Nimis P. L., Vignes Lebbe R. (eds.)
Tools for Identifying Biodiversity: Progress and Problems – pp. 389-393.
ISBN 978-88-8303-295-0. EUT, 2010.

The UK urban tree survey

Bob Press

Abstract — Public communication of science shares various educational aspects with more formal learning experiences but differences in both the aims and the target audiences make for subtly different approaches. The UK urban tree survey is an example of the requirements and possibilities of a public-orientated project relying on the use of identification tools.

Index Terms — trees, identification tools, survey, public communication of science.

1 Introduction

Depending on the target audience, projects with an educational aspect need to adopt different approaches to learning. Public communication of science differs in small but significant ways from projects exclusively aimed at formal learning in schools (Tab. 1).

Schools (formal learning)	Public (informal learning)
Not voluntary for participants	Entirely voluntary for participants
Linked to curriculum	Linked to personal interest
Narrow within-group ability range	Broad within-group ability range
Direct support available	Little/no direct support available
Participants use results	Participants do not use results

Tab. 1 – Considerations for formal versus informal learning.

As a project relying on the active participation of the general public, the UK tree survey (launched in July 2010) is an example of a wide-ranging educational activity but with a focus on public participation and demonstrates some of the ways in which these differences can be addressed.

2 Context

Why survey trees at all – especially in the UK which has one of the best known

Bob (J.R.) Press is with the Natural History Museum, Cromwell Road, London, SW7 5BD. E-mail: j.press@nhm.ac.uk.

and most recorded floras in the world? Trees are currently a focus of interest in the UK, following studies such as that on urban health and forestry [1], and investigations into the potential role of trees in areas such as carbon off-setting. The Department of the Environment, Fisheries and Agriculture (Defra) recently announced plans to plant 1 miilion trees across the UK.

In addition to the wild flora, there are copious (though patchy) data relating to trees managed by such organisations as the Forestry Commision and local authorities. Despite this, the urban forest remains relatively little known. In particular, data on trees in private gardens represent something of a black hole.

Against this background, the Natural History Museum in London decided to launch a web-based survey of urban trees. For a survey of this type public participation is vital since only members the public have access to many of the areas of interest – especially to private gardens. Since public participation in such surveys is entirely voluntary, it is intimately linked to personal interest. Previous experience (Bluebells survey, OPAL surveys) indicates a strong willingness by the public to take part in what they perceive as 'real science' as long as the scientific reasons behind the project are clear.

The scientific aims of the urban tree survey are:

1. Gaining a more precise understanding of the make-up of the urban forest e.g. the constituent species
2. Changes in tree demographics (and perhaps their causes)
3. Potential impact on (and changes in) other wildlife relying on trees
4. To gain phenological data and insights into the effects of climate change (changes in the seasons as indicated by flowering times, which species are now flourishing where in the UK etc).

Trees are highly visible within the urban environment and have well-known benefits for urban populations. The scientific aims of the project are easily seen as relevant to the public at large.

3 The urban tree survey

A major factor in designing the survey is that the public user has no on-the-spot expert to consult directly such as a botanist or teacher; essentially the user is working alone. For the identification and mapping tools in particular, clarity and ease of use are essential, with an obvious progression through the necessary steps. Clear, unequivocal instructions are needed at every major decision point lest the user lose interest and stop.

A pilot survey focusing exclusively on cherries was run from April to June 2010. This garnered extensive media attention at a national level and received huge support from the public. The experience was used to modify the main survey before it was launched in July 2010 (see 6. Lessons learned).

3.1 Species included in the survey

A total of 80 'trees' were included in the survey. Some of these are individual species, others groups of species and yet others are genera. This apparent complication is necessary for three reasons. 1) Given that we do not know

precisely which taxa occur in the areas to be surveyed, producing a definitive key to individual species is impossible. One of the reasons for the survey is to gain an initial idea of which taxa are present and then to refine the keys in the light of these data. 2) A key including every possibility would be too large and unwieldy. 3) There are some taxa e.g. *Sorbus* which are simply too difficult for non-experts. A reduction to groups enables users to cope with taxonomically difficult trees.

3.2 Identification tools

Prevailing wisdom is that keys for the public must be short, simple and entirely devoid of technical terminology. We know from *KeyToNature*'s work that this is not necessarily true for schools and it is no more true for the public. However, keys which are obscure or fussy are confusing and counter productive for non-experts, so presentation is a major consideration. The choices at each step need to be clear and it must be possible to retrace the steps to correct any wrong turning.

The key provided is interactive and uses simple illustrations, images and text. As each step is negotiated it recedes on the screen while the next step takes centre screen. This guides the user through the key while previous steps remain visible to aid backtracking. An interactive version for i-phones and a printable key are also available.

3.3 Factsheets

A key alone is insufficient for identification purposes when there is no expert present to confirm the result. Thus, each exit point from the key is linked to a fact sheet for that species, enabling the user to confirm their identification.

3.4 Mapping

Familiarity breeds confidence. We used Google Earth, a mapping tool already familiar to many people. Our system is a hybrid of aerial photographs and street maps. Offering easy access is important so locations can be identified by several methods: by post code; grid reference; latitude/ longitude; or by simply zooming in. The simple system encourages users to continue and helps to avoid errors when adding records.

3.5 Recording data

A tree is added to the map with a click of a mouse and the user is asked to record data relating to it. While sufficient data to make the survey worthwhile is required there are limitations on what the users can provide due to their lack of expertise. There may also be a lack of support or encouragement (school children have a teacher to prompt them to go one step further, the public have no such presence).

We restricted data to eight fields including date of the record, identification,

type of site (private garden, street, park etc) and size of tree. This is in line with the concept of keeping the effort required to achieve a result to a minimum. The fields use drop-downs to ensure consistency of data entry.

When dealing with the public, plant names probably cause more misunderstandings than any other factor. The public prefer to use vernacular names raising all manner of complications. A particular problem arose with cultivars, of which there are many hundreds. They are often sold under names such as *Prunus* 'Amanogawa' (= *Prunus serrulata*) or *Prunus* 'pandora' (= *P. yedoensis*). Some users were convinced these were species names and, instead of keying the tree out, simply believed their species had been omitted and did not enter a record.

We provided fields for both vernacular and scientific names, with an autofill function for the field not selected. Again, drop-down lists prevent 'false' names from being added.

There is an option to upload up to three images of the specimen which helps the survey team to monitor records. No free text was allowed in any field. This is a safeguard against individuals posting abuse on the web site.

4 Other support

Given that the target audience is working without direct support, it is important to provide as much additional information as possible. The web site offers tips on tree identification, an on-line identification forum, glossary and references to other identification tools. There is an entire section devoted to learning support for schools wishing to use the survey.

5 Results

To date (July 2010), over 5000 trees have been recorded and mapped [2]. There have been more than 100,000 web site visits, with a bounce rate of 25%.

This is a baseline survey and one in its early stages. Statistical validity considerations aside, we are only able to make a generalised analysis of results for now. However, from the pilot survey we already have a snap-shot of *Prunus* species in the UK urban forest, with some ideas of which species are most frequent in different site types, which are most widespread and so on.

Providing feedback is vital to maintain the connection with the audience. The public do not themselves use the results of surveys such as these but they do want to see what difference their efforts have made. The initial results of the cherry tree survey have already been posted on the web site.

6 Lessons learned

The pilot project was informative both in terms of the data gathered and in the challenges of conducting a survey of this kind. The positive lessons learned are:

1. The public are keen to participate – as long as they can be attracted by the project (it is voluntary)
2. The public can cope with quite sophisticated methods

3. The project must be linked to a real scientific question/investigation and tie in with personal interest rather than a curriculum
4. Sufficient data can be collected
5. Unexpected data appeared e.g. on harvesting and cultural practices associated with cherries
6. Contacts with other groups were made (e.g. The Orchards Initiative, local authorities, tree warden groups)

There are also negatives:

1. Data accuracy and data usability - since the public do not actualy use the data, they may be less interested in its accuracy
2. Verification of data – a major factor but one we must live with. Only the recorders have access to the sites although posting images is of considerable help in weeding out wrong or false records
3. Technical problems e.g. Explorer initially failed to cope with the number of records on the map. This and the point above relate to lack of support or how we provide support
4. Such projects risk continually re-inventing the wheel
5. There is no clear system for migrating data upwards/outwards to other organisations and potential users e.g. GBIF

7 Next steps

The cherry tree survey has now been subsumed within the similar but larger project covering all urban trees in the UK [3]. Both surveys will be refined in light of the results received by the end of 2010 and repeated for two more years. All data will be made available to other users.

8 Conclusion

Surveys based on identification of organisms can be remarkably successful on two fronts: in gathering scientific data and in communicating science to the public. As with any such project, careful consideration of the audience's needs are paramount. Clear, consistent presentation of information (including the reasons behind the tasks) and using familiar technology are also requirements.

Acknowledgement

The author wishes to thank Kate Evans, Claire Gilby, Sam Rae, Sheila Sang, Mike Sadka, and Philippa Watson for contributions to preparing and launching the web site. This work was supported in part by a grant from the Gulbenkian Foundation.

References

[1] Liz O'Brien, Kathryn Williams and Amy Stewart, "Urban health and health inequalities and the role of urban forestry in Britain: A review". *Forest Research*, 2010.

[2] http://www.nhm.ac.uk/nature-online/british-natural-history/urban-tree-survey/results-map/index.php, 2010.

[3] http://www.nhm.ac.uk/nature-online/british-natural-history/urban-tree-survey/index.html, 2010.