How-to-use guide and worked examples:
Island Occurrences of Threatened Australian Species (IOTAS) database

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View from Captain Cook's Monument, Norfolk Island   Photo: Salit Kark

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- **All EPBC-Act listed plants occurring on Commonwealth islands**
- **Number of IUCN Red-listed species on islands, by listing status and taxonomic group**

Aims

The aim of this "how to" guide is to provide detailed information on how to use the Island Occurrences of Threatened Australian Species database. The guide complements a detailed video that provides more background about the project and how to use the database. The video can be found here: https://karkgroup.org/index/our-projects/australian-islands/.

WORKED EXAMPLES USING THE IOTAS DATABASE IN MICROSOFT EXCEL

This document provides worked examples for extracting output from the national database of threatened species on Australian islands. Similar examples, and an introduction to the database project, are available at https://karkgroup.org/index/our-projects/australian-islands/.

The Microsoft Excel version of the database is supplied with the linking relationships between the three tables already set up (the video steps through how to link tables in this way). The Power-Pivot functionality in Excel can be used to run many queries to interrogate the database.

SETTING UP

If the POWERPIVOT menu isn't available on the ribbon in Excel, it can be set up by choosing FILE –> OPTIONS from the ribbon, which brings up the Excel Options dialog box. Select ADD-INS on the left panel, and towards the bottom of the box open the drop-down menu at MANAGE. Select "COM ADD-INS" from the drop-down menu and click GO. The COM ADD-INS dialog box should appear; check the box marked "MICROSOFT POWER PIVOT FOR EXCEL" and click OK. "POWER PIVOT" should now appear on your ribbon, as shown in Figure 1.
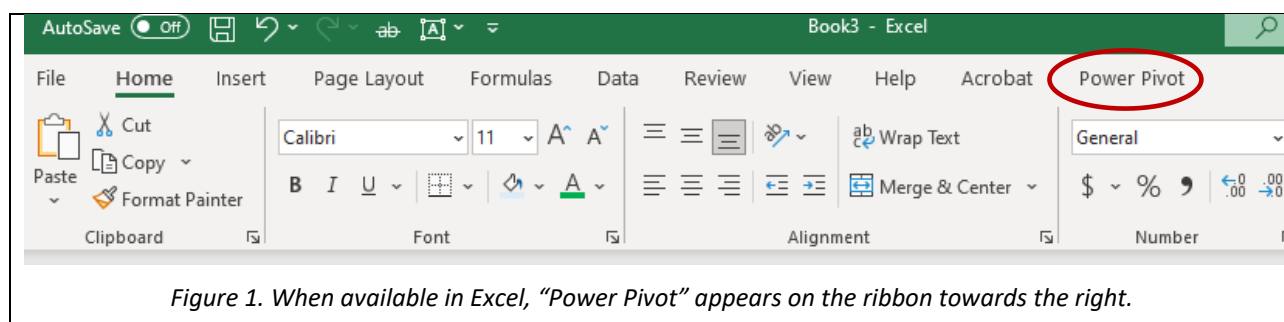

Figure 1. When available in Excel, "Power Pivot" appears on the ribbon towards the right.

SETTING UP ANALYSES

From the POWER PIVOT menu on the ribbon select MANAGE (Data Model section).

A Power Pivot window pops up. (You can visualise the links between tables by selecting DIAGRAM VIEW from the VIEW section on this window's HOME menu.)

Initiate a Pivot Table using PIVOT TABLE -> PIVOT TABLE (!), as shown in Figure 2. The CREATE PIVOT TABLE dialog box appears. Choose where you want the Pivot Table to go – select NEW WORKSHEET, probably the cleaner option.
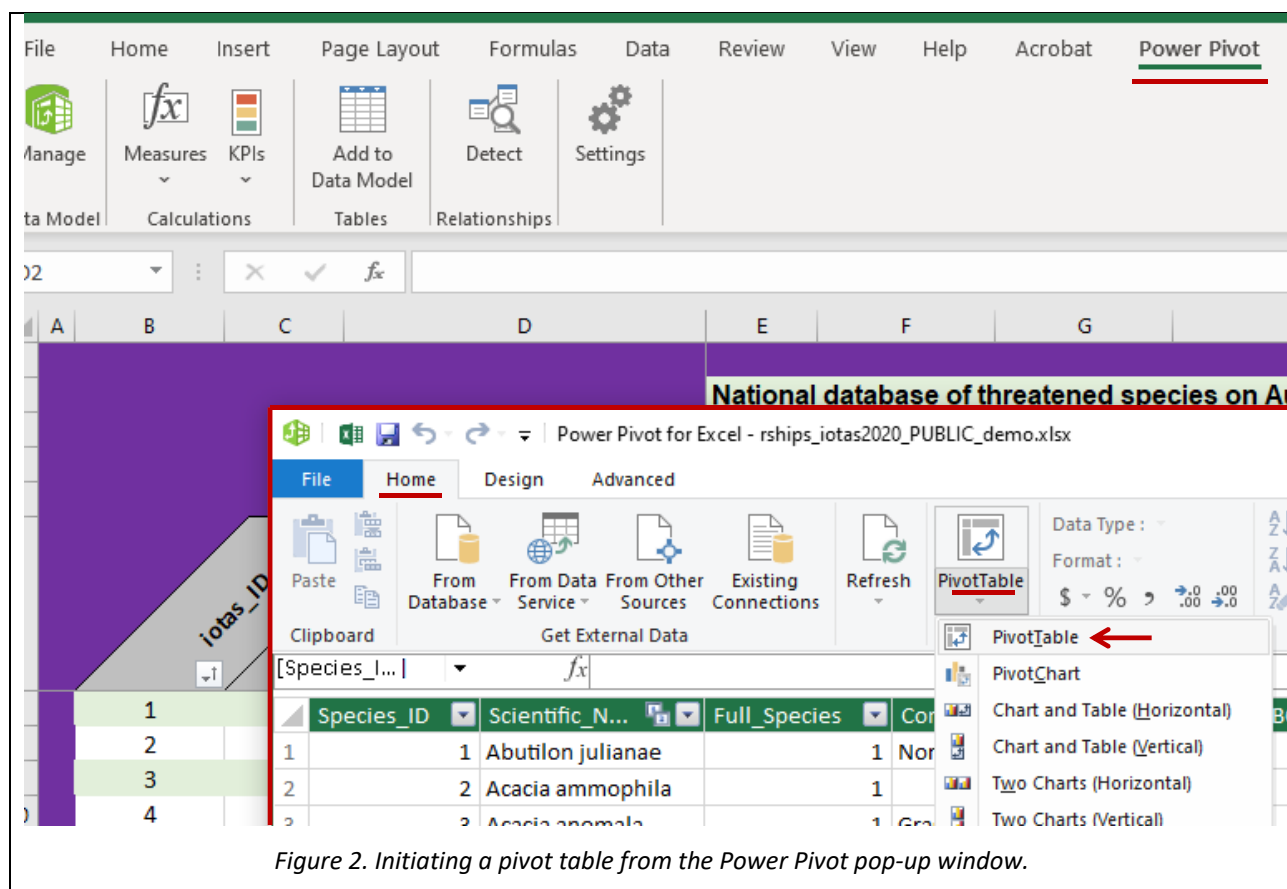

Figure 2. Initiating a pivot table from the Power Pivot pop-up window.

In the new worksheet, you'll see a space where your results will appear on the left, and the interface for analysis will appear as a panel on the right called PIVOTTABLE FIELDS.

EXAMPLE 1. EPBC-ACT THREATENED PLANTS ON COMMONWEALTH ISLANDS

It may be interesting to produce a list of plants listed as threatened under the Environment Protection and Biodiversity Conservation (EPBC) Act of 1999 that currently occur on any Commonwealth islands.

To select those database records, drag EPBCA_STATUS (from the ALLTHSPP list in the PIVOTTABLE FIELDS panel on the right) and CURRENT_STATUS (from the IOTAS list) to the FILTERS panel. Their names will appear on the worksheet with drop-down menus that allow us to filter the records to our needs. Within the EPBCA_STATUS drop-down menu, choose SELECT MULTIPLE ITEMS and check the boxes for "CR", "EN" and "VU", i.e., choosing all threatened listings under the EPBC Act. The database includes records for populations known to occur previously on islands but whose current population status there may be uncertain. To exclude records for populations definitely no longer present, from the CURRENT_STATUS drop-down menu, choose SELECT MULTIPLE ITEMS and check the boxes for all options except ABSENT, EXTIRPATED, FAILED INTRODUCTION and FAILED REINTRODUCTION (see Figure 3). This will limit our results to all EPBC Act-threatened species currently (or potentially still) on Australian islands.

Figure 3. Selecting populations likely to be currently present on islands.

To further filter for *plants* on *Commonwealth* islands, repeat the process above to filter the Taxon (from the AllThSpp list) and State (from the Islands list) fields. From their respective drop-down menus that appear on the worksheet, select Plant and CWTH. Now our analysis will give us results for all EPBC Act-threatened plants currently on any Commonwealth islands.

We can now produce a list of threatened plant species cross-referenced with their island of occurrence. In the PivotTable Fields panel, drag Island_Name (from the Islands list) to the Columns box, and Scientific_Name (from the AllThSpp or IOTAS lists) to the Rows box. (This sets up an empty table with all Commonwealth islands and all threatened plants, but including mainland plants, and islands without threatened plants.) To see which plants occur on which islands, drag Scientific_Name (from the IOTAS list) to the Values box, where it displays as "Count of Scientific_Name". We now have a table showing threatened plants, by species, occurring on four islands. There are 61 populations in total, which includes multiple counts of species occurring across different islands (e.g. *Abutilon julianae* on Norfolk and Phillip islands). To get the total number of threatened plant species on Commonwealth islands, select Count of Scientific_Name in the Values box, and choose Value Field Settings from the pop-up menu. From the dialog box that appears, change Count to Distinct Count and click OK. This counts individual species rather than each occurrence, so that the "Grand Total" for *Abutilon julianae* changes from 2 (two island populations) to 1 (one species occurring on Commonwealth islands), and the overall number of threatened plant species on Commonwealth islands is 44.

EXAMPLE 2. IUCN RED-LISTED SPECIES ON ISLANDS, BY LISTING STATUS AND TAXON

We may wish to produce a summary of how many species are listed as threatened on the IUCN Red List and occur on islands, categorised by taxonomic group. We can use an approach very similar to the previous example.

Let's first select those database records with current (or presumed current) populations, that are listed as threatened (i.e., Vulnerable, Endangered or Critically Endangered) under the IUCN criteria.

To select these, drag IUCN_status (from the AllThSpp list in the PivotTable Fields panel on the right) and Current_Status (from the IOTAS list) to the Filters panel. Their names and will appear on the worksheet with drop-down menus that allow us to filter the records to our needs. Within the IUCN_status drop-down menu, choose Select multiple items and check the boxes for "CR", "EN" and "VU", i.e., choosing all species listed as threatened on the IUCN Red List. To exclude records

for populations no longer present, from the CURRENT_STATUS drop-down menu, choose all options except ABSENT, EXTIRPATED, FAILED INTRODUCTION and FAILED REINTRODUCTION. This will now give us results for all IUCN Red List threatened species currently on Australian islands.

To list the occurrences by taxonomic group and listing status, drag TAXON and IUCN_STATUS (from the ALLTHSPP list) to the ROWS and COLUMNS boxes, respectively. (IUCN_STATUS disappears from the FILTERS box as it's being displayed as a column now; and we can filter the row and column fields directly in the Pivot table, by using the drop-down menu in the "Row [or Column] Labels" cells.)

To get the total number of island-occurring threatened species in each category, drag SCIENTIFIC_NAME (from the IOTAS list) to the VALUES box. (This example is to provide a summary count of the threatened species on islands, rather than list each species separately.) Again choose DISTINCT COUNT as the VALUE SETTINGS option (Figure 4), which will avoid double-counting species that occur on more than one island. Choosing COUNT would provide totals of island-occurrences-of-threatened species (totalling 348), rather than number of species (121).
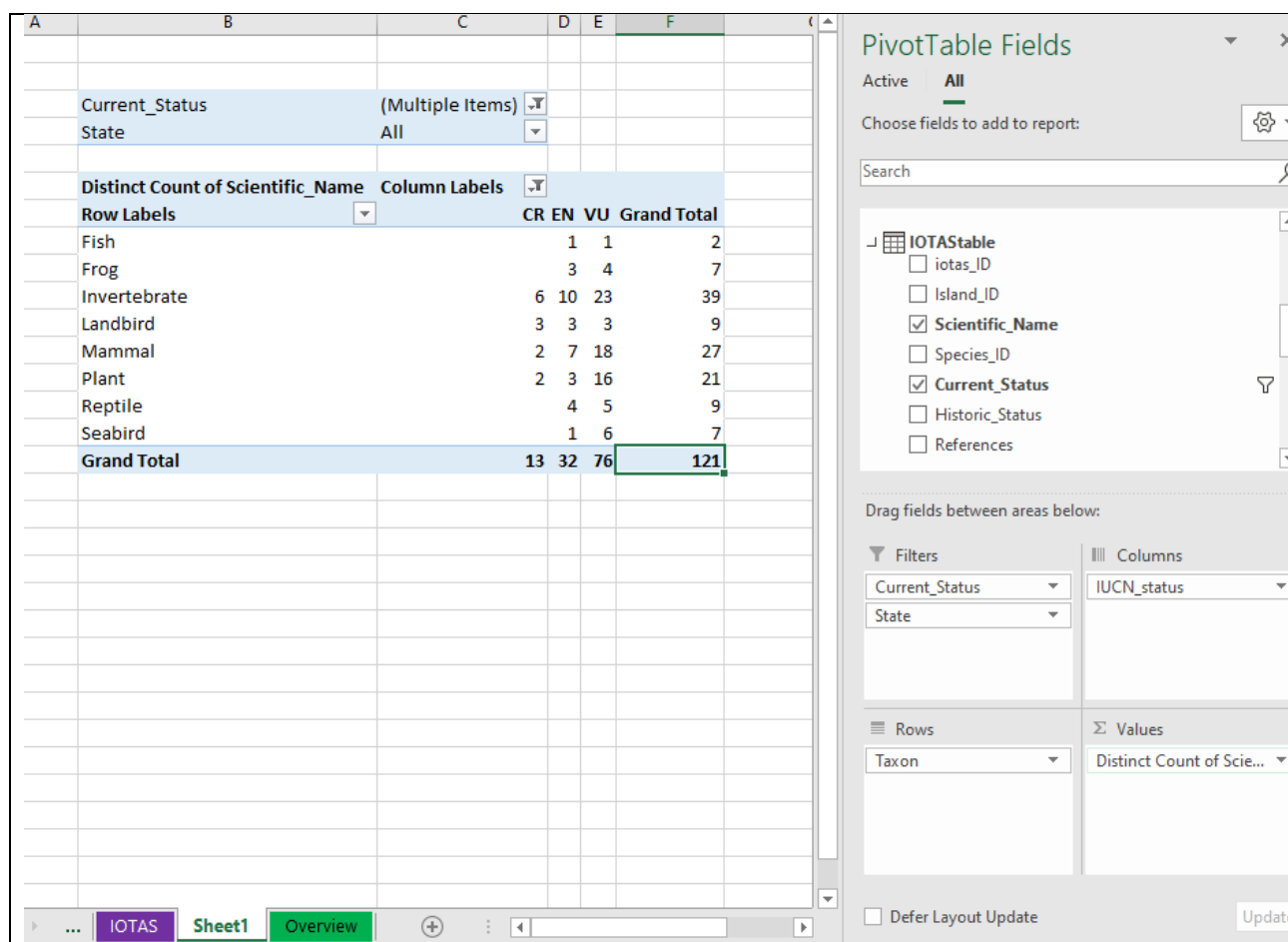

Figure 4. Ascertaining the number of species on Australian islands, in each higher taxon (rows), that are listed under any threatened status by the IUCN (columns).

Notes: Please add any notes for yourself here