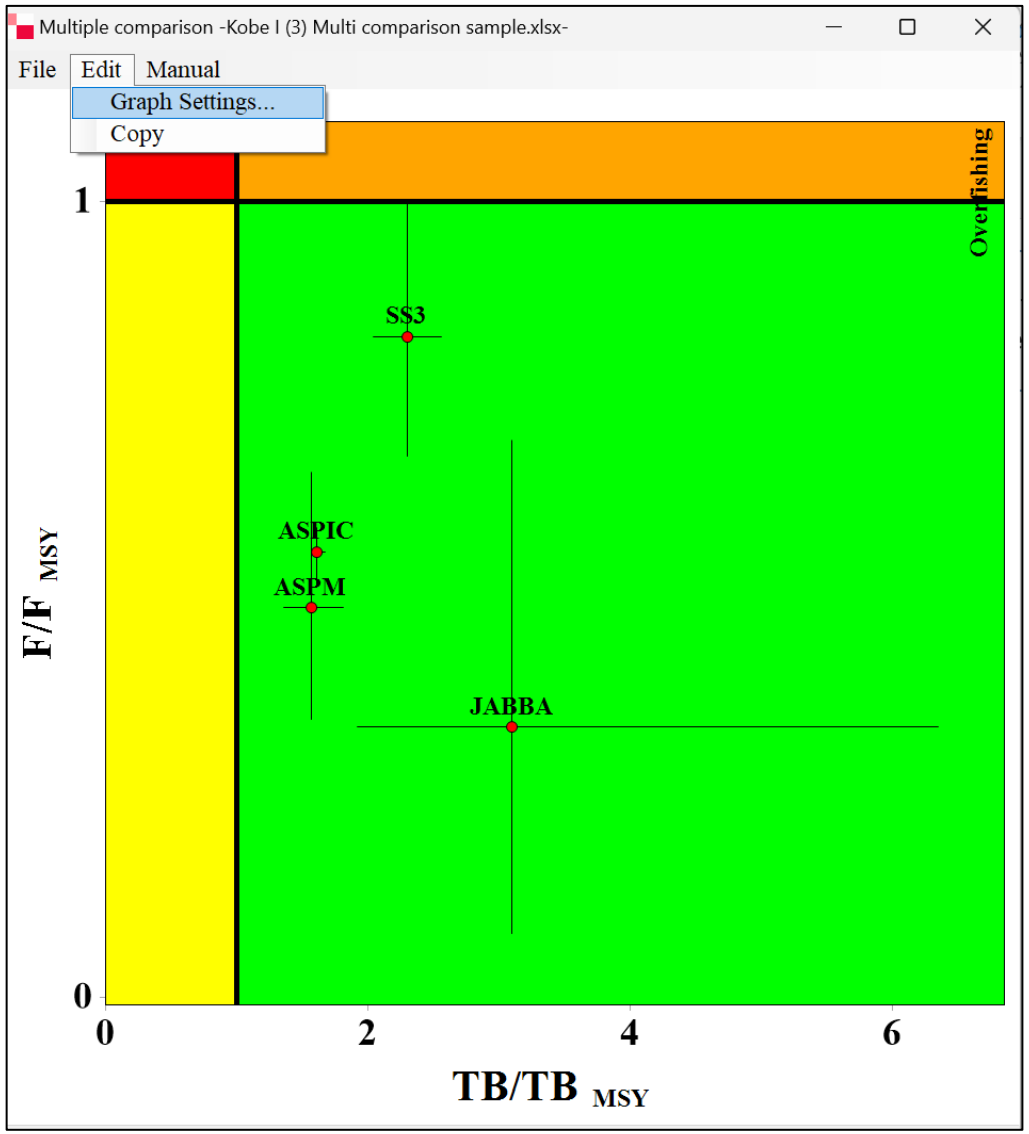


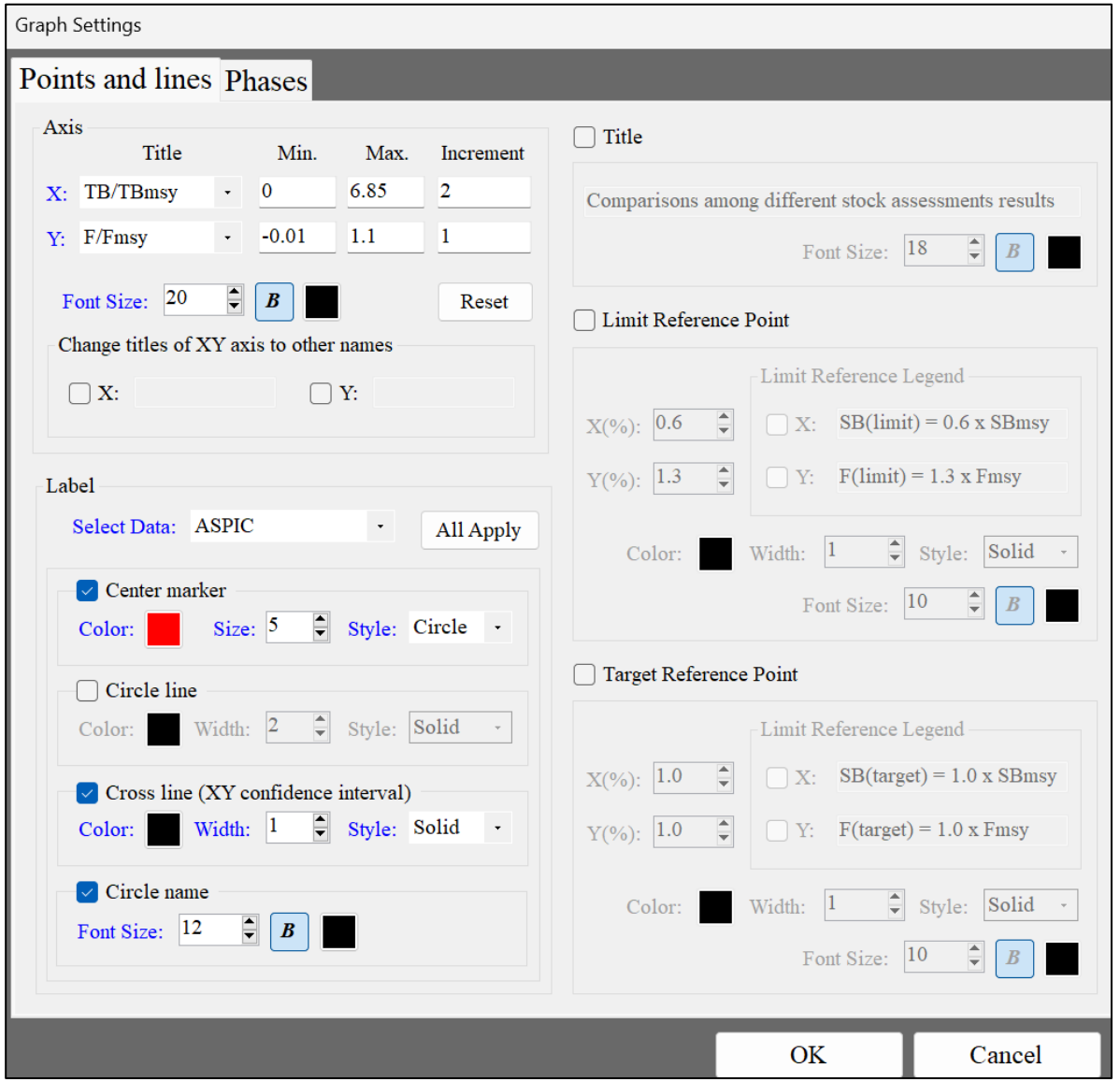


4.3 Multiple comparisons

Initial default plots

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



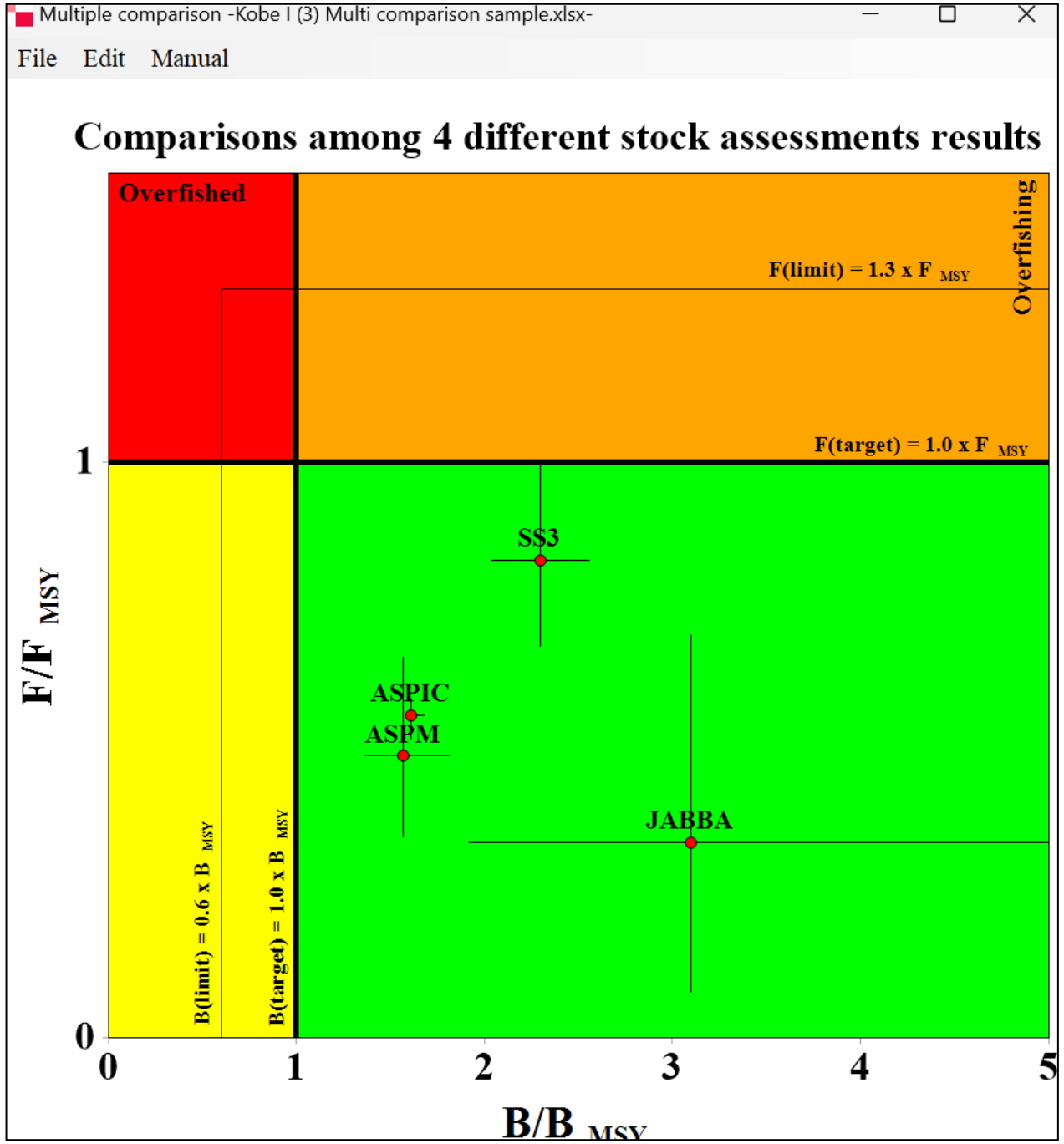


4.3 Multiple comparisons

Final plot

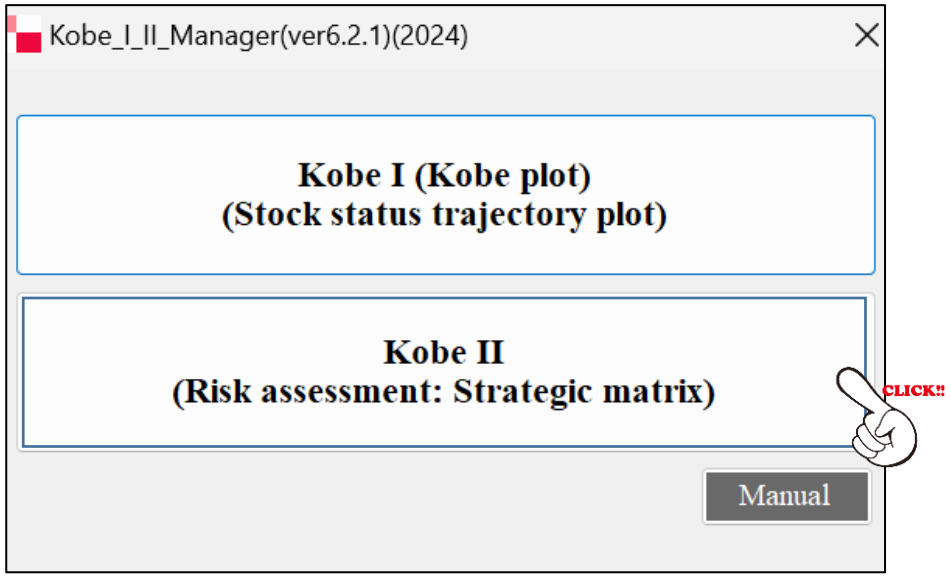
Graph settings functions are Self-explanatory. Thus users Can learn by themselves by Practice.

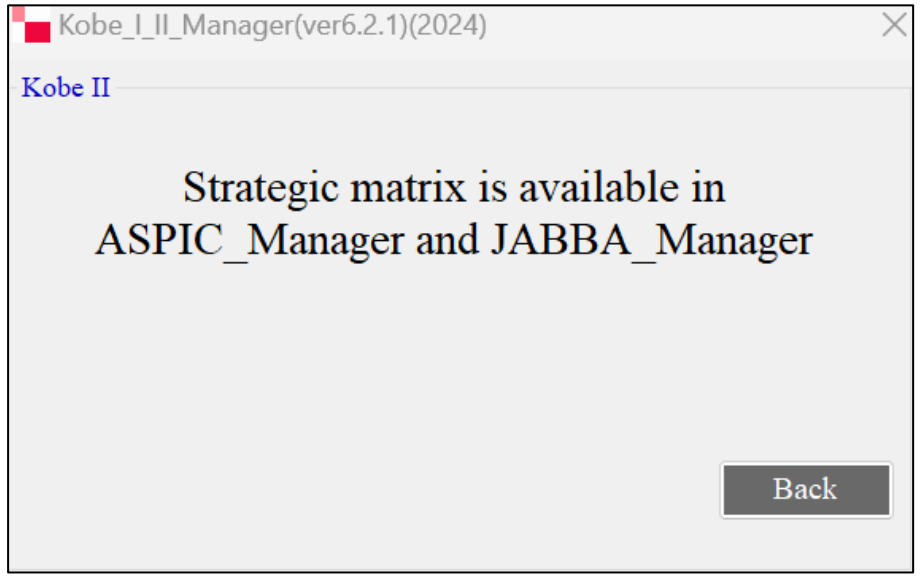
But, if users have difficulties, please contact [MENU] Menu-driven stock assessment software developing team.



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 requests by users. ● Release of two separate software for 32- and 64-bit OS PCs.	IOTC-2012-WPM04-05
3	2014	● Release of one united software for both 32- and 64-bit OS PCs for window OS. ● 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.	IOTC-2014-WPTT16-53
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)	


Stock assessments for ALL
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60%
7%
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