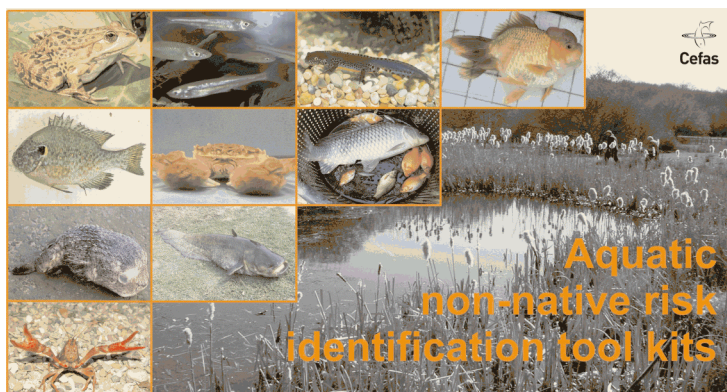


Decision support tools

Invasive species identification kits

Background and guidance in the use of these tools for identifying potentially invasive non-native species of marine and freshwater species: fish, invertebrates, amphibians



Adaptations of the Pheloung, Williams & Halloy (1999) Weed Risk Assessment tool kit.

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The electronic tool kits made available on this page for free download are Crown Copyright (2007-2008). As such, these are 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.

These tool kits were developed by Cefas, with new VisualBasic and computational programming by Lorenzo Vilizzi, David Cooper, Andy South and Gordon H. Copp, based on VisualBasic code in the original Weed Risk Assessment (WRA) tool kit of P.C. Pheloung, P.A. Williams & S.R. Halloy (1999).
<http://www.daff.gov.au/ba/reviews/weeds/system>

We are grateful to Pheloung et al. (1999) for providing an open version of the original WRA as well as for their permission to adapt the original code for the tool kits made available here:

- * [FISK - Freshwater Fish Invasiveness Scoring Kit \(v1.19 Calibrated\) \[Excel, 1.71 MB\]](#)
- * [S-FISK - Spanish language version of FISK \(v1.19 Calibrated\) \[Excel, 1.71 MB\]](#)
- * [MFISK - Marine Fish Invasiveness Scoring Kit \(v1.19\) \[Excel, 1.64 MB\]](#)
- * [MI-ISK - Marine Invertebrate Invasiveness Scoring Kit \(v1.19\) \[Excel, 1.71 MB\]](#)
- * [FI-ISK - Freshwater Invertebrate Invasiveness Scoring Kit \(v1.19 Calibrated\) \[Excel, 1.66 MB\]](#)
- * [AmphISK - Amphibian Invasiveness Scoring Kit \(v1.19\) \[Excel, 1.65 MB\]](#)

Historical background

FISK was originally adapted from the WRA during the development of a two-part risk analysis scheme for non-native freshwater fishes in the UK (see Copp et al. 2005a, 2005b). Funded by Defra contract no. SF0238, this scheme consisted of a risk identification protocol (FISK, adapted from the WRA) and a risk assessment protocol adapted from European Plant Protection Organisation standards PK5/1-4 (EPPO, 2000). Subsequently, FISK was incorporated into the GB non-native risk assessment scheme as a tool for identifying potentially invasive species ([Baker et al. 2008](#)).

As part of a contract to develop the GB scheme, FISK was adapted for marine fish, marine invertebrates and amphibians. These initial versions were all still nested within the original WRA package. The original WRA code was re-drafted to create the current versions of FISK and its 'sister' tool kits as contributions to a variety of research contracts:

- UK Defra contract SF0248 on non-native fish species (Contract Leader: Prof. Gordon H. Copp, Cefas)
- EC project 'IMPASSE' on the use of alien species in Aquaculture (Contract Leader: Prof. Ian G. Cowx, HIFI, Hull), <http://www.hull.ac.uk/hifi/IMPASSE/>
- Scottish Executive contract to finalize the GB Non-native Species Risk Assessment Scheme (Contract Leader: Prof. John Mumford, Imperial College, London).

Toolkit overview

The questions in these tool kits were adapted from the Pheloung et al. (1999) original by Cefas with contributions from the persons indicated below:

FISK: Gordon H. Copp (Cefas), Rachel Garthwaite (formerly Cefas, now the Royal Society, London) & Rodolphe E. Gozlan (University of Bournemouth, England).

S-FISK: As above for FISK, with the translation of FISK text elements into Spanish language by Roberto Mendoza (Universidad Autónoma de Nuevo Leon, Mexico).

MFISK: Jim Ellis (Cefas) & Gordon H. Copp (Cefas).

MI-ISK: Jim Ellis (Cefas), Anna Occhipinti (UNIPV, Pavia, Italy), Dario Savini (UNIPV, Pavia, Italy) & Gordon H. Copp (Cefas).

FI-ISK: Elena Tricarico (UNIFI, Florence, Italy), Francesca Gherardi (UNIFI, Florence, Italy) & Gordon H. Copp (Cefas).

AmphISK: Matthew Ellis (CCW, Mold, Wales), Liz Howe (CCW, Bangor, Wales) & Gordon H. Copp (Cefas).

The finalisation of these tool kits benefited from comments and suggestions received from a number of individuals besides those mentioned above, including: Becky Cudmore (DFO, Canada), Gemma Fenwick (formerly of Cefas), Michael J. Godard (Cefas), Stephan Gollasch (GoConsult, Germany), Vladimír Kováč (Comenius University, Slovakia), Nick Mandrak (DFO, Canada) and Hugo Verreycken (INBO, Belgium). Apologies to anyone whose name has been overlooked.

The front menu was designed by Irene Gooch (Cefas) using photos kindly provided by:

- Background - Gordon H. Copp

- Photos from left to right:

-Upper row: The Herpetological Conservation Trust (HCT, UK), Rodolphe E. Gozlan (University of Bournemouth, UK), The HCT (UK), Gordon H. Copp (Cefas);

-2nd row: Gordon H. Copp (Cefas), Riccardo Innocenti (UNIFI, Florence, Italy), Gordon H. Copp (Cefas);

-3rd row: Jim Ellis (Cefas), Luis Zamora (University of Girona, Spain); 4th row: Riccardo Innocenti (UNIFI, Florence, Italy).

Toolkit description

The tool kits are designed to be as self-explanatory as possible. The main menu has four main options:

Using the Toolkits:

- Run Assessment - this button starts the risk identification assessment. The assessor is offered the opportunity to create a new record (i.e. start a new species) or to re-visit a previously saved assessment. The assessor must give a Latin name, common name (or 'n/a' when a common does not exist), and their name. The details of the assessment procedure are described further below.

- Sort Species List - click this button and the database of assessments will be sorted in alphabetical order by Latin name (first by Genus name and then by species name).

Advanced Functions:

- Unprotect - this button (password protected) is for accessing the internal workings (programming) of the tool kit.

- Export Data - click this button to output your database of species assessments as an Excel file.

Toolkit Help:

Click any of the buttons ('Overview', 'Scoring', 'Exporting Data', 'Credits') to obtain the relevant information. The secondary menu allows the user to move between these four help screens.

Exit Excel:

- Save and Close - click this button to save changes you have made and close Excel.
- Close No Save - click this button to close Excel without saving changes.

Undertaking a risk identification assessment

The risk identification tool kits consist of six worksheets, which are linked through VisualBasic programming. Access to these worksheets is password protected. The general user is able to sort and output the database of assessments they create.

Clicking the "Run Assessment" button allows the user to select an existing species or to create a new entry.

The user is presented sequentially with 49 questions in sequential 'question menus'. In each of the 49 question menus, the assessor must:

- 1) answer the question (yes, no, don't know),
- 2) provide a confidence level for that response (very uncertain, mostly uncertain, mostly certain, very certain)
- 3) provide a justification for that response (i.e. bibliographic source, background information, etc.).

Constraints when moving forward or backward through the question menus:

With any given question menu, a consistent response is required for the assessor to proceed to the next question menu. In other words, all three queries (question, certainty, justification) must answered (or all three left unanswered) for the assessor to proceed to the next (or back to the previous) question menu.

A question is counted as unanswered if any of these items is not completed.

Better to have the section on scoring in here prior to discussing how scores are used?

The responses and scores are stored to the workbook 'database' as the assessor moves through the question menus. From the responses, a numerical score is calculated using the following threshold levels:

For FISK, which has been calibrated (see Copp et al. 2009): accept (scores < 0 = low risk), evaluate (1-18 = medium risk), or reject (≥ 19 = high risk).

For FI-ISK, which has been calibrated (Tricarico et al. 2009): accept (scores < 0 = low risk), evaluate (1-15 = medium risk), or reject (≥ 16 = high risk).

For MFISK, MI-ISK and AmphISK, which have not yet been calibrated, the original score thresholds of Pheloung et al. (1999) are used pending calibration: accept (scores < 0 = low risk), evaluate (1-6 = medium risk), or reject (> 6 = high risk).

These thresholds can be modified by the authors 'on request' once calibration and validation has been undertaken and the relevant documentation is provided.

The certainty response is only stored if both the question response and justification are completed. A question is counted as unanswered if any of these items is not completed - in such a case, a default (precautionary) score is given (i.e. the highest possible value).

The tool kit compiles all of the responses for a species in one data line (row) and these 'assessment reports', i.e. the database of assessments, can be organised alphabetically by Genus/species name ('Sort Species List' button). The database can be exported ('Export' button) as a new Excel workbook. The new workbook is only retained if the user selects 'Save and Close', and the user will be prompted to provide the workbook with a file name.

Existing entries may be exported or amended - in the latter case, the assessor can approach the questions from either end (Q1 or Q49) by using the fast advance (>>) button.

Note that changes to the database (i.e. new entries, changes to existing entries) are not saved until the assessor leaves the Excel using the 'Save and Close' button.

Scoring

The responses are translated into a numerical score, with positive values (1 or 2) allocated to reflect an elevated risk, a zero given to reflect intermediate risk, and a negative value (-1) given to reflect low or negligible risk. The scoring table is defined in the yellow columns under the heading 'Response' and the values are the same as those given in Pheloung et al. (1999), with deviations thereof described in [Copp et al. \(2005a\)](#).

The 'climate' and 'invasive elsewhere' sections generate a score using a weighting system: a better climate match decreases the climate weight (because of the increased certainty of a reliable climate matching assessment) and a poorer quality of match increases the weight (because of the greater uncertainty associated with the climate matching assessment, and thus the increase in potential risk).

The species elsewhere responses, as defined in the Response column, are multiplied by the climate weight to generate the final score for each question.

The total score is compared to the critical values in the threshold levels to determine the outcome. These values can be modified by the toolkit authors upon request.

In addition to the score, the number of questions answered in each section is tallied. More information is required if the minimum criteria in the 'Questions answered' table

are not met: The minimum numbers of questions required per section are (as per Pheloung et al. 1999):

Biogeography = 2, Undesirable attributes = 2, Biology/Ecology = 6

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