AS-ISK v2.4 USER GUIDE

RELEASE 2.4

DECISION SUPPORT TOOLS

INVASIVE SPECIES IDENTIFICATION KITS

Background and guidance in the use of the AQUATIC SPECIES INVASIVENESS SCREENING KIT

An adaptation of the Pheloung, Williams & Halloy (1999) 'Weed Risk Assessment' toolkit

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CONTENTS

CONTENTS 2

CREDITS 7

OVERVIEW 8

Launching AS-ISK v2.4 8

START 9

Information 9
Overview *9*
Credits *9*

Language 10

Colour scheme 10

Database (tab) 11
Open *11*
Existing *11*
New *12*

-ISK (tab) 12
Import *12*

Background (tab) 14

Dialogs view (tab) 15
Full *15*
Compact *16*

User Guide 16

Toolkit 16
Help *16*
Exit *16*

MAIN SCREENING WORKSPACE 17

Screening List..... 17
ID *18*
Cat *18*
Risk assessment area *19*
Taxon name *19*
Common name..... *19*
Assessor *19*
Answered *19*
Thresholds..... *19*
BRA Score..... *19*
BRA Outcome *19*
BRA+CCA Score..... *19*
BRA+CCA Outcome..... *19*
Date and Time..... *19*

Category 20

Screening no. 20

Questions 20

Risk screening context 20

Screening statistics 20

Database statistics 21

Sort..... 21
Ascending..... *21*
Descending..... *21*

Risk screening 21
Open Q&A..... *21*
Help *21*

Screening (tab) 22
Wizard *22*
New *22*
Edit *22*
Batch Edit..... *22*

Delete *22*
Replicate *23*

Thresholds (tab) 23
BRA and BRA+CCA *23*
Set/Re-set/(Re-)set *24*
Clear *24*

Report (tab) 25
Output *25*
Separate *25*
Grouped *25*
(Report file type drop-down) *26*

Utilities (tab) 26
Re-score *26*
User Guide *26*
Colour scheme *26*

Database 27
Save As *27*
Save *27*
Close *27*

WIZARD 28

Risk screening details 28
Category *28*
Risk assessment area *28*
Assessor *29*

Number of replicates 29

Help 29

Cancel 29

Save 29

NEW/EDIT 30

Taxon and Assessor Details 31
Category *31*
Taxon name *31*
Common name *31*
Assessor *31*

Risk screening context 31
Reason and socio-economic benefits *31*
Risk assessment area *31*
Taxonomy *32*
Native range *32*
Introduced range *32*
URL *32*

Help 32

Cancel 32

Save 32

REPLICATE 33

Fields to replicate 33

Number of replicates 34

Help 34

Cancel 34

Save 34

Q&A 35

(Question and details) 36

Question (Q) guidance 36

Response 36

Confidence 36

-ISK Question compatibility 37

Help 37

Justification (reference and/or other information) 37

Go to Question..... 37

Navigation 37
First *37*
Previous *37*
Next *37*
Last *38*

Screening 38
Clear Q Fields *38*
Clear Screening *38*
Cancel *38*
Save *38*

Answered Questions 38

Unanswered Questions 38

Not applicable Questions 38

REFERENCES 39

LANGUAGE CONTRIBUTORS 41

CREDITS

This electronic toolkit is freeware and may be freely distributed provided this notice is retained. No warranty, expressed or implied, is made and users should satisfy themselves as to the applicability of the results in any given circumstance.

The Aquatic Species Invasiveness Screening Kit (AS-ISK) takes its origin from questions in the Weed Risk Assessment (WRA) toolkit of P.C. Pheloung, P.A. Williams & S.R. Halloy (1999; https://doi.org/10.1006/jema.1999.0297). With their permission, the WRA architecture and questions were adapted to create the Fish Invasiveness Screening Kit (FISK v1: Copp et al. 2009), which was subsequently enhanced to create FISK v2 (Lawson et al. 2013). By a backward process, the questions of FISK v2 were used as a base for the creation of the generic screening module of the European Non-native Species in Aquaculture Risk Analysis Scheme (ENSARS), which was developed for the EU Regulation on the use of alien species in aquaculture (Copp et al. 2016a). The AS-ISK was created by combining the generic screening module of ENSARS (Copp et al. 2016a, 2016b) and FISK v2. The questions of the AS-ISK were revised or replaced by G.H. Copp (Cefas–Lowestoft, UK), L. Vilizzi (University of Lodz, Poland), L. Miossec and P. Goulletquer (IFREMER, France), A.S. Tarkan (Muğla Sıtkı Koçman University, Turkey), and P.D. Stebbing and H. Tidbury (Cefas–Weymouth, UK). The Excel Visual Basic for Applications (VBA) and computational programming of the AS-ISK v1 and v2 turnkey application were undertaken by L. Vilizzi, elaborated and expanded from the Excel automated spreadsheet in the original WRA toolkit and from FISK v1. We are grateful to Pheloung et al. (1999) for providing an open version of the original WRA spreadsheet.

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The graphic image in the front menu of the AS-ISK was designed by E.A. Copp (graphic designer) using photos kindly provided by: background *Sargassum muticum* (believed to have been provided by I. Laing, formerly of Cefas), and from left to right: zebra mussels (purchased from www.istockphoto.com/gb), wireweed (M. Werner), American mink and brown trout (GBNNSS), lionfish (purchased from www.istockphoto.com/gb), and Eurasian marsh frog (F. Holmes).

OVERVIEW

The AS-ISK is based on questions in the WRA (Pheloung et al. 1999), which were adapted to create FISK v1 (Copp et al. 2009) and then FISK v2 (Lawson et al. 2013). These were further adapted to create the generic screening module of the ENSARS, which was developed for the EU Regulation on the use of alien species in aquaculture (Copp et al. 2016a). During this developmental process, the AS-ISK's questions and related information-gathering components were revised and structured to create a decision-support tool that complies with the 'minimum standards' (Roy et al. 2018) for the assessment of non-native species for the recent EC Regulation No. 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (European Commission 2014). Notably, the AS-ISK v2.4 is an enhanced version of the AS-ISK v1 (Copp et al. 2016b).

Launching AS-ISK v2.4

AS-ISK v2.4 consists of a Microsoft Excel macro-enabled worksheet (.xlsm). Depending on the default security settings in the local computer's Excel installation, upon launching AS-ISK v2.4 the Assessor might be warned whether they want to 'Enable Editing' and then 'Enable Macros'. These two steps are necessary for AS-ISK v2.4 to open successfully. Upon opening, a preliminary check is done by the program for the Excel version compatibility. In this respect, AS-ISK v2.4 will run without issue under Windows® 10/11 with Microsoft Office 365. However, the AS-ISK will not run under the Mac OS unless a (third-party) Windows virtualisation software is used.

Any workbooks open in the Excel instance in which AS-ISK v2.4 is being launched will be automatically closed upon launching the program. This is an 'enforced' procedure due to the lack of dynamic data exchange (DDE) support since release of Excel 2016, which will also cause other Excel workbooks to not open within the instance of Excel in which AS-ISK v2.4 is running (but which can still be opened in a separate instance of Excel launched from the Windows Start Menu by typing "Excel /x" or "Excel.exe /x").

Following a preliminary compatibility check, the *Start* dialog is opened and the program's Graphical User Interface (GUI) will default to the local *Language* of the Assessor's Office/Excel version (if available), else to the English language. Also, the 'light blue' *Colour scheme* is selected by default.

To ensure that the AS-ISK will open and display properly (cf. GUI and information/error messages) in the user's local language, the following settings are needed:

1. The language of Microsoft Excel (Office) must match the user's local language: *File* → *Options* → *Language* → *Office display language*, then select the desired language and move it up to the top of the list, then press *OK* and restart Excel;
2. The language of the Windows OS (note that this refers to Windows 10/11) must not necessarily match that of the user's local language [but to do so: *Start* → *Settings* → *Time & Language* → *Region* → *Country or region* and scroll to select, then click on *Additional time, date & regional settings* → *(Region) Change date, time or number formats* → in the *Administrative (tab)* click on *Change system locale*, then scroll to select]. However, for most languages other than English, the box reading *Beta: Use Unicode UTF-8 for worldwide language support* must be ticked, then press *OK* and *Restart now* (whilst the System locale can remain in English).

START

As a stand-alone, dialog-driven Excel-based application, AS-ISK v2.4 requires a spreadsheet located on the Assessor's local computer to be opened (or created) as the screening database source file. Note that as many new sessions (i.e. spreadsheets opened, created or imported) can be run as desirable by simply returning from the *Main Screening Workspace* to the *Start* dialog.

Information

Overview

Clicking this button opens the pdf Help file (AS-ISK_v2_4_Help_Overview.pdf) that provides an overview of the program's general features. Note that the AS-ISK v2.4 Help files must be located in the same folder as that of the AS-ISK v2.4 program.

Credits

Clicking this button opens the pdf Help file with the credits (AS-ISK_v2_4_Help_Credits.pdf). Note that the AS-ISK v2.4 Help files must be located in the same folder as that of the AS-ISK v2.4 program.

Language

AS-ISK v2.4 is available in 31 languages (Copp et al. 2021, noting that Urdu has been removed starting from this version): English, Albanian, Arabic, Bulgarian, Chinese (simplified), Croatian, Czech, Dutch, Filipino, French, Georgian, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Macedonian, Persian, Polish, Portuguese, Romanian, Russian, Slovak, Slovenian, Spanish, Swedish, Thai, Turkish, Vietnamese. Note that the order of the languages is based on the language's native spelling, which is also used in the corresponding drop-down list. The list of *Language contributors*, who can be contacted for any queries about the language-specific program's interface, is provided at the end of this document. Importantly, any inconsistencies/errors in translation of the GUI from the original English language lie entirely with the corresponding language contributors (contactable at the corresponding email address).

Depending on the local computer's Excel language version, AS-ISK v2.4 will default to the local (i.e. Office/Excel) language if supported, otherwise to English. However, should an AS-ISK v1 or v2 database spreadsheet (noting that a database spreadsheet generated by AS-ISK v2.4 still retains the v2 format and notation) in a language different from the one selected from the list be opened, then, following the required checks, a message will be issued whether the Assessor wants to change the AS-ISK v2.4 interface language to the one of the spreadsheet being opened [noting that for an AS-ISK v1 spreadsheet the available languages were only English, Spanish, French, Italian, Turkish and Chinese (simplified)]. Also, this feature applies whenever an S-FISK database spreadsheet (i.e. in Spanish: see -*ISK (tab)* – *Import*) is opened in an AS-ISK v2.4 language different from the Spanish.

Colour scheme

The AS-ISK v2.4 GUI is available in ten colours: four light-shade colours including ‘blue’ (default), ‘green’, ‘brown’ and ‘grey’; one ‘neutral’ colour; four dark-shade colours including ‘blue’, ‘green’, ‘brown’ and ‘grey’; and ‘black’.

The colour scheme of choice applies to all ‘active’ (i.e. editable fields) and ‘semi-active’ (i.e. non-editable fields, labels, drop-downs) controls making up the AS-ISK v2.4 GUI.

Because active controls in AS-ISK v2.4 also behave as ‘smart’ controls (see *Main Screening Workspace*, *Wizard*, *New/Edit*, *Replicate* and *Q&A* dialogs) by changing aspect/behaviour depending on the Assessor's interaction with the GUI and the screening database features, the ‘light yellow’ and ‘light red’ colours are reserved for the GUI only.

The *Colour scheme* of choice can be changed by the Assessor at any time during a session.

Database (tab)

Open

Clicking this button will open either an *Existing* or a *New* database, depending on the option selected.

Existing

Before opening an existing database, which is selected from the corresponding (pop-up) dialog window, a series of checks is performed to ensure that the AS-ISK (v1 or v2) spreadsheet being loaded meets all requirements for formatting and consistency and whether it contains any duplicates entries (which are automatically removed). If any formatting issues or inconsistent/duplicate entries are detected during this 'screening' phase, then the Assessor is notified at any stage of the process through a (series of) (error) message(s), which, whenever applicable, include(s) reference to the row and column of the cell in the spreadsheet where the (first) error occurred. Notably, an existing spreadsheet cannot be loaded into AS-ISK v2.4 unless it meets all necessary formatting and consistency requirements. However, as long as the Assessor does not tamper with any of the entries/formatting of the original AS-ISK v1 spreadsheet, no issues should be encountered. Whereas the new password-protected AS-ISK v2 spreadsheet prevents any such editing/tampering-related issues.

Following the screening phase, the spreadsheet data are loaded into AS-ISK v2.4 and: (i) a check is done to ensure that for each screening all question-wise corresponding entries for *Response*,

Confidence and *Justification* are present (if not, the corresponding 'orphaned' entries are cleared from the screening, and the Assessor is notified in regard); and (ii) each screening in the database is re-scored to generate all relevant statistics for scores, outcomes and thresholds (the latter, if applicable, noting that the older AS-ISK v1 'thresholds' are automatically removed due to incompatibility with those in AS-ISK v2), but with the original screening date and time of creation preserved if present (see also *Main Screening Workspace – Utilities (tab) – Re-score*). The status bar (located at the bottom left of the Excel window) will indicate progress with both the checking and re-scoring phases should the process take some time (i.e. in case of large to very large databases). The *Main Screening Workspace* dialog is then opened with the *Screening List* populated with the existing screening(s).

New

In case a *New* database is created, then the *Main Screening Workspace* dialog is opened showing a blank *Screening List*.

-ISK (tab)

Import

Clicking this button will open the -ISK database selected from the drop-down list. This option allows the Assessor to import an existing database spreadsheet (.xls or .xlsx) containing previous

screening(s) done under one of the available seven '-ISK family' tools in total (see www.cefas.co.uk/nns/tools/):

1. FISK v2 – Freshwater Fish Invasiveness Screening Kit (v2)
2. FISK v1 – Freshwater Fish Invasiveness Screening Kit (v1)
3. S-FISK – Freshwater Fish Invasiveness Screening Kit (Spanish)
4. Amph-ISK – Amphibian Invasiveness Screening Kit
5. FI-ISK – Freshwater Invertebrate Invasiveness Screening Kit
6. MFISK – Marine Fish Invasiveness Screening Kit
7. MI-ISK – Marine Invertebrate Invasiveness Screening Kit

so that previous screenings can be updated to the AS-ISK protocol. As per an *Existing* database (see above), a series of preliminary checks is performed to ensure that the -ISK spreadsheet meets all the formatting, consistency and duplicate entry requirements as described above. Importantly, an -ISK spreadsheet cannot be loaded into AS-ISK v2.4 unless it meets all these necessary requirements. However, as long as the Assessor does not tamper with any of the entries/formatting of the original -ISK spreadsheet (i.e. as generated by any of the -ISK programs' database 'Output' option), no issues should be encountered. Notably, given that 33 Basic Risk Assessment (BRA) AS-ISK questions out of the original 49 -ISK questions have retained backward compatibility with -ISK (with the remaining 16 BRA questions being different and the additional six Climate Change-related questions being exclusive to the AS-ISK: see Copp et al. 2016b), the maximum number of answered questions for each screening loaded into the new AS-ISK database is 33 (out of 55).

Similar to opening an *Existing* database, the initial screening phase is followed by final checking and *Re-score* operations before the data can be loaded into the *Screening List* of the *Main Screening Workspace*. In addition, during the *Import* phase the Assessor is asked (through a dialog box) to enter the name of the risk assessment area for which the screening(s) were done but noting that in case of entering a text string longer than 40 characters (including spaces) and/or containing the unallowed characters \/:*?"<>|, the corresponding entries are eventually removed. If no name for the risk assessment area is entered or a blank string results after the above checking for unallowed character entries (or trailing spaces), then the generic term 'Risk assessment area' is entered by default.

Background (tab)

Dragging this slider changes the background colour of the Excel window in which AS-ISK v2.4 is running. Nine shades are available as combinations of white and black: 100% white, 0% black; 85% white, 15% black; 75% white, 25% black; 65% white, 35% black; 50% white, 50% black (default); 35% white, 65% black; 25% white, 75% black; 15% white, 85% black; 0% white, 100% black.

Dialogs view (tab)

Depending on the screen resolution of the computer where AS-ISK v2.4 is running, the *Main Screening Workspace* and *Q&A* dialogs will display in either *Full* or *Compact* view. In *Full* view, the *Screening List* in the *Main Screening Workspace* will display up to 26 rows (i.e. screenings, if available) at a time, and the *Justification* field in the *Q&A* dialog up to nine lines of text at a time. In *Compact* view, the *Screening List* in the *Main Screening Workspace* will display up to 16 rows (i.e. screenings, if available) at a time, and the *Justification* field in the *Q&A* dialog up to two lines of text at a time.

The threshold resolution below or equal to which AS-ISK v2.4 will display in *Compact* view is 1440 pixels in width and 900 pixels in height. As the screen resolution is automatically identified by AS-ISK v2.4 upon opening (and indicated in the corresponding screen resolution label), the *Full* or *Compact* view are selected by default as applicable. However, this function is known to encounter issues if a tablet PC is used, in which case the Assessor must select manually the *Compact* view to avoid later having to 'kill' the Excel process in which AS-ISK v2.4 is running due to the *Main Screening Workspace* dialog not fitting within the size of the screen.

Full

This option is automatically selected (i.e. by default upon opening AS-ISK v2.4) if the screen resolution is greater than 1440 pixels in width and 900 pixels in height.

Compact

This ‘option’ is the only one available if the screen resolution is less than or equal to 1440 pixels in width and 900 pixels in height. However, under a screen resolution greater than 1440 pixels in width and 900 pixels in height this option can still be selected if desired.

User Guide

Clicking this button opens the pdf Help file (AS-ISK_v2_4_Help_UserGuide.pdf) for the current dialog. Note that the AS-ISK v2.4 Help files must be located in the same folder as that of the AS-ISK v2.4 program.

Toolkit

Help

Clicking this button opens the pdf Help file (AS-ISK_v2_4_Help_Start.pdf) for the current dialog. Note that the AS-ISK v2.4 Help files must be located in the same folder as that of the AS-ISK v2.4 program.

Exit

Clicking this button quits the current AS-ISK v2.4 session and Excel.

MAIN SCREENING WORKSPACE

This dialog represents the core component of the AS-ISK v2.4 GUI, where all screening-related data manipulation is performed.

Screening List

This displays the entire list of screenings. Note that the maximum number of screenings in an AS-ISK v2 database is limited to 10,000 (mainly, for reasons of Excel 'realistic' computing capabilities).

Double-clicking a screening for which information for the required fields *Category*, *Taxon name*, *Common name*, *Assessor* and *Risk assessment area* has been provided (see *New/Edit*) will open the *Q&A* dialog. Conversely, double-clicking a screening for which information for any of the required fields *Category*, *Taxon name*, *Common name*, *Assessor* and *Risk assessment area* has not (yet) been provided (as in the case of newly generated screening(s) through the *Wizard* and *Replicate* options) will open the *New/Edit* dialog.

From the *Screening List*, which allows multiple selection of both contiguous and non-contiguous items (screenings), the Assessor can perform the following operations:

- Single screening selected (*Screening (tab): Edit/Delete/Replicate*; *Thresholds (tab) – Set/Re-set/Clear*; *Report (tab) – Output Separate*);
- Multiple screenings selected, either contiguously or non-contiguously (*Screening (tab): Edit/Batch Edit/Delete*; *Thresholds (tab): Set/Re-set/(Re-)set/Clear*; *Report (tab): Output Separate/Grouped*).

For each screening, the following details are provided:

ID

A unique, progressive number. Unlike in a relational database, this is not a unique identifier but refers to the order of items (screenings) from the top to the bottom of the list.

Cat

The aquatic organism unique identifier for the corresponding *Category* (as provided in the *New/Edit* dialog):

1. Mammals
2. Birds
3. Reptiles
4. Amphibians
5. Fishes and Lampreys (freshwater)
6. Fishes, Lampreys and Hagfishes (brackish)
7. Fishes, Lampreys and Hagfishes (marine)
8. Tunicates
9. Lancelets
10. Invertebrates (freshwater)
11. Invertebrates (brackish)
12. Invertebrates (marine)
13. Other Animals (freshwater)
14. Other Animals (brackish)
15. Other Animals (marine)
16. Plants (freshwater)
17. Plants (brackish)
18. Plants (marine)
19. Protozoans and Chromists (freshwater)
20. Protozoans and Chromists (brackish)
21. Protozoans and Chromists (marine)
22. Fungi (freshwater)
23. Fungi (brackish)
24. Fungi (marine)
25. Prokaryotes (freshwater)
26. Prokaryotes (brackish)
27. Prokaryotes (marine)

Note that the complete entry (i.e. *ID* plus *Category*) is provided in the *Category* section of this dialog.

Risk assessment area

The risk assessment area for which the screening is being done (as provided in the *New/Edit* dialog).

Taxon name

The scientific name of the taxon for which the screening is being done (as provided in the *New/Edit* dialog).

Common name

The common name of the taxon for which the screening is being done (as provided in the *New/Edit* dialog).

Assessor

The name of the Assessor doing the screening (as provided in the *New/Edit* dialog).

Answered

The number of answered questions (Qs) out of the total number (n = 55) of Qs making up the screening.

Thresholds

If specified, the Basic Risk Assessment (BRA) and BRA+CCA (Climate Change Assessment) thresholds set for the screening are displayed, else a '-; -' entry is displayed (see *Thresholds (tab)*). Note that, despite this GUI-related differentiation, the BRA+CCA threshold is automatically set to be the same as the BRA threshold.

BRA Score

The BRA based on the 49 AS-ISK BRA Qs, with minimum and maximum possible values ranging from −20 to 70 (see *Thresholds (tab)*). Note that in case of an incomplete screening (i.e. not all 55 Qs answered) this value is not provided.

BRA Outcome

The BRA outcome ('Low', 'Medium', 'High') for the BRA score, if thresholds have been provided. Note that in case of an incomplete screening (i.e. not all 55 Qs answered) this value is not provided.

BRA+CCA Score

The BRA+CCA score based on the 49 BRA Qs plus the six additional CCA Qs, with minimum and maximum possible values ranging from −32 to 82 (see *Thresholds (tab)*). Note that in case of an incomplete screening (i.e. not all 55 Qs answered) this value is not provided.

BRA+CCA Outcome

The BRA+CCA outcome ('Low', 'Medium', 'High') for the BRA+CCA score if thresholds have been provided. Note that in case of an incomplete screening (i.e. not all 55 Qs answered) this value is not provided.

Date and Time

The date and time of creation of the screening. Notably, this entry does not update following the re-scoring phase when opening an existing database, unless no date and time were previously provided. Whereas in case of an -ISK imported database, the current date and time are given.

Category

Shows the *Category* of the taxon being screened. The corresponding field turns blank in case of multiple screening selection involving taxa in different Categories.

Screening no.

Shows the ID for the selected screening in the list. In case of incomplete information provided for the corresponding *Risk screening context*, the label turns red, else it displays in the default colour. Hovering the mouse pointer on the corresponding text will cause it to turn light blue and double-clicking will open the *New/Edit* dialog. The corresponding field turns blank in case of multiple screening selection involving taxa in different Categories.

Questions

This section provides a summary of the number of *Answered*, *Unanswered* and *Not applicable* Qs in the selected screening from the list. In case of an incomplete screening (i.e. with one or more Qs unanswered), all three labels turn red. Hovering the mouse pointer on the text of any of these three labels will cause them to turn light blue and double-clicking any of them will open the *Q&A* dialog. All three labels turn blank in case either of multiple screening selection or of a single screening selected containing ellipsis '…' entries for either the *Risk assessment area*, *Taxon name*, *Common name* or *Assessor* fields (as generated through the *Wizard* or *Replicate* dialogs).

Risk screening context

This displays the screening -wise information about *Reason and socio-economic benefits*, *Taxonomy*, *Native range*, *Introduced range* and *URL*. Copying (but not editing) of text from all fields is possible. Hovering the mouse on the *URL* field turns the pointer into a 'hand' and clicking it takes to the indicated web page (provided the hyperlink is working). Hovering the mouse pointer on the text of any of these fields will cause it to turn light blue and double-clicking any of them will open the *New/Edit* dialog with the focus on the corresponding field. A text string reading 'Information not provided' displays in case of an empty field. All the above fields turn blank in case of multiple screening selection.

Screening statistics

This section provides a 'snapshot' of the Statistics information that is given in full in the report (see *Report (tab)*) generated for the corresponding screening. On the left-hand side of this section, the top panel displays the information for the *Score partition*, and the bottom panel the information for the *Sectors affected*. On the right-hand side of this section, the *Confidence* panel includes information about the confidence level for the BRA+CCA (composite score) and for the BRA and CCA scores separately. The *Report* button outputs the report for the corresponding screening, hence like selecting the *Output Separate* option from the *Report (tab)* (of which this button represents a 'shortcut'). All panels and fields in this section turn blank and the *Report* button is disabled in case of selection of an incomplete screening (i.e. with one or more Qs unanswered) or in case of multiple screening selection.

Database statistics

This section provides a summary of the *Total* number of screenings in the database, the number of fully *Assessed* taxa, *Incomplete* screenings (i.e. with less than 55 Qs answered), *Outcomes* (i.e. completed screenings for which thresholds have been specified), and *Selected* screenings from the list. In case of one or more *Incomplete* screening(s), the corresponding label turns light red.

Sort

This drop-down allows sorting of the *Screening List*, in either *Ascending* or *Descending* order, based on all headings (except for the *ID*), and with sorting starting from the selected field and then progressing in order from *Cat* through to *Date and Time*, as applicable. If sorting by *Cat*, *Risk assessment area*, *Taxon name*, *Common name* or *Assessor*, then the *Batch Edit* option on the corresponding button in the *Screening (tab)* sub-menu is enabled in case two or more screenings in the list have the same entry for the corresponding field.

Ascending

Sorts the *Screening List* items in ascending order. Note that sorting is also case-sensitive.

Descending

Sorts the *Screening List* items in descending order. Note that sorting is also case-sensitive.

Risk screening

Open Q&A

Clicking this button opens the *Q&A* dialog in which a new screening is started or continued for the taxon selected from the *Screening List*. This button is disabled in case of multiple screening selection or of a single screening selected containing ellipsis '…' entries for either the *Risk assessment area*, *Taxon name*, *Common name* or *Assessor* fields (as generated through the *Wizard* or *Replicate* dialogs).

Help

Clicking this button opens the pdf Help file (AS-ISK_v2_4_Help_MainScreeningWorkspace.pdf) for the current dialog. Note that the AS-ISK v2.4 Help files must be located in the same folder as that of the AS-ISK v2.4 program.

Screening (tab)

Wizard

Clicking this button opens the *Wizard* dialog, which allows to generate a 'template' for one or (usually) more new screenings at once.

New

Clicking this button opens the *New/Edit* dialog in which details of the new screening are input by the Assessor.

Edit

Clicking this button opens the *New/Edit* dialog in which details of an existing screening are edited by the Assessor.

Batch Edit

This option becomes available in case of multiple screening selection (i.e. two or more screenings selected from the *Screening List*) and with the *Screening List* ordered by *Cat*, *Risk assessment area*, *Taxon name*, *Common name* or *Assessor*. In such cases, the button text turns light blue and the *Sort* drop-down entry colour blue, indicating that editing is in 'batch mode'. Clicking this button opens the *New/Edit* dialog in *Batch Edit* mode, where details are provided by the Assessor for the corresponding field.

Delete

Clicking this button deletes the selected screening(s) from the list. A message request for confirmation is issued before proceeding. Note that changes to the database are not saved until the *Save* or *Save As* button (whose text turns red) is clicked.

Replicate

Clicking this button opens the *Replicate* dialog for replicating an existing screening. This button is disabled in case of multiple screening selection or of a single screening selected containing ellipsis '…' entries for either the *Risk assessment area*, *Taxon name*, *Common name* or *Assessor* fields (as generated through the *Wizard* or *Replicate* dialogs).

Thresholds (tab)

BRA and BRA+CCA

Thresholds are set from the corresponding BRA or BRA+CCA drop-down control. The minimum and maximum values for the thresholds are 1 to 70 (the value of 1 being 'default' to distinguish between low and medium risk taxa) in increments of 0.05. Note that, despite this GUI-related differentiation, the BRA+CCA threshold is automatically set to be the same as the BRA threshold.

Depending on whether a single screening or multiple screenings are selected from the *Screening List* and on whether thresholds have been previously defined or not, six possible scenarios for both the BRA and BRA+CCA drop-downs can occur, affecting their appearance:

1. *Single screening selected/No thresholds defined* – Empty threshold value entries, light red;
2. *Single screening selected/Thresholds defined* – Screening thresholds, *Colour scheme* of choice;
3. *Multiple screenings selected/No thresholds defined* – Empty entries, light red;
4. Multiple *screenings selected/Same thresholds defined* – Screenings thresholds, *Colour scheme* of choice;

5. *Multiple screenings selected/Different thresholds defined* – Empty entries, *Colour scheme* of choice;
6. *Multiple screenings selected/Thresholds both defined and not defined* – Empty entries, light red.

Set/Re-set/(Re-)set

Clicking this button assigns the selected BRA and BRA+CCA threshold values from the corresponding dropdowns to the selected screening(s) in the *Screening List*, and in case of a complete screening (i.e. all 55 Qs answered) displays the corresponding *BRA Outcome* and *BRA+CCA Outcome*.

Depending on whether a single screening or multiple screenings are selected from the list and on whether thresholds have been defined or not for the selected screening (s) from the *Screening List*, the button's caption reads:

- *Set* – Single screening or multiple screenings selected and thresholds not yet defined;
- *Re-set* – Single screening or multiple screenings selected and thresholds previously defined;
- *(Re-)set* - Multiple screenings selected and thresholds both not yet defined and previously defined.

This button is disabled whenever no threshold values are provided in the corresponding BRA and BRA+CCA drop-downs. Note that changes to the database are not saved until the *Save* or *Save As* button, whose text turns red, is clicked.

Clear

Clicking this button removes any threshold values from the selected screening(s) in the list. A message request for confirmation is issued before proceeding. In case of a complete screening (i.e. all 55 Qs answered), the corresponding *BRA Outcome* and *BRA+CCA Outcome* are also cleared. This button is disabled whenever no threshold values are provided in the BRA and BRA+CCA drop-downs. Note that changes to the database are not saved until the *Save* or *Save As* button (whose text turns red) is clicked.

Report (tab)

Output

Clicking this button outputs the report(s) for the selected screening(s) in the *Screening List*. The status bar (located at the bottom left of the Excel window) displays progress with report generation and outputting. This button (and the corresponding *Separate* and *Grouped* options) is disabled in case one or more incomplete screenings are selected from the *Screening List*.

Separate

This is the only option available in case of selection of a single screening from the *Screening List*; whereas in case of multiple screening selection, this option (if chosen) outputs a separate report spreadsheet for each selected screening. A confirmation message that the selected report(s) has/have been generated is issued at the end of the process.

The file for each report spreadsheet (Microsoft Excel Worksheet format *.xlsx) is named by default: “AS-ISK v2 Report - [Risk assessment area] - [Category] - [Taxon name] - [Assessor]”. Also, the spreadsheet tab takes the name of the taxon for which the report has been generated (but limited to 31 characters in total including spaces due to the ‘hard-coded’ string length limits in Excel).

Grouped

This option is chosen by default in case two or more screenings are selected from the *Screening List*. A confirmation message that the grouped report has been generated is issued at the end of the process.

The grouped report consists of a workbook (Microsoft Excel Worksheet format *.xlsx) named by default: “AS-ISK v2 Report - # Screenings” (where # is the number of screenings in the report). The

tab of each spreadsheet in the grouped report is named progressively from Screening 1 to Screening *n*, where *n* is the total number of screenings.

(Report file type drop-down)

This drop-down allows to output the report as an Excel Workbook (*.xlsx) (default option), a PDF document (*.pdf), or as a MHTML (Web page archive file) document (*.mhtml).

Utilities (tab)

Re-score

Clicking this button re-scores all screenings in the *Screening List*. This feature is not generally required during a session, as AS-ISK v2.4 automatically re-scores all screenings upon opening either an existing AS-ISK v1 of v2 database (see *Start – Database (tab) – Existing*) or an -ISK database (see *Start – -ISK (tab)*). A request for confirmation to proceed is made before starting the process. Note that changes to the database are not saved until the *Save* or *Save As* button (whose text turns red) is clicked.

User Guide

Clicking this button opens the pdf Help file (AS-ISK_v2_4_Help_UserGuide.pdf) for the current dialog. Note that the AS-ISK v2.4 Help files must be located in the same folder as that of the AS-ISK v2.4 program.

Colour scheme

The AS-ISK GUI is available in ten colours: four light-shade colours, including 'blue' (default), 'green', 'brown' and 'grey'; one 'neutral' colour; four dark-shade colours, including 'blue', 'green', 'brown' and 'grey'; and 'black'.

The colour scheme of choice applies to all 'active' (i.e. editable fields) and 'semi-active' (i.e. non-editable fields, labels, drop-downs) controls making up the AS-ISK GUI.

Because active controls in the AS-ISK also behave as 'smart' controls (see *Main Screening Workspace*, *Wizard*, *New/Edit*, *Replicate* and *Q&A* dialogs) by changing aspect/behaviour depending on the Assessor's interaction with the GUI and the screening database features, the 'light yellow' and 'light red' colours are reserved for the GUI only.

The *Colour scheme* of choice can be changed by the Assessor at any time during a session.

Database

Save As

Clicking this button saves the *Screening List* into an AS-ISK v2 database. A new spreadsheet is created (pending confirmation) from the corresponding Windows dialog (default name: "AS-ISK v2 database"). This applies to databases from either AS-ISK v1, AS-ISK v2 or -ISK (imported). The text for this button turns red upon opening a new database (see *Start – Database (tab) – New*), deleting one or more screenings (see *Screening (tab) – Delete*), and setting thresholds (see *Thresholds (tab) – Set/Re-set/(Re-)set*) and clearing thresholds (see *Thresholds (tab) – Clear*).

Save

Clicking this button saves the *Screening List*. Two scenarios are possible:

1. *Existing AS-ISK v2 database spreadsheet* – The spreadsheet is saved directly and overwritten with any new changes;
2. *Existing AS-ISK v1 database spreadsheet, New database spreadsheet, or -ISK (imported) database spreadsheet* – A new spreadsheet (Microsoft Excel Worksheet format *.xlsx) is created pending confirmation from the corresponding Windows dialog (default name: "AS-ISK v2 database").

The text for this button turns red upon opening a new database (see *Start – Database (tab) – New*), deleting one or more screenings (see *Screening (tab) – Delete*), and setting thresholds (see *Thresholds (tab) – Set/Re-set/(Re-)set*) and clearing thresholds (see *Thresholds (tab) – Clear*).

Close

Clicking this button closes the current dialog. If changes have been made to the *Screening List*, then the Assessor is asked whether they want to *Close* the database without saving or *Save* it before closing.

WIZARD

This dialog allows the Assessor to generate the basic information (template) for one or (usually) more screenings as part of the risk screening of several taxa for the risk assessment area under study. This option is especially useful when starting a screening 'anew', i.e. by creating a *New* database from the *Start – Database (tab)*. However, this dialog can be opened at any time from the *Screening List* in the *Main Screening Workspace* populated with existing screenings. After generating the screening template(s), a message is issued informing the Assessor that the operation has been completed. The screening template(s) in the *Screening List* will include the information provided for the *Category*, *Risk assessment area* and *Assessor*, whereas the entries for the entries for *Taxon name* and *Common name* will include an ellipsis '…' to be replaced by the Assessor with the appropriate information through the *New/Edit* dialog.

Risk screening details

Category

The aquatic organism *Category* for which the screening is being done: Mammals, Birds, Reptiles, Amphibians, Fishes and Lampreys (freshwater), Fishes, Lampreys and Hagfishes (brackish), Fishes, Lampreys and Hagfishes (marine), Tunicates, Lancelets, Invertebrates (freshwater), Invertebrates (brackish), Invertebrates (marine), Other Animals (freshwater), Other Animals (brackish), Other Animals (marine), Plants (freshwater), Plants (brackish), Plants (marine), Protozoans and Chromists (freshwater), Protozoans and Chromists (brackish), Protozoans and Chromists (marine), Fungi (freshwater), Fungi (brackish), Fungi (marine), Prokaryotes (freshwater), Prokaryotes (brackish), Prokaryotes (marine).

Risk assessment area

The risk assessment area for which the screening is being done. A limit of 40 characters (including spaces) applies. Text cannot be pasted into this field from the clipboard and neither the ellipsis '…' nor the following characters are allowed: \/:*?"<>| (checking of these requirements is handled automatically by a notification message issued to the Assessor whilst in edit mode).

Assessor

The name of the Assessor carrying out the screening. A limit of 40 characters (including spaces) applies. No pasting from the clipboard and neither the ellipsis '…' nor the following characters are allowed: \/:*?"<>| (checking of these requirements is handled automatically by a notification message issued to the Assessor whilst in edit mode).

Number of replicates

This control allows the Assessor to select the number of replicated screenings in the template. The maximum number is 10,000, which is the maximum number of screenings that an AS-ISK v2 database spreadsheet can include (see *Screening List*). The number of possible replicate templates adjusts automatically depending upon the number of existing screenings (if any) in the *Screening List*.

Help

Clicking this button opens the pdf Help file (AS-ISK_v2_4_Help_Wizard.pdf) for the current dialog. Note that the AS-ISK v2.4 Help files must be located in the same folder as that of the AS-ISK v2.4 program.

Cancel

Clicking this button closes the current dialog. If any changes have been made, then the Assessor is asked whether they want to abandon them.

Save

Clicking this button saves the changes to the current screening and database spreadsheet, and then closes the dialog. Active only if any changes have been made. Note that in case of an empty spreadsheet, the Save as dialog pops up for creating a new spreadsheet (see *Main Screening Workspace – Database – Save As*).

NEW/EDIT

In this dialog, the Assessor provides all necessary details for the screening. There are ten fields in total and their colour is context sensitive:

- *Light red* – Field empty;
- *Light yellow* – Field being edited;
- *Colour scheme* – Information provided.

Fields are grouped into two main sections: *Taxon and Assessor Details* and *Risk Screening Context*.

Taxon and Assessor Details

Category

Required field. It indicates the aquatic organism *Category* for which the screening is being done: Mammals, Birds, Reptiles, Amphibians, Fishes and Lampreys (freshwater), Fishes, Lampreys and Hagfishes (brackish), Fishes, Lampreys and Hagfishes (marine), Tunicates, Lancelets, Invertebrates (freshwater), Invertebrates (brackish), Invertebrates (marine), Other Animals (freshwater), Other Animals (brackish), Other Animals (marine), Plants (freshwater), Plants (brackish), Plants (marine), Protozoans and Chromists (freshwater), Protozoans and Chromists (brackish), Protozoans and Chromists (marine), Fungi (freshwater), Fungi (brackish), Fungi (marine), Prokaryotes (freshwater), Prokaryotes (brackish), Prokaryotes (marine).

Taxon name

Required field. It provides the scientific name of the taxon for which the screening is being done. A limit of 40 characters (including spaces) applies. No pasting from the clipboard and neither the ellipsis '…' nor the characters \/:*?"<>| are allowed (checking of these requirements is handled automatically by a notification message issued to the Assessor whilst in edit mode).

Common name

Required field. It provides the common name of the taxon for which the screening is being done. A limit of 40 characters (including spaces) applies. No pasting from the clipboard and neither the ellipsis '…' nor the characters \/:*?"<>| are allowed (checking of these requirements is handled automatically by a notification message issued to the Assessor whilst in edit mode).

Assessor

Required field. It provides the name of the Assessor carrying out the screening. A limit of 40 characters (including spaces) applies. No pasting from the clipboard and neither the ellipsis '…' nor the characters \/:*?"<>| are allowed (checking of these requirements is handled automatically by a notification message issued to the Assessor whilst in edit mode).

Risk screening context

Reason and socio-economic benefits

Optional (though recommended) field. It provides the reason and socio-economic benefits for carrying out the screening. Pasting (ctrl + V or by drag-and-drop) from the clipboard is allowed, although a limit of 10,000 characters (including spaces) applies.

Risk assessment area

Required field. It provides the name of the risk assessment area for which the screening is being done. A limit of 40 characters (including spaces) applies. No pasting from the clipboard and neither the ellipsis '…' nor the characters \/:*?"<>| are allowed (checking of these requirements is handled automatically by a notification message issued to the Assessor whilst in edit mode).

Taxonomy

Optional (though recommended) field. It provides a description of the taxonomy of the organism for which the screening is being done. Pasting (ctrl + V or by drag-and-drop) from the clipboard is allowed, although a limit of 10,000 characters (including spaces) applies.

Native range

Optional (though recommended) field. It provides a description of the native range of the taxon for which the screening is being done. Pasting (ctrl + V or by drag-and-drop) from the clipboard is allowed, although a limit of 10,000 characters (including spaces) applies.

Introduced range

Optional (though recommended) field. It provides a description of the introduced range of the taxon for which the screening is being done. Pasting (ctrl + V or by drag-and-drop) from the clipboard is allowed, although a limit of 10,000 characters (including spaces) applies.

URL

Optional field. It provides the web address for the page where external information sources can be retrieved. If the Assessor omits the prefix from the URL, this is automatically added by AS-ISK v2.4 after committing the changes. Pasting (ctrl + V or by drag-and-drop) from the clipboard is allowed, although a limit of 10,000 characters (including spaces) applies.

Help

Clicking this button opens the pdf Help file (AS-ISK_v2_4_Help_NewEdit.pdf) for the current dialog. Note that the AS-ISK v2.4 Help files must be located in the same folder as that of the AS-ISK v2.4 program.

Cancel

Clicking this button closes the current dialog. If any changes have been made, then the Assessor is asked whether they want to abandon them.

Save

Clicking this button saves the changes to the current screening and database spreadsheet, and then closes the dialog. Active only if any changes have been made.

REPLICATE

This dialog allows the Assessor to replicate a screening selected from the *Screening List* in the *Main Screening Workspace*. This option is useful when e.g. initiating one or more screenings for multiple taxa relative to the risk assessment area and/or done by the same Assessor.

Fields to replicate

These are nine fields in total whose details can be replicated: *Taxon name*, *Common name*, *Assessor*, *Reason and socio-economic benefits*, *Risk assessment area*, *Taxonomy*, *Native range*, *Introduced range* and *URL*. At least one field marked by an asterisk (*) must be included for replication of the selected screening from the *Screening List* to be possible. Notably, the *Category* field is always included in the replicated screening. In case of selection of all required fields (i.e. *Taxon name*, *Common name*, *Assessor* and *Risk assessment area*), only one replicate screening is allowed to avoid duplication of entries. The entry for any of the required fields not included in the replicated screening will include the ellipsis "…". If a field is selected (checked), the corresponding label is highlighted in light yellow.

Number of replicates

This control allows the Assessor to select the number of replicates for the selected screening from the *Screening List*. The maximum number of possible replicates is 9999 (i.e. given the maximum number of 10,000 screenings that an AS-ISK v2 database spreadsheet can include: see *Screening List*). The number of possible replicates adjusts automatically depending upon the number of existing screenings. This control displays in light red when no replicates are indicated, and in light yellow otherwise. In case of selection of all required fields (i.e. *Taxon name*, *Common name*, *Assessor* and *Risk assessment area*), the number of replicates defaults to 1 (if any another value was previously chosen).

Help

Clicking this button opens the pdf Help file (AS-ISK_v2_4_Help_Replicate.pdf) for the current dialog. Note that the AS-ISK v2.4 Help files must be located in the same folder as that of the AS-ISK v2.4 program.

Cancel

Clicking this button closes the current dialog without performing any replication.

Save

Clicking this button generates the replicates according to the Assessor's selection, saves the changes to the current screening and database spreadsheet, and then closes the dialog. An information message is issued upon completion. Active only if at least one of the *Fields to replicate* has been selected and the *Number of replicates* has been indicated.

Q&A

In this dialog, the Assessor carries out the screening for the taxon selected from the *Screening List* in the *Main Screening Workspace*. At the top of the dialog (title), details are provided of the *Taxon name* and *Assessor* together with the Section and Category of the corresponding Q. In total, 55 Qs must be answered for a screening to be completed, even though there is no answering order imposed upon the Assessor. Thus, the Assessor can elect to answer any of the 55 Qs in any order of choice and resume their screening at any time, hence completing the Qs later. However, the only constraint imposed on the Assessor is that they must complete for any Q the information relative to *Response*, *Confidence* and *Justification* before they can move on to the next Q.

In this dialog, three scenarios are possible that will affect the colour of the *Response*, *Confidence*, and *Justification* fields:

1. *Empty Q* – Fields display in light red;
2. *Completed Q* – Fields display in the colour scheme of choice;
3. *Edit mode* – Fields display in light yellow.

For a question to be in edit mode, the Assessor must be in the process of selecting an option from the *Response* or *Confidence* drop-downs or must be editing the *Justification* field. Also, whilst in edit mode, if either a *Response* or level of *Confidence* has not been specified or the *Justification* field is empty (or including only trailing spaces), then both *Navigation* and the *Save* button of the screening are disabled.

The Assessor, typically a recognised expert, is required to respond to a sequence of questions, with each answer accompanied by appropriate bibliographic justification or other information (e.g. use of expert opinion) to justify the *Response* and by a ranking (from the Assessor) of his/her level of *Confidence* regarding that *Response*. The *Confidence* rankings used are those recommended by the International Programme on Climate Change (IPCC 2005): 'Low', 'Medium', 'High', 'Very high' (see also Copp et al. 2008). These modules can also be used in stand-alone mode, and they could easily be adapted for incorporation into the web-based (electronic) risk modules currently being developed by the European Plant Protection Organisation (e.g. EPPO 2007).

A selection of *Response* options is provided with each Q, and each *Response* must be accompanied by a *Confidence* ranking (i.e. measuring the Assessor's level of *Confidence* in his/her *Response*). Each *Response* option is associated with a numerical score. This is based on the *Confidence* rankings suggested by the IPCC (2005), although the lowest *Confidence* ranking has not been used due to the lack of statistical reliability associated with it (J. Holt & J. Mumford, personal communication).

Modified IPCC scoring system used for *Confidence*:

1 – Low

2 – Medium

3 – High

4 – Very high

(Question and details)

In this field, the text for the current Q is provided. The caption to this field indicates whether the current Q is part of the Basic Risk Assessment (i.e. Qs 1–49) or Climate Change Assessment (i.e. Qs 50–55) groups. Indication is also provided of the Q number out of the total (55) Qs.

Question (Q) guidance

In this field, the text for the current Q guidance is provided.

Response

From this drop-down, the Assessor selects the type of *Response* applicable to the current Q. This control displays in the *Colour scheme* of choice in case of a complete Q, in light red in case of an unanswered Q, and in light yellow if in edit mode.

Confidence

From this drop-down control, the Assessor selects the level of *Confidence* applicable to the current Q. This control displays in the *Colour scheme* of choice in case of a complete Q, in light red in case of an unanswered Q, and in light yellow if in edit mode.

-ISK Question compatibility

This field only appears in case of a screening being done for one of the categories of aquatic organisms for which an -ISK toolkit was developed (i.e. Fishes and Lampreys (freshwater): FISK v1 and v2, S-FISK; Amphibians: Amph-ISK; Invertebrates (freshwater): FI-ISK; Fishes and Lampreys (marine): MFISK; Invertebrates (marine): MI-ISK) and applies only to the BRA Qs (i.e. 1–49). The purpose of this field is to provide guidance to the Assessor involved in a re- screening of a taxon previously evaluated under -ISK and now in the AS-ISK (see *Start – -ISK (tab) – Import*). Given the lack of 100% backward compatibility between the 49 BRA Qs of -ISK and those of the AS-ISK, in this field information is provided on the level of similarity or lack thereof as follows:

- *Near identical* – The AS-ISK Q text has remained almost identical to the -ISK one. The field displays in the colour scheme of choice;
- *Similar* – The AS-ISK Q is only similar to the -ISK one. The field displays in light yellow;
- *Different* – The AS-ISK Q is different to the -ISK one. The field displays in red.

In addition, for the *Near identical* and *Similar* Qs the -ISK Q number is provided in parentheses (#).

Help

Clicking this button opens the Help file (AS-ISK_v2_4_Help_QA.pdf) for the current dialog. Note that the AS-ISK v2.4 Help files must be located in the same folder as that of the AS-ISK v2.4 program.

Justification (reference and/or other information)

In this field, the Assessor must provide any bibliographic references and/or other information in support to the selection of the Q-related *Response* and *Confidence*. This control displays in the colour scheme of choice in case of a complete Q, in light red in case of an unanswered Q, and in light yellow if in Edit mode. Notably, a string of trailing spaces in this field is considered to be the same as a blank entry Pasting (ctrl + V or by drag-and-drop) from the clipboard into this field is allowed, although a limit of 10,000 characters (including spaces) applies.

Go to Question…

This drop-down allows fast navigation to any of the Qs in the screening.

Navigation

The navigation buttons in this section are all disabled in case of an incomplete Q whilst in edit mode.

First

Clicking this button takes to the first Q (Q1) in the screening. Disabled if at Q1.

Previous

Clicking this button takes to the previous Q in the screening. Disabled if at Q1.

Next

Clicking this button takes to the next Q in the screening. Disabled if at Q55.

Last

Clicking this button takes to the last Q (Q55) in the screening. Disabled if at Q55.

Screening

Clear Q Fields

In case of a complete Q, clicking this button will clear all corresponding *Response*, *Confidence* and *Justification* fields for the current Q. Disabled if current Q unanswered. A message asks the Assessor whether they want to proceed.

Clear Screening

Clicking this button will clear all *Response*, *Confidence* and *Justification* fields for all (answered) Qs in the screening. Disabled in case of an entirely blank screening (i.e. no answered Qs). A message asks the Assessor whether they want to proceed.

Cancel

Clicking this button abandons any changes made to any Qs in the screening. In case of any changes to the screening, a message asks the Assessor whether they want to proceed.

Save

Clicking this button saves the changes to the current screening and database spreadsheet, and then closes the dialog.

Answered Questions

This field lists the answered Qs in the screening as identified by their corresponding number. Light red in case of an incomplete screening (i.e. not all 55 Qs answered).

Unanswered Questions

This field lists the unanswered Qs in the screening as identified by their corresponding number. Light red in case of an incomplete screening (i.e. not all 55 Qs answered).

Not applicable Questions

This field lists the Qs in the screening answered as 'Not applicable' as identified by their corresponding number. Notably, in any screening no more than 5 Qs can be answered as 'Not applicable'. Also, should the Assessor not regard the Climate Change Qs (50–55) of relevance to the risk assessment area, then these questions can be answered each with 'No change' (this will result in a BRA+CCA score and corresponding BRA+CCA outcome identical to the BRA score and BRA outcome for that screening after setting corresponding thresholds). Light red in case of an incomplete screening (i.e. not all 55 Qs answered).

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