Taking Stock: Newburgh's Orchard Heritage

Report on a Mapping and Stock Survey of Orchard Trees in Newburgh in 2003

on behalf of

Newburgh Orchard Group

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Dedication

This survey and report is dedicated to the memory of

Alexander Moncrieff

Danny McGinley

both active and long time supporters of Newburgh's Orchards who passed away in 2003.

Acknowledgement

The author would like to thank survey partners from Newburgh Orchard Group; Rae, Peter, Frank, Ruth, Gordon, Mandy, Janet, & Shirley for their hard work and pleasant company, and acknowledge the important role they played in making this survey a success.

Contents

1 Introduction

This report is a factual account of the survey in 2003 of fruit trees in the town of Newburgh, located in the north of Fife. The survey attempts to give a comprehensive picture of the number and condition of fruit trees, for which the town has previously been famous.

The survey was commissioned by Newburgh Orchard Group, a voluntary body of local orchard enthusiasts.

"The situation of the town on the Tay is exceedingly pleasant, and from the gardens attached to the houses and the numerous fruit trees with which they are planted, few small towns have a more beautiful appearance. . . ."

The History of the County of Fife
J.M .Leighton (1840)

2 Background

Newburgh Orchard Group (NOG) was formed by local people in June 2002, with the aim "to preserve, maintain, and develop Newburgh's heritage as an historic fruit-growing area". Former Pathfinder Officer in Newburgh, Ellen McCance[1] facilitated meetings in early 2002 that led to the formation of the Group, with input from Fife environmental charity WECAN!, whose 'Food for Fife' project[2] is also working to assist development of NOG.

Following the formation of NOG, its Committee made plans to develop their objectives, however it was realised that there was a need for up-to-date knowledge of the overall situation regarding the distribution of fruit trees in Newburgh and their condition. It became clear that this was a prerequisite for NOG to develop and achieve their objectives[3]

Consultant Crispin Hayes[4] put a preliminary proposal to the Committee on 22 January 2003 for a survey of the orchard trees of Newburgh. The Committee asked that the proposal be developed and in April 2003 a comprehensive proposal *'Taking Stock: Newburgh's Orchard Heritage. A Mapping and Stock Survey of Orchard Trees in Newburgh'* was put to the Committee by Crispin Hayes. The proposal contained detailed costings in a budget amounting to approximately £5,000.

The Committee applied for funding, and was successful in accessing money from the EU Leader+ programme and Fife Council's Venture Fund for the survey and other works. The Committee also sought bids from other consultants to conduct the survey, and following a competitive tendering process awarded Crispin Hayes the contract on the basis of quality, feasibility and value for money.

3 Historical Context of Newburgh's Orchards

3.1 Benedictine Connection

Newburgh's orchard heritage is reported to have originated with the close proximity of the Abbey of Lindores which was founded in 1191. The monks were Benedictines of the Order of Tiron, founded in Abbeyville in France. They were practical artisans and are popularly considered to have brought fruit trees to the area. Indeed "the abbey pear and apple orchards were famous throughout Scotland" [5]. The Abbey fell into disrepair in the 1580s, after the upheaval of the Reformation.

" The monks . . . were pioneers of improvement, and were the first to adopt every discovery calculated to increase the productiveness of the soil, of which, from their intercourse with their brethren, both at home and abroad, they had the earliest the earliest intelligence. To this source can be traced the excellence of the fruit, especially of the admirable varieties of pears, for which the orchards of Newburgh are so justly celebrated"

Lindores Abbey and its Burgh of Newburgh
A. Laing (1876)

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1 At that time (2002) Local Economic Development Officer, Fife Council. Contact details in Appendix A

2 Food for Fife project description and WECAN! contact details in Appendix A

3 Newburgh Orchard Group Mission Statement including objectives is given in Appendix B

4 Contact details given in Appendix A

5 Lamont-Brown R. (undated) The Abbey of Lindores; A Visitors' Guide. North East Fife District Museum Service.

The connection with the Abbey lives on with the Lindorsii variety of pear which is reported to be a variety unique to Newburgh.

Newburgh has an active history society and a local museum[6]

"Nestled snugly beneath the brow of picturesque and craggy hills, it offers to the spectator a series of terraced gardens, scattered in unstudied elegance far up the hill sides – their well-furnished slopes, in the luxuriance of their fruitage, offering a pleasing contrast to the bald and rugged mountain masses up which they climb….."

Fifeshire Journal
24th September 1850

3.2 Trees in the Town

While the casual passer-by travelling through Newburgh could be forgiven for not realising that Newburgh was a fruit town, the scale of the orchards is still surprising. From the High Street, long narrow gardens radiate perpendicular to the road for up to 100m, containing many mature fruit trees. It is not uncommon to have 15 to 20 mature apple, pear and plum trees in these gardens.

Anecdotal evidence collected during the survey tells us that there was a thriving and lucrative local industry selling Newburgh fruit locally and even nationally in Glasgow and to Dundee for jam. However, interest has diminished in the fruit over the last two to three decades leaving much fruit rotting on the ground, while the local supermarket stocks apples from France[7].

4 Survey Design

4.1 Rationale

The rationale for the design of the survey comes from three strands; firstly a recognition that the heritage of Newburgh's orchards, and the historical interest associated with them, are potentially a valuable asset to the town. Secondly that many key objectives of NOG, have at their core, the revival of the use of Newburgh fruit. Thirdly that this survey is the start of a process gathering information that is likely to continue, be refined and augmented.

At an early stage it was clear that if information regarding individual trees was to be collected, the survey would need to visit individual orchard locations. Remote data collection was not possible, neither was a 'sampling and extrapolation' exercise. A strategy for a comprehensive on-the-ground survey was therefore developed.

4.2 Survey Methods

The survey structure was designed to provide a broad foundation for the ongoing work of Newburgh Orchard Group, and this led to the survey collecting data by four methods:

- **Database:**
  A record of each **tree**, containing details such as variety, age, girth, height, pruning and fruiting state[8]. Each tree was given a unique reference number - Tree ID.
  A record of each **location**, containing details such as keeper, address, years as keeper, and use of fruit. Each location was given a unique reference number - Location ID
  Thus trees and locations were recorded in two separate databases that were linked via the Location ID in a 'one to many' database relationship.

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[6] Contacts for both Newburgh History Society and the Laing Museum are in Appendix A

[7] Co-op Supermarket, High St, Newburgh. Data collected September 2003.

[8] A full list of database fields in given in Appendix C

- **Mapping:** the location of each and every tree, its type and unique database reference number were recorded on a paper map. The map used was a site centred print from OS 'Superplan' at a scale of 1:1250 (1cm = 12.5m on the ground) and incorporates revisions up to August 2003.
- **Photography:** A digital still image was taken of most trees that were surveyed. Some fruit was also photographed digitally to aid identification and cross-referencing of varieties. Digital still images were recorded with the unique reference number - Tree ID - so that links could be made to the database.
  A number of photographic slides were also taken during the survey to illustrate presentations and serve as a general record of the survey activity.
- **Anecdotal and Personal History:** Although this was not a formal element of the survey proposal, it was considered to be important for a fuller orchard history. When possible conservation with the keeper was engaged in and anecdotes of their own, of their family or of the location were noted. Comments that relate to the whole orchard or location were noted in the Location database and comments that relate to a particular tree were noted in the relevant record in the Tree database.

The database was built using FileMaker Pro software, which provides ease of use, cross-platform ability (meaning it works on Windows and Mac) and web-serving at a moderate price. A laptop computer was used for the survey to record information directly to the database in the field. Not only does this save considerable amounts of work, it eliminates otherwise inevitable transcription errors.

4.3 Scale of Survey

A preliminary assessment of the quantity of orchard trees in Newburgh was made on a site visit on 3rd March 2003, carried out with a NOG committee member. That assessment indicated that there were at least 500 fruit trees. Subsequently, it was estimated that an average of 50 trees a day could be surveyed, and accordingly 10 days of survey fieldwork was proposed.

4.4 Timing of Survey

Timing of the survey was considered to be crucial to achieving a good assessment of Newburgh's orchard assets. Clearly good weather is preferable but perhaps more importantly, identifying varieties is much more feasible when there is fruit on the trees. Additionally plums, apples and pears do not fruit at exactly the same time. It was proposed that the survey team would not visit each orchard location more than once, so returning to collect data on different species is not feasible. Therefore a survey period in which all varieties had fruit on the trees was desirable. NOG advised that local conditions favour mid to late summer as a suitable time to carry out the survey, and it was therefore scheduled for September 2003.

4.5 A Representative Selection

There were no known contemporary lists of orchards in Newburgh and therefore prior to the survey, it was necessary to rely on local informal knowledge of where orchards were located. However, the main selection criteria would be that of volunteering to be part of the survey. So the orchards that were surveyed would be those of a self-selected group of community-orientated and fruit loving individuals.

Therefore in a statistical sense, the surveyed orchards cannot necessarily be seen as an entirely representative sample of Newburgh's fruit trees, but as the survey sample increases in number and approaches the whole population of orchards in Newburgh, it inevitably becomes more representative.

While the orchards surveyed to date may not be considered entirely representative in a strict statistical sense, perhaps more importantly, those that volunteer to be part of the survey are likely to form the basis for a communal revival of Newburgh's orchard fortunes.

5 Conducting the Survey

5.1 Pre-Survey Public Meeting

NOG organised a public meeting entitled 'Count Me In' which took place on Wednesday 27th August 2003. Its purpose was to announce the forthcoming survey and to enlist Newburgh residents to volunteer their orchards for survey. Gaining a significant quantity of volunteered orchards was a key basic step for a successful survey.

At the meeting presentations were made in which we described the survey process. We also used the opportunity to reassure the public we would not physically damage the trees during the survey. No samples were to be taken - apart obviously from the odd tasty looking ripe fruit!

NOG had responsibility for creating a contact list of volunteers who were willing that their orchards were part of the survey. Signup sheets were provided at the meeting and this resulted in an immediate number of orchards being volunteered.

After the public meeting, ongoing work by NOG committee members on signing orchards up was successful. The Plum Fayre held on 6th September 2003 by NOG was also used as a signup event. This culminated in a large number of orchards being available at the beginning of the survey. With only one exception, NOG received full support from everybody that they contacted regarding the survey - this shows an outstanding level of support in the community for the project.

During the survey, NOG also took responsibility for scheduling the visits to orchards and contacting their keepers to arrange the date and time.

5.2 Survey Teamwork

Close collaboration between NOG and the Consultant took place throughout the survey, to the extent that the survey work was carried out together with a member of NOG present at all times. This was considered necessary for two reasons:

- **Access & introduction** In order to gain access to properties in a sensitive way that was clearly locally inspired, and to be introduced to local orchard owners.
- **Local knowledge** To assist in recording the rich local knowledge on these trees.

5.3 Ten Days in September

The survey went ahead as planned, beginning on the 8th September 2003. Surveying was carried out in mainly during the daytime but sometimes in the evening as light allowed.

We were extremely fortunate with good weather, and lost no time due to inclement conditions. This, coupled with no unforeseen problems arising, meant that we were able on average to survey more than 50 trees per day. On the 24th September, after $8^1/_2$ days of survey, we reached the 500th tree. NOG organised a photo shoot with the Dundee Courier to publicise the progress of the survey - the resulting article is shown right.

Arriving at this landmark tree brought with it the realisation that we had not yet surveyed the majority of fruit trees in Newburgh - we had underestimated the quantity. This was good news in one key respect - the size of Newburgh's orchard heritage was larger than we had hoped.

Ten days of surveying were completed on the 28th September by which time 631 trees at 53 locations had been covered. The survey had exceeded its target by 26% in terms of quantity of data collected.

Treasurer Mike Pearson marks the group's feat while committee members Raye Mitchinson, Mandy Horner and consultant Crispin Hayes (front) look on.

NEWBURGH ORCHARD Group is well ahead with their survey of all of the fruit trees in the town.

The original plan was to cover 500 trees before the end of September but the enthusiasm and encouragement of the orchard owners has meant that tree number 500 has been reached already.

A lot of information on old varieties of plum, apple and pear trees has been gathered, together with details of the location and condition of each tree.

The group plans to continue the survey, which is partly funded by Fife Council Venture Fund and Leader Plus Fund.

The new target is to locate and survey up to 1000 trees this year.

The Courier and Advertiser
25th September 2003

5.4 Extension to the Survey

Although the survey had clearly been very successful in the number of trees it had been able to cover, the ongoing 'Count Me In' recruitment drive had signed up many more people for the survey. Following discussions with NOG, we agreed to extend the survey by 3 days. The additional 3 days took place between 22nd and 30th October 2003. Being late in the season, fruit was now absent from all plum trees, and most apples and pears. Thus identification of variety was often not possible.

The extension brought the final number of trees surveyed to 836 at 69 locations.

5.5 Determination of Variety

Determination of variety can be one of the most difficult aspects of surveying a fruit tree, even for experts. To be completely certain of a variety which is untagged or unrecorded, it is necessary to send a sample to the laboratories of the national collection at Brogdale in Kent. This of course is time consuming and costly, and completely unfeasible for a survey of this scale. It may however be desirable in the future for a small number of strategic examples within Newburgh as a means of determining a wider number of trees.

During this survey, we relied on local experience and comparison with various reference books to determine variety. We developed a system of indicating level of certainty as is shown in the table above.

Variety field in Tree database	Level of certainty
name	Variety name alone indicates a high degree of certainty. Either tree is tagged or keeper has informed us of the variety or a very good match with reference book or another good reason to have this level of certainty
probably *name*	reasonably good match with reference book
possibly *name*	possible match with reference book
like *name*	similarities with *name* variety but other factors indicate otherwise. Included to provide a starting point for identification.
not possible to determine	we were unable to determine variety, often because there was no fruit on tree at time of survey or a very low level of certainty

6 Results and Analysis

6.1 Database

Information on the database is subject to data protection legislation. Therefore the database itself is not provided as part of this report as it contains personal information which NOG has committed not to pass on to third parties without specific consent.

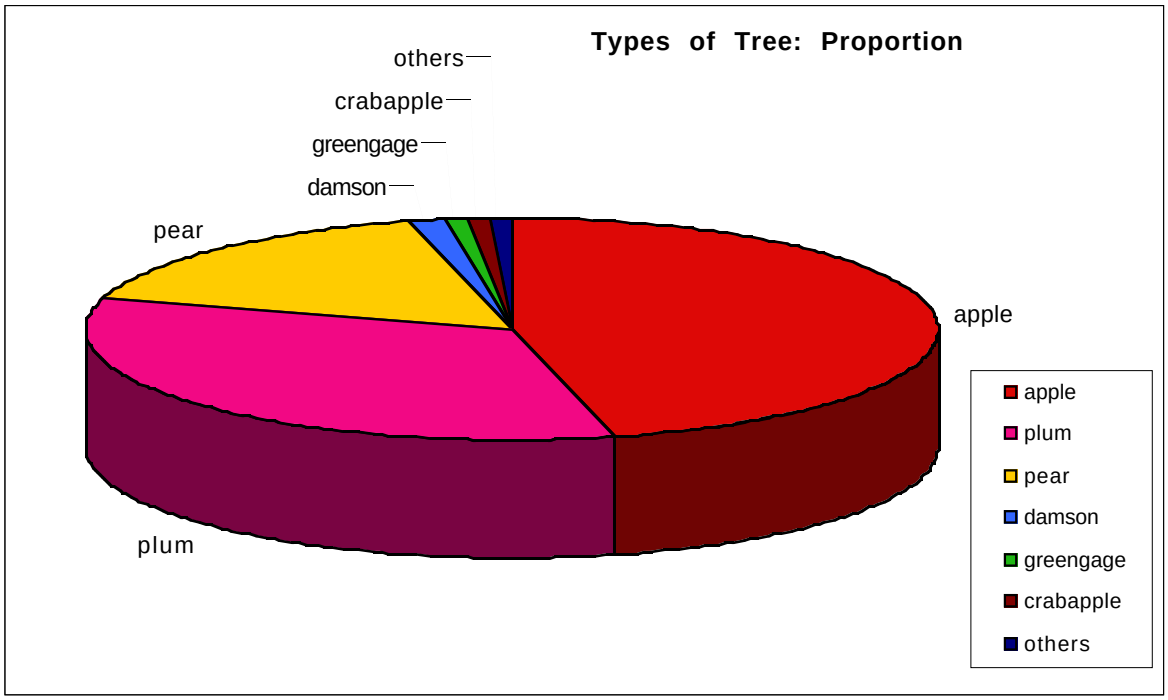
The database is however a rich source of material which has been analysed and used to produce the results below.

6.2 Results from Tree Data

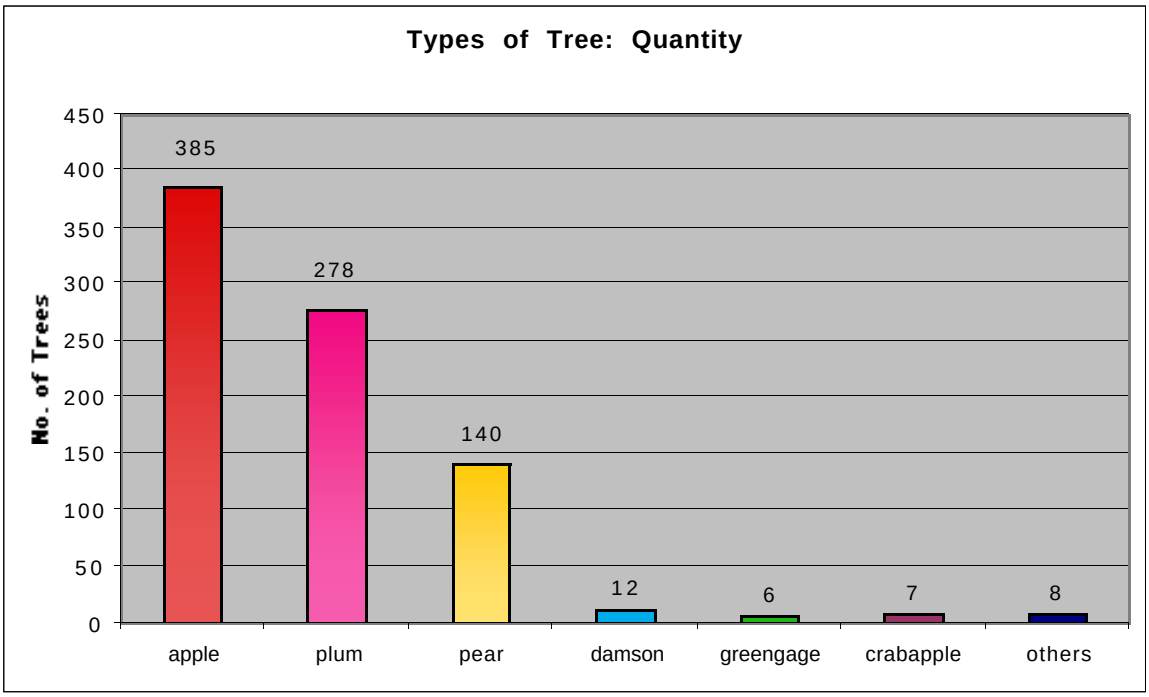
The graphs use a consistent colour scheme for the three main fruit trees: apples are red, plum are purple and pears yellow.

Tree Type

Perhaps surprisingly - as Newburgh is known for its plums and pears - apple trees were found to be the most numerous fruit trees as shown in the two graphs below.



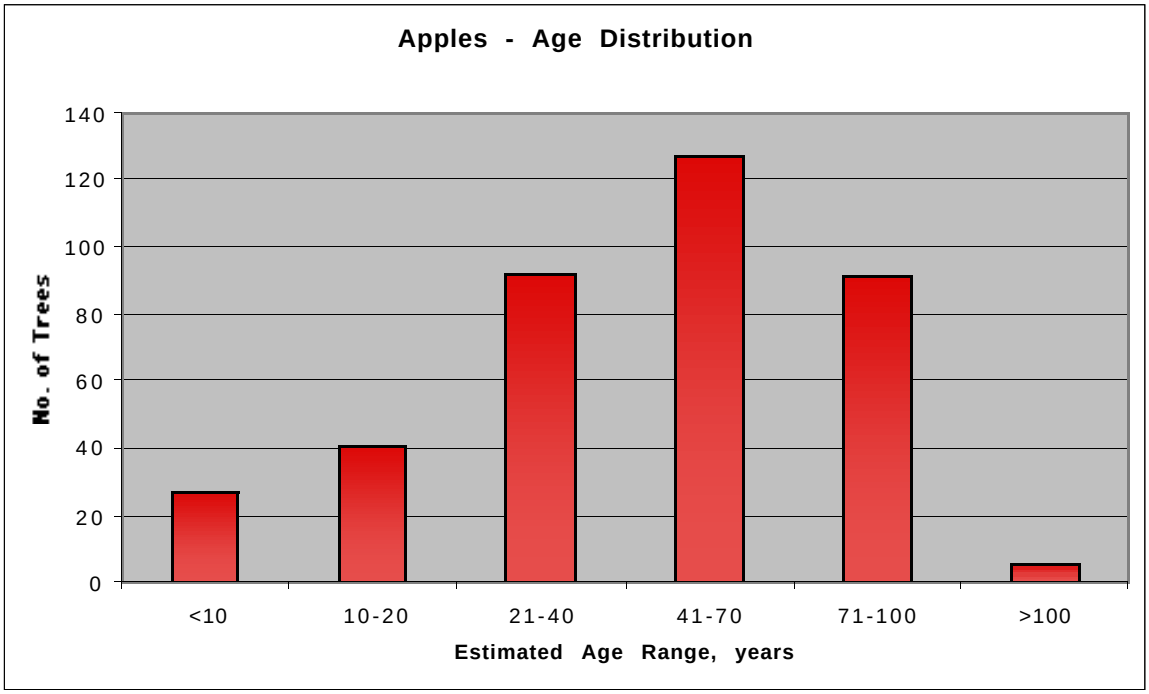
The graph above shows **proportions** of different types of fruit tree in Newburgh, while the graph below shows the same data expressed as actual **quantity** of trees. Trees in the 'Other' category were mainly cherry, which were recorded only when they were significant trees at a Location. A surprisingly small number of damson, greengage and crabapples were found.



Age Distribution

At the 'Count Me In' meeting, we asked that only people with trees over 15 years old should sign up because we wanted to prioritise orchards that were more mature and had greater heritage value. Therefore, the survey has to a certain extent, selected out those orchards which contain only very young trees. However many orchards that had mature trees also had young replacement trees, and these latter young trees were included. These facts should be borne in mind when interpreting the age distribution data.

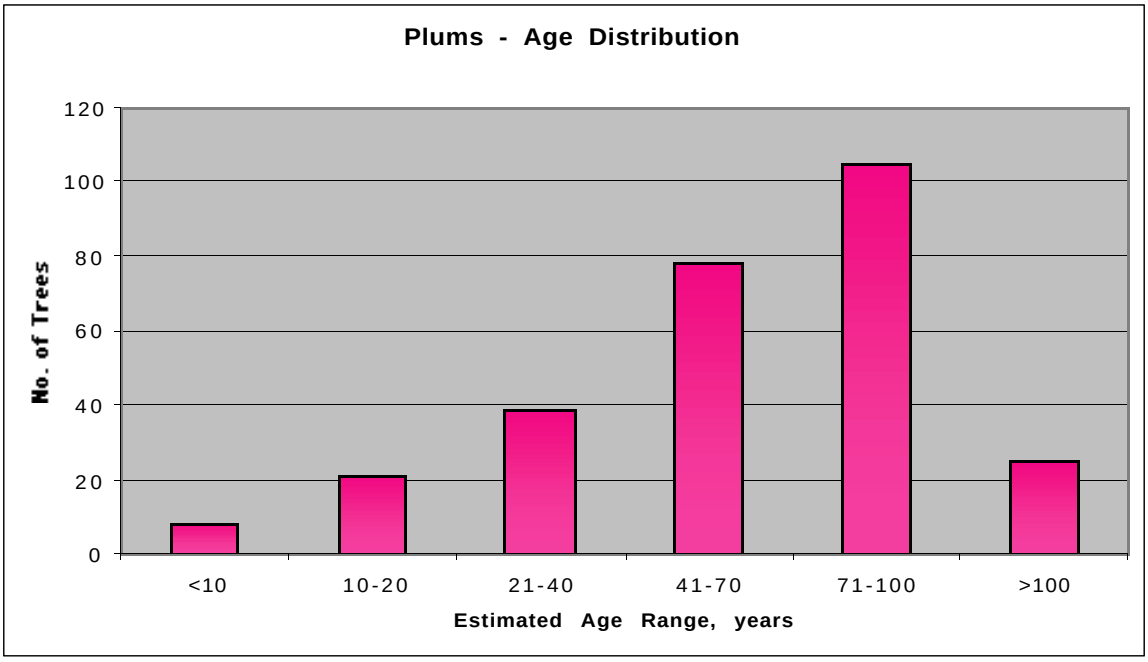
The age distributions of apple, plum and pear trees are shown in the three graphs below. It is worth noting that for the majority of trees, age had to be estimated as most keepers didn't have specific information. Age was estimated by interpolating between, and in some cases extrapolating from, trees of a known age.

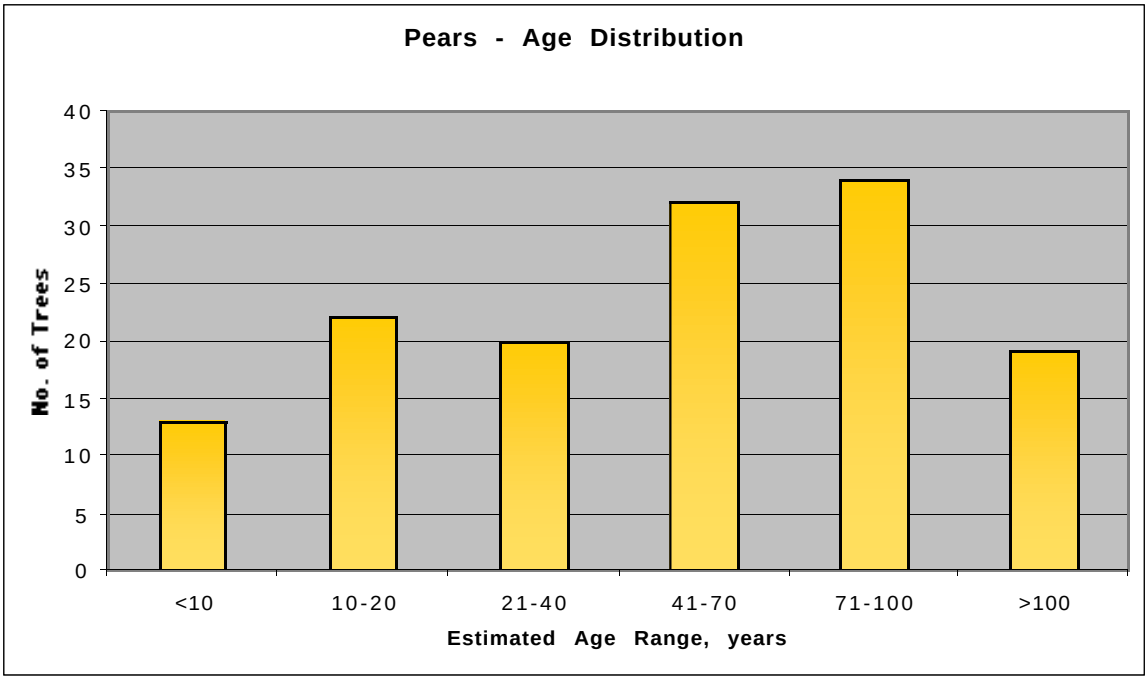


Age distribution is an important measure of the long term viability of Newburgh's orchard in terms of the quantity and quality of fruit produced.

For apple trees in Newburgh the graph above shows an ageing population, with a large quantity of trees in their prime yielding years, but with fewer replacement trees being grown. Therefore, over the one or two decades to come, the quantity of apples produced in Newburgh will decline, even if every dying tree is replaced with a new one. To a certain extent this may be offset by replacement with more rapidly maturing modern dwarf varieties but this would severely alter the character of the orchard groves that are such a feature of the town. The graph above also shows that few trees were estimated to be over 100 years old - one explanation for which is that apple trees in Newburgh do not normally survive to that age.

For plum trees, as shown in the graph below, the situation is far more severe. The age distribution is skewed to the more aged trees, indicating that relatively few plum trees have been planted in Newburgh in recent decades.



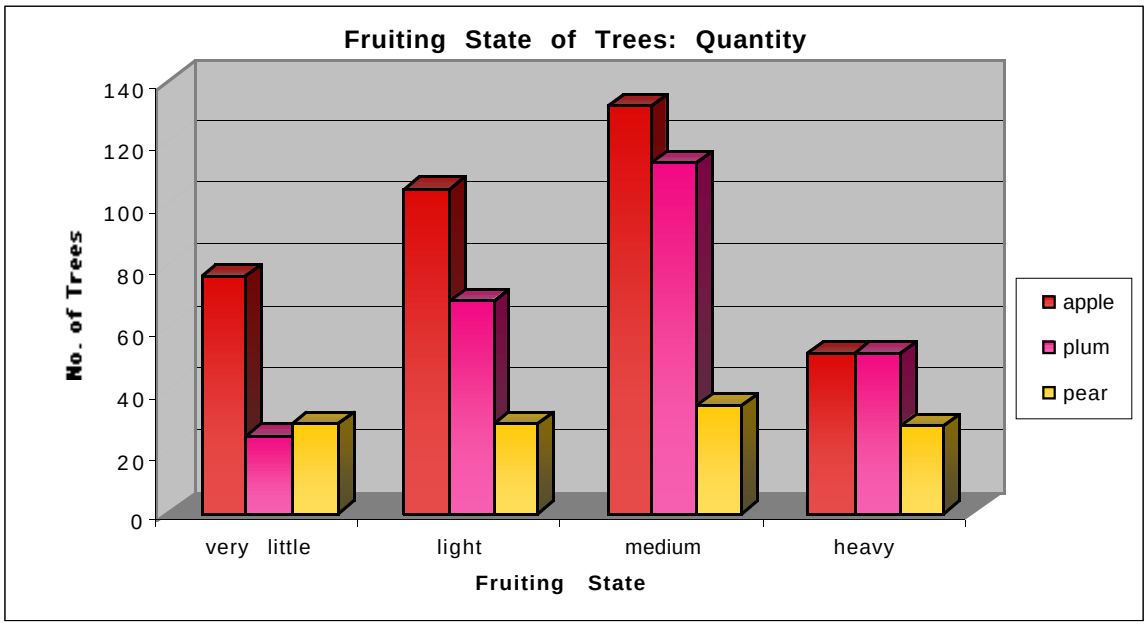


While it is clear that plum trees have a longer life than apple trees in Newburgh, it is also clear that the quantity of plums produced is going to decline sharply in the next two to three decades. The situation may be further exacerbated by the fact that many of the older plum trees look knarled, have rotten and sometimes hollow trunks, yet have been fruiting prolifically for many years despite this condition. We noted during the survey that there appeared in the minority of keepers, a desire for a 'tidy' garden in which these older sometimes scruffy-looking and semi recumbent trees didn't fit in. Hence 'disease' was used as justification for removing them.

With regard to pear trees, the graph above shows a much more even distribution, and also that the trees appear to be capable of great longevity. We recorded many older pear trees that were much in excess of 10m in height. Many of these had huge amounts of fruit, probably running into hundreds of kilograms - picking them was however the problem.

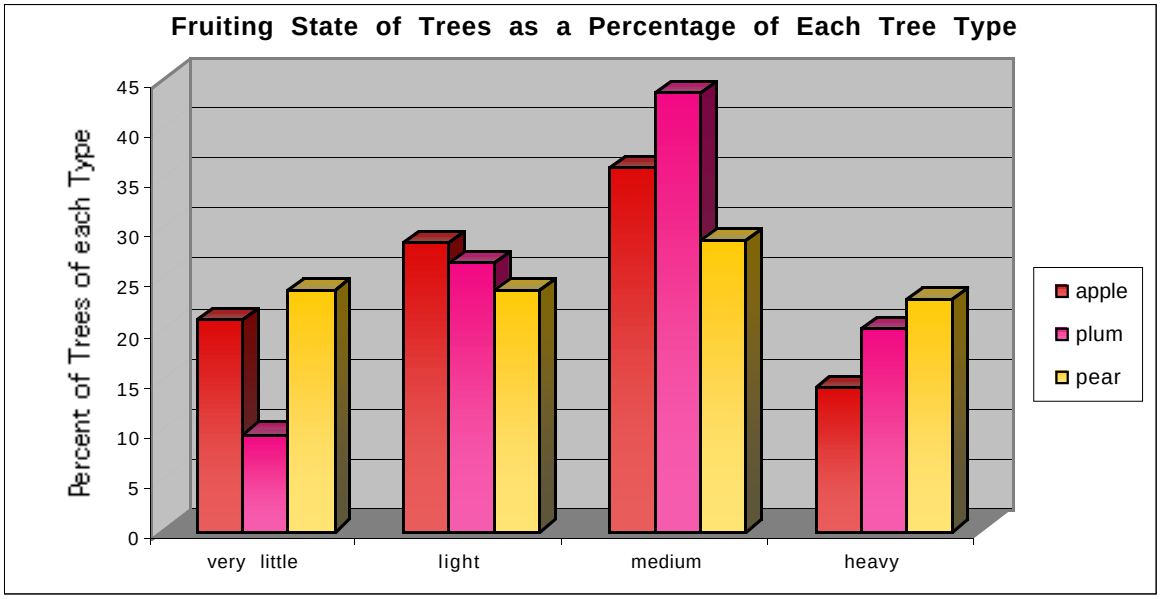
Fruiting State

We found during the survey that very few people actually knew the quantity of fruit (by volume or weight) that a tree yielded. While these yields were recorded when they were known, we also recorded a cruder assessment of the yield of a tree, which we have called 'fruiting state'. We made the assessment for fruiting state, not just for the year 2003, but when possible by talking to the keeper and finding out the typical situation. We felt this necessary, as an assessment over the longer term is more useful than just a snapshot. We did however record comments regarding particular years in each record when they were given. This is of particular relevance to plum yields - in 2003 some people had excellent quantities and quality of plum, while others had poor yields or nothing at all. We have yet to analyse the plum yield for geographical distribution, but a preliminary assessment doesn't show a link between location in the town and good or bad plum yields in 2003.



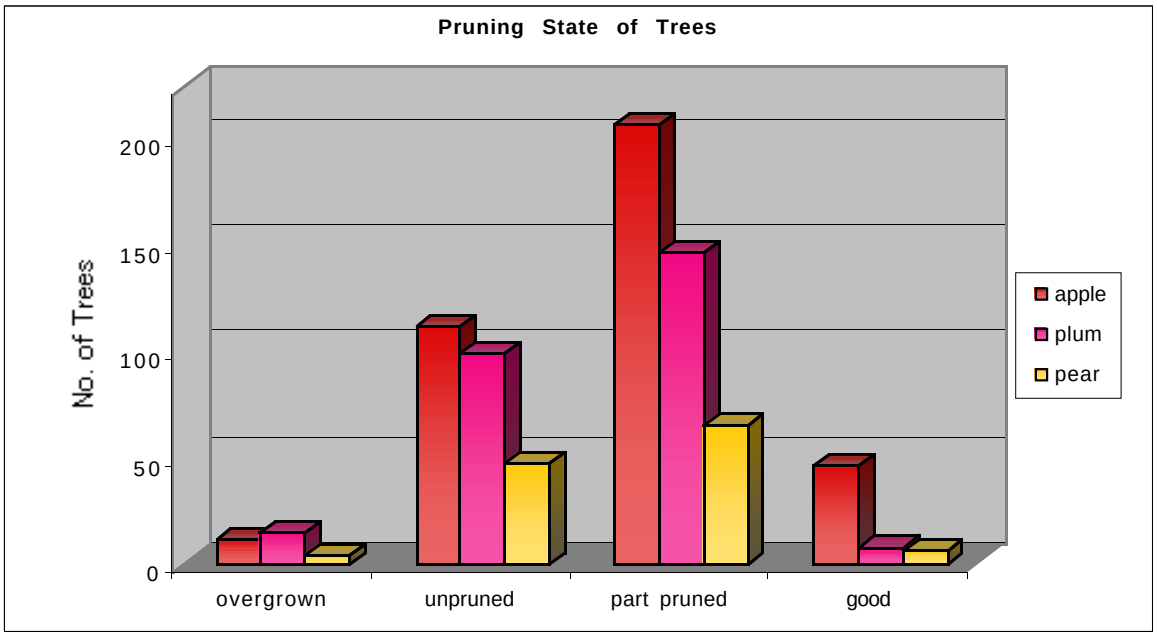
The graph above shows the fruiting state for apples, plums and pears by number of trees in each category. This is useful for assessing the likely yield as a whole. For example, we can see that there are in excess of 120 apple trees that have a 'medium' yield and a further 50 or so that yield heavily.

The graph below shows the same data but expressed as a percentage. This format is more useful to make comparisons of fruiting state between the tree types. While all three types have around a quarter of their number that produce a light yield, both pear and apple trees have a significant proportion that produce 'very little' - indicating virtually no fruit. Pears however also have the highest proportion of heavy yielding trees, while plums can be seen as having the greatest proportion of consistent good yielders with over 60% either medium or heavy.



Pruning State

The state of each tree in terms of its maintenance was recorded as a parameter that we called 'pruning state'. This was necessarily a coarse gauge of the situation, but useful none the less. Some guidance on interpreting the terms used: 'Overgrown' indicates that the tree is overgrown by something other than itself - usually ivy. 'Unpruned' indicates that the tree is entirely unkempt or has not been pruned for a long time - perhaps the last decade or more. 'Part pruned' has a wide range, indicating either the tree has been recently pruned to a certain extent, or that it was pruned sometime within the last few years but may now be rather straggly. ' Good' indicates it was recently pruned well.



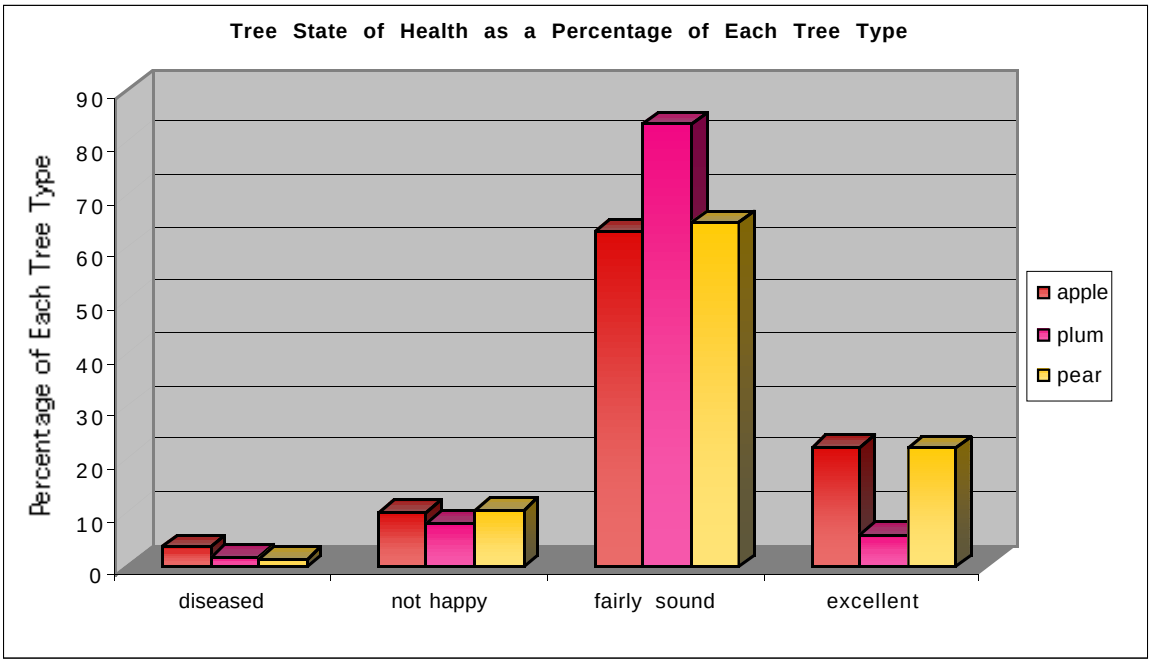
For a more comprehensive assessment of each tree in this respect, the digital photo of each tree (shown in the database) should be consulted. Together a clear assessment of the maintenance condition of the tree can be made.

From the graph above, it can be seen that the majority of trees are in need of some pruning. More plum trees were overgrown than the other trees, while more apples were well looked after than pears and plums.

During the survey, we received frequent requests for pruning advice. We were also told by some older members of the community that pears and plums shouldn't be actively pruned - just the dead wood pulled out.

Tree Health

The state of health of each of the trees was assessed. Trees were termed 'diseased' only if there was clear visual evidence, for example of canker. 'Not happy' indicates that the tree appears sickly though there is no evidence of disease. 'Fairly sound' is a broad category indicating that the tree is not 'excellent' but none the less is in a perfectly adequate state of health. As an example, some aged plum trees lost the core of their trunks through rotting yet had continued to yield heavily, often for decades. These trees were classified as 'fairly sound'. 'Excellent' indicates that the tree is in an outstanding state of health, with no signs of disease, rotting or excessive stress.

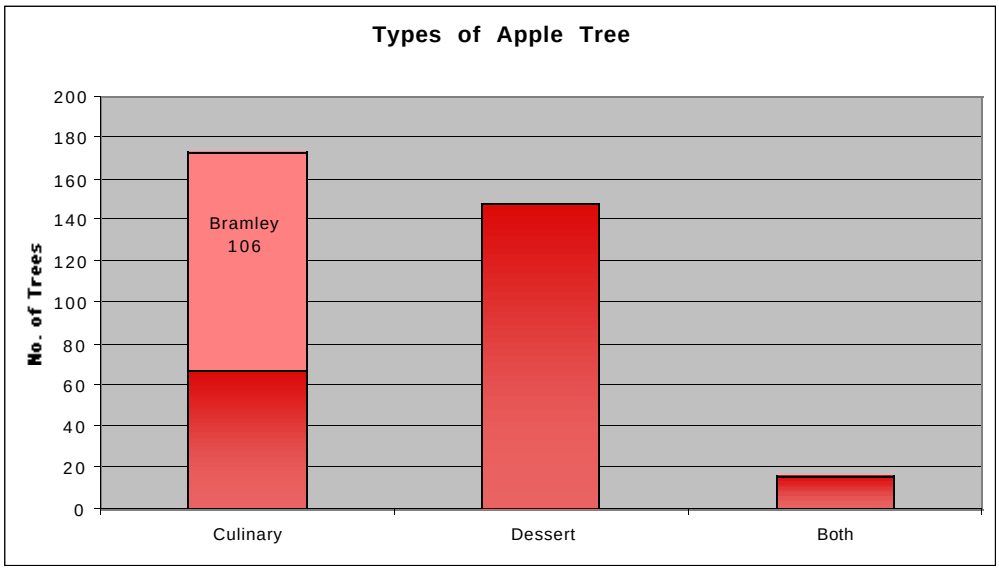


The graph above shows that by far the majority of trees were fairly sound or excellent. This is great news for Newburgh. Incidence of canker was quite uncommon. The smaller number of plum trees in excellent condition is mainly a function of their aged population.

Variety Analysis

Analysis of varieties had not been carried out in great depth because the overall degree of certainty for variety naming was not sufficiently high - particularly with apples. This is an area where more work needs to done to improve the determination of varieties of trees that have been surveyed.

The analysis for apples is therefore limited to the split between cookers and eaters. The graph below shows this, and also includes the proportion of cooking apples that are of the Bramley variety. This is included as there is a reasonable degree of confidence regarding Bramley identification.



The graph shows that there is a fairly even spread between culinary and dessert apples though the former are in the majority.

Pear and plum trees were found to be almost entirely for dessert, where a determination was possible.

There is a little more certainty regarding varieties of plum and pear varieties. The table below shows data for plum varieties. Clearly Victoria plums predominate in Newburgh, though it was noted that there is a significant degree of variation in what people believed to be Victoria plums. Further verification is appropriate. Of particular interest is one example of what we believe to be Guthrie's Taybank which we understand is a locally bred variety, and we found to be a "tasty sweet large yellow plum".

Analysis of Plum Varieties:

Variety	No. of trees	Comments
Victoria	214	of which there appeared to be some variation in skin and flesh colour.
Undetermined	49	mainly due to fruit being finished later in season
Others	13	including Pershore Yellow, Marjorie Seedling, Cherry Plum, Czar, Guthrie's Taybank, Oullins Golden Gage, Coe's Golden Professor

The analysis of pear varieties is shown in the table below. There were three factors that led to the greater certainty of determining pear varieties. Firstly there are fewer varieties commonly grown. Secondly the relatively larger proportion of young trees meant that many were still tagged or their keeper was able to tell us the variety, and thirdly several of the finer old pear orchards were kept by enthusiasts that had long standing knowledge of their trees.

Analysis of Pear Varieties

Variety	No. of trees	Comments
William's bon Chretien	26	
Conference	29	
Winter Nelis	5	
Auchens	3	Black and green
Doyenne du Comice	5	
Jargonelle	7	
Lindorsii	1	Newburgh's unique pear variety
Undetermined	39	
Others	25	including Glasgow Yellow, Buerre Hardy, Buerrie de Amis, Bristol Cross, Concorde, Craig, Beth, Benvie

Note the Lindorsii pear - of which we surveyed only a single example - we understand that this is locally bred and unique to Newburgh.

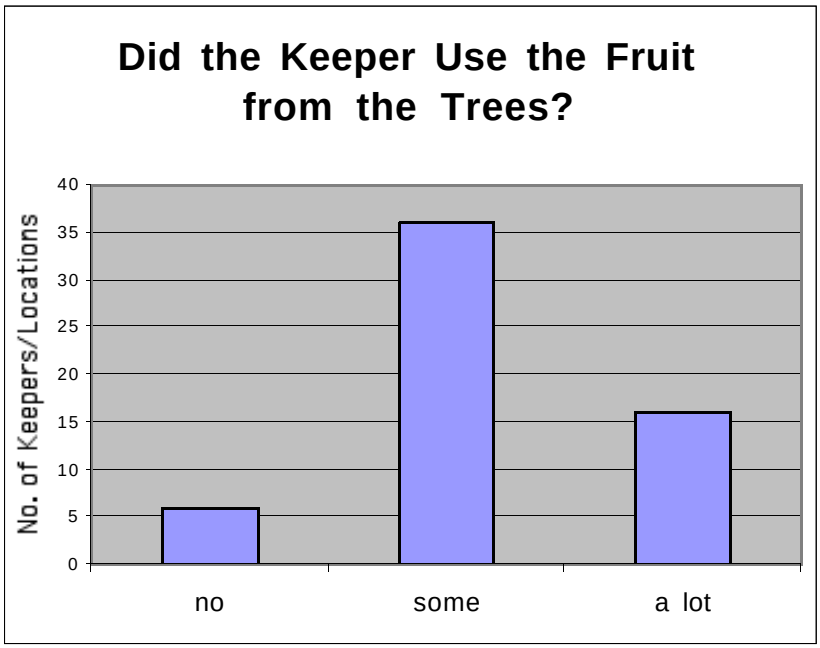
6.3 Results from Location Data

The Location database has less quantitative data for numerical analysis, however its key role is to anchor together collections of trees and provide location information which is not analysed for this report.

A total of 69 locations were surveyed.

Use of Fruit

The use of fruit was recorded when we were able to speak to the keeper of the orchard. The graph below shows our findings. Very few locations did nothing at all with their fruit. Most people used some of it themselves and/or gave some of it away. Around a quarter of keepers used a lot of the fruit; eating, storing, selling or making jam. However, it was clear during the survey that in Newburgh as a whole a significant amount of fruit, perhaps the majority, rots on the ground. This represents a significant opportunity for NOG, as most keepers said they would like to see the fruit used rather than 'go to waste'.



Location Type

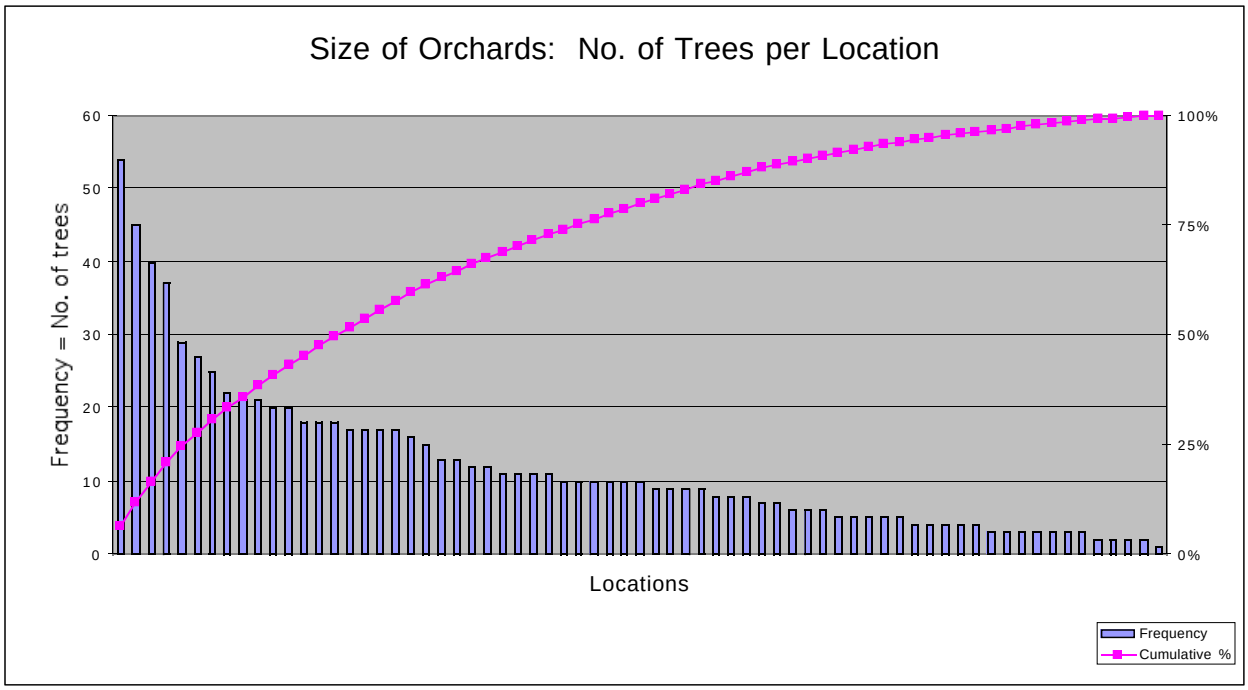
The table below shows what type of property each orchard location was. The orchards surveyed were predominantly private gardens.

Type of Location Surveyed	
Private Garden	65
Allotment	1
School	1
Public Space	1
Unknown Owner	1

Size of Orchard

Frequency analysis was carried out on the number of trees per location, and the results are shown below as a sorted frequency bar chart and a cumulative frequency curve: two different ways of representing the results on the same graph.

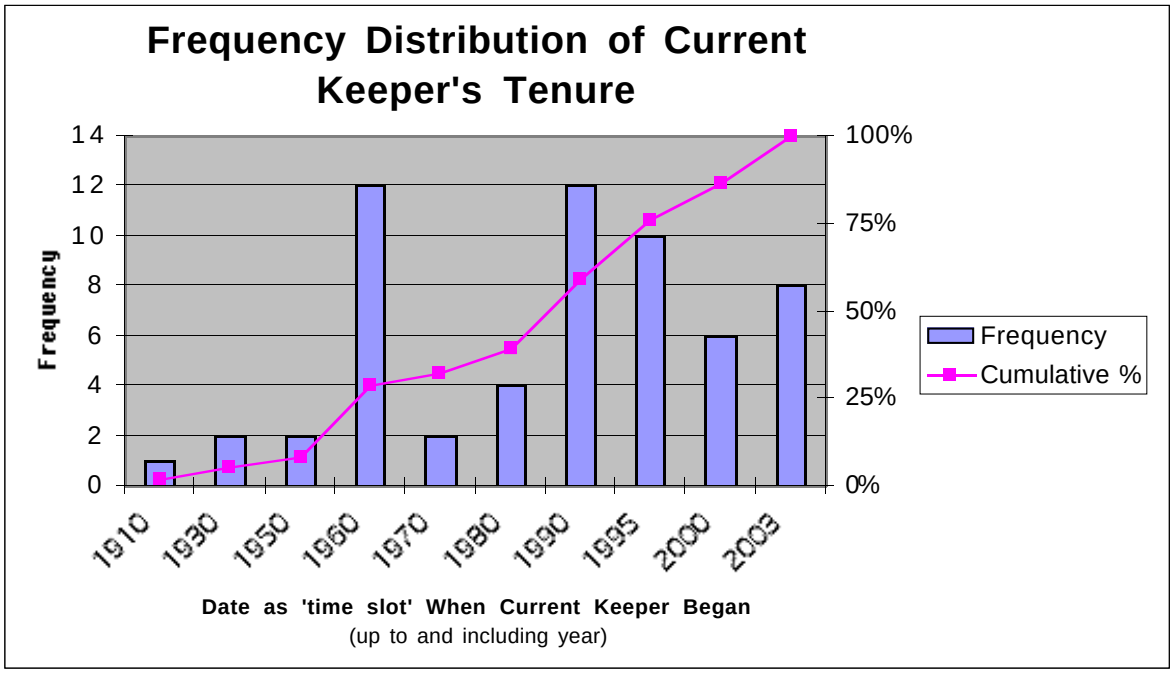
First consider the frequency chart; using the left hand vertical scale. Each blue bar represents a location, i.e. one orchard. All 69 locations that were surveyed are shown. The height of the bar represents how many trees are at the location. The locations are sorted so that the largest ones are at the left of the graph and smallest at the right. The graph shows that the largest orchard has about 55 trees and the smallest just 2. It also shows that half of the locations have less than 10 trees. Of the medium sized orchards, quite a few have 10-12 trees and another batch have 17-21 trees. A larger scale version of this graph with individual Location ID labelled is shown in Appendix D.



Turning now to the cumulative frequency part of the graph. This is shown by the purple curve and the right hand scale should be used. The curve represents the cumulative number of trees as locations are added up from left to right. It tells us that 25% of all fruit trees are at just 6 locations, and that 50% of trees are in the 18 largest orchards. The smaller half of orchards account for less than 25% of trees

Years as Keeper

The length of time that a person had been looking after the orchard at a particular location was recorded, as a date. In general the longer the time, the less specific the date given. A number of people said that they had been looking after the orchard for more than 50 years. This was recorded as 1952 on the database. Three keepers gave us specific information about when their parents or grandparents took the property on: these dates were 1900, 1914 and 1926. While it was normally the case that the *current* keeper's tenure was recorded, in these three cases the keeper's family had been in continuous tenure and therefore this was recorded.



For the purposes of frequency analysis, which is shown in the graph above, years have been collected together to create a batch of time or 'time slot'. So looking at the horizontal axis, the first time slot (at the left hand end) was up to and including 1910, the second time slot was from 1911 up to and including 1930, the third time slot from 1931 up to and including 1950, and so on. The dates that have been used for time slots were chosen arbitrarily, though the length of time in each slot is shorter at the right hand end of the scale, closer to the present day. Therefore the time scale in not linear.

Looking firstly at the blue bars and the left hand scale, we can see that prior to 1980, the key time when there was a change in keepers was in the 1950s (i.e. from 1951 up to and including 1960) when 12 of the 69 locations surveyed got their new keepers. Subsequently from 1981 to 1995 was a decade and a half of change for a further 22 locations. Finally 2003 alone saw 8 new keepers.

Looking now at the purple curve which represents cumulative frequency and uses the right hand scale, we can see that 25% of the locations changed keepers in the last 8 years, since 1995; and that 60% of locations have changed keepers in the last 23 years since 1980.

6.4 Mapping

Hard Copy Map

The master copy of the paper map (OS Superplan @ scale 1:1250) showing locations of every tree surveyed is held by NOG.

Computer Map

A software map of the same area as that covered by the hard copy is held by NOG. It is an OS Superplan product in dxf file format. Most competent drawing packages can deal with this format. The data is separated into layers and the scale is zoomable. This means great detail can be added. At this stage the surveyed trees have not been added to this map, and indeed it was not an agreed deliverable for this survey contract that they would be.

Having a map on computer does however present many useful opportunities, including being able to produce large scale prints of particular areas for NOG internal use. Copyright issues should be clarified before any external or third party use is considered.

Tree Co-ordinates

A facility to record the spatial co-ordinates of each tree has been made in the Tree Database (in the fields 'grid eastings' and 'grid northings'), though the acquisition of this data was not an agreed deliverable for this survey. The facility was made with a view to future creation of 'Geographical Information Systems' (GIS) which essentially are a marriage of computer maps with location specific data on a database. GIS can provide powerful analysis capabilities, but requires quite expensive software along with training to use it. At this stage of NOG's evolution, GIS is probably not appropriate, unless developed as a student project.

6.5 Photographic Collection

Digital Still Images

Approximately 1000 digital still images, referenced to individual trees, their fruit, other detail shots and to locations, were taken during the survey and are held by NOG on CD-ROM. The JPEG file format has been used. The images are high quality (16bit colour depth) with a resolution of 768x576 pixels which is suitable for viewing on a video or computer monitor, whilst not producing an excessive file size. These images are not suitable for large scale printing.

The main method of viewing these images is via the database. However, the images may be accessed directly using almost any picture viewing software. The image files have been given intuitive filenames; so the fruit tree with Tree ID 'T1448' has an image stored as T1448.jpg and if that tree has an image of fruit available it will have been stored as T1448F.jpg , alternatively if that tree has an image of a tree detail - such as a graft - it will have been stored as T1488D.jpg

Slide Photographs

Approximately seventy 35mm photographic slides were taken of the survey process. These are not referenced to particular trees or locations, but are more general shots. They will be used for presentation and projection, and a number of them are held by NOG.

These photos are also available as high quality, high resolution (1817x2749 pixels) digital images which may be viewed on screen, but are also suitable for printing. The images are stored in the JPEG file format on CD-ROM and are held by NOG.

Other Photographs of Survey

Various NOG members involved in the survey also took a number of photographs of the process. These are not formally recorded in the survey, but may be useful additional material.

6.6 Anecdotal and Personal History

We received many interesting comments from Newburgh's orchard keepers, during the course of the survey. We also made observations of our own. In this section is a sample of the comments and observations that were recorded. Observations and quotes that identify particular people have been omitted in order to protect their privacy. One exception to this is John Wilson, now deceased, who was well known and respected in Newburgh and surrounding areas for his grafting expertise.

Most of the following comments are from the Location database - making general comments - and some at the end of this section are from the Tree database, making specific comments.

On when they came

When her father in-law came in 1929, old trees were there then

Old lady that lived downstairs (who died 2 yrs ago at close to 100) is reported to have said that the trees were there when she was a girl.

He was born 1946 and has always lived here. Most of trees (except those otherwise noted) were here and mature when he was a boy.

Main orchard planted in 1910, when house was built. Mr William Stuart, now deceased, formerly a coal merchant in Newburgh helped plant these when he was a boy

Property was formerly a bakery - Henderson's Temperance Bakery. Bakery and tea room - famous for fruit pies.

House and garden built by them in 1975. Before that all orchard - some trees cleared with saw and bulldozer.

Mary has said all the trees were there since she can remember. The trees at top of garden have always been old, whereas the ones at the bottom of the garden she can remember when they were younger.

Family owned property for "centuries".

On Using the Fruit

"granny said when the starlings started at the pears - that was time to pick them"

makes apple and elderberry jam

gives a lot away - "I can't eat all these!"

doesn't use fruit at all - happy for folks to come and help themselves - i.e. for fruit fairs

A lovely eating pear in the middle of the garden, which was excellent but nobody knew the name of it.

Mainly use the plums and cooking apples. last year juiced some of the apples. She has also made an excellent spiced plum chutney.

pears don't agree with him so doesn't eat any.

On Selling the Fruit

Bramley - keeps best ones and sells them (Bramleys 20p/lb)

"Used to sell the plums up at Bridge of Earn hospital when the wife worked up there"

picked 730lb this year of cooking apples - Bramley and Stirling Castle

Bramleys: used to take 10lb lot to Beryls of St Andrews, a fruit seller. About 60lb in all - used to get £11 in about 1989 - hardly worth it.

Sell some at the gate in a good year, make chutneys and jam. More fruit than can deal with in a good year 80lbs off all 8 trees. Not a good year this year.

On Pruning

Don't reckon to prune older varieties - don't like it.

pruning - tend to pull branches off when they get in the way of mowing.

wasn't fruiting, root pruned but no better, then left unpruned and started fruiting.

Doesn't prune Bramley or Victoria - just cuts out dead wood.

All larger trees have been pruned - pollarded in recent years.

Other Observations

Garden is in process of having several years of undergrowth removed. Garden has been overgrown for perhaps more than a decade on the evidence of size of sapling growing. Jim later told us that it had been overgrown for at least 20years. Top third of garden still impenetrable

Many trees have bark damage by strimmer

Personal Connections with Individual Trees

planted by Maurine's grandfather

her father grafted the Bramley on some 'found' rootstock

planted for a cousin's birth

Comments of the Fruit of Individual Trees

nice rosy eater - he suggested 'Red Court Grieve'

good keeper, good bottling pear, good to eat once it has ripened. not ready yet.

floury texture when cooked

A good bottling pear - but need to be caught early.

not yielded well this year

Origins of Individual Trees

sent up from a nursery in England - this one has never done very well

several grafted onto large old root. Root is 70 - 100 yrs old - ~100cm girth, cut off at 0.3m above ground. Grafted by John Wilson

he guesses that it was planted when house was built - 1922

Other Comments on Individual Trees

tree looks as though it has had several varieties grafted on to it. One limb with fruit looks like Merton Pride - a large roundish pear, and another limb has a small tear shaped pear. Limb with small pear was very heavy yield - almost to exclusion of rest of tree.

one major trunk has been cut off. A fair bit of rot in the trunk but it still seems to be going strong.

tree used as a tree-house by kids.

kids said that they took the fruit down and used it for apple fights

7 Conclusions

On the Orchards

- There is a larger than expected population of fruit trees in Newburgh.
- Apples are the main fruit tree, followed by plums and then pears.
- Newburgh's orchards are predominantly in private gardens.
- Half the surveyed orchards have 10 trees or more.
- Fruit trees in Newburgh are an ageing population, and in decades to come the town will have fewer mature trees.
- There are pressures on the population of trees. These come from changes in expectations people have of their gardens, that result in clearance or lack of replacement. There is also pressure from building development. Historical maps and Ordnance Survey editions in the early 20th century, clearly show nearly every garden in the town containing fruit trees. Modern maps show fewer trees, and it is clear from the survey that the extent of the trees is diminishing.
- The rate of turnover of properties in Newburgh has been increasing - more than a quarter of people have had their property (including its orchard) for less than 8 years.
- There is a vast resource of unused fruit, most of which rots on the ground.

On the Trees

- The population of fruit trees is predominantly healthy.
- Most trees are yielding well.
- Pruning has been ignored in recent years.
- There is a lack of knowledge about care and maintenance of the trees, particularly pruning.
- There is a willingness to learn, and indeed a demand for 'hands on' instruction for pruning.
- Further work needs to be carried out regarding the determination of varieties, particularly regarding the population of apple trees.
- There are a number of unusual and even unique varieties within the orchards of the town.

On Heritage Aspects

- A comprehensive snapshot has been taken of the condition of Newburgh's orchards at the beginning of the new century.
- A large photographic archive has been created.
- A significant amount of anecdotal history has been collected.

On the Keepers

- There is overwhelming support for NOG amongst those surveyed, and a great deal of interest in the developing project.
- The majority of people use some of their fruit.
- A significant minority of people store or preserve their fruit.
- There is a great deal of goodwill and willingness to co-operate in order to use the fruit, rather than it "go to waste".

On Survey Process

- With only a single exception, NOG received full support from everybody that they contacted regarding the survey - this shows an outstanding level of support in the community for the survey.
- The survey design and process worked well and resulted in the work being completed successfully.
- The survey initially exceeded the target of 500 trees by 26%.
- The extension to the survey resulted in the entire survey exceeding the target of 500 trees by 68%.
- The survey extension incurred an additional cost of just 11%, thus by extending the survey a significant increase in value for money was realised.

8 Next Steps

This section discusses possible next steps, makes recommendations and puts forward ideas - that result from and flow on from the survey.

8.1 Development of Fruit as a Resource

1. There is currently an excess of fruit production over consumption in Newburgh. Therefore the balance of activity should focus on developing use of the existing fruit resource rather than planting more trees immediately. (There are some exceptions as noted below.)

2. There are two key areas which need to be developed; firstly relationships with keepers of orchards and secondly marketing and use of fruit.

3. Relationships between NOG and orchard keepers need to be established more firmly, to provide a more formal basis but remaining flexible. Care should be taken to create links which are mutually beneficial and impose the minimum of obligations - most of the orchards are first and foremost private gardens.

4. A 'Participatory Appraisal' exercise may be useful in developing the sorts of relationship that keepers of orchards would like to enter into with NOG or a marketing body.

5. 'Newburgh' should be used as a marketing 'label', drawing on the town's orchard heritage and its origins with the monks of Lindores, to create a premium position in the market. In the longer term the Newburgh name or a logo can be built into a brand, or a 'locality' along the lines of 'appellation controlleé'.

6. Recently there has been growing interest amongst the public in knowing where their food comes from. Developing 'Newburgh' as a source of fruit, in which the public can clearly see the origin is potentially a great strength, that should be exploited.

7. Consideration should be given to creating a co-operative, community business or some other sort of social enterprise, in order to market the fruit. This could create meaningful and long term local employment.

8. In addition to the marketing of fruit, alternative uses of fruit should be investigated. These could be particularly effective as a way of using blemished fruit unsuitable for first grade sale. Perry (pear cider) for example is being promoted by the Campaign for Real Ale. Cottage industries have a real opportunity to develop in the current food market. NOG should seek funding for a comprehensive study of business opportunities.

9. The Organic Market. Preliminary research suggests that there is a local market for organic fruit, and this would be a premium market. Although anecdotal evidence suggests that few people in Newburgh use agrochemicals in their orchards, organic certification of private gardens is clearly not feasible on a wide scale, although the odd enthusiast may be found. Therefore the orchard in council hands on the north side of the High Street, and any newly planted orchards in the control of NOG are the best placed to go through the organic certification process. Operating these orchards organically would not entail a significant change in practices. Organic markets should be further investigated with a view to producing certified organic fruit.

10. As an organisation NOG could also benefit from links with the Soil Association, because it champions locally produced food, promotes the use of 'healthy, local, organic food in school meals in Scotland' and has a 'Community Supported Agriculture' programme which would help to market Newburgh. It is inexpensive to join as a 'producer member' and NOG should do this forthwith.

11. Central Core Network is a useful networking body for orchards in Scotland. NOG should join forthwith.

12. Preliminary research indicates that within health education in Fife, there is potential interest in the local sourcing of fruit for schools in Fife - and NOG is in a key position to develop this interest and should do so.

8.2 The Community of Orchards

13. While the community orchard is not unusual in Scotland or even in Fife, Newburgh is has the distinction of being a 'community of orchards'. This is unusual and should be valued, the distinction embellished and used to develop the marketing potential both for fruit and for visitors.

14. The heritage value of Newburgh's unusual and possibly unique occurrence of some varieties should be built upon. There is potential for selling grafts of these to horticultural enthusiasts, and indeed propagating new specimens, and this should investigated.

15. Building on their excellent work putting on Fruit Fayres, NOG should take forward their idea of declaring Newburgh 'Fruit Town of Fife'.

16. An 'Orchard Trail' around Newburgh could be created - as is done for example with architectural trails around some cities. The trail could take

in some key viewpoints and if designed sensitively, need not intrude into private gardens or indeed the privacy of residents. Descriptive signage would allow the trail to be taken autonomously, although it would be interesting to have guided walks on particular occasions - for example Fruit Fayre days, for visiting groups and perhaps on a weekly basis during the tourist season.

17. There is significant potential for developing outside visitor interest in Newburgh, from both the fruit tree specialist and the general tourist. NOG need to consult with other local bodies and residents in general, on the benefits and disbenefits of tourism, with a view to be involved in creating a tourism development plan.

18. Greater value needs to be placed on the large older pear trees. These are relatively rare even in Newburgh and only a few specimens over 10 metres estimated height exist. Some are subject to pollarding, and indeed the tallest pear that we recorded on the survey in now reduced to less than a third of its original height. In order to raise the public profile and recognise the value of these magnificent and unusual specimens an acknowledgement of the largest and finest specimens in Newburgh should be made - with perhaps a recognition award given at the time of one of the Fruit Fayres. These acknowledgements need not be restricted to pears but could include apples and plums as well.

19. Liability Insurance. Connected with the pollarding of large trees is the issue of affordable liability insurance. Insurance premiums have generally increased dramatically. As a service to members and for the benefit of the wider community, NOG should arrange for affordable orchard liability insurance to be available to its members.

8.3 Education and Training

20. There is an evident demand for training in the practices of orchard husbandry by the people who took part in the survey. NOG should arrange and run pruning workshops. At those workshops, and by other means it should collect information of other skills development that is required.

21. NOG members should arrange expert advice and training in determination of varieties in order to development their skills in this area.

22. Educating the young people of Newburgh about the orchards is a key element to the long term success of the wider project. The nascent orchard beside the school is to be thoroughly welcomed in this respect. However it will be of minimal use and impact unless **use** of the fruit is embraced by the children and the school administration - this means the orchard is not just an area of alternative landscaping but somewhere that they are free to eat from and the school kitchen can also source fruit. This is a key element to raising awareness on food issues.

8.4 Deepening the Knowledge Base

23. This survey has always been envisaged as the beginning of a process, and there remains a number of mature trees - perhaps 200 - and an unknown number of immature trees, which have not been surveyed. NOG should continue to collect survey data so that a complete picture of Newburgh's orchards can be realised.

24. Variety Determination - with expert advice and development of skills of NOG members, determination of varieties will become more reliable.

NOG should continue the variety identification process, and using specimens of known variety 'triangulate' with specimens of unknown or uncertain variety. Some of this will be possible working with just the database, for the trees that have pictures of their fruit; in other cases a visit to the relevant trees during the fruiting season will be necessary.

25. In order to conduct fieldwork effectively, especially when refining and adjusting information held on the database (such as variety determination), NOG should consider the purchase of a laptop computer. The model does not need to be particularly powerful to run the database, but must have very good battery life - hence care should be taken especially if buying used machines.

26. The measurement of yield from trees should be a priority in future seasons. Very little actual yield data was available during the survey. NOG should ask keepers to measure yield in order that it can be recorded (on the database). NOG may also want to consider measuring yield for a number of key trees each year. It may be necessary for NOG to purchase appropriate equipment for this to be accomplished - for example a number of weighing devices which can be lent to participating orchard keepers.

27. Further Analysis of Data. Further and more detailed analysis of existing data can be carried out. This could include in depth yield analysis by area. Additionally yield estimation across Newburgh could be carried out, if the actual yield was determined on a small number of trees, and this was used to calibrate the model in terms of key parameters (ie. height, age, fruiting state)

28. The computer map has as yet, not been fully utilised. NOG should purchase software (<£100) to use the (dxf format) layered map. In addition to providing a useful management tool for NOG, it can also provide an effective backdrop to involving children and students in the wider project.

29. Geographical Information Systems. GIS is a powerful tool combining computer mapping with geographical data. We already have both elements as a result of this survey, and a GIS project could realise even more powerful spatially orientated analysis of the data collected. Whether it is strictly necessary for a project at this stage and with aims & objectives as they stand is debatable. It would however make an excellent student project, whether approached from the geography, horticulture or environmental history angle. It would also be a very good way of creating links with the research and teaching community which would validate the heritage value of the whole project. NOG should make contact with appropriate university departments with a view to initiating such a project.

30. Dendrochronology. This is an archaeological technique for measuring the age of (and dating) trees. For a living tree a small diameter core sample is taken through the trunk. The hole in the trunk is sealed, and there is no adverse effect on the tree. The core is taken to a laboratory where the progression of growth rings is established. For a living tree it is a simple process to determine age. It is also possible to determine the age of dead wood - for example a dead stump if it is reasonably preserved. These services are available in Scotland. NOG should initiate a dendrochronology project to determine the age of key trees in Newburgh - thus calibrating the whole dataset.

8.5 Devolving & Involving

31. In principle as much information should be devolved to the public as possible. However, during the survey in order to comply with our understanding of the data protection legislation, NOG pledged not to release personal data to third parties without their express permission. Personal data should remain confidential unless a new agreement with the survey participants is established. It is therefore proposed that where data about trees or locations is to be made public, all names, addresses and location identification should be omitted. Additionally, comments should be edited to remove any information identifying persons and locations

32. A copy of this report (which does not contain any identifiable persons or location addresses participant in this survey) should be lodged with the local library in Newburgh.

33. A copy of this report should be given to the Newburgh History Society.

34. A pdf file format copy of this report should be available via email or the web, free of charge to anybody requesting it.

35. A full copy of the survey data, including this report should be lodged with the Museums Service of Fife Council. NOG should negotiate with the Museums Service on how confidentiality of personal information can be maintained.

36. Serving to the Web. FileMaker, the database software is able to serve data to the web. NOG should investigate the feasibility of the serving a non-confidential version of the database on the web, via their forthcoming website. Individual survey participants could be privately given the Location ID that was allocated to them during the survey and thereby look at their own data on the web.

37. Involving Young People. Devolving information via school projects is an excellent way of involving children in the project. NOG should investigate how the survey information can feed into the curriculum at schools in the area.

38. NOG should investigate working with youth groups, scouts, cadets and BTCV Scotland to undertake some of the intense work: picking fruit, supervised pruning of trees whose keepers are older less nimble townsfolk, and assisting keepers in reclaiming some overgrown orchards.

APPENDICES

Appendix A: Contacts

1. Newburgh Orchard Group

   Chair: Frank Batchelor, 14 The Paddocks, Newburgh [tel 01337 841098]

   Secretary: Mandy Horner, The Old Draper's House, 154b High Street, Newburgh

   Treasurer: Peter Pearson, Westend Cottage, 2 Shuttlefield, Newburgh [tel 01337 840410]

2. Local Contacts with relevance to the history and heritage aspects of Newburgh's orchards

a) Newburgh History Society
Secretary: Janet Bayne 01337 857904

b) Museums Service, Fife Council
Local information held at Laing Museum, High St, Newburgh and at Cupar. Contact Gavin Young or Marion Wood on 01334 412933

3. Local Contacts with relevance to the orchard development

a) Central Core Network. Networking organisation for orchards in Scotland. Contact Catherine Lloyd on cathlloyd@ukf.net or Greenbank House, West End, Abernethy, Perthshire, PH2 9JL

b) WECAN! is a grassroots environmental action network based in Fife. The *Food for Fife* project is working with local groups to establish four new initiatives, evaluate their impact and assess what potential there is for these projects to make a difference to food awareness and disadvantage in Fife. For more info and contacts, visit www.wecan.org.uk

c) Social Economy Team, Development Services, Fife Council. Contact Ellen McCance on 01592 415994 or ellen.mccance@fife.gov.uk

4. Survey Consultant and Report Author

Dr Crispin W. Hayes,
Eco Consultancy and Research
Address: 48 Main Street, Springfield, Fife, KY15 5SQ
Phone: 0845 458 8335
Email: environment@omnipresence.org.uk

Appendix B: Newburgh Orchard Group Mission Statement

Our Aim:

To preserve, maintain and develop Newburgh's heritage as a historic fruit-growing area

To enable local people to gain maximum enjoyment and economic benefit from fruit-growing in the local area

Short-term objectives:

To create a working Community Orchard

To encourage recycling of waste into compost

To build up a network of fruit tree owners/growers

To bring people, skills and resources together for the benefit of all

Long-term objectives

To see Newburgh put on the Tourist Trail as Scotland's Fruit Town

To create a resource of which the people of Newburgh will be proud

To attract tourism and generate prosperity

To research the history of Newburgh's fruit heritage and to preserve its ancient fruit varieties

Appendix C: Database Fields

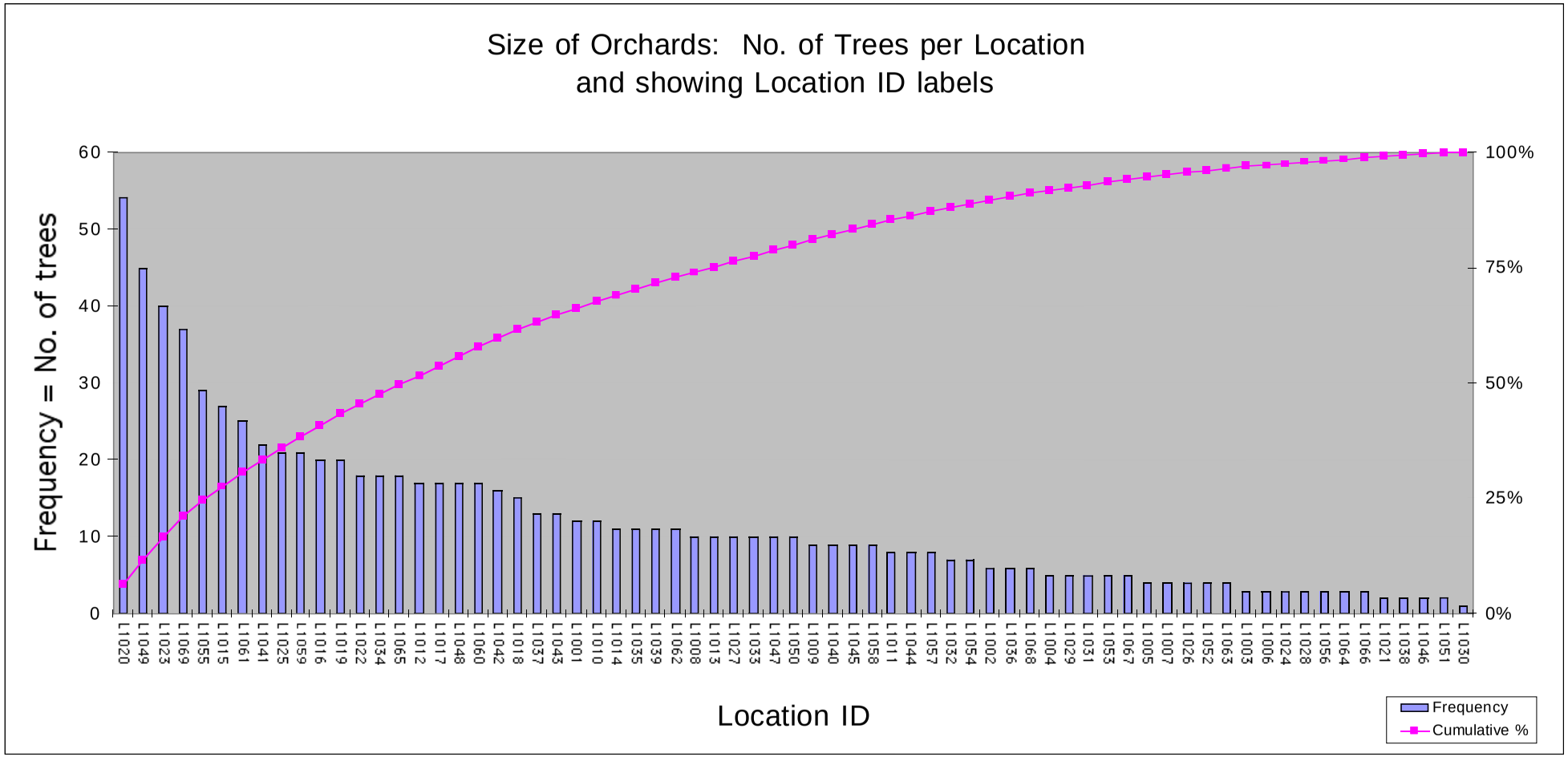
2 linked databases:

1. Location and keeper database - 'Location' Database	
Field	***Example or list criteria***
Location ID = key	L*nnnn*
name of keeper of orchard	
orchard location/address	
contact address (if different)	
location type	private garden/ allotment/school/other public
how long have you been looking after these trees (year)	
use fruit?	no,/some/alot
Keeper present at survey	yes/ no/partly
NOG surveyor for this location	
Comments & Notes on location	
Picture of location	

2. Stock Record - 'Tree' Database	
Field	***Example or list criteria***
cross ref via Location ID	
Stock ID = key	T*nnnn*
Tree location - Grid eastings	
grid northings	
Tree type	apple, plum, pear, damson, greengage, crab apple
Variety/Cultivar	
Culinary or Dessert	culinary, dessert, both
Grafted rootstock	y/n/ don't know/ can't tell
Approx age range	0-9, 10 -20, 21 -40, 41 - 70, 71 - 100, 100+
Age known/ estimated (yr)	
Size girth (cm)	
Size height estimate (m)	
Form multi	standard, half standard, draft, espalier, cordon, low trunk, other
Fruiting state	very little, light, medium, heavy
Yield (figure & units)	
Pruning state in	overgrown, unpruned for sometime, partly pruned (but need of some attention), good
Tree health	diseased, not happy, fairly sound, good
Picture link (link to file(s))	
Comments & Notes on this tree.	

Appendix D: Frequency Analysis of Orchard Size

This is an outsize graph, providing a more detailed version of data presented in Section 6.3.



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PROJECT PART-FINANCED BY THE EUROPEAN UNION

Europe and Scotland
Making it **work together**

Fife Council Venture Fund

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The Newburgh Orchard Group 'fruit device' appearing as part of cover design is used courtesy of Janet Bayne, original artist.

All photos by Crispin W. Hayes

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