

BTCV Safe Use of Hand Tools Guidance

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1). Introduction

Hand tools are used for a great deal of practical conservation work, particularly that done by volunteers. This section illustrates the range of tools most widely used and the correct techniques for using them safely.

All people on conservation projects must be shown how to use, carry, store and maintain these tools correctly before starting work. This not only encourages safe working practices but also makes the job easier. This section will help by outlining the key safety and technical points.

Remember that other factors affect how tools are used and these need to be taken into account. Site conditions, terrain, weather and the attitude and abilities of participants will all influence the ease with which the work can be undertaken, and the level of risk involved.

All tool use has some level of risk, however safe it may seem. By observing the recommendations given here, these risks will be minimised. A general safe working distance for working with swinging tools is at least twice the combined length of tool and arm away from any other person. In adverse weather conditions, or with inexperienced people, a greater distance should be observed. Do not carry too many tools - it is safer to make two lightly loaded journeys, than one overloaded one.

2). Clothing

When using hand tools it is best to wear clothes which are tough enough for the work and give adequate protection from vegetation, weather and the harmful effects of the sun. Wear stout footwear, preferably with steel toecaps. Avoid soft shoes which offer no protection at all. Although clothing should allow for freedom of movement, it should not be too loose fitting as it could get snagged on tools, twigs, branches etc.

Be careful to protect the head, face and back of the neck from cold, heat and sun as well as from injuries, dust and other harmful substances.

Gloves can be useful but generally should not be worn when using sharp edged or other swinging tools as they reduce grip. However, when clearing bracken, nettles or other plants where there is a greater risk of an allergic reaction to plant sap, gloves with a rubber webbing grip may be used. In this case it is important to increase the safe working distance from other people.

3). Axes

Axes are used for tree felling, snedding, coppicing, hedge laying and splitting logs. Tree felling by axe is a skilled job and a bowsaw provides a quicker and safer method for the inexperienced. Personal instruction is essential.

Safety points

- Make sure the blade is sharp. A blunt axe can bounce off wood instead of cutting into it.
- Keep a good grip on the haft, or handle. Never wear gloves and be careful if working in wet conditions.
- Make sure there is a clear path in which to swing the axe. Even a small twig can deflect the axe and cause injury.

- Be aware of people around you. Stop working if someone comes too close. The general rule for logging is that the safe distance should be at least twice the combined length of a person's arm and of the axe haft. When felling, the **safe distance** away is at least **twice the height** of the tree that is being felled.
- Make sure that the haft is not split or cracked. Never bind a cracked haft: replace it. Make sure that the head is tight on the haft.
- Never carry an axe over your shoulder. Carry it by your side with the blade pointing down.
- Transport axes with the blades guarded or wrapped in sacking or some other material.
- Always wear steel toe-capped boots when using an axe.

Technique

- Practise logging-up before attempting felling.
- Before starting any felling, check for overhead cables and any other obstructions.
- Work from a balanced position with good footing and sufficient clearance. Check your distance before starting and adjust it as necessary between blows.
- Hold the axe in both hands: if right-handed, hold it with your left hand at the foot of the haft and your right hand near the head (though some right-handed people may feel more comfortable using their left hand near the axe head - practise first). For left-handed people the normal grip is with the left hand near the axe head.
- Bring the axe up and over your shoulder or lift it to the required height. As you swing it down, let your higher hand slide down to meet your lower one, while bending the knees and keeping the back straight. Put effort into the beginning of the swing, but let it end with the momentum of the axe doing the work.
- Keep your eye on the target as you work.
- If the axe jams in the cut, free it with a sharp blow downwards on the foot of the haft. Do not jerk it from side to side or you may break it.

4). Wedges

Wedges are used to split logs and to keep the saw-cut open when cross cutting. They may also be used to control the direction of fall when felling.

Safety points

- Check for metal burrs and grind or file off before using.
- Wear safety goggles when hitting steel wedges with a sledgehammer.

Techniques

- For chainsaw operations, use plastic or alloy wedges to avoid damage to saw-chains. The back of an axe may be used to hammer in these wedges but not a sledgehammer.
- Use a sledge or lump hammer to drive in steel wedges, not the back of an axe.

5). Billhooks

There are many different types of billhook. In general, the curved bladed ones with a weighted nose are for brashing and coppicing, whilst the straighter bladed ones are used for hedging.



Safety points

- To be safe and to work effectively, billhooks should always be kept sharp. A blunt blade can bounce off wood instead of cutting it and is tiring to use.
- Make sure that the handle is tight. If it becomes slightly loose, soak it in water, but if very loose it should be replaced.
- Never wear a glove on the hand holding the billhook. It makes the handle hard to grip safely.
- Make sure there is plenty of clear space to work in, as branches and twigs may deflect the swing.
- Keep a safe distance from people: if someone approaches too close, stop working. The safe distance away is at least twice the combined length of your arm and the tool that you are using.
- Always be careful when working in rain, or wet or icy conditions. If in doubt, stop working.
- Transport billhooks with the blades guarded in sheaths or wrapped in sacking or other materials. When carrying the tool in the hand, carry it at the point of balance. Never swing it as you walk.
- If you need to attract the attention of someone using a slasher, call out: do not walk up to them.

Technique

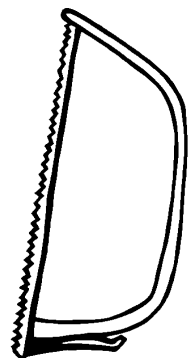
- Cut with, not across, the grain.
- Branches over 2 ins (5 cm) diameter are better cut with an axe or a saw
- Before starting any felling, check for overhead cables and any other obstructions.
- When coppicing and felling very small trees, use an upward stroke near ground level to avoid digging the blade into the ground. Clear debris before cutting.
- To log up small timber, cut out a wedge. The wedge will have to be nearly as wide as the log is thick.

6). Bowsaws

Bowsaws are used for tree felling, scrub clearance, coppicing and cross-cutting felled timber.

Safety points

- You should choose the size of saw according to the size of timber you wish to cut and taking account of the distance between the blade and the handle.
- Use the saw with one hand holding on to the lever end of the frame. Do not use your other hand to guide the blade but use it to hold the wood steadily and keep it well clear from the saw blade. The blade can jump out of the saw cut and cause injury.
- When carrying the saw, hold it down by your side with the blade facing down.
- Make sure the blade is well protected with a guard or is wrapped in sacking or other materials when being transported.
- Before starting any felling, check for overhead cables and any other obstructions.
- A safety helmet should be worn when bringing down any trees or scrub over 3 metres high, or whenever there is a risk of falling wood.



Technique

- Push and pull the saw with one hand, holding the lever end of the frame near the blade. When cutting small wood, hold the wood steady with the other hand well clear of the saw in case it jumps out of the cut. When cutting large wood, rest the other hand lightly on the back of the frame to keep the blade in contact and aligned in the cut.
- Check the tension and condition of the saw blade. Re-set and re-tension if necessary and check whether any teeth are cracked or missing. A poorly maintained saw will make the work more difficult and hazardous.
- Saw with easy, relaxed strokes, using the full length of the blade. Use a rocking motion when cutting large timber. Let the blade do the work - don't force it, especially if it sticks.
- Large bowsaws (36-inch) are easier to use with a partner. Pull on alternate strokes. Do not push, or the blades will jam.
- When felling large trees or removing larger branches (at least 8 ins/ 20 cm diameter), cut a felling sink or 'birds' mouth' to help control the direction of fall, and to stop the tree pinching the saw.
- With smaller timber, make a horizontal cut instead of a felling sink facing the direction of fall. Prune small branches in a similar manner, making the undercut first.

7). Loppers and pole loppers

Loppers (toggle loppers) are used for brashing and woodland clearance as well as for general pruning of small shrubs and vegetation. They are particularly useful in restricted situations.

Pole loppers are used for pruning branches high up, particularly in hedging to release tangled trees.

Safety points

- Loppers are relatively safe tools. They are especially useful for those inexperienced with billhooks and bowsaws.
- Beware of branches and debris falling on the face or in the eyes.
- When using pole loppers wear goggles and a helmet to protect from falling debris.

Techniques

- Hold lopper handles and close them to cut straight across the grain of the wood. Do not exceed the cutting capacity of the loppers (approx. 2-3 cm or about the thickness of an adult's thumb).

8). Brashing saw and pole saw

A brashing saw is used to clear side branches of standing trees, usually conifers, and in hedging. A pole saw is a brashing saw mounted securely on a length of pole up to 2.4 metre (8 feet) in length.

Safety points

- Check the blade for cracks, missing teeth, setting and sharpness. Check the handle for splits and cracks. Check the saw is secure on the pole.

- Check for overhead cables before starting work, and if any are within 5 metres of the ends of the branches, do not use the pole saw.
- When high pruning in the vicinity of power cables, ensure no branches are closer than 15 metres to steel tower lines, and 9 metres to wooded pole lines. The Electricity Company should be contacted if work is likely to be inside these distances.
- When reaching to work above shoulder height, wear a helmet and face visor to protect against falling branches and saw dust.
- Make sure there is enough space for the sawing action and a safe working distance from other people. A good guideline is twice the length of this tool and arm.
- Keep the blade covered with a guard or sacking or other material when in transit.

9). Slashers and brushing hooks

Slashers and brushing hooks are used for clearing brambles and cutting out excess brush in large quantities. For most work the brushing hook is adequate, but for heavy work a heavy duty or straight-bladed slasher is needed. They are not a replacement for billhooks or an axe.

Safety points

- Always be careful when working in rain, or wet or icy conditions. If in doubt stop working.
- Make sure the handle is in good repair with no cracks or splinters that could injure hands.
- Don't wear gloves, because they make the handle hard to grip, unless the hazard from the vegetation is greater than that posed by using the tool with gloves on (see 4.2).
- Keep a safe distance from other people - the safe distance away is at least twice the combined length of your arm and the tool that you are using. Be aware of those around you. Stop if anyone comes too close.
- If you need to attract the attention of someone using a slasher, call out: do not walk up to them.
- Carry the slasher by your side, held at the point of balance. Hold the blade pointing down. If you trip, push the slasher away and let go.
- Transport slashers with the blades securely wrapped or guarded.

Techniques

- Keep the blade sharp. A blunt blade needs extra effort to use and can bounce off the vegetation, instead of cutting in.
- To cut light vegetation, hold the slasher with one hand at the heel and the other part way along the handle.
- Swing the slasher through a wide arc, sliding the other hand along to meet the one at the heel as you start to cut. Put the effort into starting the swing: use the momentum to do the cutting.
- Through the swing, keep the end of the blade slightly pointing up to avoid digging into the ground and blunting the blade.

10). Scythes and grass hooks

Scythes and grass hooks are lightweight tools designed to cut grass and annuals. The blades are made from pressed steel of varying thickness, from disposable blades not designed for sharpening to the thick blade of the 'father time' scythe. The most efficient cutting action is as the sharp blade slides across the vegetation.

All these tools are designed for right hand use. Cranked grass hooks have a handle that raises the user's right hand above the ground. The scythette has a renewal blade, which can also be sharpened, and is very useful for thistles and nettles due to its longer handle which prevents the user from stooping. The scythe is for cutting large amounts of grass in meadows and needs care and practice to use correctly.

Safety points

- Ensure you work well away from other people, at least 2 metres.
- Check that the blades are tightly attached to the hafts, that they are sharp and that there is no damage to the handle.
- Wear sturdy footwear. For the wooden handled grass hook, only wear a protective work glove if the vegetation being cut is likely to cause irritation if it comes into contact with the skin. If a glove is worn, allow more space between users.

Techniques

- Swing the tool from right to left in a smooth arc, keeping the blade parallel to the ground or slightly angled up, and the required height above it.
- Cut only in front of you, clearing the cut vegetation away with the left hand when it starts to lie in the path of the next cut.
- Ensure the swing draws the blade across the vegetation to achieve the cleanest cut.
- For the scythe, the right hand grips the lower handle and is used to swing the tool round in front of you. The left hand grips the top handle and controls the height and turn of the tool.

11). Sharpening stones

There are three major types of sharpening stone:

Canoe stone - for billhooks and slashers

Cigar stone - somewhat coarser, for sickles and scythes

Double-sided stones - for axes, coarse one side and fine the other.

Safety points

- Wear gloves when sharpening tools.
- Keep hands away from the blade.
- Work in a quiet place away from distractions.

NB Only sharpening tools by hand is included here. Separate techniques and safety aspects need to be addressed and, in some cases, specific training required when using bench grinders or other powered tools to prepare and maintain blades of hand tools. This will be covered in a later section.

Techniques

- All stones are best used wet.
- Sharpen with small circular motions of the stone with the blade facing away from you.
- Hold the stone at the same angle as that to which the blade has already been sharpened.

- Don't sharpen in one place for too long.
- Sharpen from behind the blade, not in front along the sharp edge.

NB. Many new sharp-edged tools are supplied by the manufacturers in need of final sharpening before use.

12). Sledgehammers, mells and mauls

Sledgehammers have steel heads and are used for heavy hammer work with stone, brickwork and driving in steel stakes.

Mells are stake and fence post driving tools with cast iron heads: they must not be used on rock or metal as the head will shatter.

Mauls are stake and fence post driving tools. They have wooden heads, with heat-shrunk metal rings round the ends to reduce fraying, or solid re-inforced rubber heads.

Safety points

- Always wear a safety helmet and steel toe-capped boots.
- Never wear gloves while using swinging tools as you may lose your grip on the handle.
- Wear goggles to protect your eyes from flying chips when breaking rocks and hitting metal with a sledgehammer.
- Check the head at regular intervals to ensure it is not working loose. Before use, make sure the haft is in good condition with no cracks or splinters.
- Never bind a split haft, always take the tool out of service and replace the haft before using it again.
- When someone else is holding the post for you, work carefully. The assistant should wear a safety helmet. Use a stob twister (see 4.8 for details) if possible. Other people should keep at least twice the combined length of your arm and the length of the tool away. Stop working if they come closer.
- Carry these tools by your side held at the point of balance.

Technique

- Make sure you have a firm footing. Check your distance from the object you want to hit.
- Lift the tool with one hand at the end of the handle and the other near the head, bending the knees and keeping the back straight. As you swing it down, slide the upper hand down to meet the lower. Keep your eyes on the target.
- For mells and mauls it is important to use the flat of the head to strike the top of the post/stake to avoid unnecessary splitting.

13). Crowbars and wrecking bars

Crowbars (also called pinchbars) and wrecking bars (also called jemmys or swan-necks) are levers for moving heavy objects and forcing things apart. Crowbars are also used to make post holes. Wrecking bars are also designed for pulling nails.

Post-holing

Do not hold the bar too tightly

Pulling nails

Pull large nails with a wrecking bar not a hammer

Safety points

- Check for burred edges and file down before use.
- Check for underground utilities, e.g. electricity cables - see Section 3.6.7 for guidance.
- When levering with a crowbar, be sure that you will not hurt yourself if you slip, or if the object moves suddenly.
- Wear steel toe-capped boots when using a crowbar.
- When lifting, make sure you have a firm footing. Bend your knees and keep your back straight. Use your leg muscles: don't let your back take the strain.
- When post-holing, keep your head clear as you raise the crowbar.
- Lay tools flat on the ground in full view when not in use.
- Carry tools down by your side at the point of balance, with due regard for those in front and behind.

Techniques

Mainly for large objects:

- When tackling large objects, use a log or a stone as a fulcrum, placed as near as possible to the object to be moved. It is useless trying to lever against soft ground. Make certain that the bar is placed under the centre of the object to be moved and over the centre of the fulcrum.

14). Stob twister

A stob twister is usually made from square cross section steel, in the shape of an S. The length is approximately 75-90 cm (2¹/₂ feet) and the two open, square mouths are made to the size required. The common sizes are to suit stakes for peg and board steps (often known as stobs) at 5 cm (2ins.), and to suit stakes for post and rail fencing at 7.5 or 10 cms. (3 ins. or 4ins).

Safety points

- Always wear a safety helmet, strong gloves and steel toe-capped boots.
- Use on opposite side of post from the person driving it.
- Check the metal for damage or nicks.



15). Drivall

The drivall is either a two- or four-handled hollow cylinder with a cast iron weighted end for the purpose of driving in wooden posts.

Safety points

- Carry between two people, and when lifting or lowering, ensure knees are bent and back straight.
- Always wear a safety helmet and safety boots.
- When the drivall is being lowered onto a post, do not support the post by hand.
- Be careful not to raise the drivall too high between strokes as this could lead to head injuries.

Techniques

- Use a drivall only on sound, regularly shaped posts.
- The drivall is a two-person tool, do not use it alone.
- Hold one or two handles each, keep a firm stance with the feet and legs clear of the drivall, and lift it no higher than the top of the post. Relax your grip, but do not let go of the drivall, allowing its own weight to drive the post into the ground.

16). Shuv-holer

The shuv-holer is a large tool, consisting of two long-handled spades hinged together. The shuv-holer is indispensable for quickly making a deep narrow hole in most types of soil and does away with the discomfort of grovelling with your hands in deep muddy holes.

Safety points

- Check for underground utilities, e.g. electricity cables - see guidance in Section 3.6.7.
- Keep your head well clear of the handles.
- Carry the tool down by your side, held at the point of balance and keeping the two handles close together.
- Boots or wellingtons with steel toe-caps are recommended.

Technique

- The shuv-holer is used like large tongs in a pincer movement. Open the handles so that the blades are the correct width.
- Push the blades into the ground, which should be loosened beforehand. Bring the two handles together and lift out the soil caught between the spades.
- Bend your knees and keep your back straight at all times.
- It should not be used for driving holes in hard or stony ground, as the blades become bent and damaged.

17). Spades and forks

Spades and forks are digging tools.

Safety Points

- Check for underground utilities, e.g. electricity cables - see Section 3.6.7 for guidance.
- Position feet carefully to avoid cutting them with spades or impaling them with forks, particularly on hard or stony ground.
- Wear appropriate footwear - sturdy or steel toe-capped boots.
- Carry tools at your side, held at the point of balance.
- Ensure that the handles and hafts are in good repair.

Techniques

- Keep your weight over the tool to push it down with maximum force.

- Use the heel or ball of the foot; using the arch can damage your foot. Do not kick down on this tool or jump on it with both feet.
- Do not use a spade or fork to lever stones or rocks from the ground - see crowbar or pick.

18). Shovels

Shovels are designed for lifting and shifting. They have a broader, thinner blade than spades.

Safety points

- Do not try to lift too much. A well-loaded shovel will have a considerable weight.
- Avoid twisting your body to deposit material. Use your arms and legs to do the lifting and moving.
- Make sure the handle is in good repair without splits or cracks.

Techniques

- When shovelling, work from as low a position as possible, and lift from the knees with your back straight to avoid straining it.
- To shift a pile of material, dig out from the bottom. Push the blade in, let the material fall onto it, then squat down to lift with your legs, not your back.

19). Picks and mattocks

Picks are used to break up and loosen hard and stony ground but should not be used to lever boulders or any great weight of compacted earth.

Mattocks are of the same construction as picks, but the heads are made of softer steel which will bend if used on rocks. The broad blade of a mattock is used for grubbing and breaking up hard ground. The 'axe' blade of a grubbing mattock is useful for cutting roots. Mattocks should not be used as levers.

Safety points

- Check for underground utilities - see Section 3.6.7 for details.
- Wear safety helmet and boots. Wear goggles if working on stony ground. Never wear gloves as these can affect grip.
- Always check that the blade is secure on the handle and is not loose. At least 3 cm of the haft should show through the front of the blade, otherwise the blade could be propelled off the end of the haft while in use. If the head cannot be firmly fastened on the haft *do not* use the tool.
- Ensure that you can work a safe distance from other people, i.e. a minimum of two tools' lengths away.
- Make sure the haft is in good repair, with no cracks or splits.

Techniques

- To construct the tool, place the narrowest part of the haft through the front (widest part) of the blade. With the blade face down knock the haft through the blade by raising the tool and thumping

it hard in the ground several times. Take care not to drop the blade onto the fingers of the hand holding the haft.

- Hold the tool with one hand at the end of the shaft and the other one near the head. Lift the tool, bending your knees and keeping your back straight. As you swing the tool down, slide your upper hand down to meet the lower.
- When grubbing up or breaking ground, dig the point in and roll the handle away from you over the point. Do not pull the handle towards you. This could injure your back if done persistently.
- To disengage the tool, hold the blade in one hand and knock the haft on hard ground whilst covering the blade end of the haft with your other hand until the blade works loose.

20). Rakes and cromes

Garden rakes are lightweight general purpose tools used to rake over bare ground, to break up the earth and remove small stones from the surface.

Cromes (also known as muck rakes or manure drags) are mainly used to drag reeds and rubbish from ponds.

Tarmac rakes are larger and stronger than garden rakes and are used to spread chippings and ballast on footpaths.

Hay rakes are wooden tools, used to rake grass and other light vegetation.

Springboks are used on lawns to comb out grass and to rake leaves.

Safety points

- Check that handles are in good repair.
- Work from a balanced position and be careful of your footing, especially in wet and muddy conditions.
- Keep well clear of others, especially in water where you can easily knock someone off balance. Be aware of what or who is behind you.
- Always leave rakes and cromes prongs downward. If the prongs are pointing up someone might impale their foot or be hit in the face.
- Carry rakes and cromes by your side, held at the point of balance, with the prongs pointing downwards. If you trip, push the tool away from you. Do not attempt to carry more than one in each hand.

Technique

- Use all rakes with two hands. Stand at an angle to the material you are raking. Drop the head of the rake into the material and, keeping your back straight, roll the material towards you.

21). Hand-operated winches

A hand winch is used to pull heavy objects. It can be used to remove tree stumps from the ground and for directional tree felling. It should only be used by trained operators.

Safety points

- Wear safety footwear and safety helmets for lifting operations, and strong gloves when handling wire cables/ ropes.
- The weight of the load you wish to lift must not exceed the safe working load (SWL) of the winch. The cable and slings in use with the winch must have a breaking strain well in excess of the winch's SWL (e.g. a 1600 kg SWL Tirfor winch is supplied with cable of 8,145 kg breaking strain). Check the capacity of the winch and cable before use.
- Similarly, the weight of any load you are attempting to pull across ground must not exceed the winch's specified pulling capacity (commonly 1.5 times the SWL but check this).
- Do *not* pull or lift people with a winch.
- Winches and accessories are covered by the Provision and Use of Work Equipment Regulations, and they must be maintained in good, safe, working order by competent personnel. The equipment should be examined every 12 months by a competent person and the findings recorded.
- Most winch manufacturers state both the inspection and testing interval for their machine and its associated cables and slings. For Tirfor winches, they must be inspected and serviced by a competent person, usually a Tirfor dealer or engineering firm, annually. They must be tested and certificated every 4 years.
- Examine the equipment for obvious defects such as cable frays or kinks before use and do not use until any defects have been competently rectified.
- Only people directly involved should be in the vicinity of the winch. Everyone should stay clear of the cable, its attachments and the load being winched.
- If a winch is being used for lifting or lowering a load, the operation and equipment must comply with the requirements of the Lifting Operations and Lifting Equipment Regulations.
- Do not use the cable doubled back on itself as a sling around the object to be moved. Always use a separate sling for this and attach it to the winch cable as shown.

Techniques

For taking down hung-up trees:

- Follow the manufacturer's instructions and technical data explicitly.
- The winch must be further away than 2.5x the height of the tree. No-one should be within this distance of a tree being brought down by any method.
- Winch a hung-up tree from the butt as if the pull point is high in the tree, the winch and rope will rise off the ground when under tension and drop suddenly as the load is removed.
- If a winch has to be used to guide a tree down, it is advisable to use a pulley which is in line with the direction of planned fall and which will then allow the winch and operator to be at right angles and well clear of the fall zone (see diagram).
- Do not allow cables to kink or become crossed on any drum used for winding or storing the cable, as this reduces strength.
- If using a tree as an anchor, make sure it is strong enough to take the pull without causing damage. Do not use smooth-barked trees as they are easily damaged.
- When winching, check that the anchor sling is not riding up the anchor and that the anchor is not cracking under the strain.

