Traditional Orchard Survey instructions

people's trust for endangered species

For the purpose of this work we are defining an orchard as five or more fruit trees that are no more than 20m apart from crown edge to crown edge.

The survey form is a series of questions which should take approximately 5 - 15 minutes to complete once you have arrived at each site. The following pages will help explain the survey form in more detail.

You will be assigned a set of potential orchards that will be marked, with their reference number, on an Ordnance Survey map. Before setting out for the day, take some time to study the maps and identify where there are access points such as roads, public footpaths and rights of way. Planning a route prior to departure will save you both time and effort.

Your map may refer to lower priority survey sites which do not appear to meet the habitat definition. These are not a priority for surveying, but please visit them if you have time as there is a chance they may in fact be a traditional orchard or have significant interest.

You may be able to gather some of the information without the need to enter a site if it is visible from a public right of way. Please do not enter land that you do not have permission to access. Often the easiest way is to find the landowner is to knock on the door of the nearest house and enquire. Always take someone with you if you are doing this. Alternatively there are orchard owner questionnaire packs which can be posted through the door of the nearest dwelling. When doing this please write the site number of the orchard in the space provided on the questionnaire.

If an orchard owner approaches you or is easily identified then explain the aim of the survey and ask if they would allow entry to the orchard to undertake a survey. Most landowners are happy to talk about their orchards but if at any time you feel uncomfortable or if an unsympathetic orchard owner approaches you do not hesitate to move on to the next site. Please pass on my contact details (at the end of this document) to anybody that would like further information or clarification about the project.

Please familiarise yourself with the 'potential risks for survey volunteers' document provided in your survey pack before embarking on surveying and always let somebody know where you are planning to work. Do not put yourself or others at risk.

Equipment checklist

- Map
- Survey forms
- Identification sheets
- Orchard owner questionnaire packs
- Pens/pencils
- Long handled spoon
- Gloves
- Camera (optional)
- Mobile phone

The survey form

First establish if the orchard marked on your map still exists and is definitely an orchard. If not, still fill in numbers 1 – 6 on the survey form. Please make a note of the current land use in the comments section. For example intensive agriculture, woodland, development etc.

If there is an orchard present continue filling in the survey form by ticking the appropriate boxes. Fill in any other comments you feel may be useful at the end of the form.

1. Site number

This is the number of the orchard as marked on your map and will help us to organise the survey results.

2. Surveyor's name

By knowing who has undertaken each survey we will be able to easily contact the surveyor if there are any queries at a later date.

3. Orchard owner contact details

It will be helpful for future work if the contact details of the orchard owner can be obtained. For example we can contact owners with information about grants or training days in their area. Please ask for permission for People's Trust for Endangered Species to contact them regarding the project.

If you do not speak to an owner for a site please put an orchard owner questionnaire through the door so that they can provide us with the information should they so wish.

4. Date

The date that the survey was undertaken.

5. Visibility

This does not refer to access on to the site but to the visibility of the site.

Some sites will be easy to view, some will only be partially seen from the footpath or road and others may be impossible to see if you cannot gain access. The level of visibility will affect the level of information that can be gathered.

If the orchard can only be seen partially and you cannot gain access then tick the limited visibility box and fill in as much information as you can. If the orchard cannot be seen at all then still fill in numbers 1 – 5. In these instances please put an orchard owner questionnaire through the door.

6. Determination of orchard type

If there is an orchard present and it can be viewed easily and safely, does it appear to be traditionally managed?

An information sheet showing the differences between orchard types is provided in your survey pack together with a sheet outlining the indicators of orchard management. The simplest visual indicator of intensive management is the presence of herbicide-treated or cultivated strips/patches along the tree rows or beneath the trees, where the ground is generally bare or with some annual plant re-growth. These bare strips/patches contrast with the permanent grassland of the between-row spaces. You may need to look carefully for signs of chemical use as it may not be as evident at certain times of the year.

7. Orchard and tree management status

By looking at the orchard floor and fruit trees, you can determine how the site is managed.

The way in which the orchard floor is managed will affect the wildlife present. To establish ground floor management look for evidence of animals, machinery, uniform mow lines or chemical use.

Livestock grazing is ideal if undertaken at the correct intensity with appropriate livestock species. If no animals are present at the time of surveying then please try and identify stock from any droppings and look for grazing damage to trees. In some orchards, without tree protection, livestock can have a detrimental impact and animals may cause serious damage to trees.


Evidence of mowing


Evidence of herbicides


Tree guards


Grazing damage

Determine if the orchard trees are being managed - for example is there evidence of pruned branches, are there piles of cut branches (brash) on the ground or has the orchard become abandoned and overgrown with scrub? Refer to the information sheet outlining the indicators of orchard management.

8. Tree planting evidence

Maintaining a diverse age structure and ensuring the continued presence of the orchard in the landscape is one of the most important aspects of traditional orchard management.

Determine if the old orchard trees are being replaced when they die. Are there gaps in the orchard with no evidence of new tree planting or are gaps being filled with new trees? Is the orchard fully stocked (no gaps) and therefore there is no need to plant new trees at this time?

Mature orchard with gaps and no new planting

Mature orchard with new planting

Fully stocked orchard with few or no gaps

9. Fruit tree species

If possible identify the species of tree present. A simple fruit tree identification guide is included within your survey pack.

10. Number of old fruit trees

Estimate how many old fruit trees you think are present and tick the corresponding box. Old fruit trees are those with veteran features such as dead wood, cavities, rot holes and loose bark.

This will provide us with an idea of the extent of decaying wood habitat available to many different species. Larger tree populations might support a wider range of species and large numbers of old trees suggest continuity in the landscape allowing a greater diversity of species to colonise over time.

11. Number of young fruit trees

Estimate how many younger fruit trees, without the veteran tree features above, you think are present.

This will provide us with an idea of the ratio of old trees to younger trees in the orchard and to establish if younger trees are available to replace the older ones as they die.

12. Vegetation DAFOR scale

The type of vegetation present on the orchard floor can influence diversity.

For each vegetation type (brambles, nettles, thistles, grass and scrub) estimate the amount present and assign a letter code using the DAFOR scale below. If it is absent please leave the box BLANK.

D	Dominant	The main vegetation type. Usually more than 70% cover
A	Abundant	Many individuals or patches visible, usually 30-50% cover
F	Frequent	Several individuals or few patches, usually 10-20% cover
O	Occasional	A few individuals or small patches, usually 5-8% cover
R	Rare	Very small patch or individual, usually 1-3% cover

13. Site grade for noble chafer

By assessing the condition and age of the fruit trees in the orchard a grade can be given to the site that will provide an indication of suitability for the noble chafer beetle.

An orchard grading system sheet has been provided in your survey pack.

14. Veteran tree features

Is there any deadwood present in the orchard? This could be on the ground (e.g. detached fallen branches or parts of trunk lying on the floor), in the canopy or as whole standing dead trees.

Are there any trunk or branch cavities present on the trees? Inspect the main trunk to see if there are any large holes and look into the crown of the tree to see if there are smaller diameter holes in branches. Hollowing may be easily visible or can be concealed within an apparently intact trunk or limb. It occurs through a combination of wounding and decay and an entirely hollow stem or partial shell may result.

15. Noble chafer signs

With your arm, a long handled spoon, or similar such implement reach into any accessible hollows and collect a handful of the wood mould that is inside. Check this wood mould material for noble chafer droppings (frass). It may be useful to use a white sheet or piece of paper for this as when shaken the pellets usually come to the surface. See the noble chafer fact file in your survey pack for help with identification.

If you discover noble chafer larvae please leave them undisturbed, however if frass is found please take a small sample and post it to us for verification.


Looking for noble chafer evidence


Sifting for frass

Noble chafer frass


Noble chafer larvae

16. Other habitats

Have a look around the site to see if there are other important habitats to record. This may include species rich hedgerows, ponds and non-fruit tree species that are likely to increase diversity.

17. Other species

Make a note of any other species that you may encounter such as mistletoe, lichen, butterflies and birds of interest.

Comments

Add any additional information that you feel may be useful or of importance.

Un-mapped Orchards

Orchards may be encountered that are not marked on your maps. If such an orchard is discovered, please mark it on the map giving it a temporary number and complete a survey form for the site.

If you are not able to post your map back to us, please provide a grid reference or postcode and a clear description so that we can easily find where the site is.

On completion

Please return your completed survey forms together with your maps to the freepost address below (NB this must be written in capital letters. You do not need to affix a stamp):

FREEPOST PTES

I hope that you have enjoyed this work. If you would like to do some more surveys then I will be delighted to send you another set of maps. Either call or email me and I will send some more.

Thank you very much for you time in helping People's Trust for Endangered Species and the traditional orchard habitat!

Henrietta Pringle
Key Species Monitoring and Data Officer

henrietta.pringle@ptes.org
020 7498 4533

Orchard types

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Traditional

- Managed in a low intensity way
- Widely spaced
- Standard or half- standard sized trees
- No application of pesticides
- Old trees present
- Grazing of orchard floor or cutting for hay

Intensive

- Managed intensively for fruit production
- High density planting
- Dwarf or bush fruit trees
- Pesticides and herbicides used
- Short-lived trees
- Bare ground present
- Frequent mowing of orchard floor

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Indicators of orchard management

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Traditionally managed orchard - widely spaced, large trees, grazed with livestock.

Traditionally managed orchard - mown.

Intensively managed orchard - densely planted, small trees with evidence of herbicide application.

Intensively managed orchard with herbicide lines not so evident.

Neglected traditionally managed orchard.

Scrubbed over traditionally managed orchard - tall fruit trees protruding from scrub.

Neglected intensively managed orchard.

Scrubbed over intensively managed orchard - small trees covered by brambles.

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Fruit tree identification

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Apple

Tree has rounded crown
Bark is flaky and mottled
Leaf petiole (stalk) is downy and buds are rounded
Leaf edges are serrate (toothed)
Leaves shiny on upperide and downy on underside
Twigs are downy on current years growth

Pear

Tree has a pyramidal crown
Bark is fissured into square plates
Leaves are bright, glossy and never downy
Buds are large, pointed and shiny

Plum

Tree has rounded crown
Bark with small raised pores (lenticels) arranged in horizontal bands
Leaf edges are serrate (toothed) but not downy
Buds are small, pointed and conical in shape

Cherry

Shiny shoots with clusters of buds on older twigs
Leaves strongly toothed with small glands on the stalk
Bark is often glossy, broken up with bands of corky lenticels

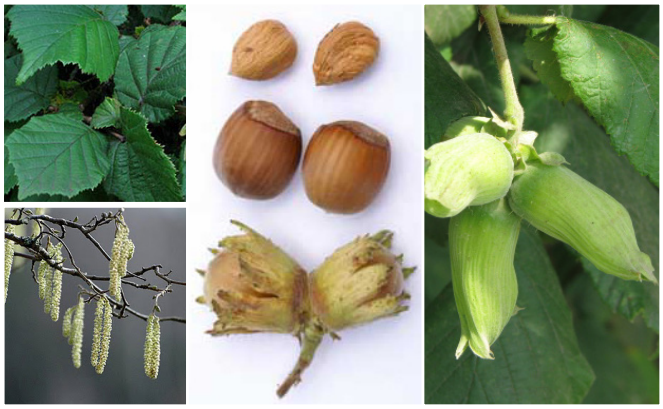
Quince

Downy shoots and small brown buds. Ends of shoots often flattened and club-like. Yellow, scented pear shaped fruits.

Medlar

Downy shoots, rounded oblong leaves. Large white flowers followed by distinctive round fruits.

Cobnut



Cobnuts are the domesticated form of the wild hazelnut. Rounded, slightly flattened green buds. Large, heart shaped leaves are downy to the touch. Bright yellow catkins in spring and nuts concealed by a large husk.

Damson

Also known as Bullace, the Damson is a sub-species of the plum tree. A small tree with occasional spiny, brownish and downy branches. Small white flowers in early spring followed by rounded purple, red, yellow or green fruits.

Greengage

Another relative of the plum tree - very similar in appearance but with fruits that are green and sweet.

Fact file

Noble chafer

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This shiny green beetle is dependent on dead wood to complete its life cycle. It is closely associated with traditional orchards, but as orchard loss and neglect reduce its habitat, this handsome beetle has become a rare sight.

COMMON NAME Noble chafer

SCIENTIFIC NAME *Gnorimus nobilis*

DESCRIPTION The noble chafer is a very attractive beetle. The adult is approximately 20mm long and has a metallic-green body, speckled with white. The whole body displays a brilliant iridescence which can flash copper, gold and even violet. The noble chafer resembles a much more common species, the rose chafer (*Cetonia aurata*). The main difference between them is the small triangular area (the scutellum) between the wing cases forms an equilateral triangle on the noble chafer but is elongated on the rose chafer. The rose chafer is also more globular looking and lacks the 'waist' of the noble chafer.

HABITAT This rare beetle is associated with traditional orchards where it is dependent on old, decaying wood within live trees, especially cherry, plum and apple. They have a preference for orchards that contain mature fruit trees between 50 and 80 years old. These sites are vulnerable to removal or clearance, particularly if the trees are reaching the end of their productive life. In the New Forest they are thought to breed within old oak and beech trees - they have only been seen so far as adults visiting flowers on road verges.

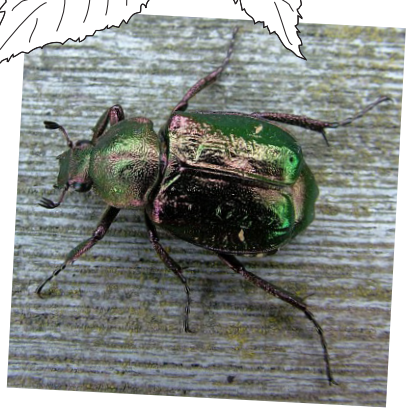
DIET The larvae feed on decaying wood in hollowed trunks and boughs. They produce characteristic droppings called frass, which may become abundant and accumulate in hollow branches or trunks. Adults feed on pollen and nectar from a range of umbellifers (plants with clusters of tiny flowers).

HABITS Adult noble chafers emerge in early summer and live for about 4-6 weeks. The peak flight season is June and July. In the morning, after emerging from the tree, beetles will bask for a short while to warm up their flight muscles, then fly to feed on nearby flowers. Later on in the day they may be found up in the canopy some distance from their larval habitat.

BREEDING The adult females lay up to 35 eggs in areas of wood mould formed by the action of fungi beneath the bark or in the centre of the trunk of old, decaying fruit trees. The larvae hatch about two weeks later. They are white, c-shaped and grow to about 3cm long. They remain feeding within the tree for two to three years, until they pupate. It is thought that some beetles never leave their host tree.

DISTRIBUTION The noble chafer is found throughout Europe. In England populations are centred around the fruit growing counties of Gloucestershire, Herefordshire and Worcestershire, with outlying populations in the New Forest and South Oxfordshire. Recently, noble chafers have been discovered in two adjacent orchards in Kent and two unconnected orchards in Buckinghamshire. Historically this beetle was also known to live in Essex, Northamptonshire, Devon and Cumbria.

CONSERVATION STATUS In Britain, the species has been rare for the past century. It is a Biodiversity Action Plan (BAP) species and is classified as 'Vulnerable'.



The noble chafer beetle is often confused with the rose chafer, above. The rose chafer however has a globular shape and lacks the 'waist' of the noble chafer, right.

Images: Matt Smith, Mark Sanders, Andrew Curran, Chris Harris

How to survey fruit trees for noble chafer beetles

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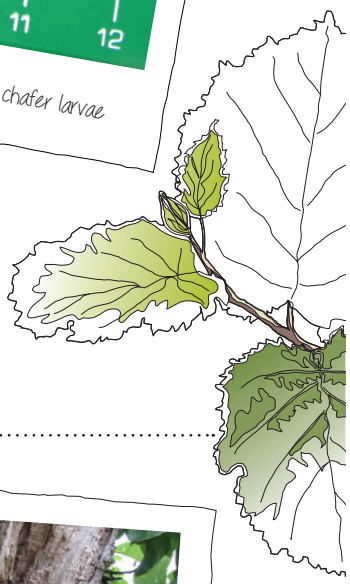
Where old fruit trees in an orchard exhibit decay features, look for noble chafer signs:

- With your arm, a long handled spoon or similar implement, reach into any accessible hollows.
- Collect a handful of the wood mould that is inside. This will be fine, woody material produced by fungal activity during the decay process.
- Inspect the wood mould for noble chafer frass. It may be useful to use a white sheet or piece of paper for this as when shaken the pellets usually come to the surface. Noble chafer frass is approximately 3mm long and lozenge-shaped.
- If noble chafer frass is discovered please take a small sample and send it to the PTES office, with address or grid reference for confirmation and recording.
- If noble chafer larvae or adults are discovered please leave them where they are but take a photograph to send to us (address below) if possible.
- Return the wood mould to the hollow.
- Always be aware that other species inhabit tree hollows so please explore with care and keep disturbance to a minimum.

Frass from the noble chafer larvae



Noble chafer-friendly orchard management

If you are lucky enough to find evidence of the noble chafer in your orchard, follow these steps to ensure the beetles continue to thrive:

- Take care when pruning and leave thick branches alone as these may contain noble chafer larvae.
- Encroaching scrub should be controlled around trees that are known, or suspected, to have noble chafer within them as increased shading may cool the trunk which in turn may affect the development of the larvae.
- Fallen trees should be left undisturbed as they may contain developing noble chafer larvae. Where they need to be moved for access, move them to the side of the orchard where they can continue to support deadwood invertebrates and fungi.
- Aim for an organic approach to the management of your orchard. Pesticides may poison noble chafer and fertilisers may compromise tree health through impacts on fungal mycorrhizae which have many benefits to trees.
- Keeping your orchard well-stocked with trees will maintain a diverse age structure and ensure the continued presence of wood-decay habitats and future habitat for the noble chafer.
- An active management programme is beneficial to orchard wildlife in maintaining the open structure which favours noble chafer and other key species.

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Orchard grading system

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Grade 1

The orchard trees are of a suitable age and condition for noble chafers with decay present in the form of cavities in trunks that are accessible for surveying and/or fallen branches on the orchard floor.

Sites are judged to be of the highest priority for further investigation.

Grade 2

The orchard trees are old and of a suitable age and condition but there are no signs of fallen deadwood or trunks with obvious decay cavities.

Sites are judged to potentially have noble chafers present but surveying is unlikely to detect it due to the absence of accessible cavities.

Grade 3

The orchard trees appear to be of medium age and probably not yet suitable for colonisation by noble chafers.

Very little or more likely no decaying wood present or trees with cavities.

Sites are judged to have the potential to generate suitable habitat for noble chafers within the next few decades.

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Potential risks for survey volunteers

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The aim of this checklist is to help you improve your own personal safety while carrying out People's Trust for Endangered Species' (PTES) surveys in the field. The activities and hazards are not intended to be completely exhaustive; this assessment is for guidance only. Remember that each site and survey type is unique and thus risks must be assessed individually. If you are in doubt about any aspect of health and safety relating to a site or survey seek further advice from PTES before proceeding. Further advice along with a risk assessment record template can be found at www.ptes.org/healthandsafety.

Please remember that as a volunteer you are under no obligation to take part in this survey. You should not put yourself or any others in danger.

Potential hazard	Precautions to be taken to remove hazard or reduce risk level (one precaution may tackle several hazards)
Danger of injury through accident	• Identify potential hazards on arrival at each site • Wear suitable clothing and appropriate footwear for the location/terrain and weather conditions • Carry a mobile phone with sufficient charge • Carry a torch and spare batteries if working late afternoon • Carry a first aid kit • Ensure you have access to drinking water • Talk to landowners about the location of potentially hazardous animals • Avoid contact with animals • Avoid well known danger spots. Do not cross railway lines or other potential hazardous sites e.g. quarries or ravines
Inclement weather	• Wear appropriate clothing for the time of year, and be prepared for weather changes • Carry waterproof and/or warm clothing. Hazards can increase significantly in heavy rain, strong wind and thunderstorms • Avoid/terminate outside activity in inclement weather as appropriate
Uneven ground	• Identify potential hazards in daylight • Wear sturdy boots or shoes • Use footpaths where possible • Do not carry out distracting work whilst walking
Traffic/driving	• High visibility clothing should be worn whenever working in the vicinity of roads and someone else should keep watch for traffic • Take care to park sensibly, preferably off-road, and do not block entrances • Do not attempt to undertake surveys alone whilst driving • Do not brake or swerve to make a survey observation or get out of your vehicle to identify a sighting unless safe to do so • If you need to stop to record survey information ensure it is safe to do so; do not stop on the hard shoulder of a motorway unless it is an emergency
Getting lost	• Don't rely solely on a mobile phone for navigation, always take a map and compass and know how to use them

Potential hazard	Precautions to be taken to remove hazard or reduce risk level (one precaution may tackle several hazards)
Alcohol and drugs	• Anyone under the influence of alcohol or drugs is not permitted to take part in any PTES activities. If you are using prescribed drugs, seek medical advice on any side effects that may affect your performance (eg drowsiness)
Lone working	• Working alone should be avoided. Try to work in a pair. If this is not possible, always notify someone (partner, friend, neighbour) where you are going and when you expect to be back. Agree on a course of action if you have not returned home by the time you stated • Lone workers should be aware of the location of the nearest house or phone so that help can be called if required. Anyone working alone, or those working on sites remote from the emergency services, should carry a mobile phone. This should be tested at the start of the visit to detect reception blind spots
Tetanus and leptospirosis (Weil's disease)	• While not common, these diseases can have severe effects, and in rare cases result in death. Clean any cuts etc immediately with clean water and cover adequately • Ensure that your anti-tetanus treatments are up-to-date (normally within the last 10 years) • Avoid contact with water, particularly if contaminated with cattle/rat urine • Wash hands thoroughly and always before eating or smoking. If you contract flu-like symptoms, tell your doctor that you may have been exposed to Weil's disease
Lyme's disease	• When working in grassland areas with deer present, wear long trousers and long socks. Check exposed skin after for ticks. If a tick is found and you contract flu-like symptoms, tell your doctor that you may have been exposed to Lyme's disease • If you do find a tick on your skin, remove it by gently gripping it as close to the skin as possible, preferably using fine-toothed tweezers, and pull steadily away
Salmonella and toxocariasis	• These are rare infections spread from animals to humans via their faeces. If you need to inspect animal droppings do so by using a small stick. Wear gloves if you need to collect samples • Wash hands after handling animals or coming into contact with animal droppings, soil, sand or water that may be contaminated
Bees and wasps	• The group leader should be made aware if anyone has an allergy to bee or wasp stings and the individual concerned should carry appropriate personal medication
Risk of drowning	• Non-swimmers should be accompanied when walking by water • Do not cross rivers or streams unless by bridge • Avoid work when there is a risk of flooding and be aware of tides • Keep at safe distance from banks, cliffs and the water's edge
Fencing	• Avoid touching or climbing over electric fences • Avoid touching or climbing over barbed-wire fences, please make sure your tetanus vaccine is up to date
Trees	• Be aware of low, fallen and hanging branches and take care to avoid them • Do not climb trees or onto tree limbs • Be aware of other wildlife when investigating tree cavities or nest boxes – especially bees, wasps and hornets