

Raising Purple Hairstreaks

Favonius quercus

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Why raise Purple Hairstreaks?

Purple Hairstreaks are very difficult to see and photograph up-close in the wild, as they live high in the trees. Rearing them offers a chance of seeing a pristine example.

Purple Hairstreaks overwinter as eggs, with a tiny caterpillar inside, so egg hunting is something you can do in the winter when there are no butterflies around.

It's possible to 'rescue' Purple Hairstreaks, as some of twigs on which eggs are laid blown down from the trees in windy weather and die off. By raising the caterpillars you are giving them a chance they wouldn't otherwise have.

Following any butterfly species through all the stages of its lifecycle is a fascinating journey, offering a deeper insight into their nature.

What are the chances of success?

Not every egg will result in a successful butterfly – there can be failures at every stage, as in nature.

- The egg may not hatch
- The caterpillar may wander off never to be seen again
- The butterfly may not emerge from the pupa successfully
- If it emerges, it may not manage to inflate its wings successfully

Failures are quite likely, but a rescued egg would not have had a chance of survival if left on a fallen dead twig.

My success rate at the first season of trying was about one in three (6 successes from 18 eggs), but I'm optimistic of improving this.

What equipment do I need?

A USB microscope that can plug into a computer is useful but not essential. Likewise, a magnifying glass is also useful.

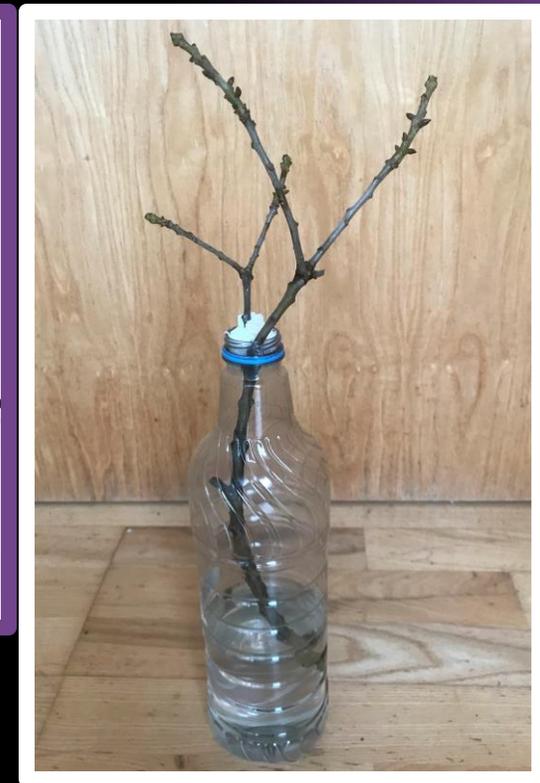
Empty plastic drinks bottles or similar for holding twigs in water.

A potted oak sapling or two makes things easier.

Some ties (eg freezer bag twists) for marking twigs

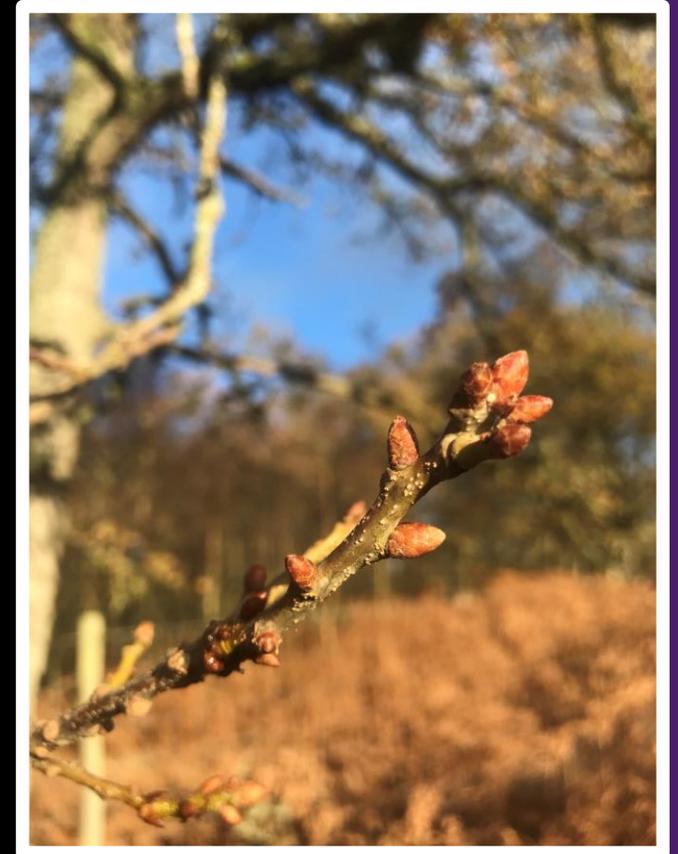
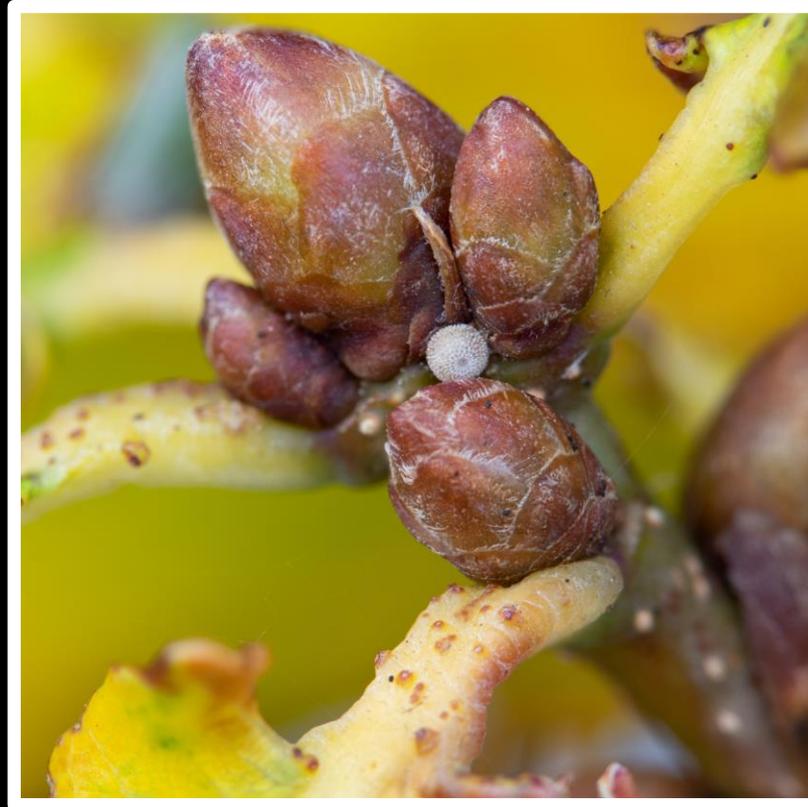
An uncontaminated spraying bottle for misting with rainwater.

A container for caterpillars to pupate, and the butterflies to emerge. A foldable mesh rearing cage, available from lepidoptera suppliers is a good option.



How can you find eggs?

Eggs are found on oak twigs, usually pedunculate oak rather than sessile. The eggs are always laid at the leaf buds.



How can you find eggs?

Sunny exposed branches are much more likely to have eggs, usually on the south facing side of a tree.

For rearing, you should search for eggs on fallen twigs and branches after strong winds, rather than take them from trees. Finding them on trees helps learn what to look for though.

It can be hard to judge which part of a tree windfall twigs are from, but looking on the ground on the south side of trees helps improve the odds of success. There are eggs on only a small minority of twigs, so patience is needed. Larger twigs or branches with plumper buds and clusters of buds are more likely candidates.

When you have found a white dot on a bud, rotate the bud to see that it is a 3 dimensional object that could be an egg, not just a white mark.

Purple Hairstreak eggs are very distinctive under a magnifying glass, being bun-shaped, white or off-white, with a small indentation in the middle, and covered in small spines, but there are also other kinds of eggs on oak buds such as moth eggs. The others tend to be smaller and a little less white.



Purple Hairstreak eggs

Other eggs on oak buds

Storing eggs

Once found, twigs with eggs need to be stored until spring when the oak leaf buds are breaking, as this is what the newly hatched caterpillars feed on. They will tunnel into a new bud, taking advantage of cracks in the unfurling bud as the leaves start to open.

The eggs can be stored outdoors, or in the fridge or a cold garage or shed, not somewhere warm where they may dry out or hatch too early.

Preparing for Hatching

It's very useful to have oak saplings in pots so that you can keep the caterpillars in a controlled environment. The bigger the better but even small seedlings are useful.

When spring is approaching (eg mid March), cut some live oak twigs from mature Common (pedunculate) oak trees and stand them in a bottle of water in a greenhouse or sunny windowsill to try to speed up greening of the buds. Long straight twigs are easier to prune and slot into bottles. (Saplings will not have big enough buds - potted saplings are for later, once the caterpillars are eating leaves).

You should cut new twigs regularly to try to keep a succession of breaking buds, as they don't last long before the leaves start to die back, and you can't be sure exactly when you will need them.

Hatching

Once you have some green buds you can start watching the eggs for signs of hatching. You can either bring them into the warmth, to trigger the hatching, or regularly inspect them in their cold storage and wait for them to hatch naturally.

You should remove any kept in the fridge either way and place them in natural daylight. It *is* possible for them to hatch in the fridge, but the timing may be unpredictable.

When one starts to hatch you will see a black shiny dot in the centre of the egg. This is the caterpillar's head as it starts to eat its way out. Once you see this, it will take anything from a couple of hours to a couple of days for them to fully emerge.

Emergence is the most critical moment – you need to get the tiny, barely-visible caterpillar from where it hatched on the old dead twig onto a new living green bud.



Hatching

It is possible to transfer the caterpillar using a very fine paintbrush.

However this is a very delicate operation – a safer option is to place the fresh bud next to the hatching caterpillar and let it find its own way. It will be able to detect the fresh food.

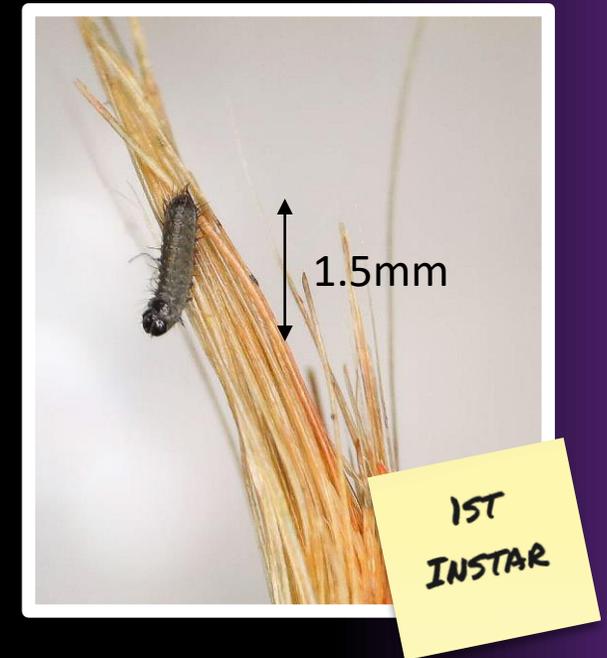
This can be done by either:

- (i) laying the old and new twigs side-by-side, touching, and replacing the new twig back in its bottle once the caterpillar is inside the new bud, or
- (ii) tying the old twig to the new one in its bottle with buds touching.

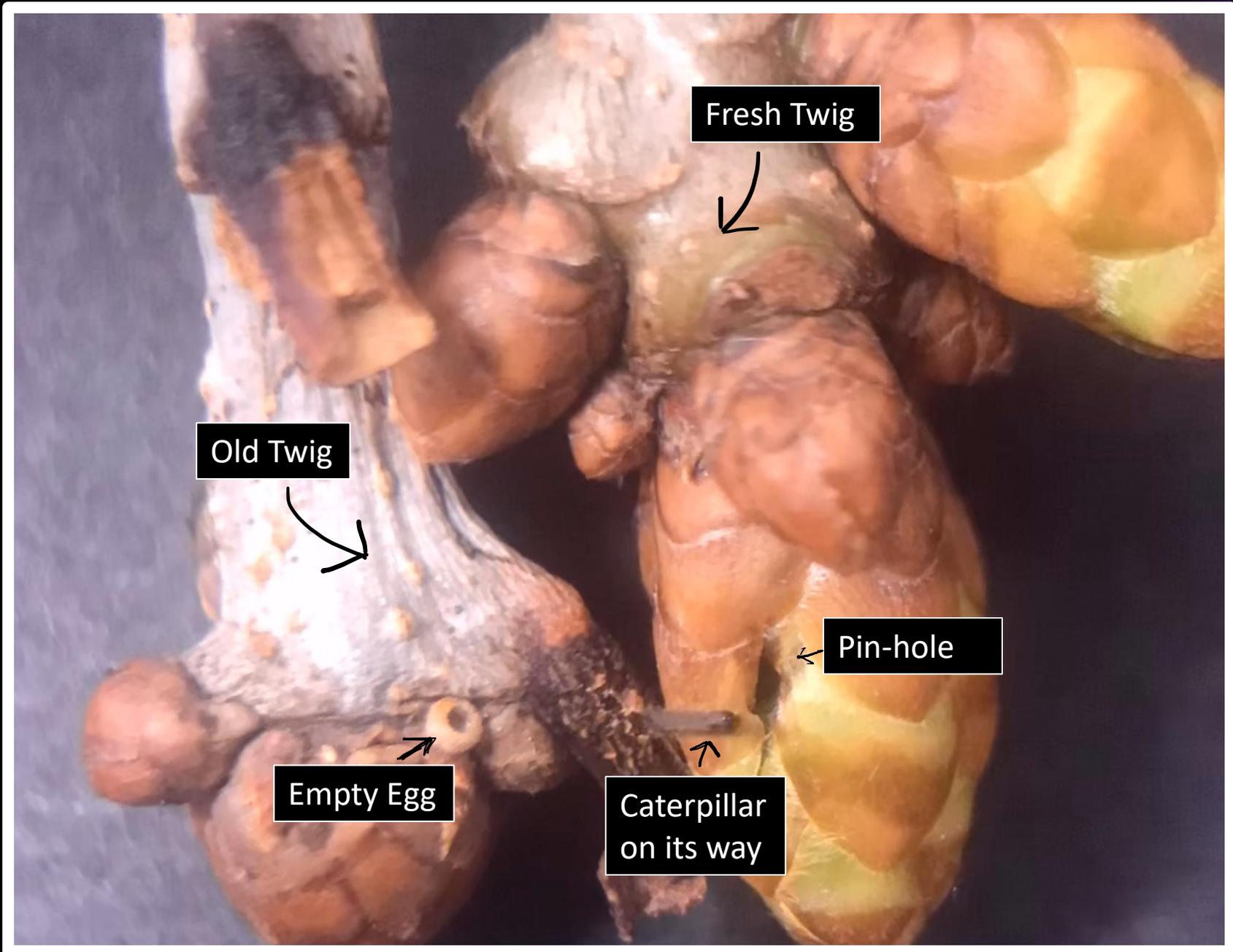
The latter option is lower-maintenance as you can attach it and then just check whether the egg is empty every now and then. If so, you can assume that the caterpillar is now somewhere in the living buds.

Creating a pre-prepared hole in the nearest fresh bud with a pin makes it even easier for the caterpillar to make it into the new bud safely.

Don't put caterpillars too close together when they are very small, to avoid risk of cannibalism!



Hatching



Looking after caterpillars

As the tiny caterpillar is now inside the bud, you will probably not see it again for a few days. However you should assume it's in there, and that it will need fresh food soon, so have fresh buds ready.

You may want to mark the caterpillar's current bud with a tie of some kind, especially if you have more than one caterpillar – it is easy to lose track of where they are.

Once the current bud is starting to look less fresh, after 2 to 4 days, tie a new twig to the current one, so that the small caterpillar can transfer itself when it needs to.

You should try to keep an eye on the buds and spot the maturing caterpillar once it emerges from its first bud. It will now be about 3mm long and a sandy colour, and will start to venture out more.



Looking after caterpillars

If you have any oaks in pots that have come into leaf, the caterpillars can be transferred to those once they are 4 or 5mm long, which means you don't need to keep changing the twigs. Otherwise you'll need to keep providing a continuous supply of cut twigs with breaking buds or leaves.

The caterpillar will now grow quite quickly and the main risk is that it will start wandering away from the food. If you can keep it in an enclosed space, or just keep a close watch on it, you may be able to catch it and place it back on the foodplant.

Block the top of bottles around the twig with tissue paper or similar to prevent caterpillars from reaching the water in the bottle, if you continue to use cut twigs.

The caterpillars progress through 4 distinct stages, or instars, shedding their skin each time. Each instar is designed to camouflage against the current stage of oak bud development.

Looking after caterpillars



As the caterpillars grow they are easier to keep track of, especially as they tend to have a favourite place to return to rest. It's just a case of keeping them supplied with fresh food. Their camouflage can be very good but you can usually find them if you look thoroughly.

If kept warm, the caterpillars will, however, develop much too fast and butterflies will be ready to emerge several weeks before the wild ones are flying. In order to release them back into a wild population at the right time, their development need to be slowed down by keeping them in cooler conditions some days, during which they will stay dormant.

Preparing for pupation

Once they reach their 4th instar, you can think about providing pupation places and arranging an emerging chamber. A mesh rearing cage is a good option, and can be used for the whole rearing process to exclude parasitic wasps if you are rearing outdoors.

The caterpillars will want to leave the foodplant and bury into some substrate. Dead leaves, bark, compost, and loose, open moss placed in the bottom of the rearing cage are all suitable.

You might wish to transfer caterpillars back to twigs in bottles and put the whole lot inside the cage for this final stage, or just feed the caterpillars in the cage with cut foliage. Trees should be in full leaf now, providing easy access to plenty of food.

If you use one of these cages and plan to place it outdoors, something heavy inside to weight it down and stop it blowing over will be required. A large stone with smooth edges to avoid damaging the net is a good option.



Preparing for pupation

Once fully grown, the caterpillars will wander to find a place to pupate and then become dormant as they turn into a pupa. They must not be moved or disturbed at this point.

The butterflies will also need twigs to climb onto to dry their wings once they emerge, which can be placed into the rearing cage. If you are able to locate the pupae, positioning twigs close to them will help.

The pupa will sit for around 4-6 weeks before suddenly turning very dark. This means they should emerge in the next day or two. Mist the contents of the container with rainwater every day or two to keep things from drying out, but keep the pupa dry when they are dark and preparing to emerge.



PUPA

Emergence!

The butterflies are likely to emerge first thing in the morning. They can be surprisingly hard to spot and quite often finding an empty pupa is the first giveaway, before the butterfly is then located somewhere in the cage, drying its wings.

The butterfly will be ready to fly in an hour or two, and will for the first time open its wings, and you will discover whether it is male or female!

Once its wings are dry you may be able to coax it onto your hand before releasing, but you will need to be in a shady spot. It will fly straight up to the tree tops in warm sun.



Good luck!

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