WRL reference	M02 D03
Module	M02 Survey Techniques
Data set	D03 Comparison of bird survey techniques

Cusuco National Park: which method is best?

We focus on Cusuco National Park – a Cloud forest park in Honduras, Mesoamerica. Cusuco supports a very diverse range of bird species including a large number of endangered species and endemic species found only in cloud forest.

Imagine you are a conservation scientist in charge of managing and protecting bird species in all of Honduras's cloud forest parks. These habitats are under threat from deforestation and you need to make plans for conserving what remains quickly. However you are the first person to have this role and no-one has ever extensively surveyed these forests before and no-one knows which methods are most effective in this ecosystem type.

Before you can make plans to protect the cloud forest birds of Honduras, you need to complete a large scale survey to find out which species occur in them. Before starting this large survey you decide to run a small pilot study in a single cloud forest park – Cusuco - to decide which methods will be best to use.

You have two potential methods you can use: mist-nets and point counts. You send two teams of ornithologists to Cusuco to conduct the pilot study. One team spends 70 hours completing point count surveys, and the other spends 400 hours completing mist-netting surveys. From examining their results you must decide which method is the most effective and efficient. You must then decide whether to employ just one method for the country-wide survey, or one primary and one secondary method, giving reasons why.

Analysis methods:

1) Plotting efficiency curves

Open the file "M02 D03 RAW DATA" (found in the folder '4. Data for tasks'). Here you will see how many species were detected by the point count team and the mist-netting team at spaced time intervals. The first column shows the amount of minutes spent surveying for each team. The second column shows the number of species detected after surveying for this amount of time by the point count team, and the third column shows the number of species detected after surveying for this amount of time by the mist-net team. We will use this data to determine which method is the most efficient (ie which detects the most species in the shortest period of time) by plotting effort-efficiency curves.

Highlight the data **in all three columns**. Don't worry about blanks at the end of the point count column or at the beginning of the mist-net column. Now go to the top of the screen and click on

"insert". Highlight and click "scatter" and select the scatter chart option in the top left of the drop-down screen ("Scatter with only markers").

This will produce a scatter plot of our two values. You can add appropriate labels and a title to this graph by highlighting the whole chart and selecting "Layout" at the top of the screen, and then "Chart title" and "Axis titles".

We will now add a trend-curve to each dataset to visualise the overall pattern displayed in the plot. Click on any of the data points representing the mist-net efficiency curve and they will all highlight for you. Now right-click and add "add trend-line". Select "logarithmic" as the curve type. Now do the same for the point count data points.

Now open the second file "M02 D03 CALCULATED". Your own graph should resemble what is on this spread sheet. Note whether you think the data indicates point counts or mist-nets as the most efficient methodology.

2) Comparing the species detected by each method

While keeping the previous files open, now open the third file "M02 D03 COMPLETED.
This file gives a detailed breakdown of the species detected at two points which have been surveyed by both the point count team (30 minutes survey effort) and the mist-net team (3 hours survey effort).

First make a note of which method detects the most species. Does this match the pattern indicated in your efficiency curves?

Now examine the individual species detected by each method. Does each method detect the same kind of species? Do mist-nets detected any kinds of birds missed by point counts, and vice-versa? If so, can you identify any groups where this is the case?

Using your efficiency curves and the sample of species breakdowns for the two individual points, attempt to answer the three research questions below.