Useful Excel functions to analyse IWC data

VERSION 1

Background

The IWC Online and the Observado.org enables National Coordinators to export their data in a spreadsheet format. Using such spreadsheet outputs makes it possible to:

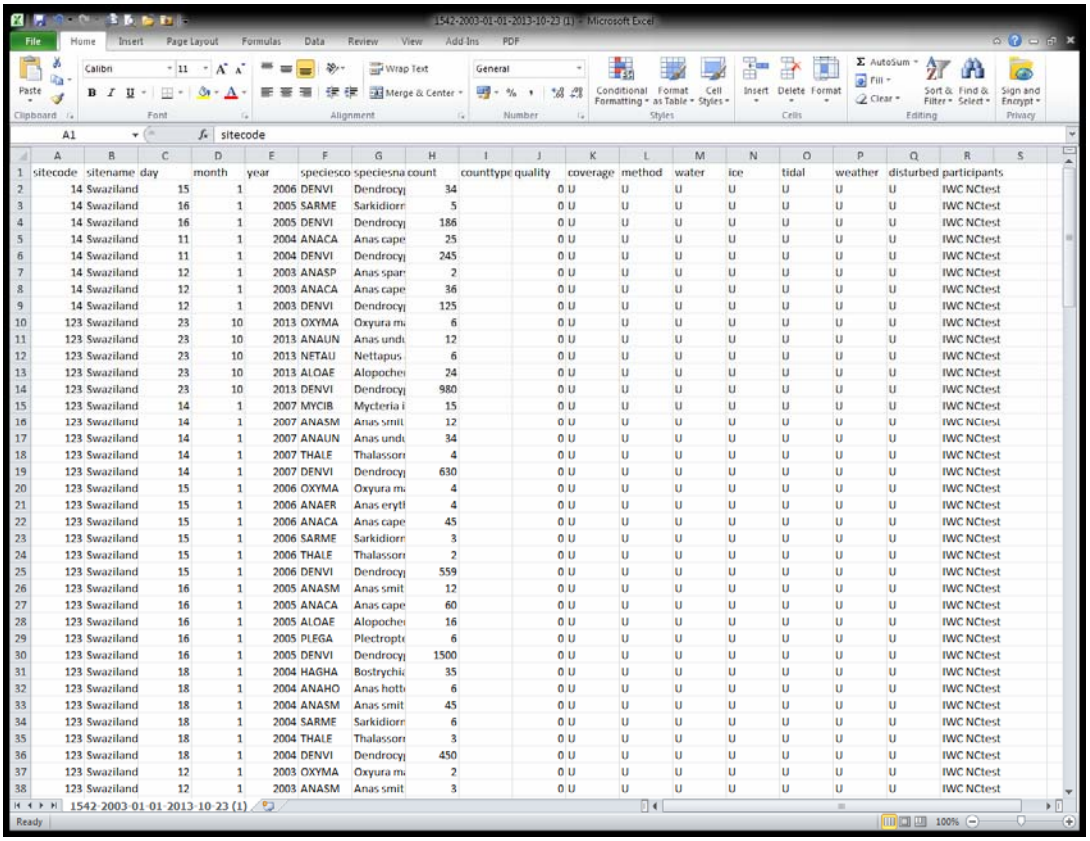
- Review data with filters (i.e. excluding certain dates, sites or species from the analysis);
- Produce tables or graphs for national reports;
- Import the data into BirdStat or TRIM or other appropriate statistical packages for trend analyses.

This document will provide guidance on using these basic Excel functions to make some of the most common reviews and reports.

The spreadsheet output

The IWC application in Observado.org produces a standard IWC output from the data entered by using the Add an IWC count function of the national IWC subsites. For more details see the guidance on using the Observado.org system to collect IWC data. There is also a manual available for the IWC Online system.

National coordinators can export all IWC counts entered into the Observado.org system from their country using the Regional Admin Options \ Exports menu. They can export data from the IWC Online through the export page. The output from both systems will have a very similar structure, shown in Figure 1. The IWC online system has two additional columns for counts that are considered outliers and to indicate if a site is redundant.



sitecode	sitename	day	month	year	speciesco	speciesna	count	counttype	quality	coverage	method	water	ice	tidal	weather	disturbed	participants
14	Swaziland	15	1	2006	DENVI	Dendrocyg	34		0	U	U	U	U	U	U	U	IWC NCtest
14	Swaziland	16	1	2005	SARME	Sarkidiorn	5		0	U	U	U	U	U	U	U	IWC NCtest
14	Swaziland	16	1	2005	DENVI	Dendrocyg	186		0	U	U	U	U	U	U	U	IWC NCtest
14	Swaziland	11	1	2004	ANACA	Anas cape	25		0	U	U	U	U	U	U	U	IWC NCtest
14	Swaziland	11	1	2004	DENVI	Dendrocyg	245		0	U	U	U	U	U	U	U	IWC NCtest
14	Swaziland	12	1	2003	ANASP	Anas spar	2		0	U	U	U	U	U	U	U	IWC NCtest
14	Swaziland	12	1	2003	ANACA	Anas cape	36		0	U	U	U	U	U	U	U	IWC NCtest
14	Swaziland	12	1	2003	DENVI	Dendrocyg	125		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	23	10	2013	OXYMA	Oxyura ma	6		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	23	10	2013	ANAUN	Anas undu	12		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	23	10	2013	NETAU	Nettapus	6		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	23	10	2013	ALOAE	Alopochei	24		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	23	10	2013	DENVI	Dendrocyg	980		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	14	1	2007	MYCIB	Mycteria i	15		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	14	1	2007	ANASM	Anas smit	12		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	14	1	2007	ANAUN	Anas undu	34		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	14	1	2007	THALE	Thalassorn	4		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	14	1	2007	DENVI	Dendrocyg	630		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	15	1	2006	OXYMA	Oxyura ma	4		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	15	1	2006	ANAER	Anas eryth	4		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	15	1	2006	ANACA	Anas cape	45		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	15	1	2006	SARME	Sarkidiorn	3		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	15	1	2006	THALE	Thalassorn	2		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	15	1	2006	DENVI	Dendrocyg	559		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	16	1	2005	ANASM	Anas smit	12		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	16	1	2005	ANACA	Anas cape	60		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	16	1	2005	ALOAE	Alopochei	16		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	16	1	2005	PLEGA	Plectropte	6		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	16	1	2005	DENVI	Dendrocyg	1500		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	18	1	2004	HAGHA	Bostrychia	35		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	18	1	2004	ANAHO	Anas hotte	6		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	18	1	2004	ANASM	Anas smit	45		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	18	1	2004	SARME	Sarkidiorn	6		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	18	1	2004	THALE	Thalassorn	3		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	18	1	2004	DENVI	Dendrocyg	450		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	12	1	2003	OXYMA	Oxyura ma	2		0	U	U	U	U	U	U	U	IWC NCtest
123	Swaziland	12	1	2003	ANASM	Anas smit	3		0	U	U	U	U	U	U	U	IWC NCtest

Figure 1

Filtering the data

It might be possible that the user does not wish to use all the data exported from the Observado.org or IWC Online system. In such situations filtering the data using the **Filter** function of Excel can be useful. This function can be found under the Data menu in most Excel versions. The simplest process is to select the data which meets the selection criteria and to copy it into a new spreadsheet for further analysis.

Producing tables and graphs

The most efficient way of producing tables or graphs from a spreadsheet is using the **Pivot Table** function. This function is available in older versions of Excel under the Data menu, but under the Insert menu from Excel 2007 onwards.

The first step for creating a pivot table is to select the table or range that pops up when one clicks on the Insert Pivot Table button in Excel 2010 or its equivalent in other versions of Excel. It is recommended to choose **New worksheet** in response to the question **Choose where you want the PivotTable report to be placed** (Figure 2).

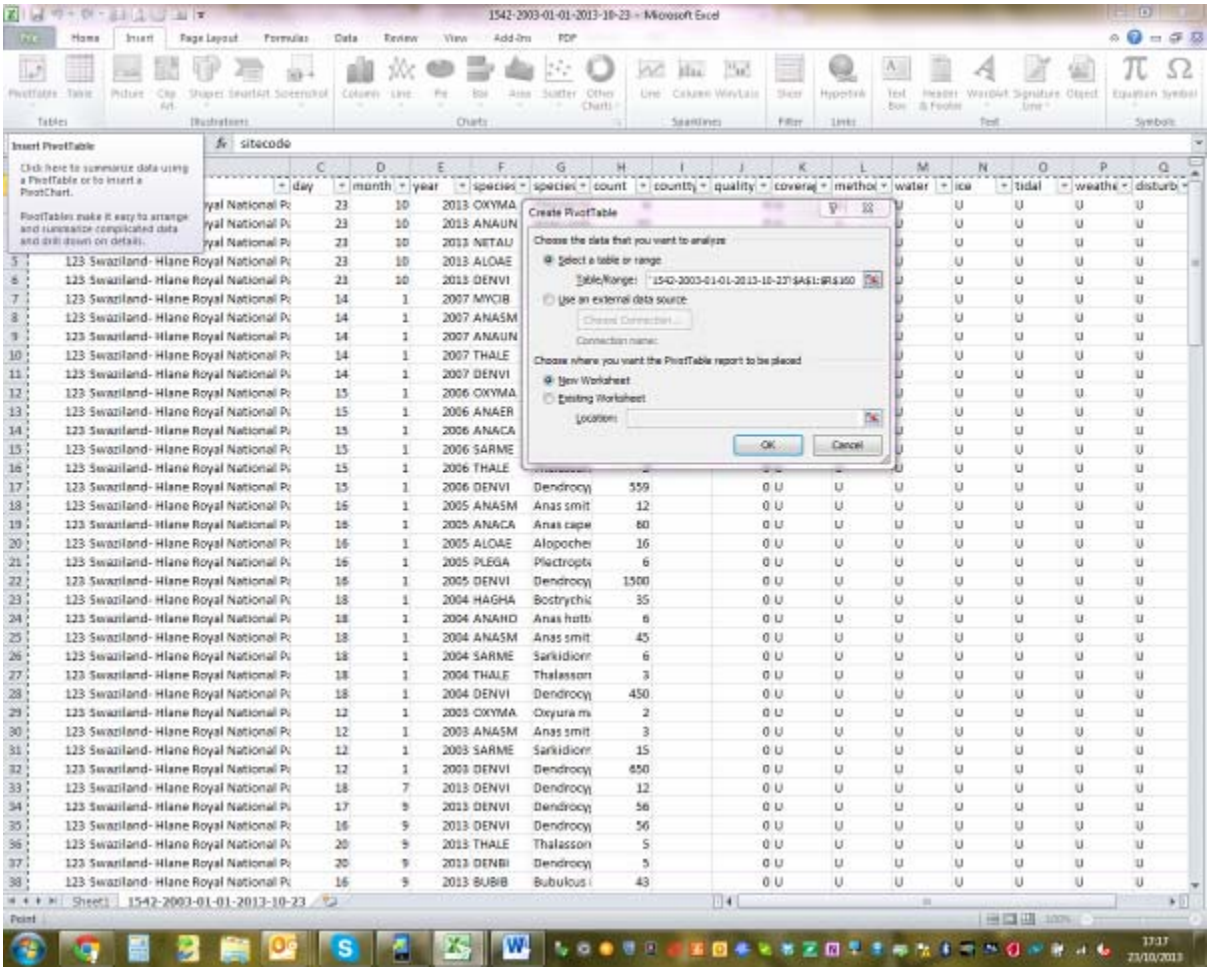


Figure 2

Following this command a new empty worksheet will be created and the list of fields included in the PivotTable will be listed in a separate panel (Figure 3). These fields can be dragged and dropped to the relevant parts of the table, i.e. they can function as filters, column or row headings or as values.

In the following parts we show how to use each of these to create the most commonly occurring tables and graphs.

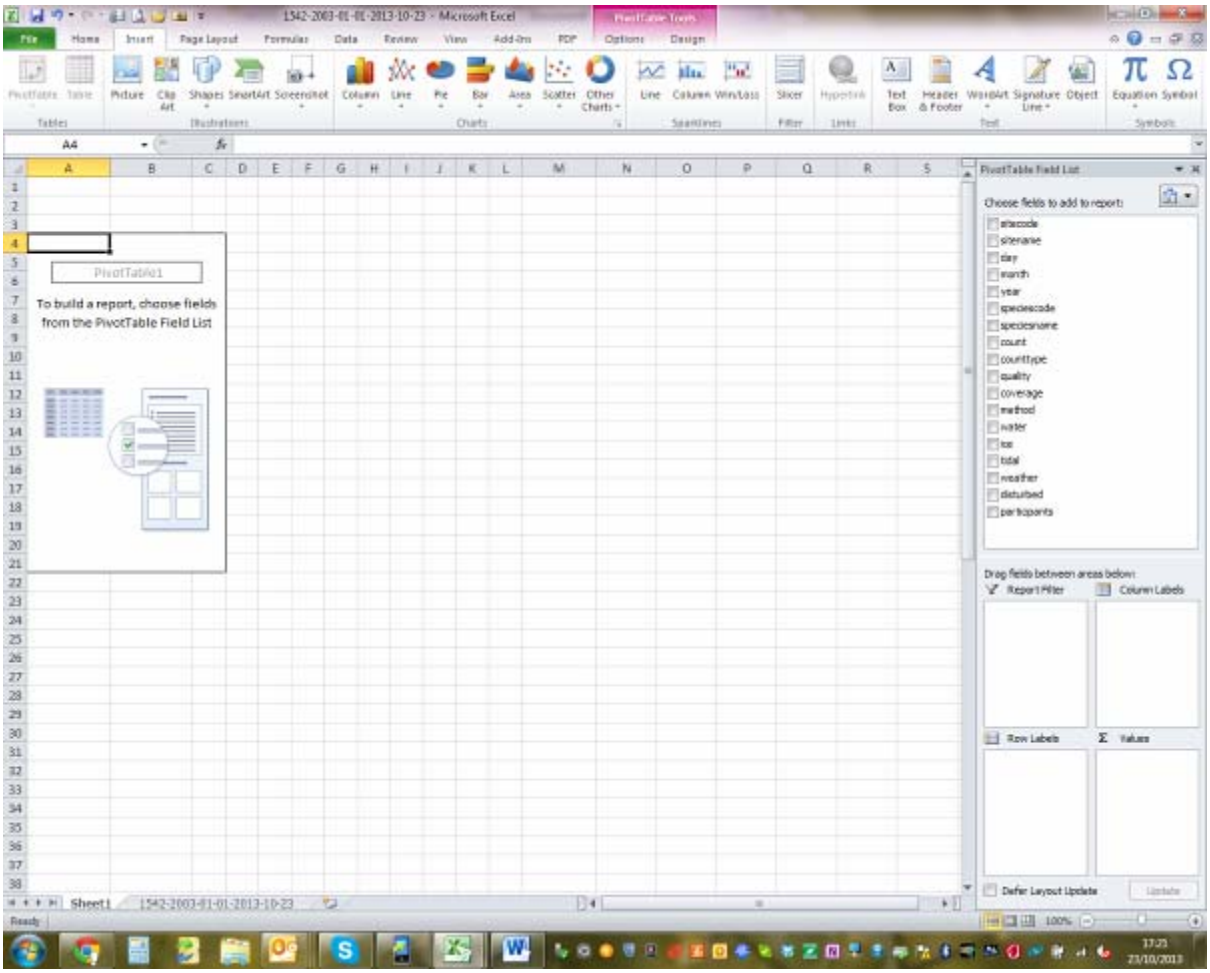


Figure 3

Reporting the results of one census

National coordinators need to provide feedback to their network shortly after the counts to maintain the motivation of the network. In such feedbacks the observers also prefer to see their name appearing. Commonly this feedback is given in a cross table showing the species observed as row labels and the sites and participants as column labels. (To avoid that additional Total columns appear, change the subtotals in the Field Settings of the sitename field to None (Figure 4).

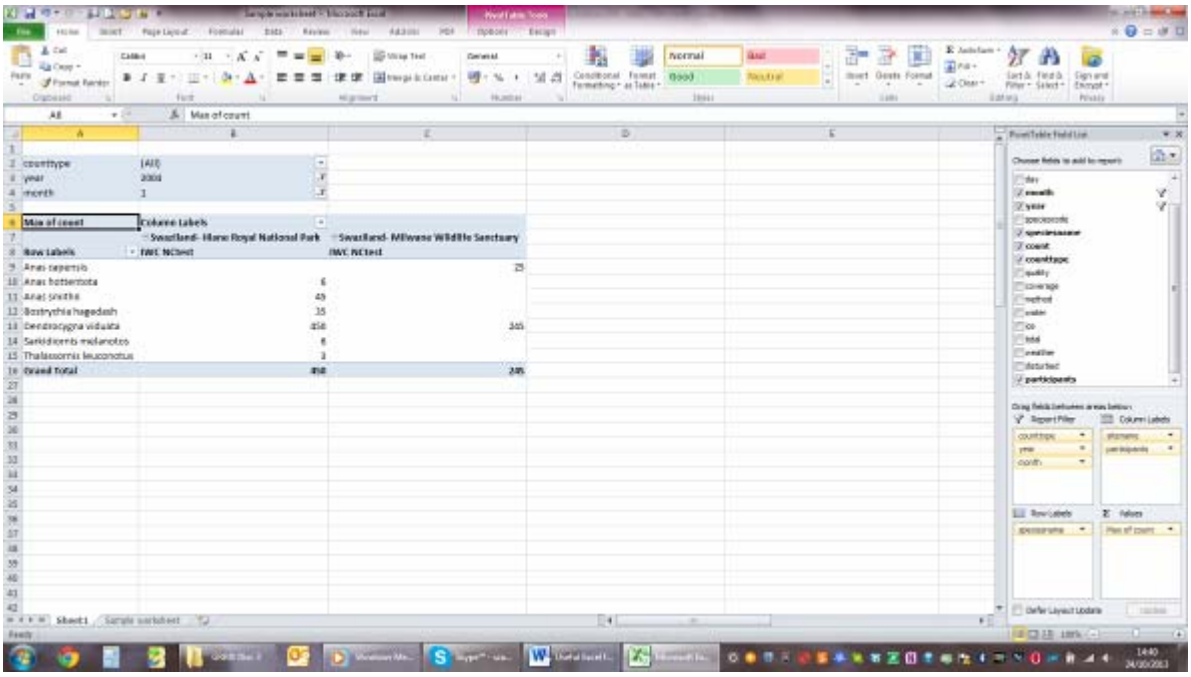

countype (All)
year 2008
month 1
Sum of count
Column Labels
Swaziland- Hlane Royal National Park
Swaziland- Mlilwane Wildlife Sanctuary
Row Labels
IWC NCtest
IWC NCtest
Anas capensis 25
Anas hottentota 6
Anas sinilla 49
Bostrychia hagedash 35
Dendrocygna viduata 456 245
Sarkidiornis melanotos 6
Thalassornis leuconotus 3
Grand Total 456 245

Figure 4

Producing a species overview

Species overviews are frequently needed for national reports as these can indicate which sites are important for a particular species or how the number of the species has changed over time.

To produce such a table, the species name has to be chosen as a report filter. Additional filters may include the count type of the months. Often there is more than one count per month from the same area. If you want to include only one count per site in the report, you can remove the unwanted counts from the list of data used for the pivot table. Alternatively, you can set the value field settings to take the maximum count from a site instead of the total sum (Figure 5).

If years are selected as row labels, the information in the table can be directly converted into a graph using the PivotGraph function (Figure 6).

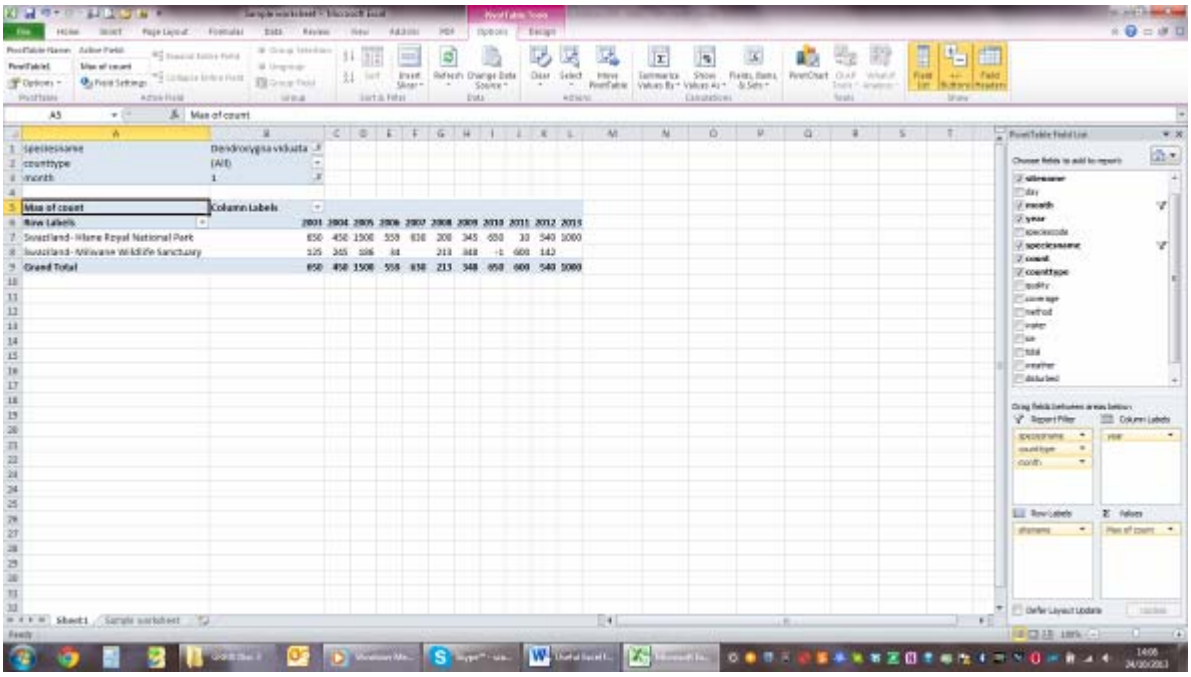


Figure 5

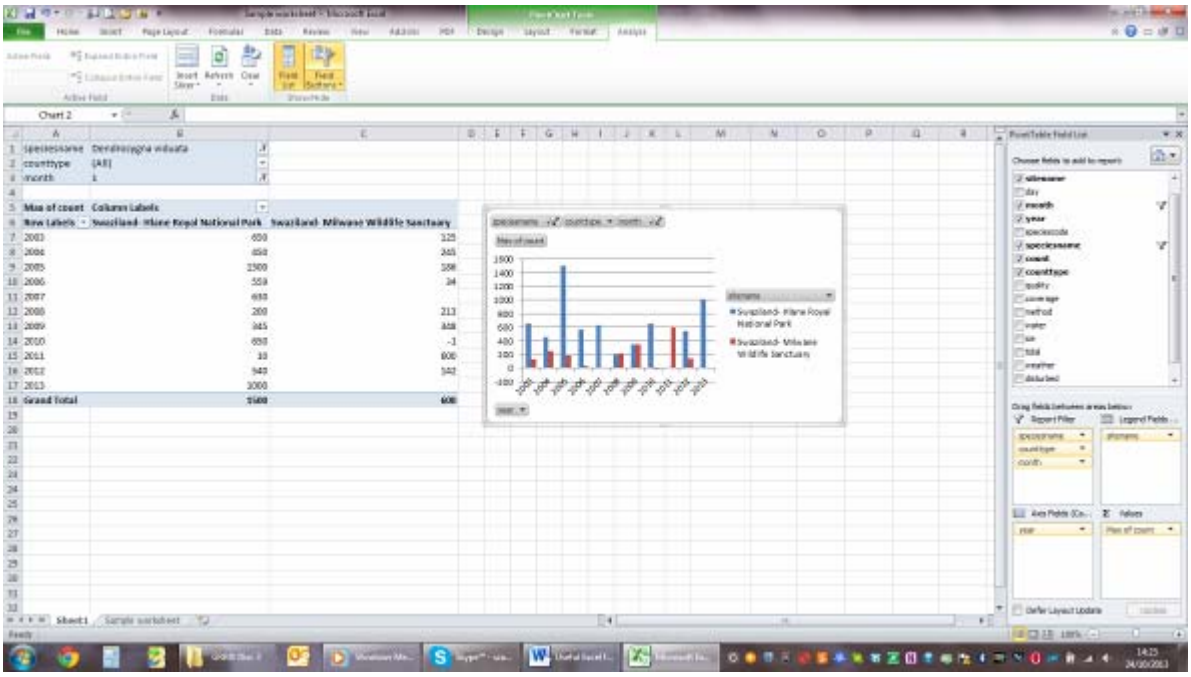


Figure 6

Population changes at site level

By making the site name a filter and using the species name as row heading, it is possible to produce an overview about the population changes at site level both in the form of tables (Figure 7) and graphs (Figure 8). To produce graphs showing time series, the years should be selected as row labels as mentioned above.

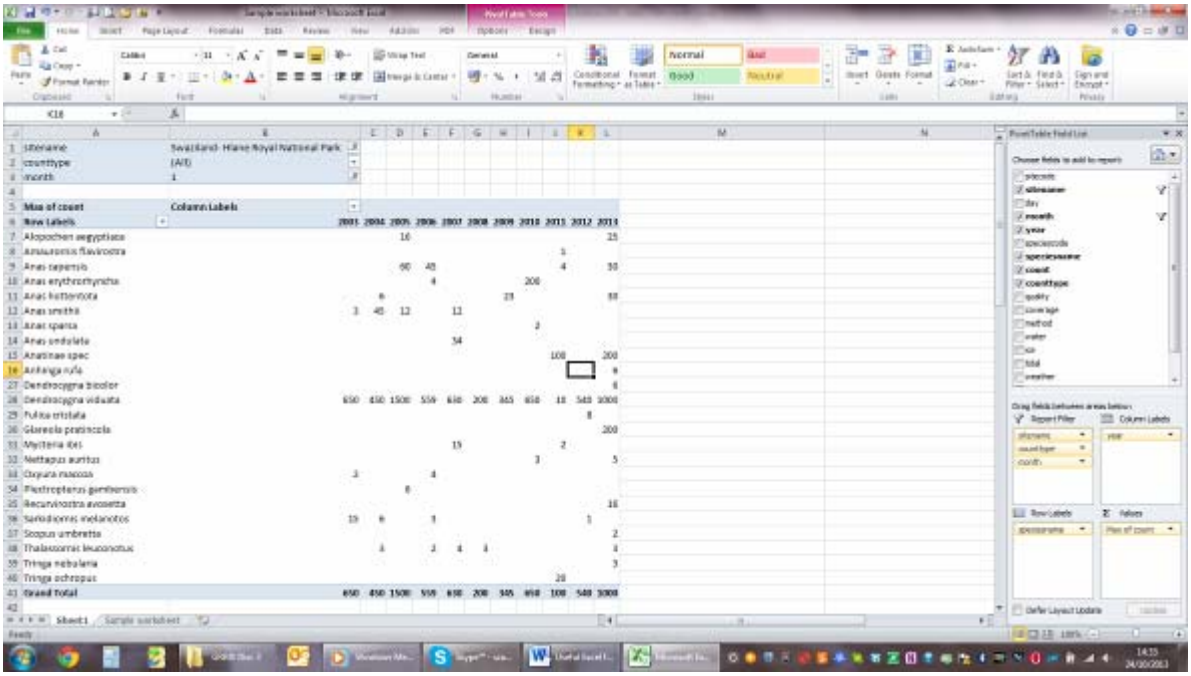


Figure 7

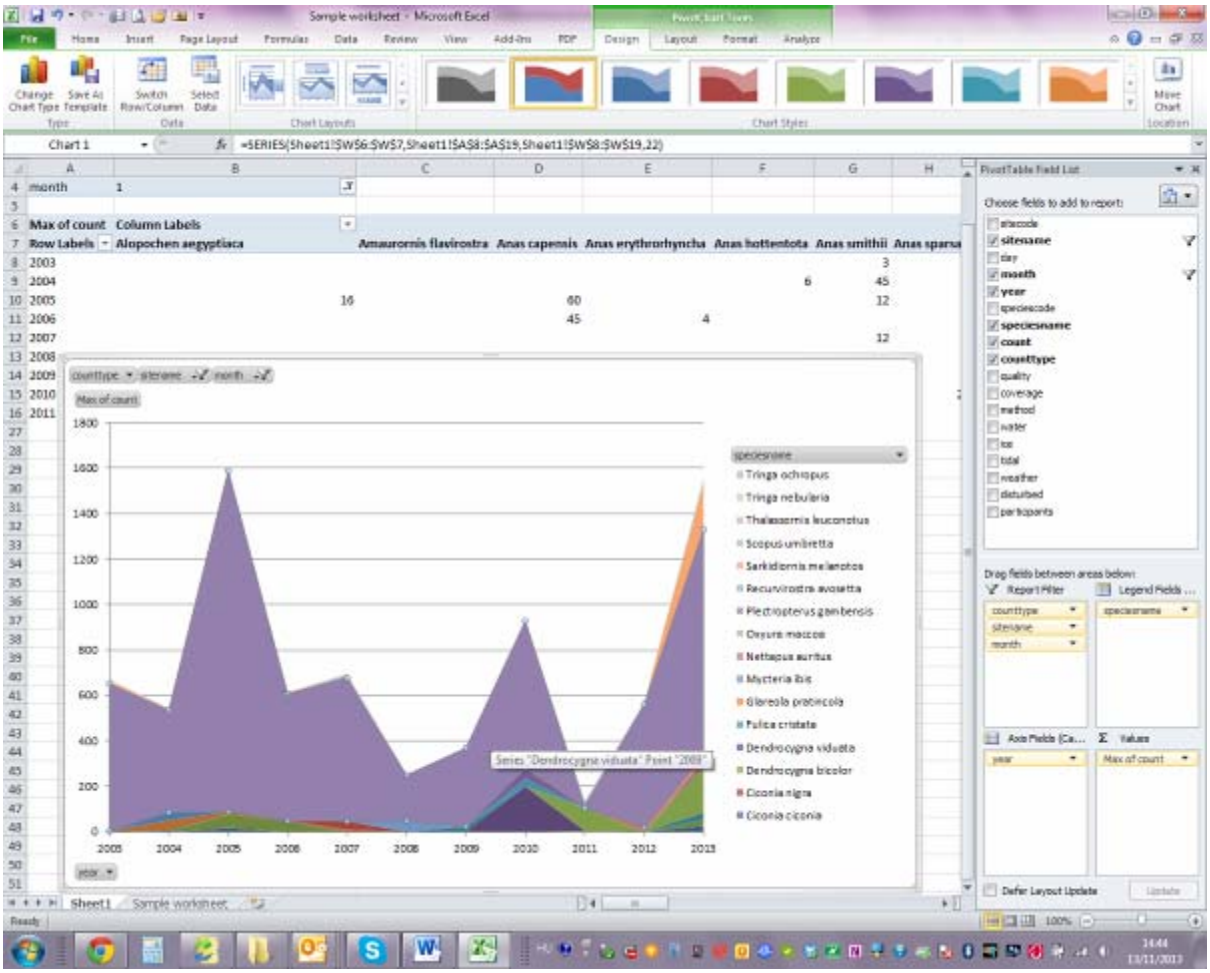

Sample worksheet - Microsoft Excel
=SERIES(Sheet1!$W$6:$W$7,Sheet1!$A$8:$A$19,Sheet1!$W$8:$W$19,2)
month 1
Max of count Column Labels
Row Labels Alopochen aegyptiaca Amaurornis flavirostra Anas capensis Anas erythrorhyncha Anas hottentota Anas smithii Anas sparsa
2003 3
2004 6 45
2005 16 60 12
2006 45 4
2007 12
2008
2009
2010
2011
Max of count
1800
1600
1400
1200
1000
800
600
400
200
0
2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
speciesname
Tringa ochropus
Tringa nebularia
Thalassornis leuconotus
Scopus umbretta
Sarkidiornis melanotos
Recurvirostra avosetta
Plectropterus gambensis
Oxyura maccoa
Nettapus auritus
Mycteria ibis
Glareola pratincola
Fulica cristata
Dendrocygna viduata
Dendrocygna bicolor
Ciconia nigra
Ciconia ciconia
Series "Dendrocygna viduata" Point "2008"
PivotTable Field List
Choose fields to add to report:
sitename
month
year
speciesname
count
counttype
Drag fields between areas below:
Report Filter
Legend Fields
Axis Fields
Values
Max of count
Defer Layout Update
Update
Sheet1
Sample worksheet
Ready

Figure 8