

Wildlife transfer database: user guidance Version 1.6

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Purpose

The purpose of the database is to provide parameter values for use in environmental radiological assessments to estimate the transfer of radioactivity to non-human biota (i.e. 'wildlife'). The database has been initiated to aid both: (i) the International Atomic Energy Agency (IAEA) in the production of a handbook on non-human biota transfer parameters (to be published as an IAEA Technical Report Series); and (ii) the derivation of transfer parameter values for the International Commission on Radiological Protection (ICRP) list of *Reference Animals and Plants* (RAPs). The database is being compiled in collaboration with the International Union of Radioecologists (IUR) and it is hoped that it will provide a future and evolving source of up to date information to those conducting assessments and developing/maintaining models. All contributors to the database will be acknowledged in the IAEA Technical Report Series publication (final draft due early 2010).

The focus of the database is the compilation of biota-media concentration ratio values as this is the parameter most often used in the currently available assessment models. The database has been initially populated with the databases from the ERICA Tool¹.

Unless specified otherwise the database is for adult life stages (see **life stage** below).

The database can be accessed from the following web address:

<http://www.wildlifetransferdatabase.org>. The database is **not** intended for contributors to record values from review publications (i.e. previously 'recommended' values).

This document provides guidance on how to use the database and also a short summary of the transfer parameters being collated and their methods of derivation. These can be accessed via the hyperlinks below:

[Guidance on using the database](#)

[Transfer parameter: definition and methodology](#)

PLEASE read the short text on definition and methodology **BEFORE** entering data.

If you have data which you think would be useful to enter into the database but do not want to enter it yourself please contact: nab@ceh.ac.uk

Questions and answers – as people start to use the database we are receiving requests for advice with regard to, for instance, data manipulation and for points of clarification. Those queries and our subsequent responses may be of use to other people can be accessed via the following hyper-link: [Questions and answers](#).

¹See: (i) N.A. Beresford, C.L. Barnett, B.J. Howard, W.A. Scott, J.E. Brown & D. Copplestone. 2008. Derivation of transfer parameters for use within the ERICA Tool and the default concentration ratios for terrestrial biota. *J. Environ. Radioact.*, 99, 1393-1407; (ii) A. Hosseini, H. Thørring, J.E. Brown, R. Saxen, & E. Ilus. 2008. Transfer of radionuclides in aquatic ecosystems – Default concentration ratios for aquatic biota in the Erica Tool. *J. Environ. Radioact.*, 99, 1408-1429.

Guidance on using the database

Click hyperlink below to access appropriate section of guidance.

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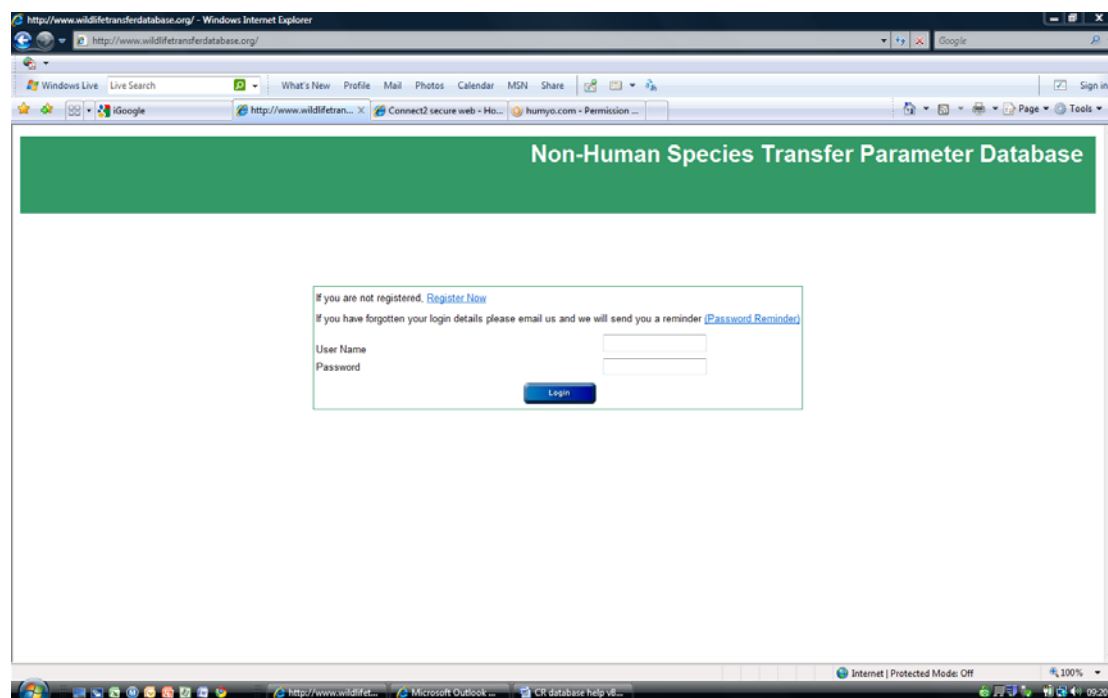
[Notes](#)

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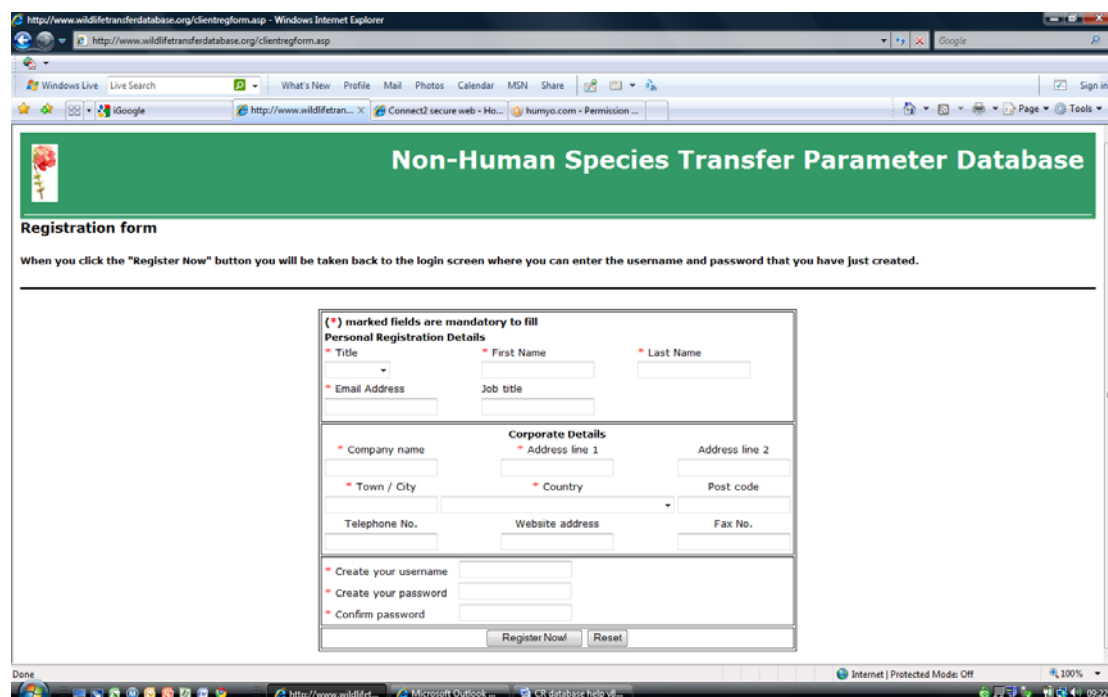
PLEASE NOTE that the database cannot be used using the Mozilla Firefox web-browser you may also experience problems if using an Apple Mac.

Registration and login

When accessing the database (<http://www.wildlifetransferdatabase.org>) for the first time you will need to register. On the **login** screen (see below) select **Register Now**.



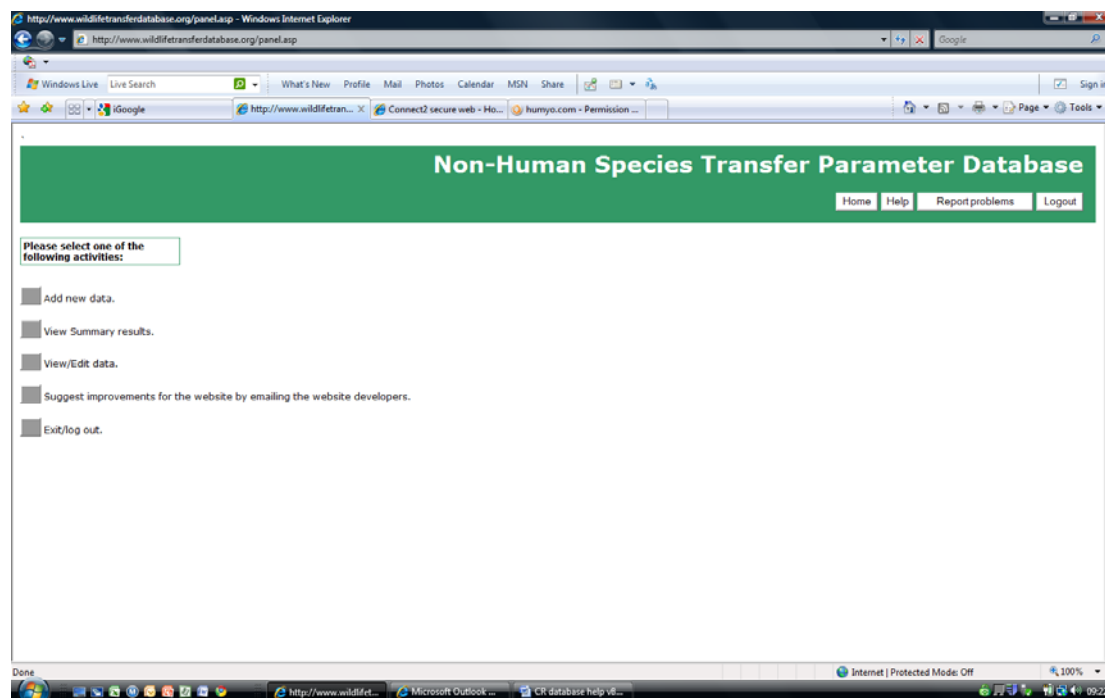
The following **registration form** will then appear:



Fields marked with a star are mandatory. You are able to choose your own username and password. Once the form has been completed press the **Register Now** button. You will then be taken back to the login screen where you can enter the user name and password that you have created.

If you subsequently forget your password select **Password Reminder** from the login screen, follow the instructions given and you will be sent a reminder email to your registered email address.

Once logged on you are taken to the following [main menu](#) screen:



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Database Navigation

You will also notice that every screen within the database has the following four buttons in the top right hand corner: **Home**, **Report Problems**, **Help** and **Logout**:

The **Home** button always takes you to the [main menu](#) screen

The **Help** button will open this guidance document

The **Report Problems** button will open an email for you to complete a description of the problem that you have encountered which will then be sent to one of the database managers for a response

The **Logout** button returns you to the [login](#) screen

Typing the first letter of (for example) publication title or radionuclide in a **drop down list** will scroll you down the list to the start of selections with that letter.

Text entry boxes – you can copy and paste into text box entries from MSWord files. This may be useful for completing reference details and notes.

NOTE – There is an automated logout on the website if activity is not detected for 30 minutes.

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Main menu

The **main menu** screen provides you with the following options:

[Add new data](#)

[View summary results](#)

[View/edit data](#)

Information on each of these options can be accessed by selecting the hyperlinks above.

Add new data

NOTE If you want to evaluate the effect of adding your data then you need to view and print the summary before adding. Once you have added your data the summary will include your data. Select **View Summary Results** from the **main menu** screen to access summary information and see the effect of adding your data to the database.

Selecting **add new data** will open the **data entry screen** enabling you to enter details of your data into the database.

The top of the screen enables you to enter reference details. There is also a link to **send paper and other relevant information electronically**; selecting the link will open an email to which you can attach a pdf of the paper or report. Sending your publication may help us in fully exploiting the database and also with quality control. We would therefore appreciate you sending it to us if possible. Any other relevant information may include a photograph of the species you have entered data for (e.g. if you are unsure of the Latin name).

The **Reference ID Number** is assigned automatically; you may want to make a note of this number in case you want to view your submissions at a later date.

IMPORTANT

The database already contains a number of journal titles which can be view from by selecting the drop down arrow on the **Publication title** box. If you need to add a new journal title please do so **BEFORE** completing other entries.

Selecting the add button opens a window were you can write the new journal title. Once added close the small window and select the **F5 key**. Your new title will now be available from the drop down menu.

Similarly any additional **Language** should be added, using a similar window, prior to completing other entries.

Selecting **F5** refreshes the screen and makes the new publication or language information available BUT will result in the loss of any data that you have entered if new journal titles and or language are not entered first.

Before entering data you can determine if it is already in the database by typing the first authors surname into the **Author** box and then selecting the magnifying glass (in cases of translated articles you may want to check both author and title).

Note if the media and biota data are from different publications enter the information for biota into this screen and record the reference details for the location of the media information within the [Notes section](#).

The screenshot shows a web browser window displaying the 'Non-Human Species Transfer Parameter Database' form. The form is titled 'Add a new record:' and includes a link 'Send paper electronically'. The form fields are as follows:

| | | | |
|---------------------|--------------------|------------------------------------|------------|
| Reference ID Number | 3_95652 | Year | |
| Author | | Article Title | |
| Publication type | Abstract | Location | Electronic |
| Publication title | Aquatic Toxicology | Part | |
| Volume | | Translation into English available | N/A |
| Page Nos | | | |
| Reference Language | English | | |

The formats for entering reference information are as follows:

Year

Format as: 2000 Note that this is a prescribed format and can not be altered

Author

Single author: MERTZ, W.

Multiple authors: GALERIU, D., MELINTESCU, A., BERESFORD, N.A.,
CROUT, N.M.J., PETERSON, R.H.T.

Article Title

Paper – Estimating radionuclide transfer to wild species-data requirements and availability for terrestrial ecosystems

Book/report - A graded approach for evaluating radiation doses to aquatic and terrestrial biota, U.S. Department of Energy, Washington D.C.

Book chapter – "Physiological and biochemical aspects of the accumulation of contaminant radionuclides in milk", Lactation: a comprehensive treatise. Nutrition and biochemistry of milk/maintenance, Volume 3, (Larson, B.L., Smith, V.R., Eds.), Academic Press, London

Proceedings – "The transfer of Cs-137 and Sr-90 to wild animals within the Chernobyl exclusion zone" International Conference on the Protection of the Environment from the effects of Ionizing Radiation (Proc. Conference Stockholm), IAEA, Vienna

Unpublished data – International Radioecology Laboratory, Slavutych, Ukraine

Please use the spelling (e.g. American or English) used by the authors.

Publication type

Please select the type of publication that the reference has been taken from. Where data are unpublished enter **pers. comm.**

Location

Please select whether you have a hard copy or electronic copy of the paper. If electronic please consider sending the database managers a copy. If hard copy, please consider scanning and sending it to the database managers.

Publication title

If adding a new journal title please add full journal name. Remember that any new journal titles should be entered **BEFORE** entering other data into the form.

Volume

Format as: 2

Part

Format as: 20

Page numbers

Format as: 20-100 If citing complete book or report please note the total number of pages in this box.

Language

Please select the language of the original publication (default is English).

Translation into English available

Please select yes if there is an English translation of the publication available.

The lower half of the **data entry screen** enables you to enter the data related to the concentration ratio:

The screenshot shows a web-based data entry form for the wildlife transfer database. The form is organized into several sections with labels on the left and input fields on the right. The top section includes fields for Habitat (Estuarine (terrestrial)), Wildlife Group (Amphibian), Species Common, and Species Latin. Below this are fields for ICRP RAP (Frog), Studytype (Field), and Measurement Date. A Lifestage dropdown is set to 'None', and there is a Notes text area. A 'Dynamic Info (e.g. biological (1/2))' section contains an Element/Nuclide dropdown set to 'Ac'. The middle section has Media Type, Media wet/dry, Media conc, and Media units (Bq/m3) fields, along with N for media and SD for media. The bottom section has Tissue type (Wholebody), Status of biota (Wet), Biota conc, and Biota units (Bq/kg) fields, along with N for biota and SD for biota. At the very bottom, there are fields for Concentration Ratio, N of CR, and SD of CR. 'Add All' and 'Add Mid' buttons are located at the bottom left of the form area.

Habitat

Select the appropriate habitat from the drop down list. The database was originally built around those from the ERICA Tool which has three generic habitats: Terrestrial, Freshwater and Marine. Two habitats have been added Estuarine (water) and Estuarine (terrestrial). The drop down list also contains a wider selection of sub-ecosystem options to enable you to categorise your data more precisely ([see table below](#)). However please note that data will only be summarised (by selecting [View summary results](#) from the [main menu](#) screen) by the Terrestrial, Freshwater, Marine and two Estuarine habitats. As the database develops summarisation by the more specific habitat types may become available but this will be determined based upon the quantity of good quality data that has been entered.

Habitats

| Habitat | Definition |
|--------------------------------------|---|
| Terrestrial | Generic ecosystem including data from all terrestrial ecosystem types (with the exception of estuarine systems) |
| Terrestrial – semi-natural grassland | Includes: mountain and upland grasslands, heath and shrub lands, and some Arctic ecosystems |
| Terrestrial - forest | Land with tree crown cover of more than 10 % over an area of more than 0.5 ha and with trees, which are able to reach a minimum <i>in situ</i> height of 5 m at maturity |
| Terrestrial – agricultural grassland | Managed grasslands |
| Terrestrial – coastal sand dunes | Coastal sand dunes (<u>not to include marine organisms</u>) |
| Terrestrial - wetland | Marsh, fen, peatland (<u>not estuarine saltmarshes</u>) |
| Freshwater | Generic ecosystem including data from all freshwater ecosystem types |
| Freshwater - flowing | Rivers and streams |
| Freshwater - lake | Lakes and other static water bodies |
| Marine | Generic ecosystem including data from all marine ecosystem types |
| Marine - coastal | Water of less than 100 m or within 3 km off the coast (not estuaries) |
| Marine – open water | Water of greater than 100 m depth or more than 3 km from the coast |
| Estuarine (water) | For samples taken from the waters of estuarine ecosystems. Data for <u>brackish water ecosystems</u> should also be added to this category. |
| Estuarine (terrestrial) | For samples taken from the ‘terrestrial’ components of estuarine ecosystems (including saltmarshes and mud flats, but <u>not coastal sand dunes</u>) |

Wildlife group

Select the appropriate wildlife group from the drop down list. The drop down list contains all the ERICA Tool reference organisms which were selected to encompass European protected species. The drop down option gives a wider

wildlife group listing than the ERICA Tool reference organism to both (i) represent potential organisms of interest worldwide; (ii) allow a less generic categorisation. The wildlife groups available are presented in the tables below categorised by generic habitat. Note that currently data will only be summarised (by selecting [View summary results](#) from the [main menu](#) screen) according to the higher level reference organism listing. As the database develops summarisation by the more specific wildlife group may become available if the data entered justifies it. Only those wildlife groups applicable to the selected habitat appear in the drop down list.

Freshwater wildlife group list and relationship to ICRP RAPs

| Broad group | Available subcategories | Potential appropriate ICRP RAP |
|----------------------------|-------------------------------------|---------------------------------------|
| Amphibian | - | Frog |
| Bird | | Duck |
| | Bird - Carnivorous | Duck |
| | Bird - Herbivorous | Duck |
| | Bird - Omnivorous | Duck |
| Crustacean | - | - |
| Fish | | |
| | Fish – benthic feeding ¹ | - |
| | Fish – piscivorous ² | Salmonid |
| | Fish – forage ³ | - |
| Insect | - | - |
| Insect larvae | - | - |
| Mammal | | - |
| Mammal - Carnivorous | - | - |
| Mammal - Herbivorous | - | - |
| Mammal - Omnivorous | - | - |
| Mollusc | | - |
| | Mollusc - Bivalve | - |
| | Mollusc - Gastropod | - |
| Other benthic invertebrate | - | - |
| Phytoplankton | - | - |
| Reptile | - | - |
| Vascular plant | - | Wild Grass |
| Zooplankton | - | - |

¹Fish feeding on benthic dwelling organisms; ²fish consuming smaller fish, amphibians and/or birds; ³fish feeding primary producers and pelagic invertebrates

Terrestrial wildlife group list and relationship to ICRP RAPs

| Broad group | Available subcategories | Potential appropriate ICRP RAP |
|------------------------------|-----------------------------------|--------------------------------|
| Amphibian | - | Frog |
| Arachnids | - | - |
| Bird | | Duck |
| | Bird - Carnivorous | Duck |
| | Bird - Herbivorous | Duck |
| | Bird - Omnivorous | Duck |
| Earthworm | | Earthworm |
| Fern | - | - |
| Flying insect | - | Bee |
| Fungi | | - |
| | Mycorrhizal | - |
| | Parasitic | - |
| | Saprophytic | - |
| Gastropod | - | - |
| Grasses and herbs | | - |
| | Grasses | Wild Grass |
| | Herbs ¹ | - |
| Invertebrate - Detritivorous | - | - |
| Lichens and bryophytes | - | - |
| Mammal | | Rat or Deer |
| | Mammal - Carnivorous | Rat |
| | Mammal - Herbivorous ² | Rat or Deer |
| | Mammal - Omnivorous | Rat |
| | Mammal - Marsupial | - |
| n/a ² | Mammal - Rangifer spp. | - |
| Reptile | - | - |
| | Reptile - Carnivorous | - |
| | Reptile - Herbivorous | - |
| Shrub | - | - |
| Tree | - | - |
| | Tree - Coniferous | Pine Tree |
| | Tree - Deciduous | - |

¹Herb here is used to refer to any non-woody plant which does not fall into one of the other categories. ²n/a as Rangifer spp. (reindeer and caribou) should be entered as Mammal - Rangifer spp..

Marine and Estuarine (water) wildlife groups list and relationship to ICRP RAPs

| Broad group | Available subcategories | Potential appropriate ICRP RAP |
|----------------------------|-------------------------------------|--------------------------------|
| Bird | - | Duck |
| | Bird - Carnivorous | Duck |
| | Bird - Herbivorous | Duck |
| | Bird - Omnivorous | Duck |
| Crustacean | | - |
| | Crustacean - Large | Crab |
| | Crustacean - Small | - |
| Fish | - | |
| | Fish – benthic feeding ¹ | Flatfish |
| | Fish – piscivorous ² | Salmonid |
| | Fish – forage ³ | - |
| Insect | - | - |
| Macroalgae | - | Brown Seaweed |
| Mammal | | - |
| | Mammal - Carnivorous | - |
| | Mammal - Herbivorous | - |
| | Mammal - Planktivorous | - |
| Mollusc | | - |
| | Mollusc - Bivalve | - |
| | Mollusc – Cephalopods ⁴ | - |
| | Mollusc - Gastropod | - |
| Other benthic invertebrate | - | - |
| Phytoplankton | - | - |
| Polychaete worm | - | - |
| Reptile | - | - |
| Sea anemones/true coral | - | - |
| Vascular plant | - | - |
| Zooplankton | - | - |

¹Fish feeding on benthic dwelling organisms; ²fish consuming smaller fish, amphibians and/or birds; ³fish feeding primary producers and pelagic invertebrates; ⁴squid, octopus, cuttlefish etc..

Estuarine (terrestrial) wildlife group list and relationship to ICRP RAPs

| Broad group | Available subcategories | Potential appropriate ICRP RAP |
|------------------------------|-----------------------------------|--------------------------------|
| Amphibian | - | Frog |
| Annelids | - | Earthworm |
| Arachnids | - | - |
| Bird | | Duck |
| | Bird - Carnivorous | Duck |
| | Bird - Herbivorous | Duck |
| | Bird - Omnivorous | Duck |
| Crustacean | | - |
| | Crustacean - Large | Crab |
| | Crustacean - Small | - |
| Flying insect | - | Bee |
| Grasses and herbs | | - |
| | Grasses | Wild Grass |
| | Herbs ¹ | - |
| Invertebrate - Detritivorous | - | - |
| Mammal | | Rat or Deer |
| | Mammal - Carnivorous | Rat |
| | Mammal - Herbivorous ² | Rat or Deer |
| | Mammal - Omnivorous | Rat |
| Mollusc | | - |
| | Mollusc - Bivalve | - |
| | Mollusc - Gastropod | - |
| Other benthic invertebrate | | - |
| Shrub | - | - |

¹Herb here is used to refer to any non-woody plant which does not fall into one of the other categories.

Species common and Species Latin

Please enter the common name of the species in English and note that this is a mandatory field. Preferably the species name in Latin will also be entered (in full).

ICRP RAP

The list will have been pre-filtered according to habitat and wildlife group selected as outlined in the tables above on the wildlife groups. Attributing an ICRP RAP is not appropriate for all organism types and an option of 'none' is selected where this is the case. Note not all species within a broad group will be applicable to an ICRP RAP (e.g. amphibian includes newts but these do not fall within the ICRP definition of their Frog RAP). For the purposes of collating CR values for the ICRP RAPs on data specifically for those species as listed by the ICRP in the RAP description will be included – please see links in the following table.

Species which can be attributed to an ICRP RAP

| RAP | Habitat | Family | Species* |
|---------------|-------------------------|----------------|---|
| Bee | Terrestrial | Apidea | See http://en.wikipedia.org/wiki/Apidae |
| Brown Seaweed | Marine | Fucaceae | <i>Ascophyllum</i> , <i>Fucus</i> , <i>Hesperophycus</i> , <i>Pelvetia</i> , <i>Pelvetiopsis</i> , <i>Silvetia</i> & <i>Xiphophora species</i> |
| Crab | Marine | Cancridae | See http://en.wikipedia.org/wiki/Cancridae |
| Deer | Terrestrial | Cervidae | See http://en.wikipedia.org/wiki/Cervidae#Subfamilies.2C_genera_and_species |
| Duck | Terrestrial, Freshwater | Anatidae | Ducks (http://en.wikipedia.org/wiki/Duck), geese (<i>Anser</i> spp., <i>Chen</i> spp. & <i>Branta</i> spp.) & swans (<i>Cygnus</i> spp.) |
| Earthworm | Terrestrial | Lumbricidae | See http://en.wikipedia.org/wiki/Lumbricidae |
| Flatfish | Marine | Pleuronectidae | See http://en.wikipedia.org/wiki/Pleuronectidae |
| Frog | Terrestrial, Freshwater | Ranidae | See http://en.wikipedia.org/wiki/Ranidae |
| Pine Tree | Terrestrial | Pinaceae | See http://en.wikipedia.org/wiki/Pinaceae |
| Rat | Terrestrial | Muridae | Old World rats and mice (Murinae), gerbils, jirds and sand rats (Gerbillinae) as well as <i>Leimacomys buettneri</i> , <i>Lophiomys imhausi</i> and the Subfamily Deomyinae |
| Trout | Freshwater, Marine | Salmonidae | Freshwater white fish (Coregoninae), Grayling (<i>Thymallus</i> spp.) and the Subfamily Salmoninae which includes salmon (<i>Salmo</i> spp. & <i>Oncorhynchus</i> spp.) trout (<i>Salmo</i> spp. & <i>Salvelinus</i> spp.) & chars (<i>Salvelinus</i> spp.) |
| Wild Grass | Terrestrial, Freshwater | Poaceae | Grasses (see http://en.wikipedia.org/wiki/List_of_Poaceae_genera) |

*Genus given where a Family is comprised of relatively few Genera; where a Family (or Subfamily) is comprised of many Genera a web-link is provided.

Study type

Options from the drop down list are Field or Laboratory.

Sampling date

Can enter in the format '12/01/2009' or as text such as 'Jan-Feb 1999' or '2000-2001' etc.. Note that data from 1986 following the Chernobyl accident and during the period of peak weapons fallout may be excluded from the summarised data for terrestrial ecosystems when quality controlled (contact nab@ceh.ac.uk if unsure if your data should be entered).

Location

Enter general location description and country where the data being input was generated.

Life stage

This is included to help with the collation of data specifically for the ICRP RAPs. As such the life stages listed are those specified by the ICRP. The list you see will have been pre-filtered on the basis of ICRP RAP you have selected. Note only the data entered for Adult life stage will be included in the summarised data. Where an ICRP RAP is not appropriate data should ONLY be entered for ADULTS (e.g. do not enter reptile egg data).

Notes

This is a text box where you should record any relevant information about your data. The type of information that should be recorded is listed in the [notes](#) section below. Note that information for this section can be written in word and can be copied and pasted into the **Notes** box. Alternatively the information can be copied from existing documents and pasted into the notes section.

Dynamic Info (e.g. biological $\frac{1}{2}$)

This is a text box to record any biological half life information for future evaluation. In addition to half-life values please remember to state the units of time and in the case of multiple half-lives fractions of initial activity lost in each component.

Element/Nuclide

The drop down box contains all nuclides listed within ICRP Publication 38 and stable element list. In some instances your data may be for more than one radioisotope (e.g. $^{134,137}\text{Cs}$ or $^{239,240}\text{Pu}$ activity concentrations may be available) in these instances select the element (i.e. Cs or Pu in the examples given) and not a radioisotope. Use the notes box to record which radioisotopes the data are for.

Media type

Select water or sediment for aquatic ecosystems and soil or air for terrestrial ecosystems.

Media wetdry

This is not a user entry box but rather provides mandatory information linked to **Media type**. Please ensure that your data is of the right type.

Media conc

Enter either the value or arithmetic mean for media concentration. If you have activity concentration data for biota for which the accompanying soil activity concentrations are below limits of detections then enter the media concentration as, for instance **<22**. This will store the data for subsequent evaluation but will not calculate a CR value (you will see the following error appear in the **Concentration Ratio** box: NaN). However, the data will be extracted separately for evaluation.

If your dataset includes both values below and above the limit of detection then if no more than 20% of the values are below the limit of detection estimate a mean whereby a value of 50% of the limit of detection is used for those values below the limits of detection. Please state that you have done this within the [Notes](#) box.

NOTE – Please do not enter data where both the media and biota concentrations are below limits of detection.

Media units

The default units are Bq kg⁻¹, however there are various other options available including Bq m⁻² and those relevant to stable element concentrations. The options available to you are dependent upon the habitat selection. The units will be converted to calculate the CR value given in the **CR box**.

N for media

Enter number of samples contributing to mean media concentration or enter 1.

Media SD

Enter standard deviation of mean media concentration.

Tissue type

Concentration ratio (CR) values will be estimated on the basis of wholebody and entry of biota data expressed as wholebody concentrations is preferable (see [Transfer parameters: definition and methodology](#)). However, recognising that data may only be available for specific tissues, entry as muscle, liver or bone etc is allowed for some vertebrate-radionuclide combinations. If you select a tissue-radionuclide combination for which the database does not have default conversion factors you will be notified of this. Your data will still be stored but we will need to derive a suitable conversion factor in consultation with you. You will see that in the case of trees and shrubs, wood and other plant parts are options under tissue type. Note that the conversion factors will also correct for different dry or ash matter contents if you do not enter as fresh weight. Note that there is an option to enter reproductive tissue data – this is solely for the purpose of collating information for the ICRP review and CR values will not be estimated in the database. Do not enter multiple tissues for a given study with the exception of entering reproductive tissue information in addition to wholebody or one of the other tissues. There are a number of wholebody options on the **Tissue type** drop down menu:

- Wholebody
- Whole body - no gut
- Wholebody - no fur/feathers/shell
- Wholebody - no fur/feathers/shell & no gut

These may be used to help interpret entered data, however, currently when you select [View Summary Results](#) from the [main menu](#) screen no distinction is made between the different selections. It would also be useful if you could use the [Notes](#) box to indicate if samples were washed or not prior to analyses.

PLEASE NOTE the conversion factor calculations are not operational at the moment. Please enter any tissue specific data as this will be stored in the database but the information will give an incorrectly calculated CR value. We will amend the record when the data is quality checked. We hope to have the conversion factor calculations working by the end of June.

Status of biota

Select ash, dry or wet depending upon nature of your data. Wet is the preferred entry as CR values will be estimated on a fresh weight basis. If you have sample specific data to enable conversion of ash or dry weight data to fresh weight then please use this. If not: (i) the hyperlinked [table](#) contains some species specific values you may want to consider using (ii) the database contains some default generic conversion factors (which can also be seen from the hyperlinked [table](#). If you select a tissue-organism combination for which the database does not have default conversion factors you will be notified of this. Your data will still be entered and we will derive a suitable conversion factor in consultation with you.

NOTE the table of conversion factors will be provided at the end of June once all the calculations are working correctly.

Biota conc

Enter a value or arithmetic mean biota concentration. As you enter this (assuming you have already entered the media concentration) a CR value will be estimated in the **Concentration Ratio** box below. If you have activity concentration data for media for which the accompanying biota activity concentrations are below limits of detections then enter the media concentration as, for instance <43. This will store the data for subsequent evaluation but will not calculate a CR value (you will see the following error appear in the **Concentration Ratio** box NaN).

If your dataset includes both values below and above the limit of detection then if no more than 20% of the values are below the limit of detection estimate a mean whereby a value of 50% of the limit of detection is used for those values below the limits of detection. Please state that you have done this within the [Notes](#) box.

NOTE – Please do not enter data where both the media and biota concentrations are below limits of detection.

Biota units

The default units are Bq kg⁻¹, however there are various other options available including those relevant to stable element concentrations.

N for Biota

Enter number of samples contributing to mean biota concentration. This number will be copied down to **N for CR**.

Biota SD

Enter standard deviation of mean biota concentration. As you enter this (assuming you have already entered the media concentration and associated SD) a value will be estimated and appear in the **SD for CR** box below.

Preferably you will enter data for media and biota activity concentrations and concentration ratio (CR) values will be generated automatically. However, you can enter CR values directly into the database if you want. In this case enter values as appropriate into: **Concentration Ratio**, **N for CR** and **SD for CR**. You should not enter CR values if you have already entered media and biota concentration values. **NOTE** – please do not enter tissue specific CR values directly into the database – all entered CR values should be for wholebody.

CR

If you have not entered, or do not have, biota and media activity concentrations then you can enter a CR value directly into the CR box. Please do not enter < limit of detection values in the CR box.

If you want to add more than one data entry for a given reference, you can press **Add Mid** and this will duplicate the information in the reference details section allowing you to enter additional data.

Once completed selected the **Add All** button at the bottom of the screen

View Summary Results

Selecting **View Summary Results** from the Main menu screen enables you to elect the habitat, media and wildlife group (or ICRP RAP) for which you wish to view summarised data for all elements for which data are available. The summary provides weighted arithmetic and geometric means, together with associated standard deviation values, and minimum and maximum values from the database. The latter may represent a mean value rather than an individual measurement.

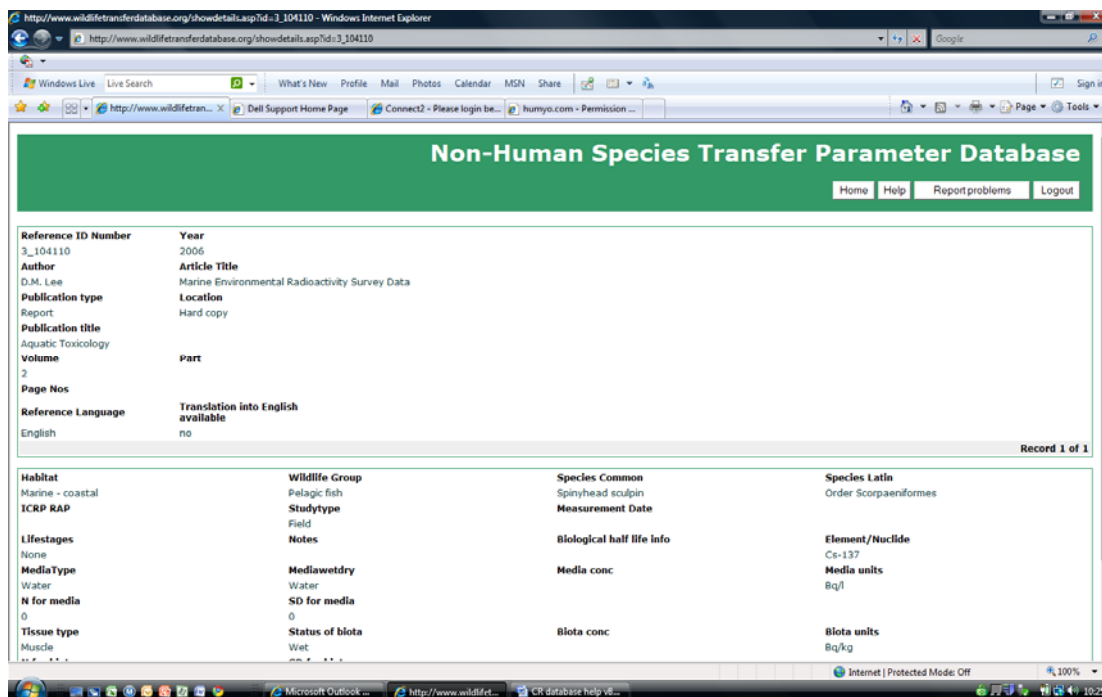
If you select to view the summary after adding your data these will be included in the summary. If you want to evaluate the effect of adding your data then you need to view and print the summary before adding. To print use right click on mouse and select the print option.

Note your data will not be included in the summary as accessed by other users until the entry is approved by the database managers.

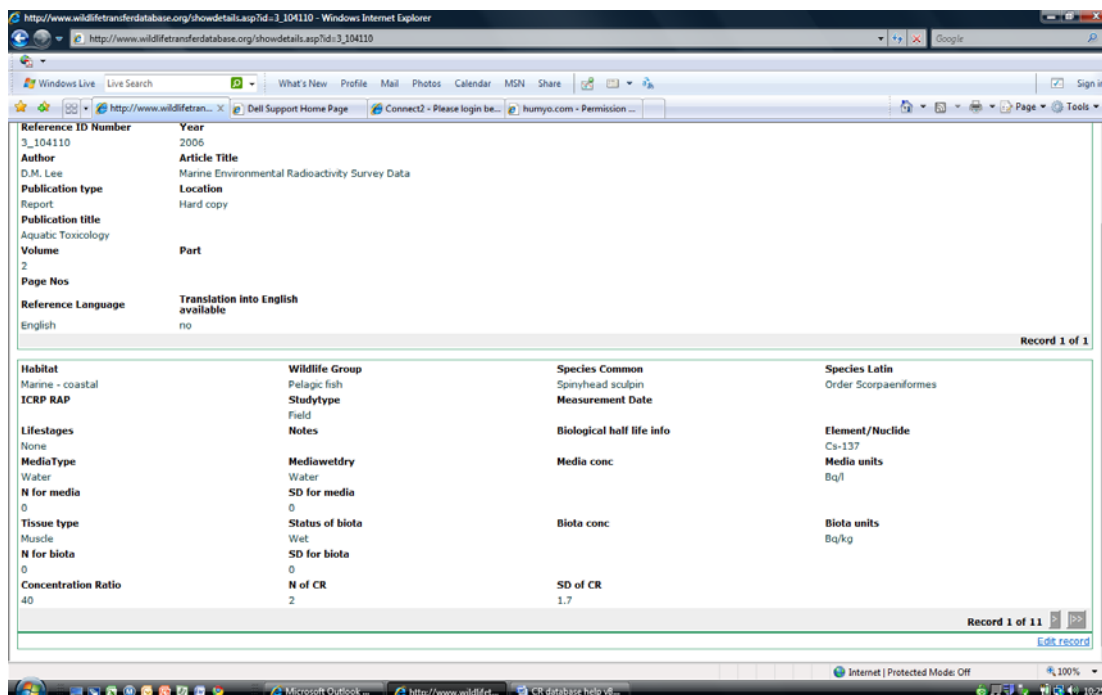
| Element | Arithmetic Mean | Arithmetic Standard Deviation | Geometric Mean | Geometric Standard Deviation | Minimum | Maximum | N |
|---------|-----------------|-------------------------------|----------------|------------------------------|----------|---------|----|
| Am | 0.7625 | 0.42 | 0.9 | 0.22926 | 0.73021 | 1.34203 | 4 |
| Pu | 2.03684 | 2 | 2.7 | 0.985 | 1.83368 | 1.58158 | 19 |
| Sr | 4.11667 | 3 | 4.85 | 1.06692 | 3.98501 | 1.29042 | 6 |
| Cs | 5 | | | | | | 1 |
| Pu | 5.1 | | | | | | 1 |
| Am | 8 | 8 | 8 | 9 | 5.31491 | 2.47033 | 18 |
| Ce | 13.5 | 13.5 | 13.5 | 20.39007 | | | 2 |
| U | 14.5 | 14.5 | 14.5 | 9.75177 | | | 2 |
| Ce | 17 | | | | | | 1 |
| Sr | 18 | 18 | 18 | 8 | 16.44861 | 1.52894 | 3 |
| Tc | 18 | 18 | 18 | 32 | 8.8247 | 3.30025 | 17 |
| Cs | 22.375 | 22 | 24 | 8.48423 | 20.92145 | 1.44271 | 8 |
| Am | 25 | | | | | | 1 |

View/Edit data

This option from the [main menu](#) enables you to review and amend the data you have added to the database up to the point it is accepted by the database managers. Select the reference you want to review from the list which appears when View/Edit data is selected. The following screen will appear allowing you to review the entry. If you need to change anything select from the bottom right hand corner of the screen.



If you do select **Edit record** a screen similar to the **data entry** screen will appear. Edit as required and select **Update**.



Notes

The following is provided to prompt various details of your study which should be recorded in the notes box of the [data entry screen](#). Adapt and complete as appropriate before copying and pasting into the database.

Soil type:

Soil/sediment sampling depth:

Information on speciation:

Soil/sediment organic matter content:

Sediment grain size:

Provide details about contamination (e.g. source(s)):

Water chemistry:

Reference details for media data if different to biota:

Was biota sample washed: Y/N

Methodology used to collect media/biota samples:

Transfer parameters: definition and methodology

To provide information relevant to the majority of models currently being applied transfer is described by simple equilibrium concentration ratios (CR), where for terrestrial ecosystems:

$$CR = \frac{\text{Activity concentration in biota whole body (Bq kg}^{-1} \text{ fresh weight)}}{\text{Activity concentration in soil (Bq kg}^{-1} \text{ dry weight)}}$$

Exceptions common to a number of approaches are for chronic atmospheric releases of ^3H and ^{14}C (and in some approaches radioisotopes of P and ^{35}S) where:

$$CR = \frac{\text{Activity concentration in biota whole body (Bq kg}^{-1} \text{ fresh weight)}}{\text{Activity concentration in air (Bq m}^{-3} \text{)}}$$

For aquatic ecosystems:

$$CR = \frac{\text{Activity concentration in biota whole body (Bq kg}^{-1} \text{ fresh weight)}}{\text{Activity concentration in filtered water (Bq l}^{-1} \text{)}}$$

The database will also allow you to enter or calculate CR values relating biota concentrations to those in sediment, i.e.:

$$CR = \frac{\text{Activity concentration in biota whole body (Bq kg}^{-1} \text{ fresh weight)}}{\text{Activity concentration in sediment (Bq kg}^{-1} \text{ dry weight)}}$$

Inputs

Media

Soil activity concentrations **must** be entered on a **dry weight** basis. The preferred soil sampling depth is **10 cm** and results should be entered as an activity concentration (preferably Bq kg^{-1}). Soil sampling depth should be recorded in the *Notes* box of the entry page. If results for soil are only available on an area basis (e.g. Bq m^{-2}) there is a conversion factor within the database (using assumed values of bulk density and sampling depth). However, if the data originator has site specific bulk density values and sampling depth information they should convert soil activity concentrations to a weight basis prior to entering into the database:

$$\text{Bq kg}^{-1} \frac{\text{Bq m}^{-2}}{\text{soil bulk density (kg m}^{-3}) \times \text{sampling depth (m)}}$$

Water activity concentrations can either be entered on a weight or volume basis. Preferable water concentrations should represent **filtered** waters.

Aquatic sediment activity concentrations **must** be entered on a **dry weight** basis. The preferred sediment sampling depth is 0-2 cm. Sediment sampling depth should be recorded in the *Notes* box of the entry page.

The available media results should be appropriate for the organism for which they will be used to estimate CR values. For instance, a single soil sample would not be representative for a large mammal with an extensive home range.

Biota

The preferred entry for biota activity concentrations is for the whole organism and on a fresh weight basis. Preferably measurements of animals should be made without gut contents and after thorough washing to remove any surface contamination. In the case of birds and mammals, feathers and the pelt should preferably be removed and the carcass then washed. For aquatic invertebrates with shells e.g. mollusca, the whole-body activity concentrations should preferably relate to the soft tissues and not include the shell.

However, as many measurements will be available for some organisms for tissues which are a component of the human food chain or which represent accumulating organs the database has correction factors to enable activity concentrations for some radionuclide-tissue combinations (see hyperlinked [table](#)). Where measurements are available for various organism compartments it is preferable that the originator calculates a whole body activity concentration on the basis of their measurements rather than rely on the databases correction factors. If the data base does not contain the required correction factors no CR values will be estimated but your data will be retained. You will be contacted to discuss how the data can be converted to wholebody estimates.

For terrestrial plants activity concentration in above ground parts only should be entered; if you wish to record data for roots then add this to the [Notes](#) box on the [data entry screen](#).

NOTE the table of conversion factors will be provided at the end of June once all the calculations are working correctly.

Temporal averaging

Data entered can be averaged over time if you are confident media and biota concentrations were in equilibrium with each other throughout the sampling period. If, for instance, discharge rates have changed substantial over time please do not average your data.

Stable element data

In addition to radionuclide measurements transfer can be estimated from stable element data if available. However, only data from sites with 'typical' concentrations should be used (e.g. use background/control site data from a study considering heavy metal contamination).