Cyfoeth Naturiol Cymru
Natural Resources Wales

Traditional Orchard Habitat Inventory of Wales

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People's Trust for Endangered Species

Evidence Report No. 18

About Natural Resources Wales

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We work to support Wales' economy by enabling the sustainable use of natural resources to support jobs and enterprise. We help businesses and developers to understand and consider environmental limits when they make important decisions.

We work to maintain and improve the quality of the environment for everyone and we work towards making the environment and our natural resources more resilient to climate change and other pressures.

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Prior to the publication of the report, Natural Resources Wales was created bringing together the Countryside Council for Wales, Forestry Commission Wales and Environment Agency Wales.

Foreword

Commercially driven agricultural advances during the 20th Century led to intensified food-production practices, fruit-growing among them and, as with meadows, woodland management, grazing pasture and the oceans, these modern methods have led directly or indirectly to a dramatic reduction in habitat biodiversity. It is undisputed that where traditional, low-intensity practices survive, the associated wildlife continues to flourish. Traditionally managed orchards are one such biodiverse habitat, a fruit-growing equivalent of 'unimproved grassland'. Like unimproved grassland, traditional orchards provide excellent conditions for wildlife to thrive.

In 2007, in accordance with obligations set out in the Convention on Biological Diversity (1992), the UK Governments agreed that traditional orchards should be designated priority habitat status under the UK Biodiversity Action Plan (BAP). People's Trust for Endangered Species (PTES) was commissioned to take an inventory of remaining examples of this habitat in Wales, to produce a digital map, and to record their condition. Such an inventory is invaluable for the future preservation and conservation of the habitat by statutory conservation organisations, biodiversity partnerships, local record centres, orchard groups and interested individuals. It will enable future changes of habitat extent to be measured and areas of conservation priority to be identified. The project also aimed to increase awareness of traditional orchards and their importance for wildlife, and adds significantly to knowledge of a declining habitat, providing a valuable tool for future conservation efforts in Wales.

Crynodeb Gweithredol

Cafodd y People's Trust for Endangered Species eu comisiynu gan Gyngor Cefn Gwlad Cymru i lunio rhestr gynhwysfawr a map daearyddol o berllannau traddodiadol, sef cynefin â blaenoriaeth yng Nghymru. Mae'r adroddiad hwn yn sôn am y broses honno, gan gyflwyno a thrafod y canlyniadau.

Roedd y dull a ddefnyddiwyd yn debyg iawn i'r dull a ddefnyddiwyd i fapio'r un cynefin yn Lloegr (Burrough et al. 2010). Golyga hyn y bydd yna ddilyniant ar gyfer y DU i gyd ar ôl i'r holl ranbarthau gael eu cwblhau, gan wneud hwn yn fap sy'n wirioneddol berthnasol i'r DU i gyd. Bydd pob gwlad yn parhau i fod ar gael fel set ddata annibynnol, a byddant yn cael eu rheoli gan y cyrff statudol perthnasol.

Canolbwyntiodd y prosiect nid yn unig ar greu rhestr a map, ond hefyd ar hyrwyddo perllannau fel cynefin a cheisio annog y cyhoedd i gydnabod ei werth i fioamrywiaeth a threftadaeth ddiwylliannol. Er mwyn gwneud hyn aethom ati i gysylltu â'r cyhoedd yn y wasg leol a'r wasg genedlaethol, yn ogystal â meithrin cysylltiadau â sefydliadau allanol er mwyn casglu'r data a fodolai eisoes a chyflogi arolygwyr gwirfoddol lleol i groeswirio ein canlyniadau ar lawr gwlad ac arolygu perllannau er mwyn asesu eu cyflwr. Ar adeg ysgrifennu'r adroddiad, roedd cyfanswm o 120 o arolygwyr gwirfoddol wedi cyfrannu 123 o ddiwrnodau gwirfoddoli at y prosiect, a chafwyd 145 o arolygon gan berchnogion perllannau.

Mae'r fethodoleg a ddefnyddiwyd wedi dod o hyd i 4687 o berllannau traddodiadol unigol yng Nghymru, sy'n cyfateb i 653 hectar o gynefin. Trwy gynnwys safleoedd ymylol – h.y. rhai a gaiff eu dosbarthu fel safleoedd creiriol, safleoedd sydd wedi'u gadael ers tro byd, coed perllannau traddodiadol a reolir yn ddwys neu berllannau llwyni organig neu rai wedi'u gadael – sydd â'u gwerth o safbwynt bioamrywiaeth yn amrywio a heb ei brofi'n fanwl, yna mae'r cyfanswm yn cynyddu i 7363 o safleoedd a thros 1037 hectar.

Mae ugain y cant o'r perllannau traddodiadol y gwyddom amdanynt wedi cael eu harolygu gan wirfoddolwyr neu berchnogion perllannau, ac mae manylion ychwanegol am bob safle wedi'u casglu. Er mai un rhan o bump yn unig o'r perllannau yw hyn, mae'n rhoi darlun da inni o statws perllannau treftadaeth yng Nghymru a'r diddordeb sydd ynddynt, ac mae'n gymesur â'r rhestr ar gyfer Lloegr.

Dengys yr asesiad o'u cyflwr fod 35% o berllannau traddodiadol Cymru mewn cyflwr gwael, 58% mewn cyflwr da a dim ond 7% mewn cyflwr rhagorol. Caiff 94 hectar o berllannau traddodiadol Cymru eu cynnwys mewn cynlluniau amaeth-amgylcheddol.

Bydd rhestr o'r perllannau traddodiadol a geir yng Nghymru ar gael i'w lawrlwyth oddi ar wefan Cyfoeth Naturiol Cymru ar y tudalennau mapiau rhyngweithiol, neu arwefan y People's Trust for Endangered Species.

Executive Summary

People's Trust for Endangered Species was commissioned by the Countryside Council for Wales to produce a comprehensive inventory and geographical map of the traditional orchard priority habitat in Wales. This report documents that process, and presents and discusses the results.

The method used was very similar to that devised to map the same habitat in England (Burrough et al. 2010). This means continuity will be preserved for the entire UK when all regions are complete, making this truly a UK habitat map. Each country will remain available as a discrete dataset and be controlled by the respective statutory bodies.

The scope of the project focused not only on the creation of an inventory and map but on promoting orchards as a habitat and working to gain a wider public recognition of its value to both biodiversity and cultural heritage. To this end we engaged with the general public via the national and local press, fostered relations with external organisations to collate existing data and employed locally based volunteer surveyors to cross-check our results on the ground and survey the orchards to assess their condition. At the time of writing, a total of 120 volunteer surveyors have contributed 123 volunteer days to the project, and 145 orchard owner surveys have been received.

The methodology used has identified 4687 individual traditional orchards in Wales, totalling 653 hectares of habitat. If we include marginal sites, i.e. those categorised as relict, long abandoned, intensively managed traditional orchard trees or abandoned or organic bush orchards, the biodiversity value of which are variable and relatively untested, then this figure becomes 7363 sites over 1037 hectares.

Twenty percent of traditional orchards identified have been ground-truthed by volunteers or orchard owners and additional information pertaining to each site has been collected. Though this is only a fifth of the total orchard habitat, it provides a good insight into the general interest and status of heritage orchards in Wales and is commensurate with the inventory for England.

The condition assessment revealed that 35% of Wales' traditional orchards are in a poor condition, 58% good and only 7% excellent. Ninety-four hectares of Wales' traditional orchards are included within agri-environment schemes.

The traditional orchard inventory for Wales will be available to download via the Natural Resources Wales website via the interactive maps pages, or on the People's Trust for Endangered Species website.

1. Introduction

1.1. Traditional orchards

Orchards and fruit trees are diverse subject area combining elements of habitat, crop, woodland, amenity, and garden, as such demanding a unique approach to their conservation. Though essentially a crop, they have become culturally enriched through centuries of agricultural and horticultural history and are a well-established element of the British landscape.

Modern orchards are highly efficient intensively managed plantations providing little by way of habitat and are scarce in biodiversity. It is the so called 'traditional orchards' and their remnants that are of concern to conservation organisations. The character of traditional orchards varies across Britain and from orchard to orchard. Indeed the very term 'traditional' masks a number of ambiguities; it refers generally to orchards that have not been modernised since the agricultural advances that gained momentum around the 1940s, and also to smaller hobby orchards planted since then.

1.1.1. Estimated extent of traditional orchard habitat

Based on Ordnance Survey data the extent of traditional orchards in Wales was estimated to be around 440 hectares (Robertson 2007). This figure was derived by deducting the commercial orchard area listed in the 2003 agricultural census from Ordnance Survey data of all orchards, based on the assumption that, for the most part, they would be modern orchards. This did not, however, turn out to be the case so the habitat estimate was low.

1.1.2. Biodiversity of traditional orchards

The extraordinary range of flora and fauna supported by traditional orchards was revealed in a study of three orchards, covering 5.39 hectares, in Worcestershire (Smart & Winnall 2006). A total of 1868 species were recorded, including vascular plants, bryophytes, fungi, lichens, vertebrates and invertebrates. The orchards were shown to host a number of nationally rare, scarce, or declining species and some that appeared on conservation watch lists as having high levels of vulnerability in the wild.

The range of wildlife that an orchard can support depends somewhat on the mosaic of habitats that make up the orchard, including the fruit trees, scrub, hedgerows, hedgerow trees, the orchard floor habitats, fallen deadwood and other habitats such as ponds (Lush et al. 2009).

Traditional orchards are becoming increasingly rare due to neglect, agricultural intensification, and land development pressure, putting the species they support under threat. The agricultural census estimates that there has been a 94% reduction in area of orchards in Wales between 1958 and1992 (TACP 1994).

1.2. Definition

Traditional orchards are defined, for priority habitat purposes, as groups of fruit and nut trees planted on vigorous rootstocks at low densities in permanent grassland; and managed in a low intensity way.

Traditional orchards are a long-established and widely distributed habitat and make a significant contribution to biodiversity, landscape character and local distinctiveness across the UK. There are many regional variations on this theme, including apple, pear, cherry, plum, damson, and walnut orchards. Although cobnut plat structure and management varies from fruit tree orchards and has affinities with coppice woodland, they are also included in the definition.

Traditional orchards are a composite habitat (similar to wood-pasture and parkland), defined by their structure rather than vegetation type, which can include trees, scrub, grassland, ponds, walls, hedgerows and hedgerow trees. They can take several different distribution patterns, including small and large patches, along linear boundaries, and trees dispersed among settlements.

Prime traditional orchard habitat consists of grazed grassland with fruit trees of varying age structure, with an abundance of standing and fallen dead and decaying wood. Young trees and newly planted orchards that are managed in a low intensity way are also included in the definition.

Low intensity management refers to orchards that are managed with little or no use of chemicals such as pesticides, herbicides and inorganic fertilisers, with relatively long-lived trees that are allowed to reach the veteran stage, and with a permanent grass sward that is usually grazed by cattle or sheep or cut for hay. Although traditional orchards have sometimes been established with soft fruit or other crops grown between rows, where these are managed extensively the orchard floor has usually been grassed over once the trees have matured and the canopy has closed.

In contrast, intensive management refers to orchards managed to maximise fruit production, usually including several of the following management practices: dense planting of short-lived trees on dwarfing rootstocks, high chemical inputs, intensive pruning to remove dead and decaying wood and maintain the trees in a restricted, highly productive form, and frequent mowing and spraying of the orchard floor.

Planting density in a traditional orchard depends on the species of tree. For apple, pear and cherry this will usually be less than 150 trees per hectare with around an eight metre spacing between the trees, but for other species such as plum and damson the tree density may be higher. Tree form will usually be standards or half-standards, but will vary according to species and local practice. Vigorous rootstocks include trees that are grown on their own rootstock, seedling rootstocks, and named rootstocks that allow the tree to develop to its full size.

The minimum size of a traditional orchard is defined as five trees with crown edges less than 20 metres apart (BRIG 2008). However, sites which fall outside the definition, but are not modern intensive orchards, we call ‘marginal sites’. These are included in the dataset and assigned a ‘NonTO’ code explaining why they do not meet the definition. The biodiversity value, or lack thereof, of many of these sites is not known with certainty, although in many cases they may have historic, cultural and genetic importance. Where appropriate these are considered as potential sites for restoration to orchard habitat due to their historical context.

1.2.1. Marginal Sites

- Relict:

A site with less than five trees or too much space between the crown edges. These are normally relics of a larger orchard and may only be a single (mature) tree on a site mapped by OS as an orchard. Occasionally this type of site will be young trees that have been planted in low density

- Long abandoned:

A site that is, or probably was, an orchard but has become so overgrown that any fruit trees are outnumbered by non-fruit opportunist growth

- Intensively managed traditional orchard trees:

Trees which have some botanical or heritage interest, normally on semi-vigorous or vigorous rootstocks, but the site may be managed with herbicides or pesticides

- Abandoned or organic bush orchard:

Trees on highly dwarfing rootstock often planted in narrow rows but with no evidence of intensive management. Includes sites known to be organic as the biological diversity benefits may be increased by this management; there is some evidence that formerly intensive sites that have become neglected have high biodiversity value

1.3. Traditional orchard Habitat Action Plan

The habitat was officially recognised in 2007 and a UK Traditional Orchards Habitat Action Plan (HAP) Group was established and an Action Plan produced (Robertson et al. 2010). Natural England and the National Trust are leading this work, with the support of PTES, Natural Resources Wales and organisations such as the Tree Council, the Royal Society for the Protection of Birds and other UK NGOs. The inventory is primarily designed as a tool for conservation, but its use goes far beyond this reflecting the diverse interests that traditional orchards represent.

The targets set out in the HAP document aim to secure the future sustainability of the habitat:

1. No net loss of traditional orchards across the UK

   The aim of this target is to ensure there is no loss of traditional orchards of high nature quality but it is acknowledged there will be some losses and gains in space and time

2. Improve traditional orchards to a favourable condition

   A condition assessment has been agreed and is being used. The aim for this target is for the traditional orchard resource to be in favourable condition within an appropriate landscape unit

3. Increase the extent of traditional orchards across the UK

   This target aims to expand the number of traditional orchards to counter the rapid decline in the second half of the 20th century.

These targets can be achieved in several ways:

- Setting and monitoring priority habitat targets for traditional orchards
- Targeting agri-environment scheme options for traditional orchards
- Identifying orchards in local planning policies and development control
- Integrating habitat information and species distributions to support conservation action

In order to help meet these targets PTES was commissioned by Countryside Council for Wales, with additional funding from The Esmée Fairbairn Foundation, to produce an inventory of Welsh traditional orchards using, for consistency, the same methodology as that of the English inventory (Burrough et al. 2010).

1.4. Aims of the Traditional Orchard Project in Wales

The main aims of the project reflect the various interests in the habitat, ranging from conservation, education and research, to food heritage and connecting organisations and enthusiasts. They are:

- To complete an inventory and comprehensive map of remaining traditional orchards in Wales and some relict orchard sites using aerial photograph interpretation supplemented by ground-truthing in a digital format suitable for web-based dissemination
- To make the inventory available to the traditional orchard HAP group and other BAP groups (including invertebrate, birds, bats, lichens and fungi), conservation organisations and individuals, policy makers, local authority planners and anyone with a direct interest in traditional orchard habitat
- To provide the information resources required for volunteers to carry out ground-truthing of orchards in the field and inform and encourage their interest in traditional orchards and their wildlife
- To work with the various stakeholders involved in traditional orchard conservation to share knowledge about traditional orchards
- To increase awareness of traditional orchards and their importance for wildlife among orchard owners, local communities, the media and the general public

2. Methodology

2.1. Database creation

The boundary of each orchard was digitised to the same digital data standards as the England traditional orchard habitat inventory to ensure consistency and continuity between datasets and, whilst remaining a discrete Welsh dataset, contributes to a multilateral UK habitat map. Sufficient relevant supplementary information about individual sites was collected by surveyors or provided by owners to enable an assessment of habitat condition at the time of survey.

GIS (Geographical Information System) mapping was conducted on Pitney Bowes MapInfo software using a bespoke Data Capture Tool written by PTES for the England inventory. The same method will also be used for the Scottish and Northern Irish inventories. A full description of the database fields is in Appendix A.

2.2. Data sources

A desk-study was undertaken to compile a GIS layer of traditional orchard polygons for each of the local government areas of Wales. This was, and continues to be, augmented by ground based evidence collection by owners, orchard groups, other related projects and volunteer surveyors.

2.2.1. Ordnance Survey

The Ordnance Survey MasterMap series was used to locate land parcels already classified as an orchard, i.e. '0386 Orchard'. This was used as an overlay on the aerial images and identified many orchards, but does not distinguish traditional from modern and was often out of date. As a guide, it was an important source of information and allowed many smaller orchards, indistinguishable from non-fruit trees, to be identified.

2.2.2. Aerial photographs

Aerial photographs helped to distinguish management practices and locate orchards not in the OS MasterMap dataset because they have been removed, planted since the dataset was created, incorrectly identified, or omitted. They form the primary source of habitat boundary identification. The most current set of aerial photographs, from 2009 to 2010, were supplied by Countryside Council for Wales and systematically analysed.

2.2.3. Google

Google Earth (ver. 6.1.0.5001) software provided a useful source of information to assist orchard identity. The aerial images used by this resource are produced by the same company as those provided to us by Countryside Council for Wales (PGA/Infoterra). The historical option to browse older images could sometimes resolve ambiguity. In some instances the Google Street View resource was used to determine or confirm habitat presence. This data is normally more recent than the aerial photographs, all taken since 2008 in the UK and regularly updated (Google 2013).

It can determine management, fruit type, livestock presence, age, and structure with varying degrees of success.

2.2.4. Agri-environment schemes

A GIS layer of traditional orchards in the Tir Gofal scheme was provided by Countryside Council for Wales and cross-referenced with aerial photograph information. This included agreement number and size data for agreements starting between 2000 and 2008.

If the agreement orchard was visible on the aerial photographs it was mapped in the usual way using the Data Capture Tool, with the agreement number added to the 'Additional polygon notes' field. Where there was no visible evidence of an orchard being present it was not added to the inventory, but details were retained for assessment at a later date and checking with Countryside Council for Wales. Orchard area under the agreement was compared with that visible on aerial images. If a substantial difference existed this was recorded in 'Additional polygon notes.'

2.2.5. Other sources of information

Information was acquired from other orchard projects undertaken at a local level. This was cross-referenced with aerial photograph information and again mapped with the Data Capture Tool. If a reference to the original data source existed, it was recorded in 'Additional polygon notes' for purposes of back-referencing.

Relationships were fostered between various stakeholders who were considered to be vital to the success of this project. Contact was, and will continue to be, made with a variety of organisations including orchard groups, biodiversity partnerships, local record centres and local authorities.

A full list of partners and sources of existing information can be seen in Appendix B.

2.2.6. Aerial photographic interpretation

Aerial photography is one of the most useful sources of information for habitat identification. The linear regular plantings of fruit trees are easy to identify in aerial images and differences between orchards managed traditionally and those managed intensively is normally distinctive. However, ambiguities are inevitable so volunteer surveyors are employed across the country to ground-truth sites close to their homes. A typical traditionally managed orchard will be less densely planted, with larger trees, than intensively managed ones. Spray lines, due to herbicide use, are a reliable and readily identifiable indicator of modern intensive management appearing as a differentiated sward strip beneath trees. Some care has to be taken that the differentiation is not merely due to selective mowing or hay-cutting.

2.2.7. Confidence of interpretation

Each record provides three critical pieces of priority habitat information: the presence of an orchard, the type of management and orchard boundary. Associated with each of these is a degree of doubt, considered during the mapping process, and a level of certainty of priority habitat presence is determined. This is referred to as the Priority Determination (Pridet field in the data). A summary of this process follows, and full details of selection criteria are in Appendix C.

I. Only a site that has been ground-truthed will have the highest level of confidence. This degree of certainty degrades over time. Aerial images were only as good as the day they were taken, and the low resolution rarely reveals much beyond site presence.
II. Most records fall under the second level category 'probably present…'. These have no ground-truthing element, or may have been surveyed with limited visibility leaving some doubt regarding their status.

III. The third '…may be present…' category casts significant doubt on the evidence of habitat presence. This is often due to a poor quality aerial image or some other ambiguity in the data source.

IV. The lowest category includes only those orchards that cannot be defined as traditional orchard habitat but may retain some biodiversity interest. This could be due to appearing or being known to have a low number of trees (less than five), more intensive management, growing on very dwarfing rootstock, or having been long abandoned. These sites, whilst not strictly fitting the habitat definition, are retained for their potential, though often untested, biological diversity value and heritage interest.

2.2.8. Identification of boundary

The most reliable source for determination of the habitat boundary is an aerial image. The land parcel is extracted from the MasterMap layer and used to initially determine boundary edges. This is reviewed with evidence from the aerial image. If the MasterMap parcel boundary is within 20 metres of the crown edges shown on the aerial photograph, it is accepted as the boundary; if the tree crowns are over 20 metres from the MasterMap boundary, it is redrawn using the aerial image as a guide.

2.3. Volunteer involvement

The volunteer component of this project serves several purposes. As an aid to the collection of data, locally based volunteers are indispensable as this is the most effective way of maximising site visits at minimal cost. Additionally, the recruitment and publicity process raises awareness of traditional orchards, promotes their biodiversity and heritage value, and encourages an interest in the habitat. Volunteers were also employed to help with office based work, providing a work experience opportunity for people wishing to improve their work prospects or who wish to devote some spare time to conservation.

Surveyors received a map of the area they wished to survey listing the sites we had identified. They also looked for additional sites that we may have missed during the desk-study. All printed materials required, including information to disseminate to owners, was provided.

Surveys comprised two levels: a preliminary (road-side) survey (Appendix D) and an on-site survey (Appendix E). These recorded key information such as:

- the orchard trees – species, numbers, age structure, condition
- current management – ground management, pruning, retention of deadwood

- other features or species of interest such as hedgerows, ponds, mistletoe and fungi

Engaging with orchard owners was an important stated objective for this project and a questionnaire (Appendix F) was developed specifically for owners to establish the type and extent of management and current use of the orchards. Links with orchard workers or owners were forged and an advice leaflet distributed containing information on wildlife-friendly traditional orchard management.

2.4. Condition assessment

A habitat condition assessment was made for all sites physically seen by surveyors, external groups, or owners. The criteria consider the orchard's value as a habitat, not its quality as a productive agricultural crop. If an orchard is assessed as 'poor', this by no means infers that the orchard itself is in a bad condition or being poorly managed, but that the requirements of the orchard as a habitat are somehow in jeopardy (for example, there are signs of grazing damage to the trees). Of particular interest, and a prerequisite of the 'excellent' category, are the presence of younger trees to ensure habitat continuity, and retention of dead and decaying wood. Tabulated details of the criteria with full descriptions are shown in Appendix G.

2.5. Data dissemination

The inventory is freely available in several formats. The Natural Resources Wales interactive maps pages host the complete dataset. It can be downloaded as MapInfo .tab and ArcView.shp file formats together with an Excel spread sheet. In addition, there is a document explaining the data capture process and the Natural Resources Wales Terms of Use document. The PTES website hosts a 'Google map' version containing point data with abbreviated properties.

3. Caveats

3.1. Data accuracy

The traditional orchard inventory is iterative data and not expected to be flawless as sites may occasionally be incorrectly recorded or missing. An orchard may have been removed, changed or added since the inventory was produced requiring the database to be reviewed and updated as an on-going process. It should therefore not be regarded as an exhaustive and definitive resource, rather as a guide to identified sites for which information is held.

It would be overly optimistic to assume that every habitat site has been located during this project. The appearance of non-linearly planted orchards, particularly older neglected ones that may be very important sites, makes them difficult to distinguish from non-fruit trees on some occasions. If an area has not been ground-truthed the opportunity for non-inclusion increases.

The condition assessment errs on the side of caution. For example, if standing deadwood within old trees has not been recorded (as it may not be apparent), or younger trees were hidden from view, an ‘excellent’ site could be recorded as ‘good’ or even ‘poor’. As more information is received, the ratio of site conditions may improve. Conversely, information already received, in particular that from orchard owners, may be biased towards managed and cared for sites, making the current ratio overly favourable.

Occasional misidentifications do occur, for example, distinguishing between young broadleaf woodland and a young traditional orchard. If doubt exists, this is normally reflected in the notes and the confidence of determination recorded in the ‘Pridet’ data field (Appendix C). The inclusion of ground-truthing within this project aimed to minimise this and ensured a high level of data accuracy.

We often became aware of a new orchard being planted through various information vectors. These were, of course, not visible on the aerial photographs and sometimes the location could not be mapped with a high level of confidence. In these cases we had to rely on an ‘educated guess’ as to the actual location. This was also recorded in the notes.

To ensure that the inventory remains as accurate as possible, it is important that errors or changes are discovered, reported, and reflected in the data. PTES would be pleased to receive information regarding required amendments to the inventory or digital boundaries where new surveys are done, or other information comes to light.

3.2. Aerial photograph interpretation

Whilst aerial photograph interpretation is the most useful method for identifying traditional orchards, errors and omissions will occur. For example, the dates of the aerial photographs often precede newly planted orchards and consequently such sites will not be recorded unless information has been provided by other means.

3.3. Orchards in agri-environment schemes

The Tir Gofal layer provided by the Countryside Council for Wales consisted of coordinate data with an associated agreement size. Some of these agri-environment

agreements will have been for newly created orchards or restoration incorporating newly planted trees that were not yet visible on aerial photographs at the time the inventory was produced, and as such were not included. Additionally, some orchards included within the inventory may have been in agri-environment Schemes which have now expired. More information will be available from Natural Resources Wales if the agreement code is provided (this is recorded in the “Additional_polygon_notes” field).

4. Results

The following tables summarise results obtained for Wales. The data is presented with results for the strict habitat definition first followed by the inventory including marginal sites. There are 57% more sites (Table 1) when the marginal ones are included (59% more expressed as acreage). This significant area supports the case for the inclusion of marginal sites and further investigation of their biodiversity potential.

Principal Areas	Totals					Agri-environment	
	Total area traditional orchard (ha)	Total area including marginal sites (ha)	Number of sites	...including marginal sites	Average size	Sites in agri-env (2011 data)	Hectares
Blaenau Gwent	0.0	0.2	3	4	0.06	0	0.00
Bridgend	2.6	4.2	41	104	0.04	2	0.73
Caerphilly	2.0	5.0	46	87	0.06	0	0.00
Cardiff	2.0	3.3	29	50	0.07	1	0.04
Carmarthenshire	39.7	50.2	474	860	0.06	93	12.48
Ceredigion	22.7	27.9	374	513	0.05	55	6.23
Conwy	10.3	13.1	153	232	0.06	12	0.90
Denbighshire	18.4	32.5	355	596	0.05	2	0.12
Flintshire	17.4	23.2	411	772	0.03	2	0.71
Gwynedd	27.0	32.6	250	431	0.08	29	3.54
Isle of Anglesey	9.8	17.5	193	347	0.05	13	0.76
Merthyr Tydfil	0.4	0.6	9	18	0.03	0	0.00
Monmouthshire	209.3	452.4	693	892	0.51	67	27.07
Neath Port Talbot	1.9	3.1	32	95	0.03	5	0.37
Newport	24.9	40.4	87	124	0.33	1	0.59
Pembrokeshire	21.2	24.0	140	167	0.14	56	8.03
Powys	175.7	223.5	756	1007	0.22	94	32.93
Rhondda Cynon Taff	2.8	4.0	50	126	0.03	3	0.26
Swansea	17.1	19.8	176	282	0.07	21	2.13
Torfaen	5.6	6.3	30	38	0.17	0	0.00
Vale of Glamorgan	15.1	22.3	171	351	0.06	9	1.26
Wrexham	27.0	31.1	214	267	0.12	7	1.35
TOTAL	**653.1**	**1037.3**	**4687**	**7363**	**0.14**	**472**	**99.51**

Table 1. Summary of traditional orchard sites and area in Wales. The graph bars are based on a comparison to the highest number. Agri-environment schemes show 2011 data. More recent data are not included and where no evidence of an orchard existed on 2010 aerial images, the site was not included

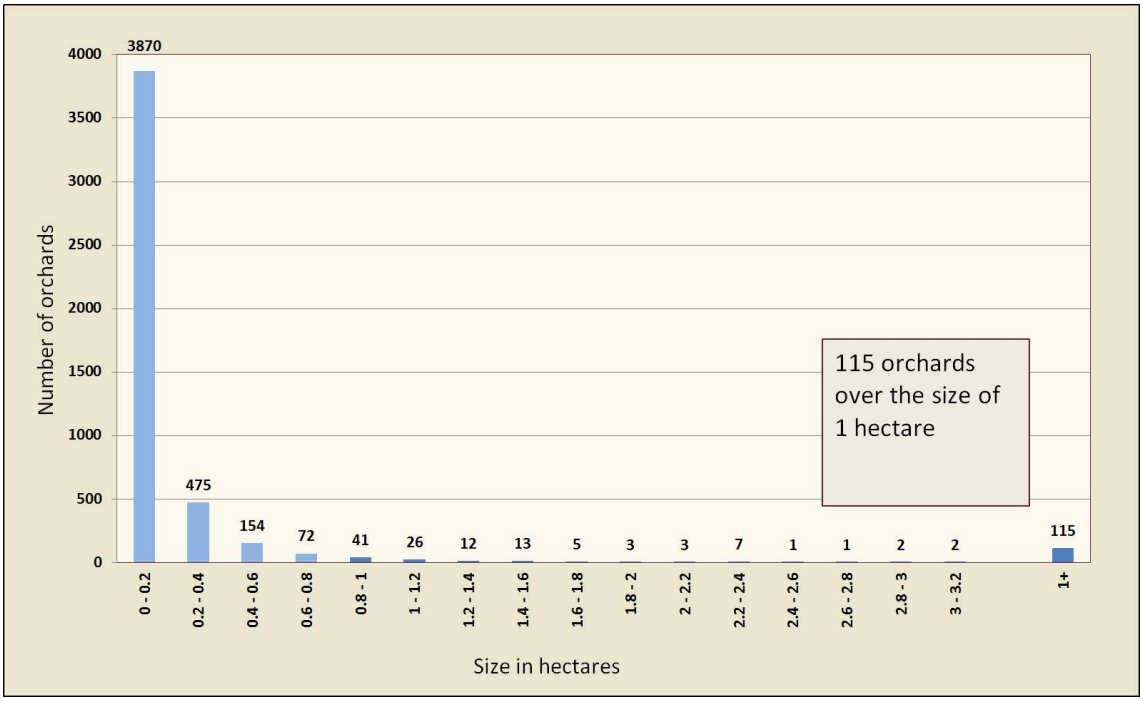

Figure 1. Size in hectares (x) against occurrence. The total number of orchards larger than 1 hectare is plotted last

Average orchard size is small, at 0.14 hectares (0.35 acres). Only Monmouthshire has a significantly larger average orchard size being, like its neighbour Herefordshire with whom it shares many landscape qualities, traditionally associated with fruit growing. Orchard size is broken down in Figure 1. The last value on the right shows a total of orchards greater than one hectare as 75. Just over half of these are in Monmouthshire, the rest are distributed throughout the country.

4.1. Habitat distribution

The distribution of the habitat is shown in Figure 2 with the darker quadrats containing relatively higher amounts. This clearly shows a preponderance of habitat along the eastern border of the country, but significant areas elsewhere, primarily Vale of Glamorgan, the Gower Peninsula, mid-Carmarthenshire, west Ceredigion, northwest Gwynedd and Anglesey, and north Conwy. This distribution equates closely to the lower lying land throughout Wales (Figure 3), with the exception of very low-lying floodplain areas, for example the land around the Carmarthen Bay and Estuaries where orchards are sparse, and the mostly unpopulated and exposed land of north Pembrokeshire.

The highest recorded orchard is found at 415 m, but the vast majority occur below 200 metres, with only 14% occurring above 200 metres and 2% above 300 (Figure 4).

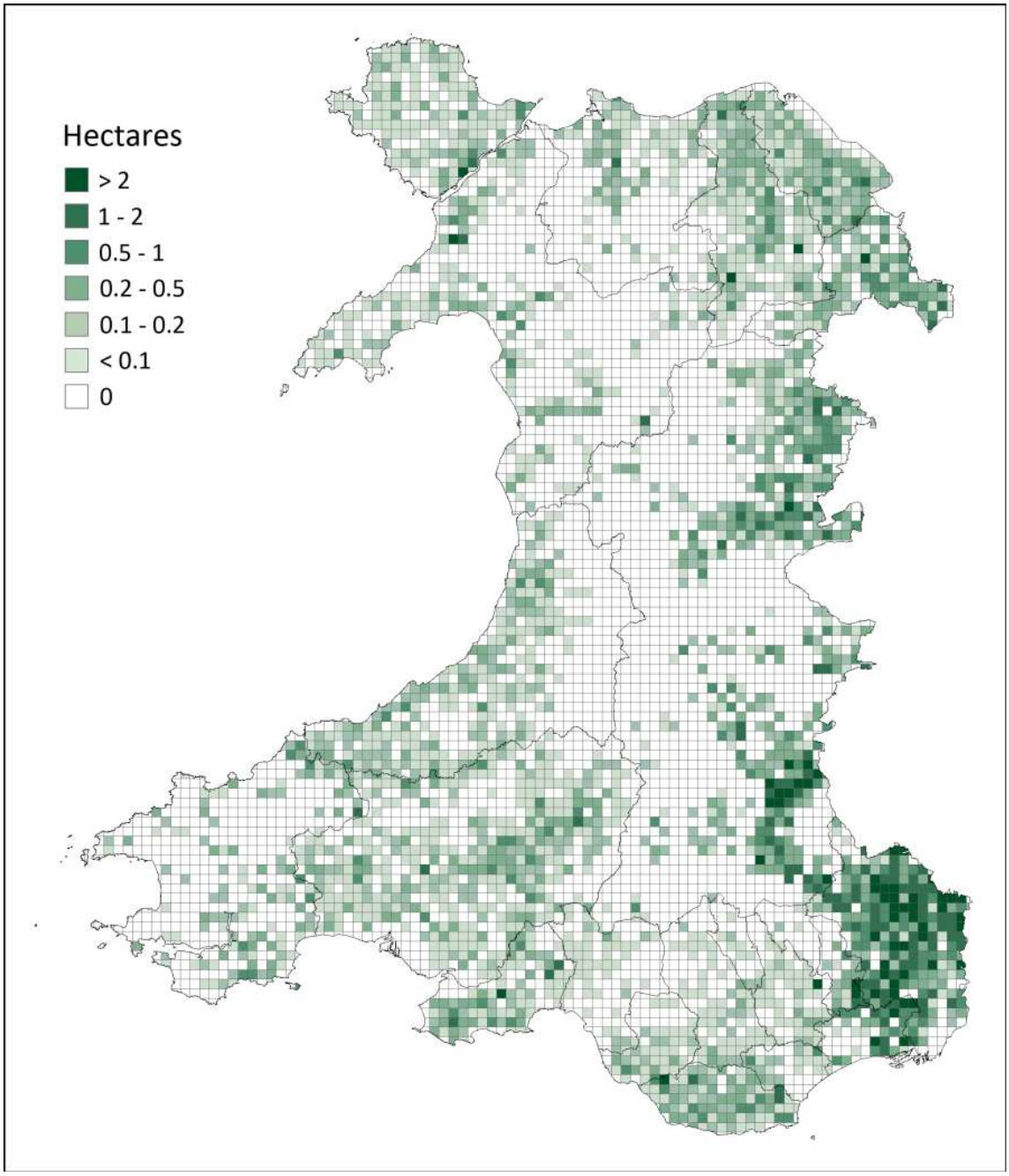

Figure 2. Distribution of orchard habitat, including marginal sites. Hectares of habitat per 200 Ha

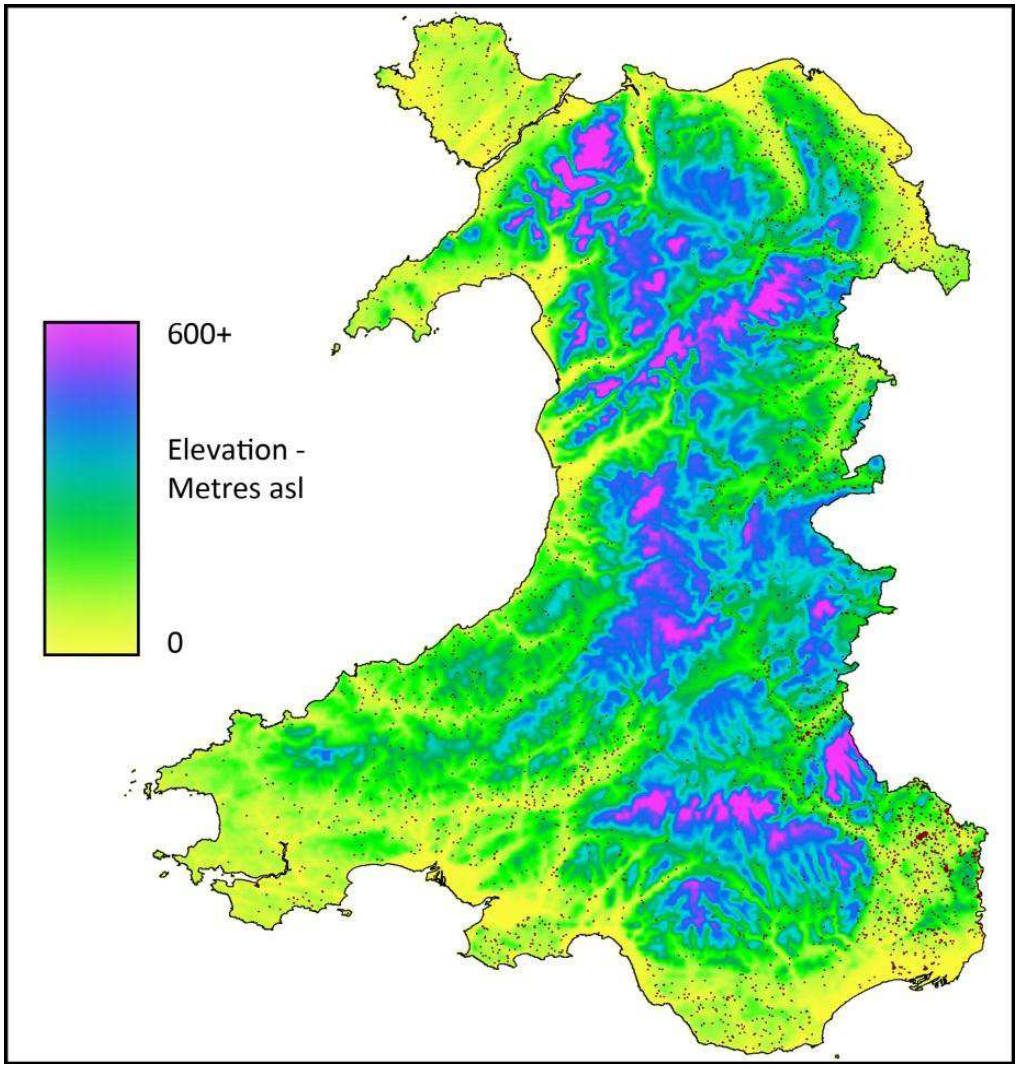

Figure 3. Distribution of orchards (dots) closely matches that of altitude above sea level

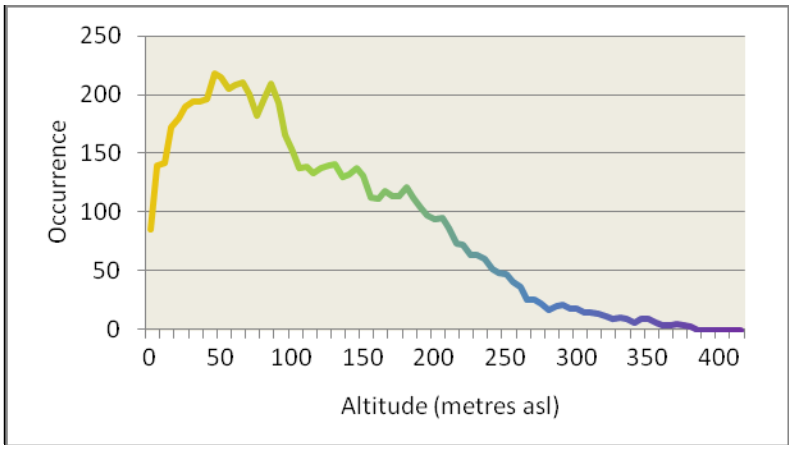

Figure 4. Habitat occurrence plotted against altitude

4.2. Habitat condition assessment

Principal Areas	Habitat condition			
	Assigned habitat condition	Excellent	Good	Poor
		%	%	%
Blaenau Gwent	3	0	33	67
Bridgend	7	0	71	29
Caerphilly	11	0	91	9
Cardiff	4	0	100	0
Carmarthenshire	14	0	79	21
Ceredigion	14	7	71	21
Conwy	26	4	81	15
Denbighshire	32	6	63	31
Flintshire	9	0	89	11
Gwynedd	33	3	82	15
Isle of Anglesey	26	4	69	27
Merthyr Tydfil	0	0	0	0
Monmouthshire	324	11	45	44
Neath Port Talbot	5	20	40	40
Newport	60	7	33	60
Pembrokeshire	2	0	100	0
Powys	113	8	73	19
Rhondda Cynon Taff	1	0	100	0
Swansea	31	0	58	42
Torfaen	23	4	57	39
Vale of Glamorgan	31	0	65	35
Wrexham	51	2	65	33
TOTAL	**820**	**7**	**58**	**35**

Table 2. Habitat condition

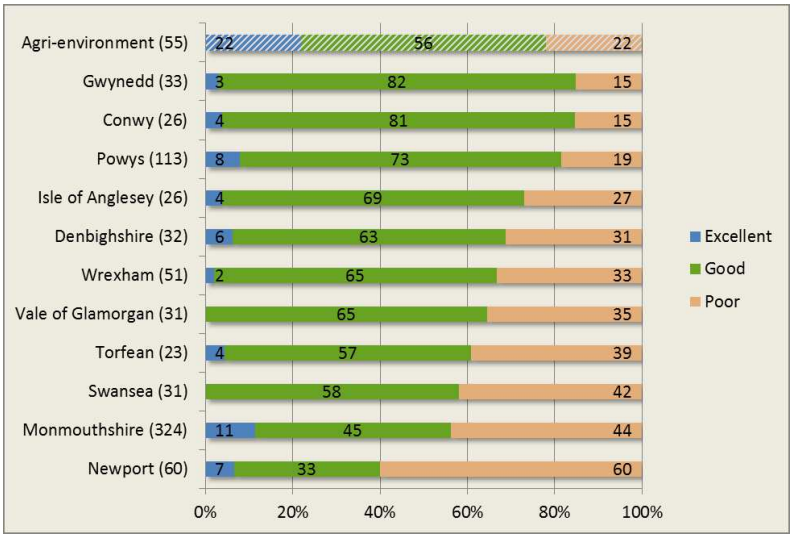

Figure 5. Condition assessment percentages ranked by 'poor' (data based on the number of assessments in parentheses). Data deficient areas are not listed (less than 25 assessments completed)

The condition assessment results (Table 2) are based on a scoring system (described in Appendix G). They reveal an average of 7% of orchards in 'excellent' condition. As discussed elsewhere, few orchards, even those managed very well as productive orchards, will meet all of the criteria to achieve the highest rank. To be graded as excellent, an orchard must have both new planting and deadwood habitats. The majority, 58%, fall into the 'good' category showing that most orchards are under some sort of management (65% when combined with 'excellent' orchards). Those orchards falling into the 'poor' category, 35%, will generally not be in current management or have grazing damage to the trees, indicating failing management practices. There appears to be a general bias of better quality habitat in the north of the country (Figure 5). This graph excludes principal areas that have too few results to be reliably representative.

It is worth noting that orchards within a agri-environment scheme agreement are more than three times as likely to be in an 'excellent' condition than average, but this accomplished as much by improving 'good' orchards as 'poor', as the latter condition habitat remains only one third below average.

4.3. Volunteering and public participation

The net effect on the general national awareness of the traditional orchard habitat is difficult to quantify. The project recruited survey volunteers via a range of organisations and community groups (Appendix B) as well as promotion in the national and local press and through use of social media, recruitment websites and local volunteering centres. Around 2800 bilingual project leaflets were distributed.

Principal Areas	Totals		Ground-truthed			
	Number of sites	...including marginal sites	Sites allocated to volunteer surveyors %	Volunteer surveys returned to date %	Owner surveys	Total surveyed including owner surveys %
Blaenau Gwent	3	4	100	100	1	100
Bridgend	41	104	68	24	0	24
Caerphilly	46	87	100	26	3	26
Cardiff	29	50	100	48	0	48
Carmarthenshire	474	860	33	4	2	5
Ceredigion	374	513	21	6	5	6
Conwy	153	232	39	20	5	21
Denbighshire	355	596	16	10	3	10
Flintshire	411	772	33	6	5	7
Gwynedd	250	431	31	16	5	16
Isle of Anglesey	193	347	37	14	7	16
Merthyr Tydfil	9	18	100	0	0	0
Monmouthshire	693	892	65	48	55	48
Neath Port Talbot	32	95	47	16	1	19
Newport	87	124	90	68	15	70
Pembrokeshire	140	167	21	1	2	1
Powys	756	1007	40	15	17	16
Rhondda Cynon Taff	50	126	74	2	1	2
Swansea	176	282	89	18	1	19
Torfaen	30	38	100	77	1	77
Vale of Glamorgan	171	351	39	25	10	28
Wrexham	214	267	43	35	6	37
TOTAL	**4687**	**7363**	**43**	**20**	**145**	**20**

Table 3. Ground-truthing details. Apart from owner-completed surveys, all data show percentages for the area

Volunteering uptake varied across the country with higher levels of interest and participation in the south east (Table 3). This may be an indication that there was already a greater public awareness in the region, potentially due to the higher numbers of orchards and greater orchard heritage value present.

One measurement of participation that can be quantified is the ratio between delivered and returned owner survey forms. When a ground-truthing survey was completed by a volunteer a form would, in most cases, have been delivered to the owner requesting further information about their orchard. Of approximately 1100 forms delivered 145 have been returned to date. This equates to one owner questionnaire being returned for every 8 delivered. However this is not a direct correlation as orchard owners may have received information about the survey via other vectors.

5. Applications and future work

5.1. Setting and monitoring priority habitat targets

The inventory and its parallels in the rest of the UK form a baseline survey of the traditional orchard habitat which enables the stated action plan targets to be measured. Future surveys and constant monitoring will continue to help identify the conservation action needed to preserve the habitat, and it is envisaged that the priority habitat targets will evolve as more information becomes available. The orchard HAP steering group continues to operate although changes to the Biodiversity Action Plan have been made since the group was established. In Wales, responsibility is currently with the Wales Biodiversity Partnership (http://www.biodiversitywales.org.uk).

5.2. Agri-environment schemes

Traditional Orchards have historically been included in agri-environmental schemes such as Tir Gofal and are included in the new Welsh Glastir scheme with management options under both Glastir Entry and advanced schemes (current confirmed Tir Gofal extent shown in Table 1). Options are available for restoring a traditional orchard with a minimum of one remnant fruit tree, or for creating a new orchard on improved land. The inventory could be used to assist the targeting of such schemes.

5.3. Identifying orchards in local planning policies and development control

Close to town and village centres, orchards, unlike many other important habitats, suffer from classification as commercial land making them vulnerable to selection for development. The inventory can help inform planning decisions, land use planning policies in Local Development Frameworks, Local Plans, and Local Wildlife Partnerships. Making local authorities aware of any threat to an important habitat, ensuring its consideration during planning decisions should be treated as a priority. Planning permission is implicit for anything included within a framework and earmarked for development.

5.4. Integrating habitat information and species distributions to support conservation action

Researchers of species associated with traditional orchards and wider landscape studies can use the inventory to focus their efforts. For example, the England inventory has been used to identify orchards containing mistletoe for a Butterfly Conservation survey of mistletoe marble moth (*Celypha woodiana*) (McGill 2009) and extensively for noble chafer (*Gnorimus nobilis*) conservation work, a result of which is that previously unrecorded noble chafer populations have been discovered in Kent and Buckinghamshire, both being the only known populations in those counties.

5.5. Heritage varieties

Many local and rare heritage varieties of apple, pear and plum among others are scattered around the country. Work is in progress to develop a UK map of fruit variety distribution based primarily on the inventory and information yielded from the PTES project. This, together with another project to create a network of local ‘mother orchard’ collections, will be a valuable tool to aid in the preservation and revival of heritage varieties of fruit.

5.6. Updating the inventory

To ensure that the inventory is as accurate as possible PTES will continue to allocate sites to survey volunteers, liaise with orchard owners and project partners and add information on new sites discovered or planted. Updates will be provided to Natural Resources Wales periodically to ensure website versions are up to date.

It is recommended that any new orchard projects undertaken across Wales refer to the inventory and liaise with PTES. Any survey work should include at least the fields from the preliminary survey form (Appendix D) so that data collected remain consistent and condition assessment is possible.

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6. Appendix A

Description of data fields used in the Welsh traditional orchard habitat inventory

Italic field names describe groups of headings and are not used in the inventory, instead the field names are listed in the description. Fields in bold are removed prior to publication as they contain personal data or are not directly relevant. All information is held by PTES.

Field name	Description	Data format or data entry choices	Length format
OriginalID	Site identifier unique within traditional orchard habitat inventory	Alpha-numeric code, *county/number*	8
UniqueID	Site identifier unique within all Welsh habitat inventories	Alpha-numeric code, TO/PTES/*county/number*	16
Pridet	Priority determiner – degree of confidence in presence of habitat based on all available sources of data	Definitely is traditional orchard priority habitat OR Probably traditional orchard priority habitat but some uncertainty OR Priority traditional orchard habitat may be present but evidence is insufficient to determine presence confidently OR Site does not meet priority habitat criteria	115
Condition	Assessment of condition of orchard based on presence or absence of a number of criteria	Excellent Good Poor	10
NonTOcode	Marginal site that does not fully meet one or some of the criteria described in the priority habitat definition, but retained in the inventory due to potential habitat or heritage value or potential for restoration	Relict Long abandoned traditional orchard Intensively managed traditional orchard trees Abandoned or organic bush orchard	40
Orch_owner_quest	**Owner survey received**	**DD/MM/YYYY**	**Date**
Permission_to_visit	**Permission granted by the owner for further contact**	**Y or blank**	**1**
Ground_truthed	**Volunteer surveyor visited site**	**DD/MM/YYYY**	**1**
Ground_truthed	Amalgamated volunteer and/or owner surveys	Y or N	1
Surveyor_name	**Names of surveyors/organisations**	**[name]**	**45**
Aerial_image_date	Date of latest photograph used to make interpretation	DD/MM/YYYY	Date
External_source	Survey conducted by another organisation	[name or organisation]	40
External_source_date	Date of dataset	DD/MM/YYYY	Date
Grazed	Managed by grazing	Y or blank	1

Field name	Description	Data format or data entry choices	Length format
Grazing_damage	Damage to trees caused by grazing animals	Y or blank	1
Mown	Managed by mowing or hay-cutting	Y or blank	1
Pruning	Evidence or knowledge of pruning maintenance	Y or blank	1
Herbicides	Evidence or knowledge of chemical use	Y or blank	1
Neglected	Evidence of general neglect	Y or blank	1
Scrub_present	Evidence of scrub on the site	Y or blank	1
Stewardship	Environmental Stewardship agreement (agreement number recorded in additional polygon notes)	Tir Gofal, Glastir, Tir Cynnal, CFO	10
Digitised_By	**Name of polygon creator**	**[name]**	**25**
Created _on	Date polygon created	DD/MM/YYYY	Date
Edit_By	**Name of last editor**	**[name]**	**25**
Last_edit	Date of last edit	DD/MM/YYYY	Date
Additional_polygon_notes	Special notes derived from Aerial Photographic Interpretation, and field and owner surveys, e.g. API difficult to interpret, specialist interest, condition of trees, stewardship agreement number, etc.	Free text	254
Crop (11 fields)	Apple, Pear, Plum, Cherry, Damson, Gage, Mulberry, Medlar, Quince, Walnut, Cobnut	Y or blank	1
Livestock (5 fields)	Sheep, Cattle, Equine, Pigs, Fowl	Y or blank	1
Old_fruit_trees~ (4 fields)	Bands recording number of old fruit trees – 0-10, 11-30, 31-100, 101+	Y or blank	1
Younger_fruit_trees~ (4 fields)	Bands recording number of younger fruit trees (those lacking veteran characteristics) – 0-10, 11-30, 31-100, 101+	Y or blank	1
Veteran features (5 fields)	Cavities, Deadwood_canopy, Deadwood_floor, Deadwood_standing, Fungal_fruits	Y or blank	1
Mistletoe	Presence of mistletoe recorded in orchard	Y or blank	1
Species_of_interest	Other significant species found in the orchard	Free text	254
Site_grade_for_NC	**Assessment of suitability of habitat for BAP species *Gnorimus nobilis***	**1, 2 or 3**	**1**
***Noble chafer evidence* (5 fields)**	**Survey result recorded as: NC_Adult, NC_Larvae, NC_Frass, NC_Fragment, NC_None**	**Y or blank**	**1**
Surrounding habitats (4 fields)	Hedgerows, ponds, veteran trees, rough areas	Y or blank	1
***Personal details* (4 fields)**	**Owner name, Site name, Address, Telephone number**	**Free text**	**Var.**
Unitary_Authority	Unitary Authority of location	Free text	17
Basemap	Maps referenced for polygon creation	Free text	60
Grid_reference	British National Grid combined format	LLnnnnnnnnn	12
Easting	BNG easting (x co-ordinate)	Exact centre of polygon	Numeric
Northing	BNG northing (y co-ordinate)	Exact centre of polygon	Numeric
Area_Hectares	Land parcel area in hectares	Exact area of polygon	Numeric

7. Appendix B

List of partners and sources of external data

Biodiversity Information Service for Powys and Brecon Beacons National Park (BIS)
Blaenau Gwent County Borough Council
Botanical Society of the British Isles (BSBI)
Brecknock Wildlife Trust
Brecon Beacons National Park Authority
Bridgend County Borough Council
Caerphilly Biodiversity Partnership
Caerphilly County Borough Council
Cardiff Council
Cardiff Naturalists' Society
Carmarthenshire County Council
Ceredigion County Council
City and County of Swansea
Cofnod - North Wales Environmental Information Service
Conwy County Borough Council
Conwy Orchard Community Group
Denbighshire Countryside Service
Dolau-hirion Fruit Trees
Dyfed Smallholders Association
Dyfi Valley Seed Savers
Federation of City Farms and Community Gardens
Flintshire County Council
Gwent Wildlife Trust
Gwynedd Council
Isle of Anglesey County Council
Marcher Apple Network
Merthyr Tydfil County Borough Council
Monmouthshire County Council
Montgomeryshire Wildlife Trust

National Trust

Neath Port Talbot County Borough Council

Neath Port Talbot Biodiversity Forum

Newport City Council

North Wales Wildlife Trust

Orchard Cardiff

Pembrokeshire Biodiversity Partnership

Powys County Council

Radnorshire Wildlife Trust

Raglan Cider Mill

Rhondda Cynon Taff County Borough Council

Snowdonia National Park Authority

South East Wales Biodiversity Records Centre

The Wildlife Trust of South and West Wales

Torfaen County Borough Council

Vale of Glamorgan Council

Wales Biodiversity Partnership

Welsh Historic Gardens Trust

Welsh Perry and Cider Society

Wenvoe Wildlife Group

West Wales Biodiversity Information Centre

Wrexham County Borough Council

External data sources:

Countryside Council for Wales
The Countryside Council for Wales provided a point data GIS layer of traditional orchards within the Tir Gofal agri-environment scheme, for agreements starting between 2000 and 2008.

Gwent Wildlife Trust
The Gwent Orchards Project mapped and surveyed a large percentage of traditional orchards in Monmouthshire, Blaenau Gwent, Caerphilly, Newport and Torfaen between 2010 and 2012 using the methodology utilised by PTES for the England inventory. This information was incorporated into the Welsh inventory and additional sites added for these counties. Ground-truthing continued in 2012 by both PTES and Gwent Wildlife Trust volunteers with close liaison to avoid duplication of survey effort.

North Wales Wildlife Trust and Flintshire County Council
The North East Wales Orchard Recovery Project provided details and locations of orchards planted or restored in 2012.

Dyfi Valley Seed Savers
Provided location data of orchards found from 2009 to 2010 during the Growing Fruit in Powys project.

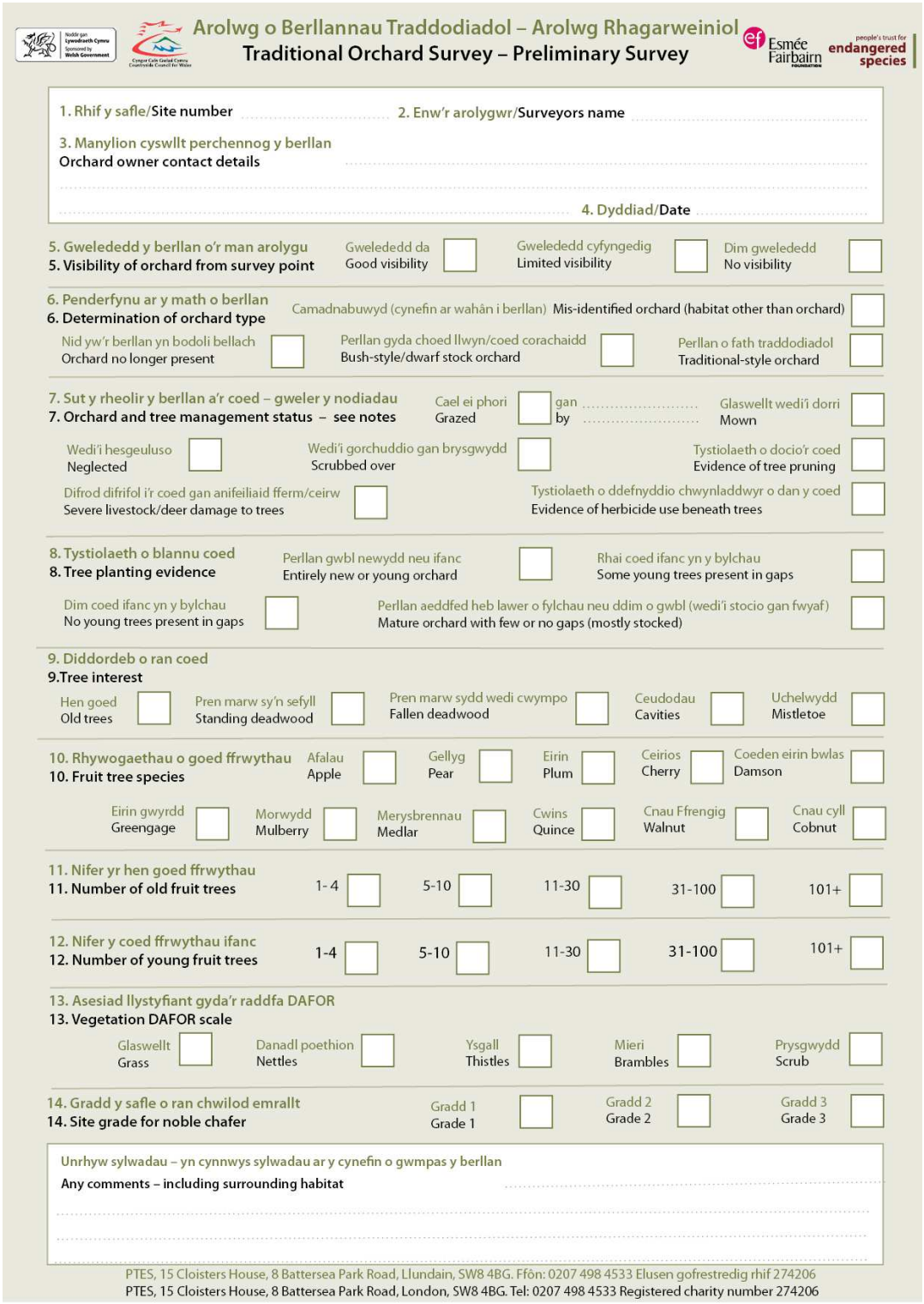
8. Appendix C

Confidence of habitat presence
The Pridet field in the database will contain one of the following confidence levels of priority habitat determination

Degree of certainty	Priority determination
Ground-truthed within last 5 years with sufficient information to establish style of orchard management AND/OR Owner Survey within last 5 years with sufficient information to establish style of orchard management OR External data within last 5 years sufficient to consistently and reliably identify establish style of orchard management, API boundary drawn using same rules as inventory project or mapped through inventory project	Definitely is traditional orchard priority habitat
API is sole data source and unambiguous: indicators clearly present such as livestock grazing, uninterrupted sward cover on orchard floor, orchard planting arrangement clearly visible OR OS MasterMap and API data sources available and unambiguous	Probably traditional orchard priority habitat but some uncertainty
API is sole data source and is ambiguous OR OS MasterMap marked as orchard but API is ambiguous	Priority traditional orchard habitat may be present but evidence is insufficient to determine presence confidently
Marginal site that does not meet priority habitat definition criteria: Relict: A site with less than five trees or too much space between the crown edges. These are normally left over from a larger orchard and may even be a single (mature) tree. Occasionally these are young trees that have been planted in low density Long abandoned: A site that is or probably was an orchard but has become so overgrown that any fruit trees are outnumbered by non-fruit opportunist growth Intensively managed traditional orchard trees: Trees which have some botanical or heritage interest, normally on semi-vigorous or vigorous rootstocks, but the site may be managed with herbicides or pesticides Abandoned or organic bush orchard: Trees on highly dwarfing rootstock often planted in narrow rows but with no evidence of intensive management. Includes sites known to be organic as the biological diversity benefits may be increased by this management; there is some evidence that formerly intensive sites that have become neglected have high biodiversity value	Site does not meet priority habitat criteria

9. Appendix D

Preliminary survey form



Arolwg o Berllannau Traddodiadol – Arolwg Rhagarweiniol
Traditional Orchard Survey – Preliminary Survey

Esmée Fairbairn Foundation · people's trust for endangered species

1. Rhif y safle/Site number ..... 2. Enw'r arolygwr/Surveyors name .....

3. Manylion cyswllt perchennog y berllan
Orchard owner contact details .....

..... 4. Dyddiad/Date .....

5. Gweledd y berllan o'r man arolygu
5. Visibility of orchard from survey point
Gweledd da / Good visibility ☐ Gweledd cyfyngedig / Limited visibility ☐ Dim gweledd / No visibility ☐

6. Penderfynu ar y math o berllan
6. Determination of orchard type
Camadnabuwyd (cynefin ar wahân i berllan) Mis-identified orchard (habitat other than orchard) ☐
Nid yw'r berllan yn bodoli bellach / Orchard no longer present ☐
Perllan gyda choed llwyn/coed corachaidd / Bush-style/dwarf stock orchard ☐
Perllan o fath traddodiadol / Traditional-style orchard ☐

7. Sut y rheolir y berllan a'r coed – gweler y nodiadau
7. Orchard and tree management status – see notes
Cael ei phori / Grazed ☐ gan / by ..... Glaswellt wedi'i dorri / Mown ☐
Wedi'i hesgeuluso / Neglected ☐
Wedi'i gorchuddio gan brysgwydd / Scrubbed over ☐
Tystiolaeth o docio'r coed / Evidence of tree pruning ☐
Difrod difrifol i'r coed gan anifeiliaid fferm/ceirw / Severe livestock/deer damage to trees ☐
Tystiolaeth o ddefnyddio chwynladdwyr o dan y coed / Evidence of herbicide use beneath trees ☐

8. Tystiolaeth o blannu coed
8. Tree planting evidence
Perllan gwbl newydd neu ifanc / Entirely new or young orchard ☐
Rhai coed ifanc yn y bylchau / Some young trees present in gaps ☐
Dim coed ifanc yn y bylchau / No young trees present in gaps ☐
Perllan aeddfed heb lawer o fylchau neu ddim o gwbl (wedi'i stocio gan fwyaf) / Mature orchard with few or no gaps (mostly stocked) ☐

9. Diddordeb o ran coed
9.Tree interest
Hen goed / Old trees ☐ Pren marw sy'n sefyll / Standing deadwood ☐ Pren marw sydd wedi cwympo / Fallen deadwood ☐ Ceudodau / Cavities ☐ Uchelwydd / Mistletoe ☐

10. Rhywogaethau o goed ffrwythau
10. Fruit tree species
Afalau / Apple ☐ Gellyg / Pear ☐ Eirin / Plum ☐ Ceirios / Cherry ☐ Coeden eirin bwlas / Damson ☐
Eirin gwyrdd / Greengage ☐ Morwydd / Mulberry ☐ Merysbrennau / Medlar ☐ Cwins / Quince ☐ Cnau Ffrengig / Walnut ☐ Cnau cyll / Cobnut ☐

11. Nifer yr hen goed ffrwythau
11. Number of old fruit trees
1-4 ☐ 5-10 ☐ 11-30 ☐ 31-100 ☐ 101+ ☐

12. Nifer y coed ffrwythau ifanc
12. Number of young fruit trees
1-4 ☐ 5-10 ☐ 11-30 ☐ 31-100 ☐ 101+ ☐

13. Asesiad llystyfiant gyda'r raddfa DAFOR
13. Vegetation DAFOR scale
Glaswellt / Grass ☐ Danadl poethion / Nettles ☐ Ysgall / Thistles ☐ Mieri / Brambles ☐ Prysgwydd / Scrub ☐

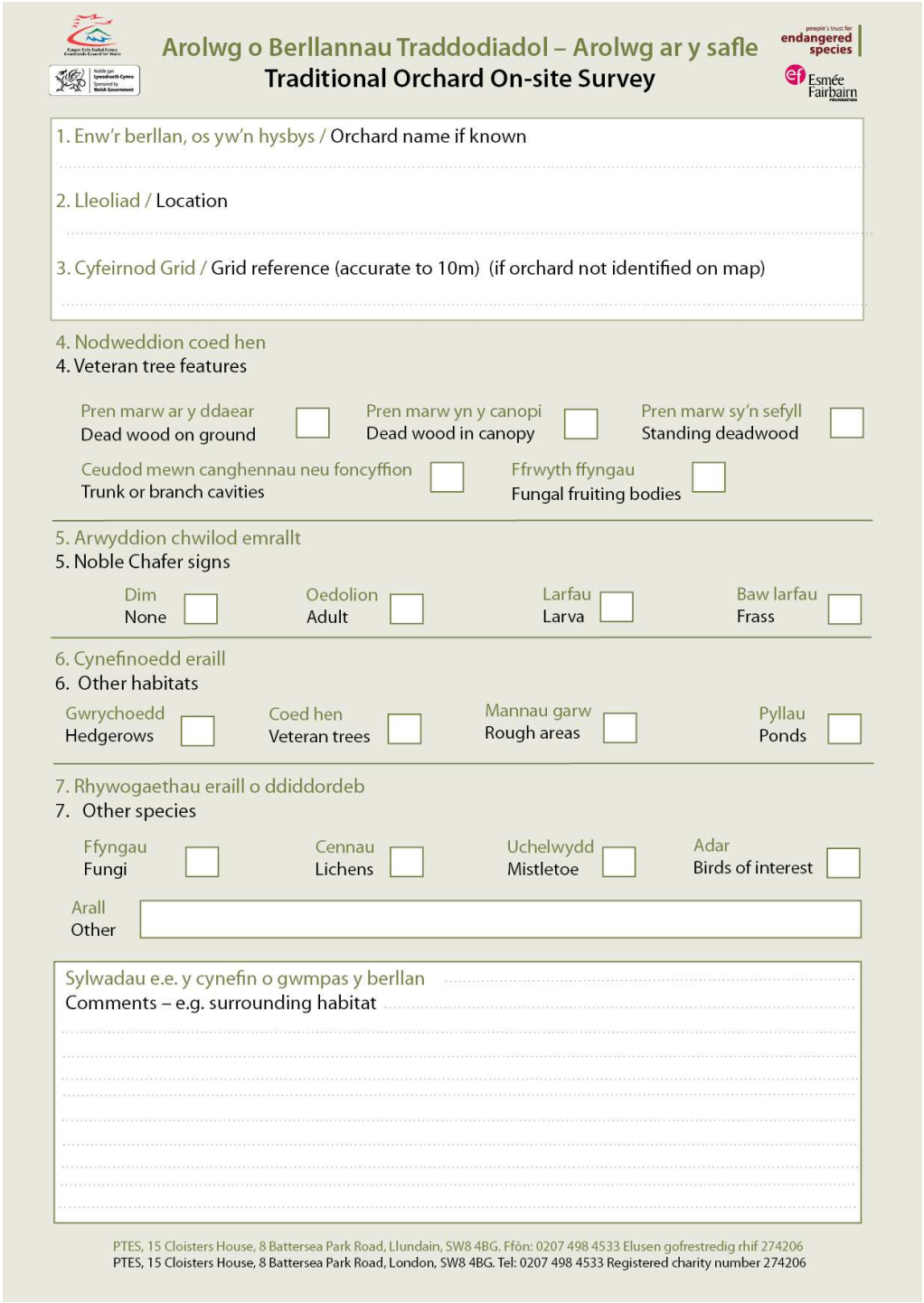
14. Gradd y safle o ran chwilod emrallt
14. Site grade for noble chafer
Gradd 1 / Grade 1 ☐ Gradd 2 / Grade 2 ☐ Gradd 3 / Grade 3 ☐

Unrhyw sylwadau – yn cynnwys sylwadau ar y cynefin o gwmpas y berllan
Any comments – including surrounding habitat .....

PTES, 15 Cloisters House, 8 Battersea Park Road, Llundain, SW8 4BG. Ffôn: 0207 498 4533 Elusen gofrestredig rhif 274206
PTES, 15 Cloisters House, 8 Battersea Park Road, London, SW8 4BG. Tel: 0207 498 4533 Registered charity number 274206

10. Appendix E

On-site survey form



Arolwg o Berllannau Traddodiadol – Arolwg ar y safle
Traditional Orchard On-site Survey

1. Enw'r berllan, os yw'n hysbys / Orchard name if known

2. Lleoliad / Location

3. Cyfeirnod Grid / Grid reference (accurate to 10m) (if orchard not identified on map)

4. Nodweddion coed hen
4. Veteran tree features

Pren marw ar y ddaear
Dead wood on ground ☐

Pren marw yn y canopi
Dead wood in canopy ☐

Pren marw sy'n sefyll
Standing deadwood ☐

Ceudod mewn canghennau neu foncyffion
Trunk or branch cavities ☐

Ffrwyth ffyngau
Fungal fruiting bodies ☐

5. Arwyddion chwilod emrallt
5. Noble Chafer signs

Dim
None ☐

Oedolion
Adult ☐

Larfau
Larva ☐

Baw larfau
Frass ☐

6. Cynefinoedd eraill
6. Other habitats

Gwrychoedd
Hedgerows ☐

Coed hen
Veteran trees ☐

Mannau garw
Rough areas ☐

Pyllau
Ponds ☐

7. Rhywogaethau eraill o ddiddordeb
7. Other species

Ffyngau
Fungi ☐

Cennau
Lichens ☐

Uchelwydd
Mistletoe ☐

Adar
Birds of interest ☐

Arall
Other

Sylwadau e.e. y cynefin o gwmpas y berllan
Comments – e.g. surrounding habitat

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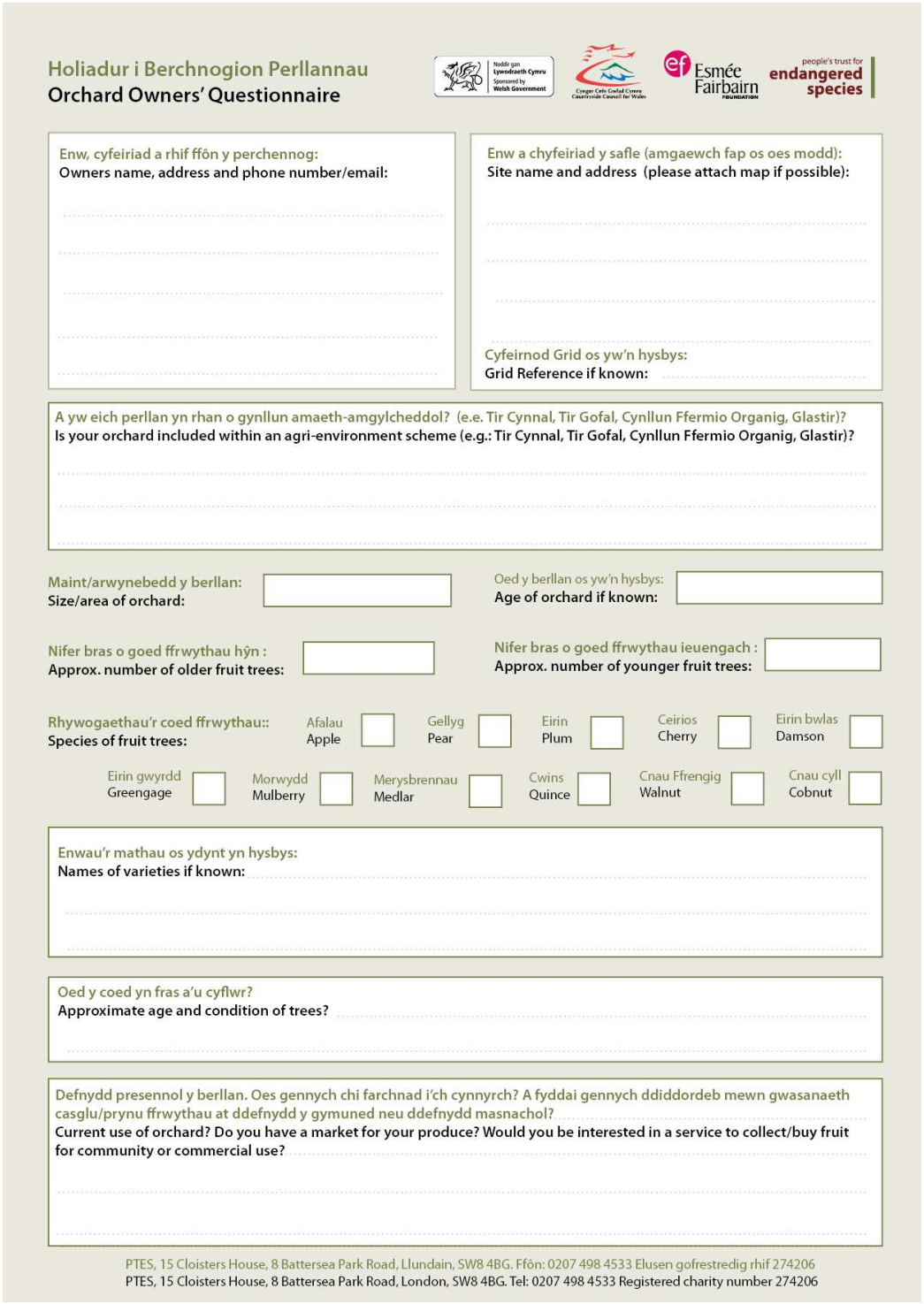
PTES, 15 Cloisters House, 8 Battersea Park Road, London, SW8 4BG. Tel: 0207 498 4533 Registered charity number 274206

11. Appendix F

Orchard owner questionnaire



Holiadur i Berchnogion Perllannau
Orchard Owners' Questionnaire

Noddir gan Lywodraeth Cymru / Sponsored by Welsh Government

Cyngor Cefn Gwlad Cymru / Countryside Council for Wales

Esmée Fairbairn Foundation

people's trust for endangered species

Enw, cyfeiriad a rhif ffôn y perchennog:
Owners name, address and phone number/email:

Enw a chyfeiriad y safle (amgaewch fap os oes modd):
Site name and address (please attach map if possible):

Cyfeirnod Grid os yw'n hysbys:
Grid Reference if known:

A yw eich perllan yn rhan o gynllun amaeth-amgylcheddol? (e.e. Tir Cynnal, Tir Gofal, Cynllun Ffermio Organig, Glastir)?
Is your orchard included within an agri-environment scheme (e.g.: Tir Cynnal, Tir Gofal, Cynllun Ffermio Organig, Glastir)?

Maint/arwynebedd y berllan:
Size/area of orchard:

Oed y berllan os yw'n hysbys:
Age of orchard if known:

Nifer bras o goed ffrwythau hŷn :
Approx. number of older fruit trees:

Nifer bras o goed ffrwythau ieuengach :
Approx. number of younger fruit trees:

Rhywogaethau'r coed ffrwythau::
Species of fruit trees:

Afalau Apple ☐ Gellyg Pear ☐ Eirin Plum ☐ Ceirios Cherry ☐ Eirin bwlas Damson ☐

Eirin gwyrdd Greengage ☐ Morwydd Mulberry ☐ Merysbrennau Medlar ☐ Cwins Quince ☐ Cnau Ffrengig Walnut ☐ Cnau cyll Cobnut ☐

Enwau'r mathau os ydynt yn hysbys:
Names of varieties if known:

Oed y coed yn fras a'u cyflwr?
Approximate age and condition of trees?

Defnydd presennol y berllan. Oes gennych chi farchnad i'ch cynnyrch? A fyddai gennych ddiddordeb mewn gwasanaeth casglu/prynu ffrwythau at ddefnydd y gymuned neu ddefnydd masnachol?
Current use of orchard? Do you have a market for your produce? Would you be interested in a service to collect/buy fruit for community or commercial use?

PTES, 15 Cloisters House, 8 Battersea Park Road, Llundain, SW8 4BG. Ffôn: 0207 498 4533 Elusen gofrestredig rhif 274206
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Defnydd hanesyddol y berllan os yw'n hysbys:
Historic use of orchard if known: .....

.....

.....

.....

Sut ydych chi'n rheoli coed y berllan? (croeswch allan fel bo'n briodol)
How are the orchard trees managed? (delete as applicable)

Eu tocio'n rheolaidd? Regularly pruned?	Ydym Yes		Nac ydym No		Cadw'r pren marw? Deadwood retained?	Ydym Yes		Nac ydym No	
Defnyddio cemegion? Chemicals used?	Ydym Yes		Nac ydym No		Ailblannu coed? Trees re-stocked?	Ydym Yes		Nac ydym No	

Manylion:
Details: .....

.....

Sut ydych chi'n rheoli llawr y berllan? (croeswch allan fel sy'n berthnasol)
How is the orchard floor managed? (delete as applicable)

Rhoi anifeiliaid i'w bori? Grazed?	Ydym Yes		Nac ydym No		Torri'r glaswellt? Mown?	Ydym Yes		Nac ydym No	
Wedi'i hesgeuluso? Neglected?	Ydym Yes		Nac ydym No		Defnyddio cemegion? Chemicals used?	Ydym Yes		Nac ydym No	

Manylion:
Details: .....

.....

Oes unrhyw hen goed yn eich perllan sydd efallai'n wag neu â cheudodau ynddynt? Are there old trees in your orchard that may be hollow or have cavities within them?	Ydym Yes	Nac ydym No
O fewn eich perllan a oes gennych goed marw sy'n dal i fod ar eu sefyll? Do you have any standing dead trees in your orchard?	Ydym Yes	Nac ydym No
A oes gennych uchelwydd yn eich perllan? Do you have mistletoe in your orchard?	Ydym Yes	Nac ydym No
A fyddech chi'n fodlon i arolygwr gwirfoddol ymweld â'ch perllan? Would you be happy for a volunteer surveyor to visit your orchard?	Ydym Yes	Nac ydym No

Unrhyw sylwadau eraill?
Any other comments? .....

.....

Diolch yn fawr i chi am eich amser a'ch cymorth.
Anfonwch eich ffurflen wedi'i llenwi i'r cyfeiriad rhadbost isod:
Thank you very much for your time and help.
Please return your completed form to the freepost address below:

Traditional Orchard Survey
People's Trust for Endangered Species
FREEPOST LON 82
15 Cloisters House
8 Battersea Park Road
Llundain/London SW8 4YY

Bydd y wybodaeth o'r arolwg yn eiddo i'r cyhoedd ac yn cael ei rhannu, ar ffurf gryno, gyda sefydliadau amgylcheddol eraill. Ni fydd y wybodaeth hon yn cynnwys eich manylion cyswllt.
Survey information will be placed in the public domain and will be shared, in summary form, with other environmental organisations. This information will not include your contact details.

12. Appendix G

Condition assessment

Feature	Score
Old trees present	50
Young trees present	50
Young trees not present	-100
Deadwood habitat	50
Grazed	1
Pruning	1
Mown	1
Unmanaged or neglected	-1000
Any scrub present	-1000
Grazing damage	-1000
Relict	-1000
Long abandoned	-1000
Intensively managed traditional orchard trees	-1000
Abandoned or organic bush orchard	-1000
Excellent	150+
Good	50 - 149
Poor	< 50

Excellent:

Both old trees – those showing veteran features – and younger trees are required to respectively provide primary habitat and secure longevity. Dead and decaying wood is highly beneficial when managing a site for wildlife and a necessary feature of 'excellent' orchard habitat. Older trees exhibiting veteran features will have deadwood within the trees themselves, which may have been recorded as 'standing deadwood'. Where deadwood retention is concerned, some discord exists between what constitutes good horticultural practice and good habitat; it is not considered good practice to store dead, potentially diseased, wood in a working orchard.

Good:

Evidence of management but a uniform young age structure and/or no deadwood habitat will confer a 'good' condition.

Poor:

Lack of, or poor, management leading to neglect, scrub growth, or grazing damage will negatively impact the condition assessment. Orchards with no young trees fall into this category due to their reduced longevity. All orchards that fall within the marginal habitat categories are assessed as 'poor' as their full biodiversity benefits are untested.

13. Appendix H

Links

www.ccw.gov.uk/interactive-maps.aspx
www.ptes.org/orchards
www.ptes.org/files/2044_traditional_orchard_guide_to_wildlife_&_management_wales.pdf

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