To use this software you must be careful about the regional settings in your computer. This is because Visual Basic takes some of its own settings from the regional settings of your computer. This code uses "**.**" (point), not "**,**" (comma), as a decimal separator so you must be sure that your regional settings do the same. To be on the safe side, whenever you use this software please do the following: go to **Control Panel** click **Regional and Language Options** select **English (United States)** and click **OK**. Once the work is terminated you can restore your own country settings.

When you use this software for the first time there is a procedure you must execute:

First you must enable Excel to accept macros. Open a blank Workbook. In the **Tools** menu, point to **Macro**, and then click **Security**. Choose **Medium** click **OK** and close Excel.

Open the Workbook **LP-TRACER** that you have just downloaded and choose **Enable Macros** in the Message Box that will appear.

Now you must "load" the Excel Solver in the Workbook **LP-TRACER**.

Perform the following steps:

Step 1- Click **Add-Ins** on the Workbook **Tools** Menu and then select the **Solver Add-in** check box under **Add-Ins Available**. If **Solver Add-in** doesn't appear under **Add-Ins Available**, click **Browse** and open **Solver.xla** in the \Office\Library subfolder.

Step 2- You must also establish a reference to the Solver add-in. With the Visual Basic module active (**Tools>Macro>Visual Basic Editor**), click **References** on the **Tools** menu, and then select the **SOLVER** check box under **Available References**. If **SOLVER** doesn't appear under **Available References**, click **Browse** and open **Solver.xla** in the \Office\Library subfolder. Close the Visual Basic Module.

Save and close the Workbook **LP-TRACER**.

You only need to perform the previous procedure once. From now on just open the Workbook **LP-TRACER** and you are ready to start working.

Please note the following:

1- This Workbook contains 4 Worksheets: **input-data**, **draft**, **long-output** and **short-output**. You should **never rename or delete** any of these Worksheets. However you can edit them or copy their contents to other Worksheets that you may add to the Workbook.

2- This Workbook contains a Visual Basic module associated with it. You should **never change the code on that module.**

3- Because of limitations in the Excel Solver **the maximum number of SOURCES allowed is 200.**

Before running the program you must supply the data on the **input-data** Worksheet. Suppose you have **k** markers **n** samples and **m** sources. Do the following:

1- Place the keyword **MARKERS:** in cell **A1**. Then place the number of markers (**k**) in cell **B1** and the marker names in cells **C1**, **D1** and the following cells of line 1.
2- Place the keyword **SAMPLES:** in cell **A2** and the number of samples (**n**) in cell **B2**.
3- Cells **A3** through **A(2+n)** should contain the sample names while cells **C3** through **C(2+n)** should contain each sample composition for the first marker, **D3** through **D(2+n)** should contain each sample composition for the second marker, and so on.
4- Place the keyword **SOURCES:** in cell **A(3+n)** and the number of sources (**m**) in cell **B(3+n)**.
5- Place the keyword **TOL:** in cell **C(3+n)** and the tolerance value in cell **D(3+n)**. This tolerance (**TOL**) is a measure of the maximum accepted "distance" between the convex polygon bounds defined by the sources and the samples that fell outside the polygon ("nonsensical mixtures"). Samples which are at distances greater than the **TOL** value are rejected i.e. not considered (see discussion paper Ecology). **TOL** must be a number between 0 and 1. Smaller values imply more rejections. The value 0.01 is normally a reasonable choice.
6- Cells **A(4+n)** through **A(3+n+m)** should contain the source names while cells **C(4+n)** through **C(3+n+m)** should contain each source composition for the

first marker, **D(4+n)** through **D(3+n+m)** should contain each source composition for the second marker, and so on.

The example provided in the Worksheet **input-data** (data for estuary Yela, in Benstead *et al*. 2006) should make this procedure straightforward.

To run the program you can either click **Tools>Macro>Macros>Run** or simply type the shortcut **Ctrl r**.

The program will execute and the results will show up in the Worksheets **short-output** and **long-output**.

If any problem occurs please contact one of the following Email addresses:

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