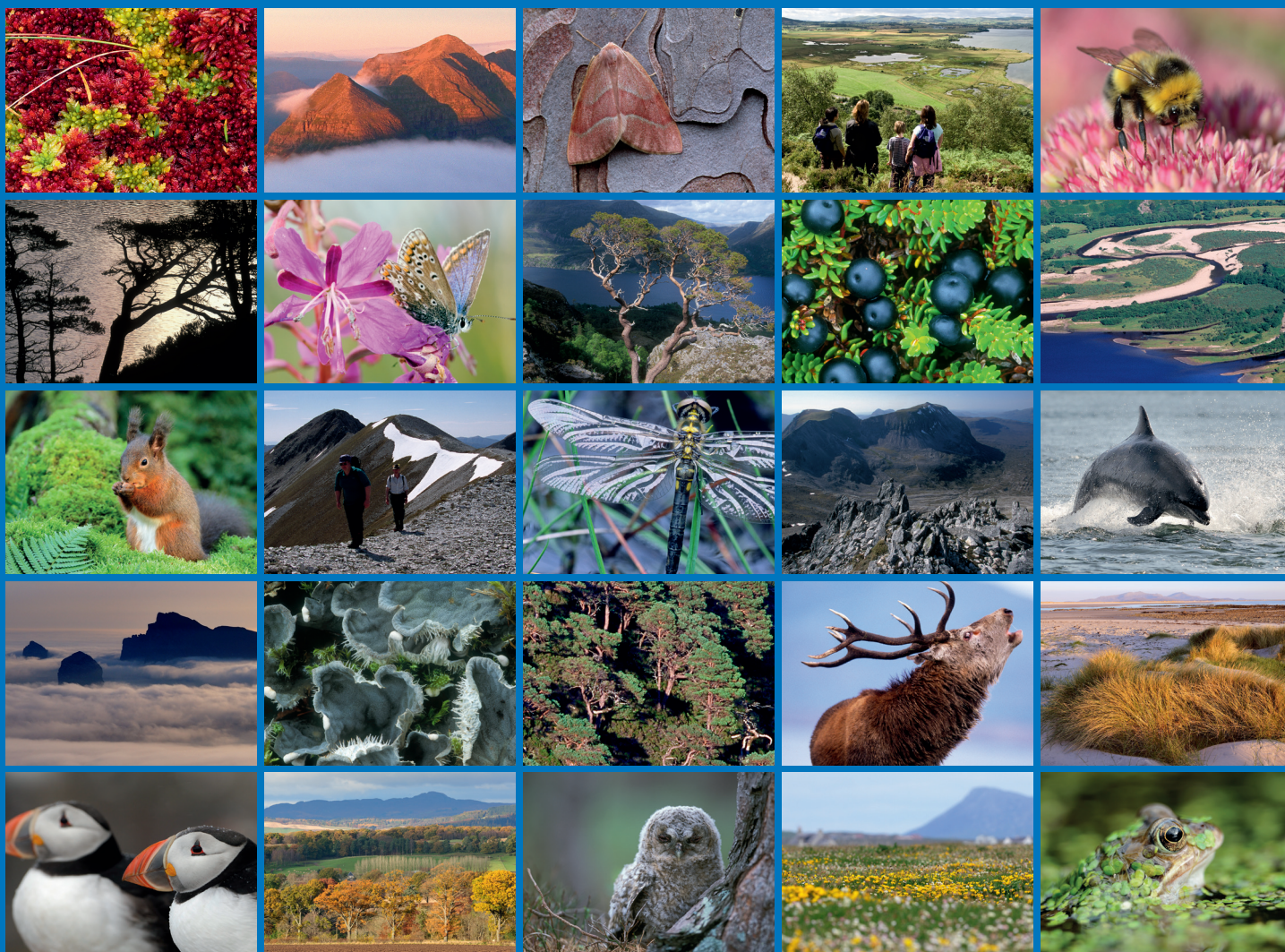


A national orchard inventory for Scotland – area report for Perth and Kinross





Scottish Natural Heritage
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All of nature for all of Scotland
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RESEARCH REPORT

Research Report No. 999

A national orchard inventory for Scotland – area report for Perth and Kinross

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RESEARCH REPORT

Summary

A national orchard inventory for Scotland – area report for Perth and Kinross

Research Report No. 999

Project No: 015801

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Keywords

orchard; fruit tree; top fruit; apple; pear; plum; undercrop; EUNIS G1.D4; Perth and Kinross; Perthshire

Background

There has been growing interest in traditional orchards in Scotland for a little over a decade. This interest has a great breadth; from cultural heritage and horticultural practice, to historic varieties and the gradual disappearance of this unusual Scottish habitat.

The National Orchard Inventory for Scotland Project aims to create a comprehensive orchard inventory for the nation. This has probably not been attempted for over a century, perhaps since the 1885 Congress. The rationale that underpins this aim is that an Orchard Inventory will form the basis for addressing a number of issues linked to the decline of orchards over the last four decades and create a strong foundation for their revival. Simply put, we need to know what's where in order to change the downward trajectory.

The project began in 2013 with a pilot study which since then has received funding support from Scottish Natural Heritage. The programme has grown since that time to add further phases so that at the time of writing more than half of Scotland's orchards have been surveyed and recorded. The national project is reported separately, and is available at the project website www.scotlandthefruit.org.uk

Main findings

- A total of 220 orchard sites were surveyed, of these 185 were found to be intact orchards.
- The total acreage of orchards remaining in this area was found to be 64.2 ha and the average area of each orchard was 0.38 ha.
- The survey showed that a relatively small area of orchards have been lost, and this has been more than offset by newer orchards. However the lost orchards are the larger mature ones that had high cultural and biodiversity value.
- Most of the orchards contain less than 30 trees and are in a domestic setting. Five larger orchards of commercial size are recorded.
- Though apple dominates, most orchards contain a diverse mixture of fruit species, reflecting their domestic use.
- The tree stock contains trees of all age ranges.
- Veteran tree features indicate the orchards contain high levels of biodiversity.

- The majority of orchards have some or active management, and this is at a higher rate than typically found elsewhere in Scotland.
- Many orchards have new plantings and younger trees, and this shows orchard renewal is occurring.
- Soft fruit and also vegetables are grown in a significant minority of orchards. This is at a higher level than most of Scotland.
- Most fruit is used for family and friends, some is sold commercially and some is left to waste.
- Livestock are grazed in minority of orchards, these mainly being sheep and horses.
- The qualitative data demonstrates the depth of history; cultural, economic and otherwise, that this area is custodian to.

To conclude, Perth and Kinross contains a large number of small orchards, most of which are quite actively managed and from which the fruit is used within the domestic setting. There are a handful of commercial sized orchards which sell their fruit. Most of the historic large mature orchards that the area was formerly known for, are still in decline.

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Acknowledgements

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Local Collaborating Organisations

Comrie Development Trust
Forward Coupar Angus
Carse of Gowrie Group

National Collaborating Organisations

Scottish Natural Heritage
Orchard Research & Enterprise CIC

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Lorna Gibson, former GIS Officer at Crispin Hayes Associates who made a first deskstudy assessment of nearly two thousand sites across Scotland.

Thanks for all your contributions.

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1. INTRODUCTION

There has been growing interest in traditional orchards in Scotland for a little over a decade. This interest has a great breadth; from cultural heritage and horticultural practice, to historic varieties and the gradual disappearance of this unusual Scottish habitat.

The National Orchard Inventory for Scotland Project aims to create a comprehensive orchard inventory for the nation. This has probably not been attempted for over a century, perhaps since the 1885 Congress. The rationale that underpins this aim is that an Orchard Inventory will form the basis for addressing a number of issues linked to the decline of orchards over the last four decades and create a strong foundation for their revival. Simply put, we need to know what's where in order to change the downward trajectory.

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This document is one of a series of reports that provide results for particular areas, which are usually coherent with the local authority domain. The purpose of producing these 'Area Reports' is to make results relevant to local organisations and local people. It is intended to raise awareness about their orchards and their cultural heritage, and to identify issues that may be contributing to their decline and, in some cases, revival.

2. COLLABORATION

The national project is structured to partner collaboratively with local groups. Resources, systems and coordination are provided nationally, fieldwork is organised and carried out by the local collaborating organisations.

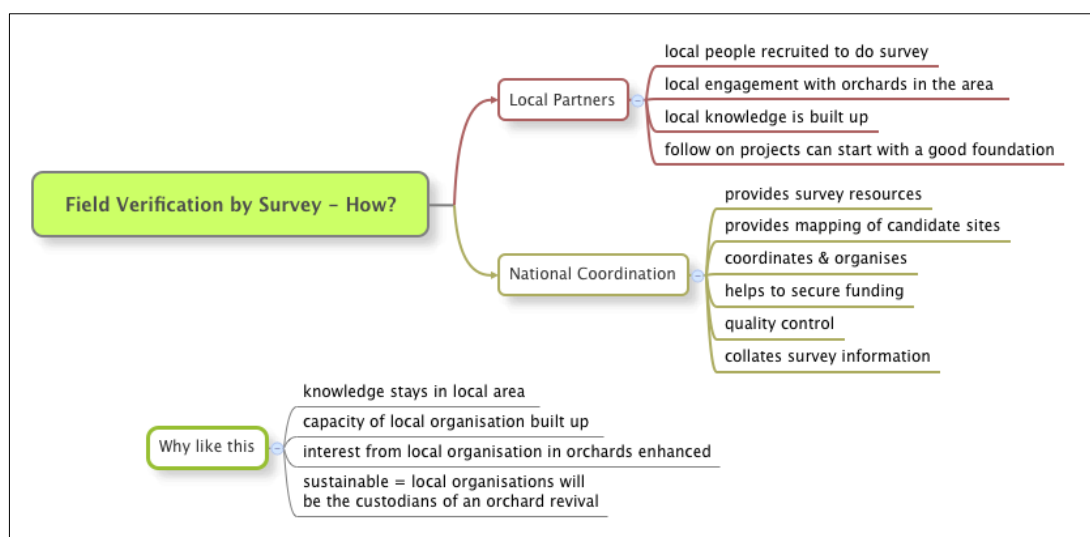


Figure 1: Structure of Collaboration for Field Verification

The graphic shows what each partner brings to the field survey work. The reason why we have structured the project like this is also shown. We want knowledge to be retained locally so that capacity is built and a sense of ownership and interest in local orchards is strongly established. We think this will be the most sustainable way to create a foundation for an orchard revival.

As a project partner, the local collaborating group has a copy of the data collected in their area.

3. BACKGROUND TO THE AREA

It is principally lowland Perthshire that contributes to the orchard lands of Perth and Kinross. One of Scotland's great and historic orchard areas is located on the flat and fertile lands of the Carse of Gowrie beside the Tay between Perth and Dundee. This was an area that for several centuries has featured large field-sized commercial orchards, which were recorded as well established in 1813 (Machray & Gorrie, 1819). There are also many orchards to be found further inland in Strathearn and to a lesser extent Strathmore.

The Carse of Gowrie has been surveyed previously (Hayes, 2007) and this survey revisited many of those sites, but also ventured up the Braes and over into Strathmore. In the City of Perth and its periphery, we were able to include many of the newer Perth 800 project orchards that have not previously been systematically mapped. To the west, many unrecorded orchards were found in Strathmore and Glenalmond.

Not all of Perth and Kinross has been covered by the work reported here because we were unable to identify collaborating groups in other parts including in Kinross and highland Perthshire. However, at least with the latter, there are likely to be relatively few orchards omitted as a result.

4. METHODOLOGY

The methodology for the project (of which this area is a subset) is described in Annex 2.

To summarise, a two stage approach is adopted.

1. A deskstudy is carried out, looking for orchard sites from mapping, historical data, existing surveys and other sources. This is collated on a Geographical Information System. Each site is given a unique number and a location map created. Nationally the deskstudy considered 1859 sites of which 1728 were considered candidates for field verification.

2. Field verification. Each candidate site was visited and surveyed by a volunteer surveyor. Photos were taken where possible. The survey results were submitted to the national project.

Finally the results are collated and reported.

The Local Facilitation for this area was provided by Andrew Fairbairn, Wendy McCombes and Kaska Hempel of Comrie Development Trust, Forward Coupar Angus, Carse of Gowrie Group.

Time input for field verification work is reported in Annex 2.

5. STRUCTURE OF RESULTS

The results are structured in this report in three distinct sections:

- Numeric and classification information (quantitative), together with overall conclusions.
- Anecdotal and comment information, qualitative aspects.
- Representative photo gallery. A collection of photos with descriptive captions that illustrate the orchards of the area.

Photos have been submitted for a total of 196 sites.

6. NUMERIC AND CLASSIFICATION INFORMATION

Quantitative Data Results

We have analysed the data collected and have turned it into a more presentable form by creating a graphical output. In the section below, those graphs are presented with a commentary.

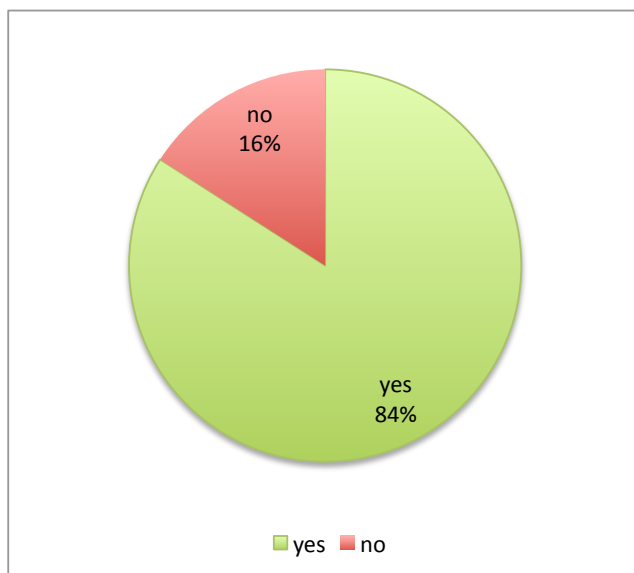


Figure 2 Summary: Is the orchard present now?

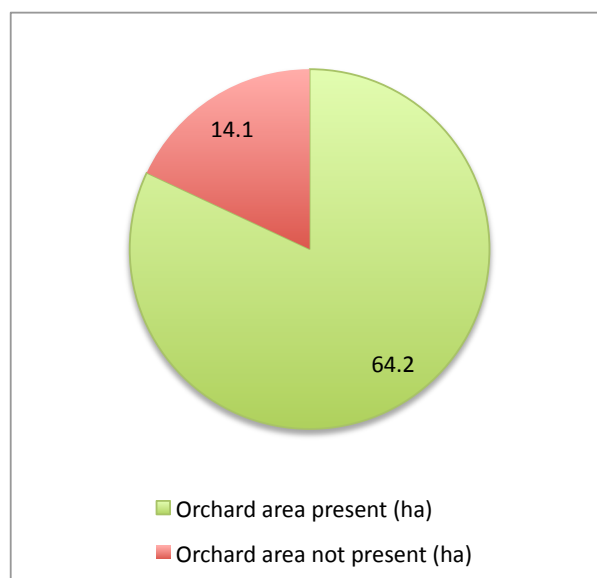


Figure 3 Area of orchard sites

The graphs above show the headline results of whether orchards were found to be present on candidate sites (left pie chart), and the total associated area (right pie chart).

Field surveywork was completed for this area for 220 candidate sites. Of that number, 185 sites were found to have an orchard present and of those 108 were new orchard sites, the balance resulting from our deskstudy. Our definition of an orchard is a collection of 5 or more fruit trees in proximity. By 'new sites' we mean sites not identified in our deskstudy - so new to us. Many, though not all, are recently planted orchards.

The fieldwork also found that a total of 35 sites were not orchards at the time of survey. Most of these latter sites were identified in the deskstudy as likely to be orchards from mapping, historical, or previous survey data. As such it is likely to represent some of the loss of orchards.

A further 3 site(s) were visited where it was not possible to gain access or make a determination as the existence of an orchard.

In terms of the acreage of sites, the fieldwork found that 64.2 ha of the orchard sites were present in Perth & Kinross. This represents 82% of the total area of deskstudy + new orchard sites. The average area of an orchard is 0.38 ha.

The graphs show that there has been some loss of orchards, both in terms of numbers and total area. It has been partly offset by newly planted orchards. The loss is significant because it has occurred in many of the large mature orchards that have historical as well as high biodiversity value.

For a historical perspective on the significance of this trend we have also analysed the OS 1st edition data which was assessed for each site during the deskstudy. The OS 1st edition was surveyed in the late 1850s and early 1860s, and covered most of Scotland and was very detailed. It represents a good resource for historical analysis.

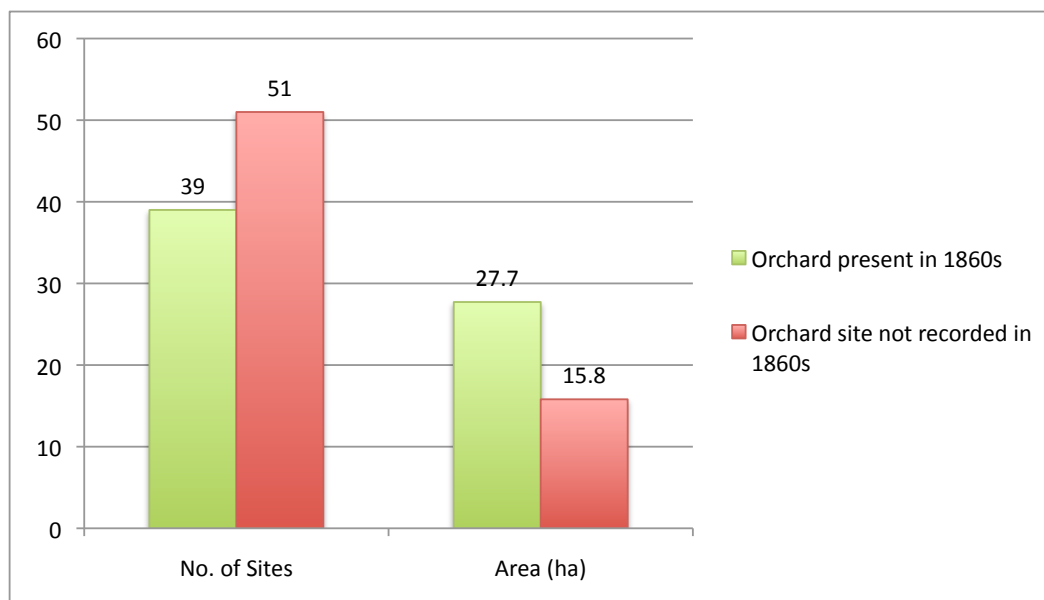


Figure 4 Orchard sites recorded on the OS 1st Edition Map (1860s)

In Perth & Kinross a determination for the presence of an orchard on the OS 1st Edition was made for a total of 90 candidate sites. The graph shows that of these, a total of 39 candidate sites were an orchard. The total area for these orchard sites was 27.7 ha in 1860s.

These data represents an interesting story for the Perth and Kinross area. Though these data only include candidate sites that our deskstudy assessed there was a reasonable prospect of an orchard being present, the indication is that the acreage of orchards today may be much greater than they were in 1860s. Though the data from 150 years ago didn't include domestic orchards which we have done, it still represents a relatively positive trend.

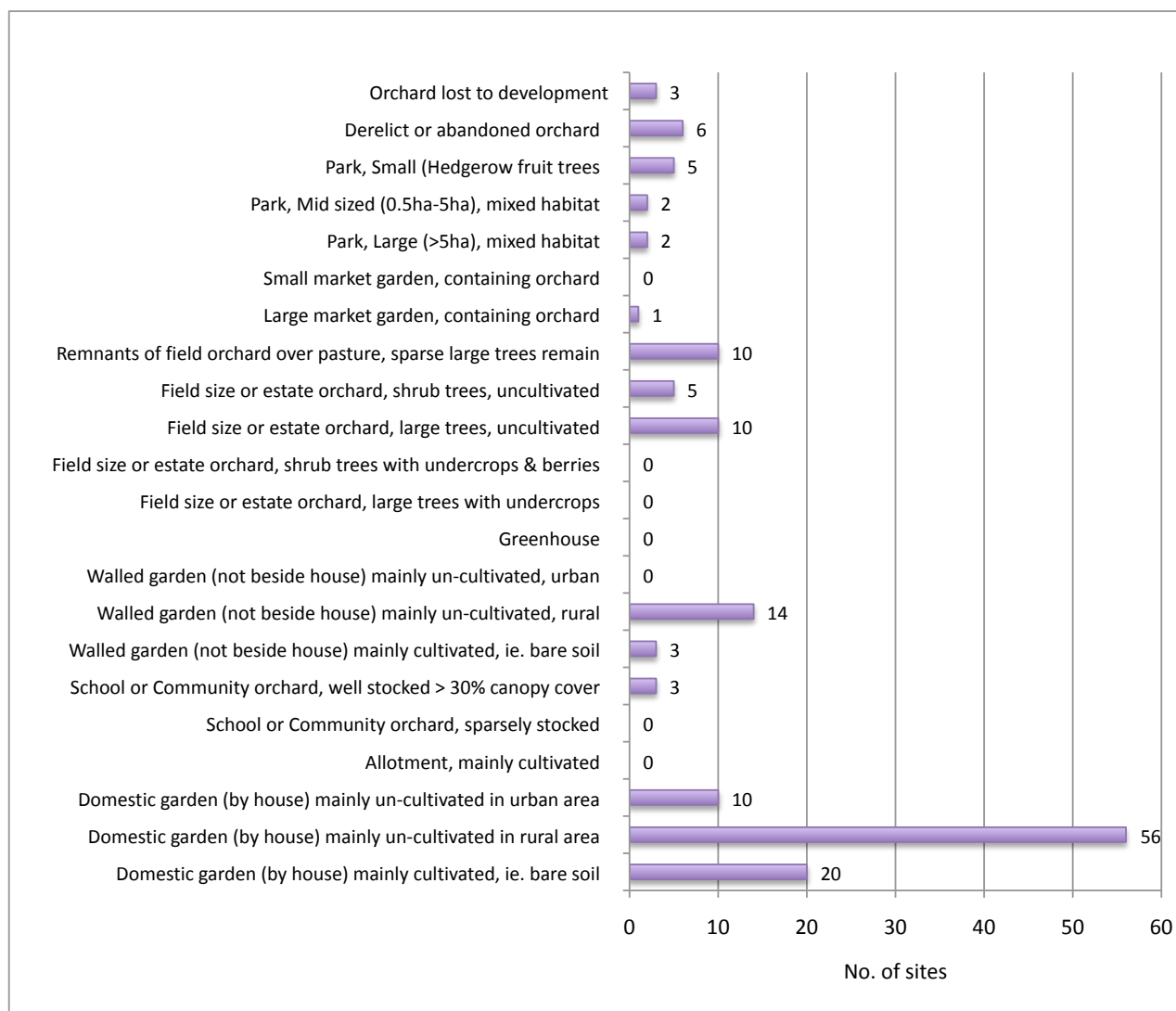


Figure 5 What type of orchard sites?

The type of site was recorded as a simple metric that can give a powerful insight into the type of orchard being considered, as well as assisting in the habitat classification using the European Nature Information System (EUNIS). Hence the apparent complexity of site types.

The graph shows the three largest classifications are for types of domestic orchard by houses. The second largest classification group is for field scale orchards, a site type that would be considered for overtly commercial purposes. Thirdly walled gardens are also recorded in significant numbers. Nine derelict or abandoned or lost to development orchards were recorded. A number of other site types are present.

Stewardship and Agricultural Payments

In the area being considered, it has been reported that 3 orchard(s) are part of a Stewardship scheme. In terms of orchard sites where an agricultural subsidy is being claimed, the survey found 8 orchard(s) were registered within the Integrated Administration and Control System (IACS) which relates to EU agricultural payments. This figure is probably an under-representation as there is some incentive to classify the land as other than an orchard.

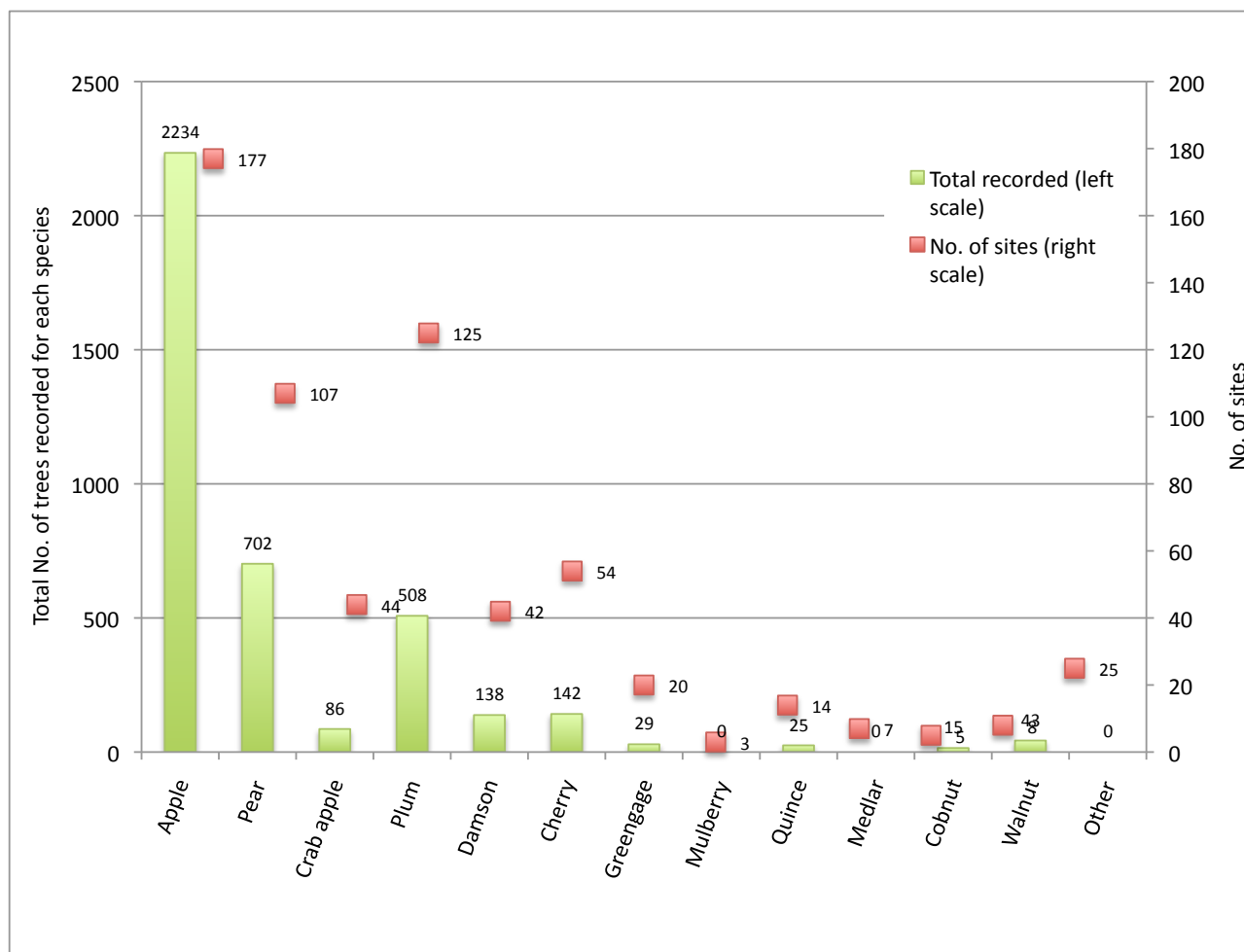


Figure 6 Fruit Species Recorded in the Orchards

A broad range of top fruit species were recorded to gain a full picture of fruit produced. The green columns (left scale) represents the total number of trees recorded for each species in the area being considered. The red markers (right scale) represent the number of orchards in which that data was collected. In some cases it was not possible to determine numbers for individual species in an orchard, so the total number of sites surveyed is likely to be greater than the maximum number of sites recorded here.

The total number of individual trees recorded in the survey was 3922. We also recorded a size range for each orchard. An estimate of the total number of trees from this size range data is 3807. This demonstrates reasonable agreement, given that number of individual trees is not always recorded in every orchard.

The graph tells the story of this area. The apple dominates in the orchards recorded as part of this survey, being present in 177 of 185 orchards. Pears are the second species which is not the case across much of Scotland, but for those that know the Carse of Gowrie it will not come as a surprise. There a good number of plums and damson which also do well in the area. Cherries have a greater representation than seen elsewhere in Scotland. There are a mixture of other species commonly found but only at a subsidiary level.

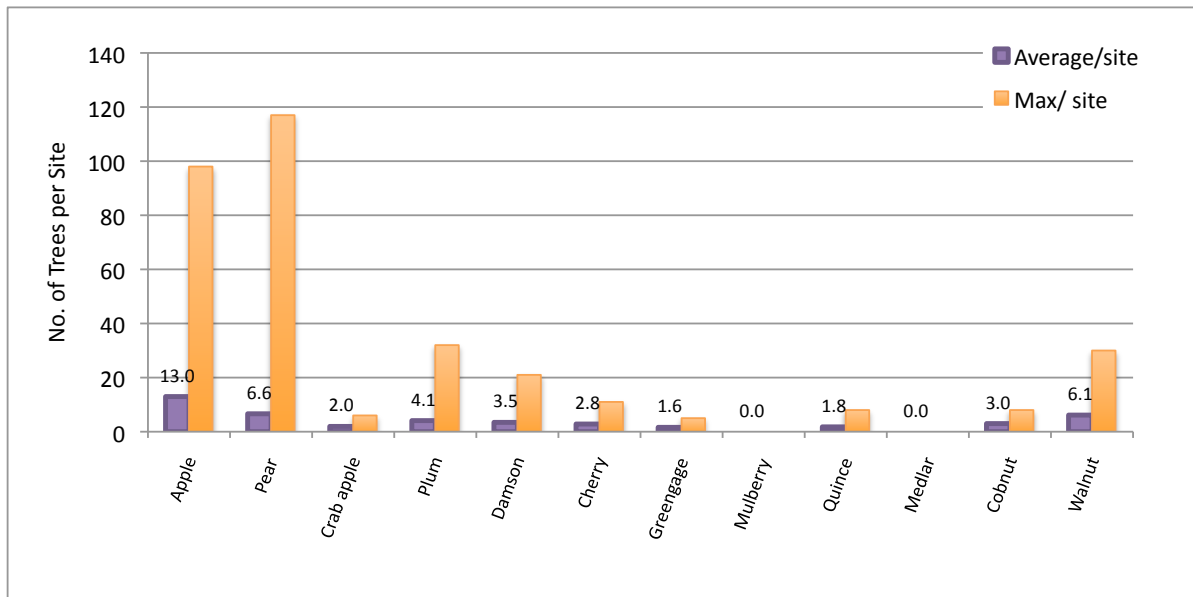


Figure 7 Average and Maximum No. of Fruit Trees per Orchard

The graph above represents the average and maximum number of each species in the orchards of the area. It does not represent the typical stocking of an average orchard.

The short purple column on the graph show the average number of each species in the orchards. The taller orange columns show the maximum number of a species found in any orchard in the area.

The high numbers for the orange columns reflect the few commercial orchards. The purple (average) provided a more realistic picture of the typical contents of a Perthshire orchard. This shows that orchards are typically mixed, with apple as the main species, and then a number of other species in support.

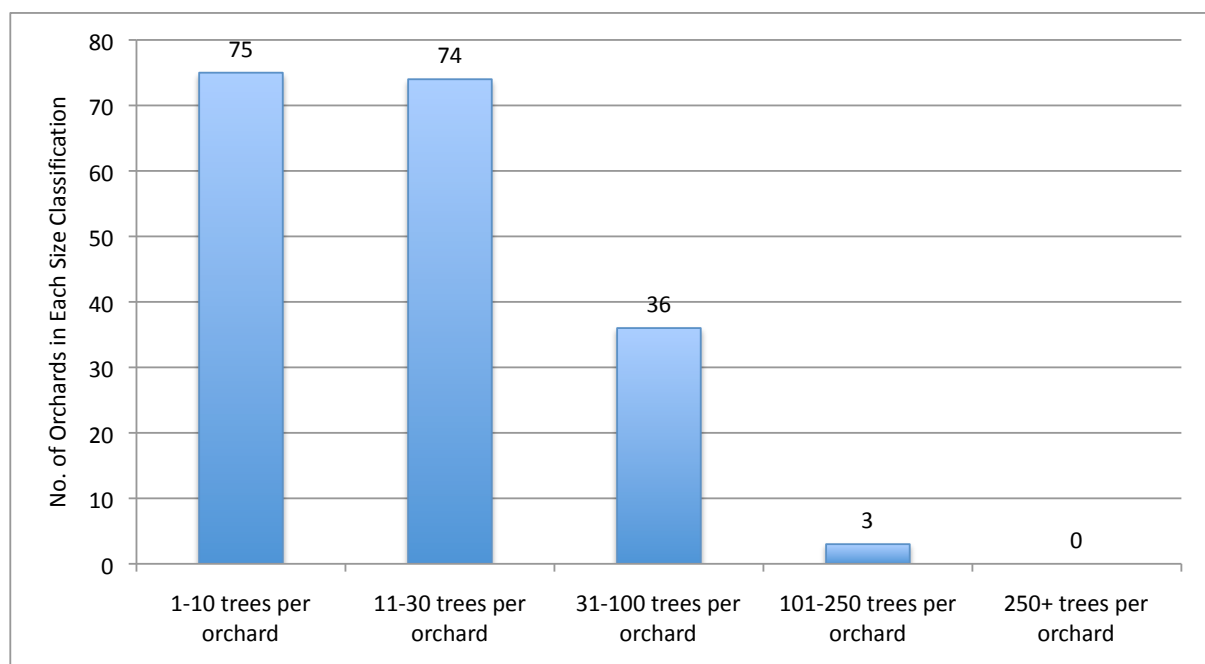


Figure 8 No. of Orchards by Size Classification

As well as asking how many individuals of each species of tree were present, we also wanted a general sense of the size of an orchard, and therefore size range classification was recorded, as shown in the graph above.

The graph shows that vast majority of orchards had 30 fruit trees or less. A few have up to 100 trees. Only 3 orchards have more than 100 trees which we consider to be a commercial size. There is a lower number of large orchards than many other parts of Scotland, which is surprising given the important role large orchards formerly played in the area.

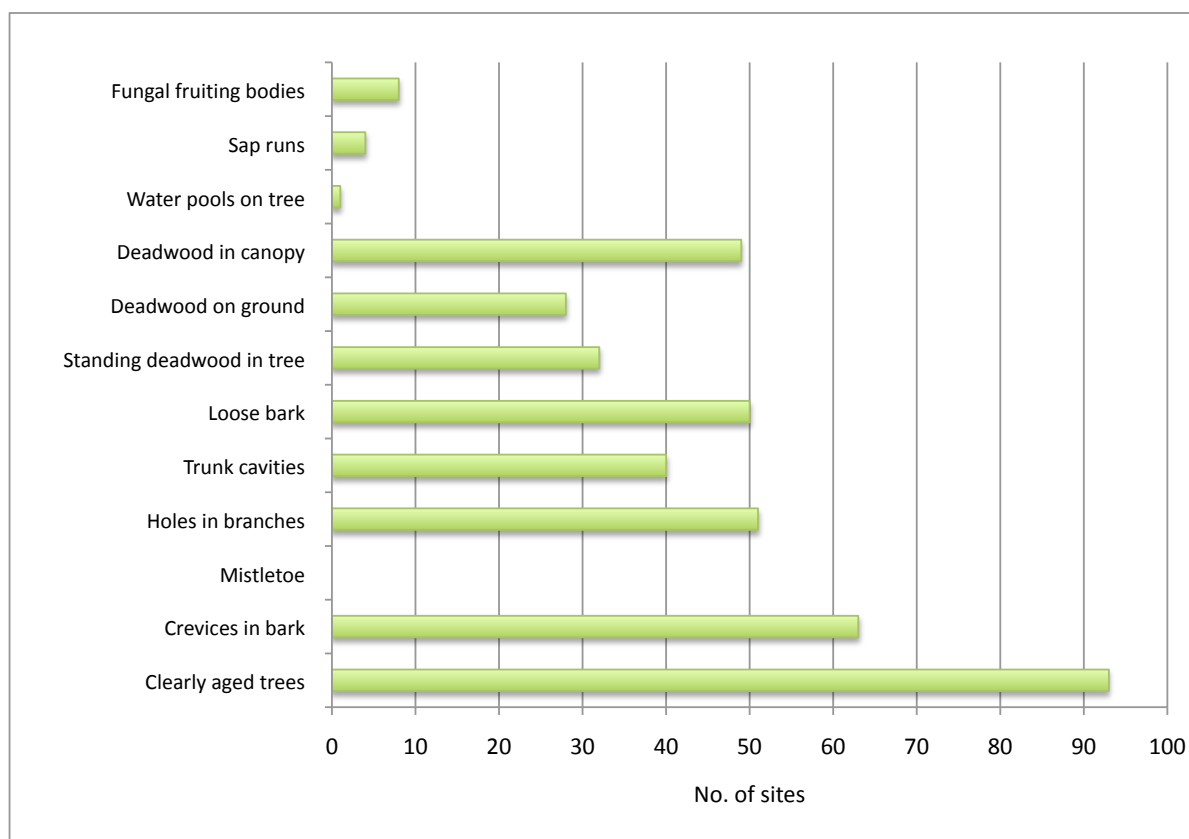


Figure 9 Veteran Tree Features in Orchards

Veteran tree features are used as biodiversity indicators. Therefore the more veteran tree features present, the higher the likely biodiversity in the orchards. There was a total of 419 veteran tree features recorded in the orchards in this area. This demonstrates significant biodiversity.

Its useful to assess how mature the trees in an orchard are. We consider trees over around 50 years old to be mature. Mature trees of older varieties generally are more established in terms of their steady yield. However, there is also potential for more disease. A further dimension is that orchards with mature trees have greater biodiversity potential.

The average proportion of older trees for the orchards was 30%. This figure was calculated from the 177 sites where data was recorded. There will however be a great variability with some orchard being entirely mature, and some being entirely young.

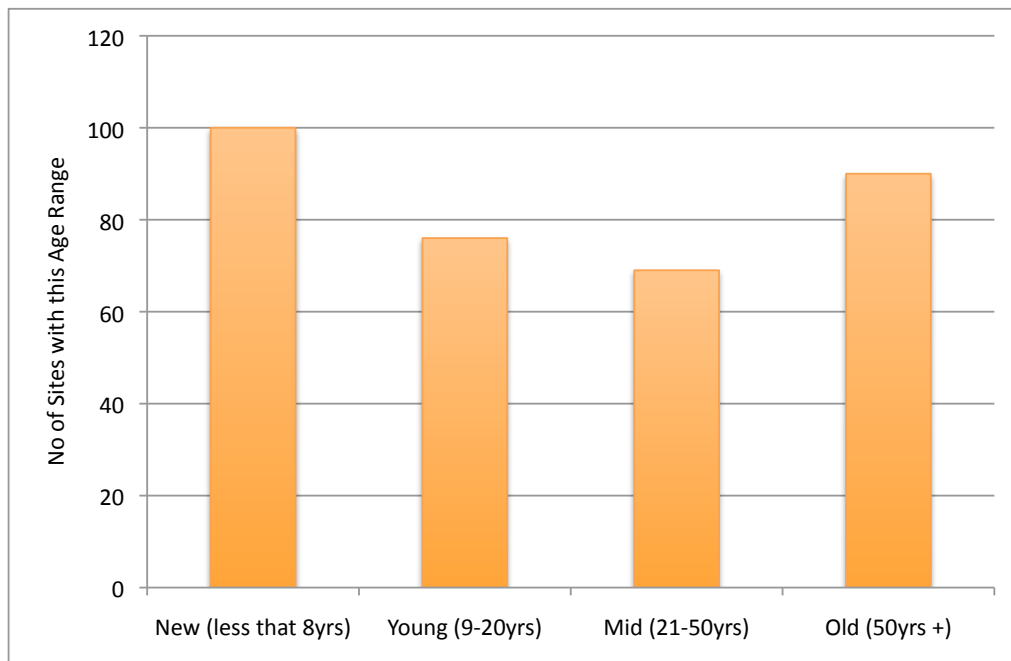


Figure 10 Age Range of Trees in the Orchards

The age of trees contained in each orchard was recorded. Ages were grouped into 4 categories to simplify the assessment in the field.

Each orchard may contain a number or all the age ranges reflecting the plantings over the years. Predominantly old trees indicates a mature collection of orchards. If no new or young plantings are recorded in an area, this indicates that the presence of orchards in the area is potentially threatened.

The graph shows all age ranges being represented and an indication of the former glory of the area is shown by more than 80 sites having mature trees greater than 50 yrs old. Though there has been some loss of orchards, it is reassuring that significant numbers of new plantings are recorded.

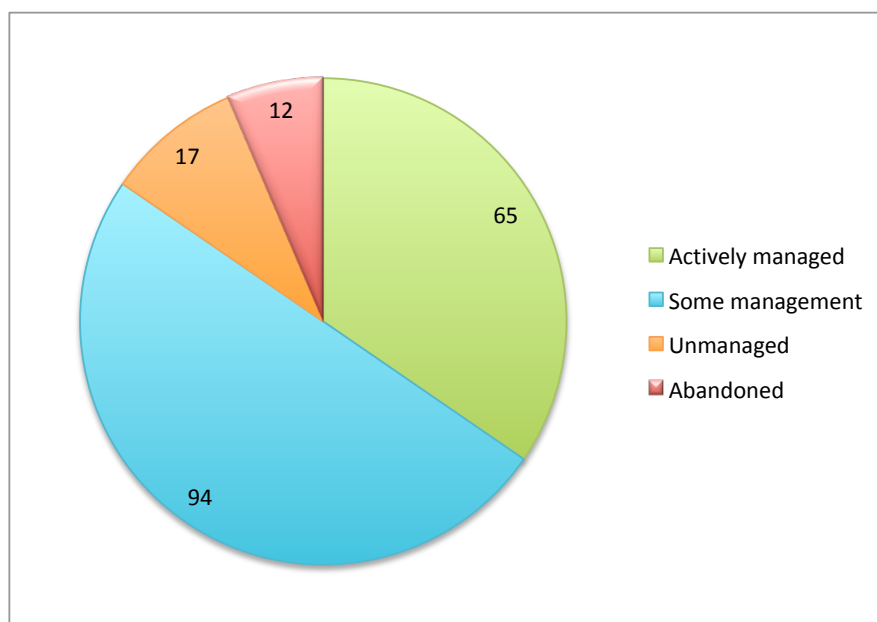


Figure 11 To What Extent is the Orchard Maintained?

The extent of orchard management is given above. A total of 188 sites have data recorded for them. The figures in the chart are the number of orchards determined to be in each particular category.

The graph shows that most orchards have some or active management. This demonstrates higher levels of orchard management than are found in many parts of lowland Scotland.

High proportions of abandoned and unmanaged orchards are an indication that there needs to be a local focus on raising awareness on maintenance issues. Maintenance skills project are also a popular way of building capacity locally.

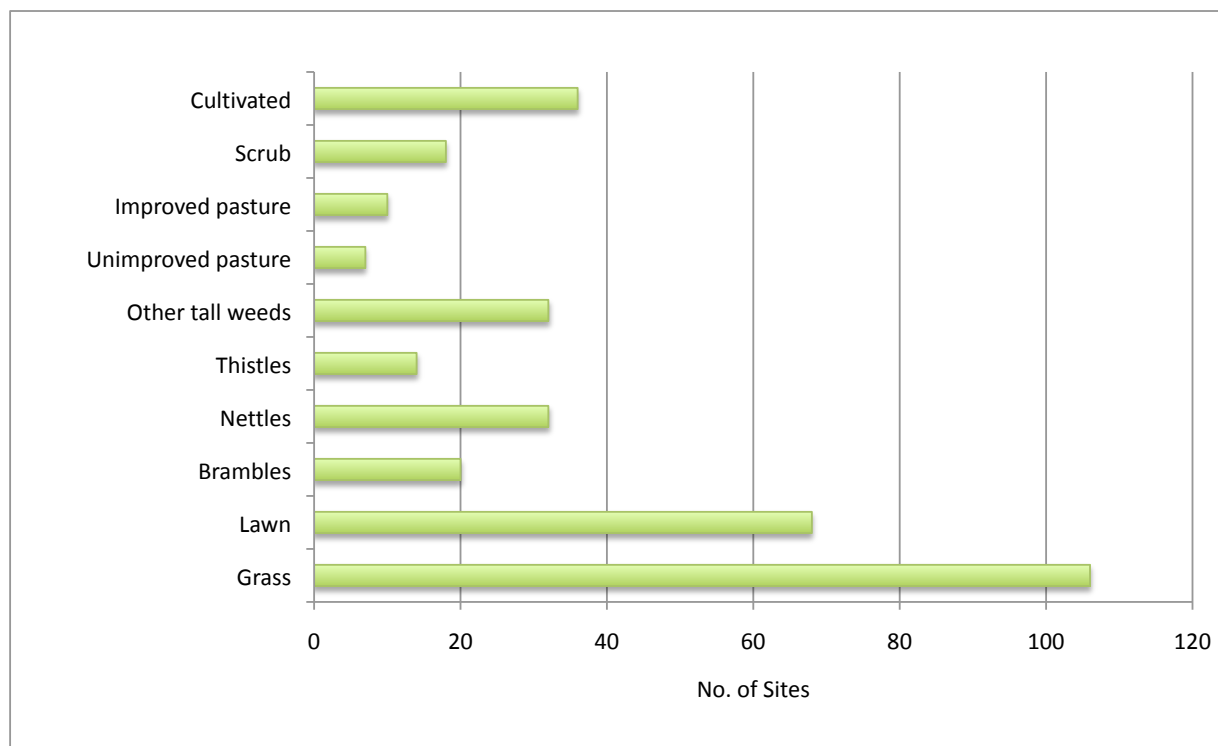


Figure 12 What is the vegetation on orchard floor?

The orchard floor is an important part of the orchard habitat, both for biodiversity but also as a further element of the growing space. The generic term used across various habitats, is the 'field layer'.

Each site may have several field layer types, for example parts of it may be mown into a lawn while other parts are unimproved pasture with thistles. We are also interested in orchards that are cultivated as this was a practice that was once much more common.

The graphs shows that though many orchards have some sort of managed grass as a field layer, there are a significant number that have various tall weeds and scrub.

There are also a significant minority of 35 orchards that are also cultivated showing a more complex use of the land.

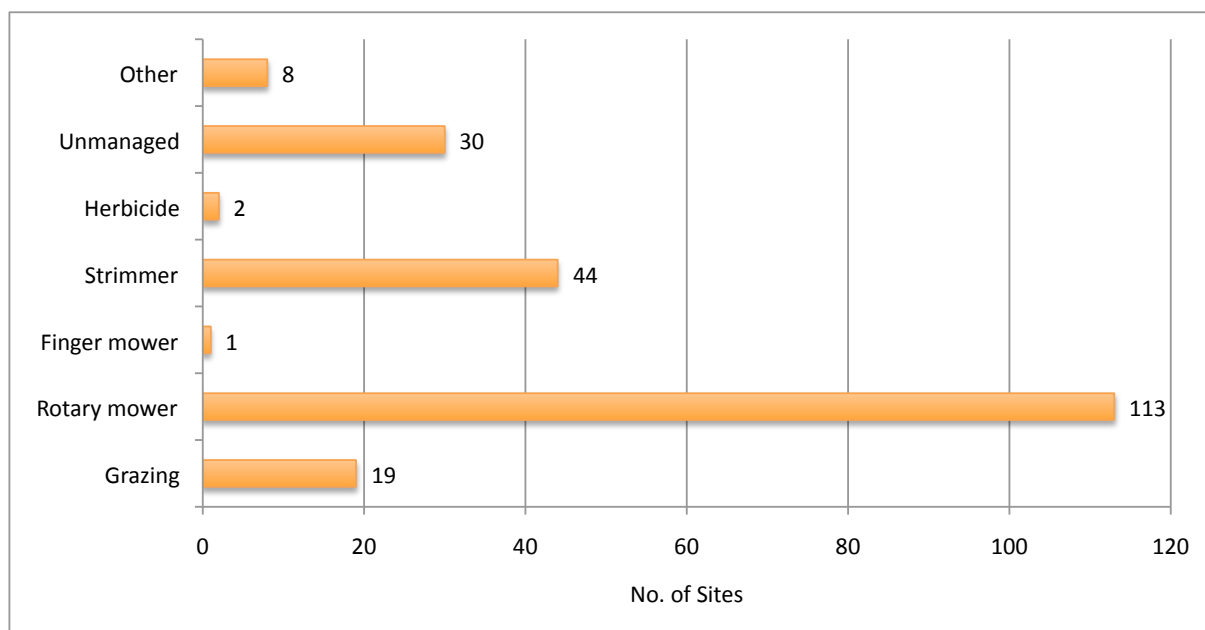


Figure 13 How is the orchard floor managed?

Each orchard can record more than one method for managing the orchard floor. The reference to the finger mower may be unfamiliar. This is a type mower that has a flat cutter bar like a hedge trimmer. The reason for recording this separately is that there is some evidence that this sort of mower does far less damage to invertebrate life in the sward than a rotary mower, which tends to suck up and eviscerate the sward contents.

In our experience herbicide use is under-reported by orchard keepers.

Unsurprisingly, the graph shows that the common method of management is by rotary mower. However, the number of strimmer managed sites comes second, with unmanaged field layer coming third.

The 'Other' classification is mainly made up of sites where mulch matting, or other mulch such as bark chips are used around the trees.

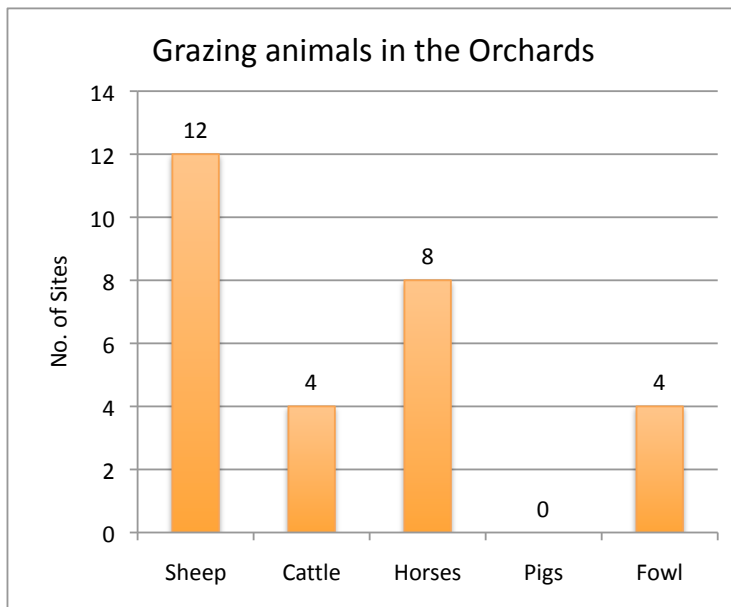


Figure 14 Grazing animals in the orchards

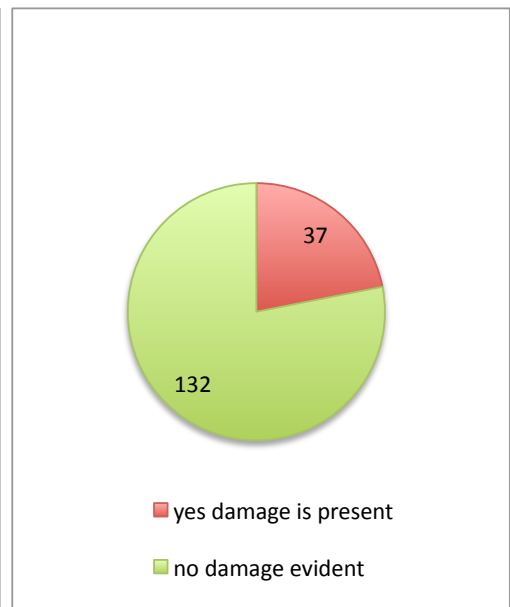


Figure 15 Herbivore damage present?

Each orchard can record more than one type of animal grazing the orchard floor.

The graph (above left) shows that sheep and horses are present in a few orchards, while fowl and cattle graze a small minority of the orchards. Sheep are clearly the most popular and make a good use of the orchard floor; horses can be benign provided that good tree protection is present otherwise they can be devastating.

The pie chart shows that where recorded, herbivore damage is evident on a small minority of sites. Some of this could be as a result of poaching by livestock.

Not all recorded damage can be attributed to grazing livestock, as deer and rabbits also play a role.

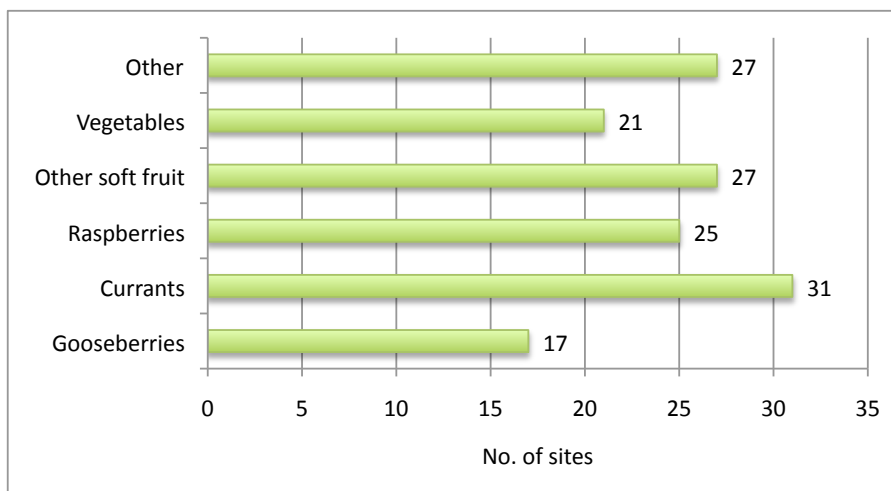


Figure 16 What undercrops are grown?

The growing of other crops within an orchard – known as undercrops - was formerly a much more common practice than it is today. Each orchard can have more than one type of undercrop recorded.

The graph above shows that undercrops are still common in this area. There is a higher level of undercrops in Perth and Kinross than in many other parts of Scotland.

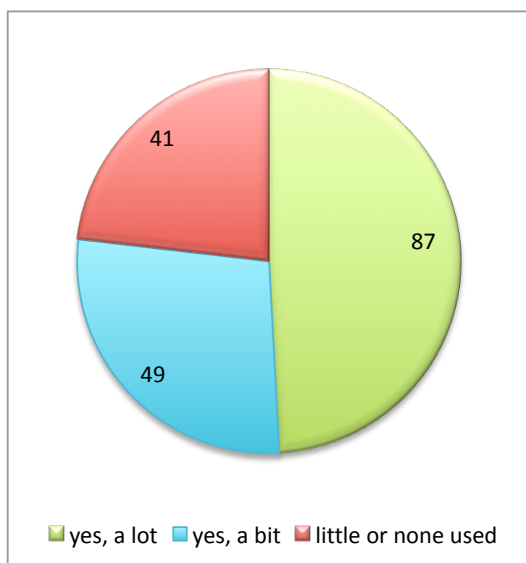


Figure 17 Use of fruit

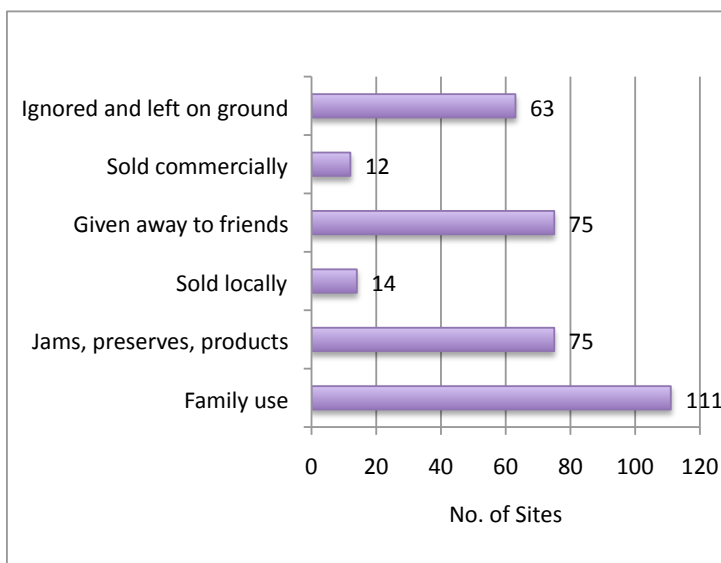


Figure 18 How is the fruit used ?

The use of fruit was determined for 177 sites. Though the categories in the pie chart are fairly broad, they do give a clear indication of the proportion of orchards that are well harvested. It also gives an indication of the scale of the unused local resource.

The chart shows that over half of orchards report that they use the fruit a lot. A minority few use little or none of their fruit. This is a higher level of use than is found in much of the rest of Scotland.

The bar graph (above right) provides detail on how fruit is used. An individual orchard can record multiple uses. So while the family may use some, they may also leave unused fruit on the ground.

The graph shows that family use, followed by jam, preserves, products and then by giving the fruit away was most common. A reasonable number of orchards sell their fruit locally, and 12 orchards sell commercially. These commercial sales are at a higher level than most of Scotland.

7. ANECDOTAL AND COMMENT INFORMATION

A qualitative data summary for Perth and Kinross

7.1 Introduction

Anecdotes and comments add a lot of colour to the survey of orchard sites. They are more valuable than they may first appear because they help interpret individual sites and whole areas in relation to their orchards. They also form an important record of local oral history that may not be recorded elsewhere; this may be about the family and its own orchard, or it may be about the characteristics, history and purpose of orchards in the area, and how this formed a part of its economic and cultural heritage.

7.2 Structure and Presentation

Guidance and training for the field survey work encouraged the collection of anecdotal history, comments, pertinent information relating to the orchard being considered. This was written up on the survey form and submitted to us in that way.

The data presented below are a selected summary, representing what we consider to be the most interesting aspects of the qualitative data collected. We have identified emergent themes from these data and have categorised them accordingly.

The comments have been subject to some editing. Our intention is to maintain them as verbatim as reasonable. The editing has been restricted to typos, spelling and minor changes to assist understanding. We have carried out further editing to comply with data protection. We have therefore also redacted content that would enable an individual person to be identified.

7.3 Anecdotal and Comment Data Categorised by Theme

Decline and Loss

There has been a good deal of decline of orchards in this area since their heyday perhaps a century ago. However we know that this decline continues today because some of the orchards on the Carse of Gowrie were surveyed around 10 years ago. Later we focus on cases of renewal but firstly we need to consider the decline and loss of orchards.

Development site in Crieff with no fruit trees in evidence. Neighbours informed me that an old orchard was felled to create the development site.

PERT0058

Site of original manse orchard as marked on 1st edition OS. The last original tree fell in 2015, picture of stump attached.

PERT0439

Very old trees abandoned in field of sheep.

PERT0418

Owner's grandfather bought orchard at auction, originally had apples too but none left. Most trees over 80 years old. Plums younger than pears. Several trees in very poor condition. Several blown over in gale.

PERT0008

This is northern half of the historic field orchard and one of the gems of the Carse of Gowrie and has been surveyed previously. Unfortunately it looks like not much has been done since the original effort of restorative pruning and planting around 2005. The newly planted apples and plums keep dying due to grazing etc and have not been replaced.

PERT0052

A historical field orchard. Owner not interested in regeneration. Used as pasture.

PERT0146

Keeper not interested in restoring orchard as runs a full time business on site.

PERT0007

Large field orchard in decline, must have been a beautiful sight in its day. Sparse, large trees with some evidence of tree management but only after years of neglect.

PERT0075

Finally in this section, an example that is not uncommon. The landowner says there are no fruit trees or that they are dead, only for it to become obvious subsequently that they are just in very poor condition.

Fruit trees seen against garden wall but landowner claimed they were all dead and he could not help.

PERT0124

Renewal

In contrast to the section above, this section demonstrates that there is also interest in renewal, restoration and replanting.

This is an old damson orchard, in existence until approx. 1960s. Much of it was grubbed out and ploughed up, leaving approx. 20 trees beside the farmhouse. In 2014, self-seeded sycamore and similar were preventing the remaining damsons getting light, they were become tall and in danger of falling over. The "weed" trees were removed and the damsons pruned back. They are now recovering. The ploughed area was grassed and some 50 new heritage varieties have been planted there.

PERT0203

This is a new orchard partially on the site of a successful small commercial orchard, the remains of which still exist (over this and two neighbouring properties) but which are unremarkable in themselves. The old orchard would have been of the same vintage as the overgrown orchards in Ballindean (after 1900, mature by 1950) and had apples (incl. Beauty of Bath and Bramley), pears (Conference - planted against house walls on what is now neighbouring property) - plums and also just one row of damsons house use (didn't sell well!)

PERT0200

The orchard is located in a walled garden of Orchard House. The garden used to be a veg garden supplying the big house but it was not used as such for a very long time. New plantings made since. 10 of the apple trees are as fans against the wall with rest as standards. Nice little glasshouse with crops and peaches/nectarines. Keeper very proud of the Peesgood Nonsuch tree which may be 100 years old.

PERT0229

Keeper very aware of the site being on a site of a historical field orchard and very keen to maintain the existing veteran trees and replace/supplement them with new trees. They try to plant a tree every time an older tree is lost.

PERT0234

The orchard is within a historical walled garden on the estate. There are a number of trees trained against 3 of the walls and espaliers along one side of the lawn. The rest of trees are as standards in the lawn - many of them fairly young.

PERT0048

This is one of the sites planted during the Orchard800 project aiming to plant 800 trees in public spaces throughout Perth in celebration of Perth's 800th anniversary of becoming a city in 2010-2011 (Perth800). Over 600 heritage varieties were given to community groups to be planted at 24 public sites across Perth.

PERT0268

This is one of several sites where fruit trees and bushes were planted to create Abernethy Fruit Trail. The trail is taken care of by Abernethy Horticultural Society.

PERT0273

This is a proper field orchard with a mix of veteran pears and apples and newly planted apple trees of many varieties (purchased from John Butterworth's collection). They are all in proper enclosures of 2x2m and well protected from grazing by horses. Each tree has a clear label attached to the enclosure with variety name. Survey number labels are also attached. Orchard floor grazed by 2 horses. The keeper is very keen on maintaining it in good condition and has done a lot of work to restoratively prune remaining veteran trees, and plant some new trees in the garden. His background in forestry is of great help here.

PERT0082

The apple orchard was put in as Phase 1 in restoration of the historical walled garden at Scone. Planting of a twin pear orchard is planned for later this year/early next year - the area is already laid out and stakes in place. The first pear tree was planted by the celebrity Mary Berry in spring while she was shooting a show at Scone. The walled garden has been out of use since 1980s - it was used as a grass paddock for horses. Between 1950-1980 the garden was used as a market garden by a couple of Polish soldiers who stayed on after the WWII. During the war it was used as a part of a training camp for the army. Prior to that last gardening records are available in 1895. It seems to have been going downhill between WWI and WWII. Morello cherries were grown against walls of the garden before WWII - the records suggest they were quite famous in the area.

PERT0223

Keeper has not been long in the Manse, but has come from a background of greengrocers so he knows his fruit. He intends to gradually sort out the tree pruning over the next few years and has already done some minimal pruning this year. He seems to know what he is talking about so this orchard seems to be in safe hands.

PERT0225

The orchard is located in the old walled garden which used to grow food for the Estate House. Part of the garden used to contain glasshouses against 3 of the garden walls growing peaches and grapes. None of the original trees remain. All fruit trees newly planted in a predominantly ornamental garden.

PERT0068

Good examples

This area is full of good examples of various types of orchard, as the comments indicate.

Fantastic and interesting trees at historic house. Although varieties are unknown they are likely to be old Scottish varieties. The trees are relatively unmanaged but have been pruned in the past. They could do with an extensive pruning by an expert. The owner is interested in the trees and has links with Inchtute orchard. Well worth a visit. The pear tree at the back of the drive is enormous and may be a wild pear.

PERT0457

Walled garden with lines of trees shown on historic map. The house, re-modelled by Lorimer in 1898, has an extensive garden restored over the past 35 years

PERT0127

Very productive old trees, likely to be 80 years plus old.

PERT0306

A small orchard recently planted by a Community Group in Coupar Angus. Trees were planted by local children and children are encouraged to eat the fruit.

PERT0302

Undercrops and other uses

Diverse uses of orchards have been recorded in the comments. The practice of undercropping was once widespread on the Carse of Gowrie, and it is still practiced in some orchards. In addition, the orchard floor is put to many other uses.

Bee hives kept in the garden. Orchard keeper very active and proud of her fruit trees.

PERT0473

A walled garden mixing fruit trees with vegetable and soft fruit production. It is used as a facility for people recovering from mental health issues with a staff gardener in charge. Produce and products are sold to raise funds at the garden gate and in the garden cafe. It is a Victorian walled garden but it's not been used as such for a long time. Current garden project established in 1994. A lovely and productive space. Most trees as espaliers along the paths and trained against walls with a few standards.

PERT0065

Very muddy around the trees due to the horses.

PERT0032

The keeper is very conscious of biodiversity value of the orchard and garden and has planted a couple of perennial wildflower meadow areas in the orchard and elsewhere. A pond was also set up with biodiversity in mind. Woodpeckers visit one of the old trees to excavate grubs - see photos. There are bees kept in the field north of the property and benefit from the flowers in the garden.

PERT0253

There used to be an apple field orchard in the grassy paddock north of the current orchard. This was taken out as not economically viable. The paddock is now grazed by sheep and there is large pond at the far end of it. In addition to livestock and fowl, there are a number of beehives in the orchard so the space is very productive.

PERT0087

Some gooseberry bushes under the plums in the lower part of the orchard - looks like the traditional underplanting.

PERT0143

Undercropping was daffodils (still there!) for cut flower sales and apart from the pears, trees were confined to the steepest land. The holding also grew berries etc.. Fruit and other produce was taken to town on a small motor lorry - the first one locally. The new orchard is partly on the less steep slope, partly on the hillside and the intention is to extend plantings over probably one more year, reclaiming more of the overgrown hillside, so the boundaries will change. Walnuts are planted separately.

PERT0200

Keeper has found an innovative way to get income from the orchard by renting it out to a assault course company which seems to be working out very well. Sheep are excluded from the orchard now and it seems to be thriving.

PERT0080

Unusual orchards

Several orchards are worth noting for their unusual and interesting content or condition.

Owner would like to plant more trees in the future. Including Peaches and Nectarines in greenhouses.

PERT0411

This is a linear orchard, on both sides of a path with arable fields on the other side of the verge in which the orchard is planted.

PERT0209

Beavers active in the Pow on south side of orchard, have felled all willow trees planted by current keeper.

PERT0007

The abandoned orchard site is becoming less accessible due to rampant vegetation taking over the orchard floor. Fruit from the orchard is frequently harvested by locals as well as people from further afield. Some of the trees have been provided with protection from grazing. The surveyor encountered a Polish man helping himself to the Damsons which are particularly prolific in the orchard. He travelled some distance to come to the orchard and says that he harvests fruit here frequently for family use. He said that they resembled the type of yellow-fleshed plums common in Poland.

PERT0002

8. CONCLUSIONS

The results presented above, and also in the following photographic record, lead to the following conclusions:

- A total of 220 orchard sites were surveyed, of these 185 were found to be intact orchards.
- The total acreage of orchards remaining in this area was found to be 64.2 ha and the average area of each orchard was 0.38 ha.
- The survey showed that a relatively small area of orchards have been lost, and this has been more than offset by newer orchards. However the lost orchards are the larger mature ones that had high cultural and biodiversity value.
- Most of the orchards contain less than 30 trees and are in a domestic setting. Five larger orchards of commercial size are recorded.
- Though apple dominates, most orchards contain a diverse mixture of fruit species, reflecting their domestic use.
- The tree stock contains trees of all age ranges.
- Veteran tree features indicate the orchards contain high levels of biodiversity.
- The majority of orchards have some or active management, and this is at a higher rate than typically found elsewhere in Scotland.
- Many orchards have new plantings and younger trees, and this shows orchards renewal is occurring.
- Soft fruit and also vegetables are grown in a significant minority of orchards. This is at a higher level than most of Scotland.
- Most fruit is used for family and friends, some is sold commercially and some is left to waste.
- Livestock is grazed in minority of orchards, these mainly being sheep and horses.
- The qualitative data demonstrates the depth of history; cultural, economic and otherwise, that this area is custodian to.

To conclude, Perth and Kinross contains a large number of small orchards, most of which are quite actively managed and from which the fruit is used within the domestic setting. There are a handful of commercial sized orchards that sell their fruit. Most of the historic large mature orchards, that the area was formerly known for, are still in decline.

9. REFERENCE LIST

Hayes, C.W. 2007. *Historic Orchards of the Carse of Gowrie. Phase 1 Survey: An Investigative Study on their Location, Extent and Condition*. Report to Perth and Kinross Countryside Trust. Available www.crispinwhayes.com/projects

Gorrie & Machray, 1819. An Account of the Orchards of the Carse of Gowrie (1813). *Memoirs of the Caledonian Horticultural Society*, 1 (1819), 317-32.

ANNEX 1: PHOTOGRAPHS



Photograph 01. A new community orchard is planted by volunteers.



Photograph 02. A young orchard with protection from rabbits.



Photograph 03. Holes in trunks are not good for the trees in the longterm but they do provide an indication of high biodiversity levels.



Photograph 04. A new orchard in the corner of a public park.



Photograph 05. Some good fruit in this garden orchard but pruning will be necessary to maintain this productivity.



Photograph 06. Mature half standards in a large orchard. Again pruning is indicated.



Photograph 07. Mature pear trees along with more recent plantings in a garden on the Carse of Gowrie



Photograph 08. Great show of fruit in this garden orchard.



Photograph 09. Fine example of aged espalier, perhaps getting on for 100 years old, though it needs some pruning.



Photograph 10. Part of a plum orchard in which the trees have finally failed. Though there is no longer much fruiting value, leaving them does contribute to the biodiversity value.



Photograph 11. An example of pears grown against a wall, these on the outside of the garden.



Photograph 12. A linear orchard for the community on the outskirts of a village.



Photograph 13. One of the new orchards planted on Moncrieff Island.



Photograph 14. A prolific apple in a garden orchard.



Photograph 15. An example of a mature farm orchard, a mid-size orchard close to the farm for their own use.



Photograph 16. A small new orchard intended for commercial production of juice.



Photograph 17. A well maintained orchard



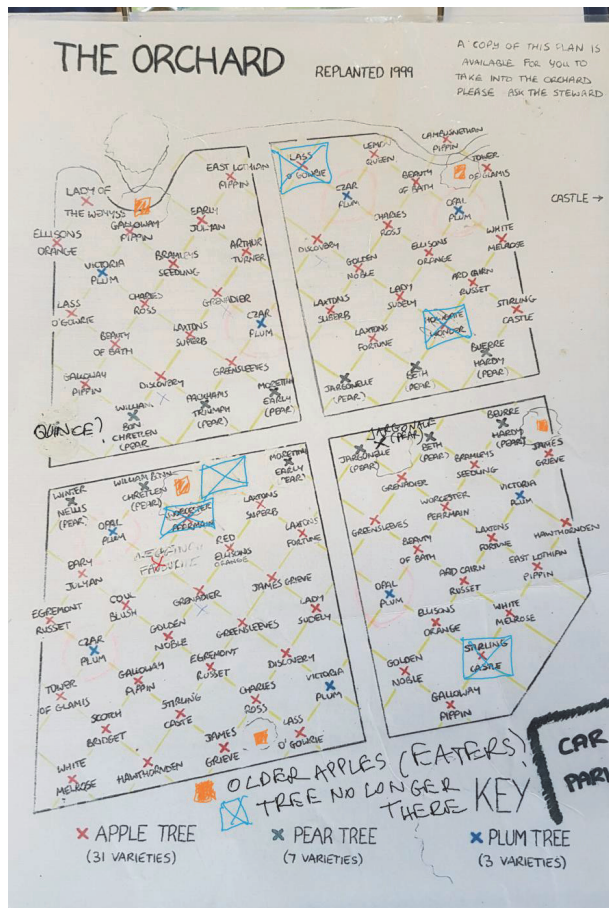
Photograph 18. Aged fan trained tree, originally fixed to the wall. Now it has become overgrown and front heavy, bringing it away from the wall. Without restorative pruning it will collapse.



Photograph 19. A maintained mixed age estate orchard. New trees fill the gaps where older trees have finally declined.



Photograph 20. Trees in a new heritage orchard. Someone pick them please.



Photograph 21. Nice example of a planting plan. Too often the details of varieties and provenance get lost as nursery tags have all too short a life.



Photograph 22. Bark stripping and damage. Example of herbivore damage on a mature pear tree. Wire netting wrapped would have prevented this. The trampling of roots by large concentrations of livestock is also a problem.



Photograph 23. Various livestock are seen orchards, and it is not incompatible if adequate protection is in place.



Photograph 24. The large members of a typical Carse of Gowrie field scale orchard



Photograph 25. Overlooking Perth from a Barnill orchard



Photograph 26. Overgrown cordons or espaliers needing some maintenance but still fruiting well.



Photograph 27. A new orchard in a walled garden.



Photograph 28. An old espalier in a walled garden. Typically these gardens were quartered with paths, and espaliers lined the paths.



Photograph 29. A farm orchard neighbouring the farm house on the Braes of the Carse, and the Tay in the distance.



Photograph 30. A modern but abandoned plum orchard. This orchard as with many, is subject to planning pressure for housing.



Photograph 31. A good example of how horses & cattle can be compatible with orchards. Very sturdy protection, a... not overgrazed so the beasts don't get too hungry.



Photograph 32. Community orchards are a feature across the area



Photograph 33. A school orchard. Planting these was popular, but it requires dedicated members of staff to ensure they are maintained.



Photograph 34. A mature garden orchard still producing plenty of fruit. The use of fruit is still not optimal, and across the whole country there is still a lot of fruit wasted



Photograph 35. Fruit trees grown in walled gardens in this area can do very well if maintained.



Photograph 36. Example of a contemporary peach pelmet. This helps prevent leaf curl in walled trained trees by reducing the amount of moisture on leaves.



Photograph 37. An ad-hoc apple store. Ambient rodent-proof stores were formally common at all estate and farm orchards.



Photograph 38. A very aged pear tree, still producing fruit, albeit small specimens.



Photograph 39. Restorative pruning has removed these rootstock volunteers and given this pear tree a new lease of life



Photograph 40. Mature field scale orchards are unfortunately still in decline across the area



Photograph 41. Mature orchards still produce some fantastic fruit.



Photograph 42. Mature pear trees.

ANNEX 2: METHODOLOGY

A2.1 Methodology for GIS desk study

The following methodology was implemented for the desk study.

GIS system: MapInfo Professional v11.5 software with Data Capture Tool Identifying locations; Various sources of data to determine orchard locations:

- Visual search of aerial and historic mapping.
- Existing survey data. Sites listed in existing surveys are reassessed.
- Additional existing datasets:
 - The OS MasterMap 'Orchard' attribute
 - RCAHMS-Historic Land-use Assessment database
 - Regional orchard projects datasets
 - National Trust for Scotland Demeter Plants Database
 - Agricultural Census, historic data (not site specific)
 - Dunn 1885 Apple Congress report (time constraints meant that only a few sites from this marvellous tome were considered)
 - Other publically available datasets, such as community orchard listings.

A more detailed description of the desk study methodology and its results are published in reports for Scotland as a whole. These are available at www.scotlandthefruit.org.uk

A2.2 Methodology for field verification

The implementation of field verification is structured as follows:

- Fieldwork is devolved to a local collaborating organisation. Ideally this is a competent local not-for-profit organisation with a track record demonstrating ability to organise and deliver locally.
- Local Facilitator. The local collaborating organisation employs or contracts a person, the Local Facilitator, to be the local interface and organiser of volunteer surveyors. This has been a paid role.
- Recruitment of surveyors. The local organisation uses various channels to recruit volunteer surveyors. The channels include local press, presence at events, membership lists, other organisations, and formal & informal networks.
- Resources are provided by the National Coordinator (in this case Crispin Hayes Associates). Site specific resources such as site location maps and candidate site lists are shared via cloud services with the Local Facilitator. Other generic material is distributed via www.scotlandthefruit.org.uk which is used as the project website. This includes the web forms used to record survey data.
- Allocation. The Local Facilitator allocates sites to volunteers, and manages their progress, ensures instructions including the risk assessment are understood.
- Mentoring. Some volunteer surveyors are very competent at all aspects. Others require a little mentoring. The Local Facilitator carries out this role, if necessary taking the volunteer on a training site visit.
- Survey Data. The Local Facilitator ensures that survey data is submitted together with photos, and that all files are identified with the site unique identification. Quality checks are also carried out, and queries referred to volunteers.
- Data processing. Further quality checks are carried out on the data, and corrections made, if necessary with reference to the Local Facilitator and the volunteer surveyor.

- Merging. The field verification data is added to the desk study data for each site via the Geographical Information System and other database tools.
- Amendments and snagging. Revision of site boundary and other desk study details are carried out on a site by site basis. Snagging is carried out as required.
- Output. Further work may be required: for example redacting personal data fields, and extracting some site subsets, before the finalised dataset is output.

A2.3 Field verification time input statistics for this area

Some statistics were recorded on the time input of various aspects of the Field Verification.

Time-on-site is reported on each survey form by the surveyor. The average time on site in this area was 34 mins. The maximum time on site was reported as 150 mins, while the minimum was 10 mins.

In Perth & Kinross, the total time-on-site was recorded as 122 hours. This does not include preparation or travel time, just the time on site.

The time to fill in the survey web form is recorded automatically by the forms service. It shows that on average it took 15 mins to complete a submission in this area.

The total time recorded for filling the survey web forms is 58 hours for this area.

This does not include preparation, fettling photos and ensuring all file uploads have the correct Orchard ID as filenames.

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