



A tree care solution which includes the new NAJA, a SEQUOIA harness, STRATO VENT helmet and a FLOW rope. petzl.com

## PETZL TREECARE SOLUTIONS

The new NAJA friction saver is easily retrievable from the ground and features an integrated high-efficiency pulley which facilitates rope glide at the anchor. The strap uses four different adjustment positions to adapt to different branch diameters and can also be expanded with additional straps. The included retrieval ball and MINO carabiner makes the system easily retrievable from the ground.



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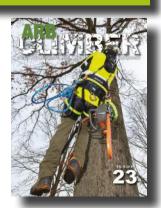
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Issue 23's cover could be highlighting any number of products but it's the nifty Stratus Harness from Weaver Arborist we're interested in. See page 2 for more details.









#### **FEATURES:**

With its modern, ultra-lightweight (4.5 lbs.) design and high-performing features, the Stratus seamlessly blends comfort and performance.

- Comfortable, waterproof back pad is crafted from durable 600 denier polyester in a sleek, modern honeycomb design
- · Inner spacer mesh in the back and leg pads for added breathability
- High-strength nylon webbing with multiple gear loops for easy, personalized configuration
- Lightweight, durable aluminum hip dees and rigging plates provide multiple attachment points on this climbing harness, giving added flexibility to arborists
- Features specific spots for chainsaw storage and four attachment rings for suspenders
- Lanyards can be attached to the saddle's lower dees
- ISC quick-release buckles on the waist belt and leg straps offer easy on and off and a contemporary look
- Replaceable double braid rope bridge is securely attached using a double overhand stopper knot on each side
- · Brightly colored rope bridge and nylon webbing enhance visibility
- Bridge and leg pad height can easily be adjusted for the perfect fit
- This arborist saddle is handcrafted in the USA by the finest craftspeople who care about every last detail
- Climbing harness is not intended to be used for fall arrest
- Important: Only authorized replacement parts from Weaver Arborist should be used on this arborist saddle. The use of unauthorized replacement parts will void Weaver Arborist's warranty.

Take your climbing to the next level with the new, performance-oriented Stratus positioning saddle. Handcrafted in the USA by the finest craftspeople who care about every last detail, the 4.5 lb. Stratus boasts a modern, ultra-lightweight design and high-performing features. The comfortable, waterproof back pad is crafted from durable 600 denier polyester in a sleek honeycomb design, giving the Stratus a modern look and feel. The back and leg pads feature breathable inner spacer mesh, and the suspension bridge and leg pad height can be easily adjusted for the perfect fit. ISC guick-release buckles on the waist and leg straps offer easy on and off and a contemporary look. High-strength nylon webbing with multiple gear loops allow for easy, personalized configuration, and the rope bridge and webbing details are brightly colored to provide additional visibility while on the job. The double braid rope bridge is securely attached using a double overhand stopper knot on each side, which can be easily replicated when replacement is necessary. Lightweight aluminum hip dees and rigging plates provide multiple attachment points, offering arborists even more flexibility. The Stratus also features four attachment rings for suspenders and specific spots for chainsaw storage, as well as lower dees that are perfect for attaching lanyards and additional gear. This lightweight, functional saddle was designed with the modern arborist's needs in mind in order to deliver the ultimate climbing experience. NEED DRINK?...
they got drink

Suspenders with **Hydration Pack** These durably constructed. American-made suspenders feature a detachable water bladder and tube for convenient hydration any time. The comfortable design evenly places the weight of your saddle or belt on vour shoulders. and the suspenders are lined with ProCool™ Mesh Technology that allows air circulation for a cooling effect. The detachable water bladder holds up to 1.5L of water, and the chest strap buckle features a built-in emergency whistle. For device tending, a small

**Deluxe Work** 



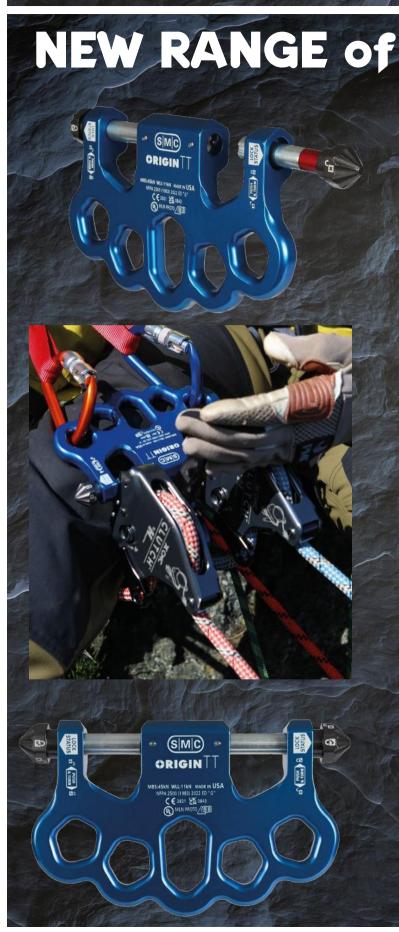
#### Nylon HAAS® by Weaver Arborist Velox Clip'N Step Boots Ascent System

The popular Nylon HAAS® Velox System by Weaver is specially designed to clip into the ascent system foot loop on your Clip'N Step Boots Double tube system allows 30" of in-line bungee to be contained within the unit for over 30" of elongation. Versatile ascent system has zero set up and can be used by multiple users without adjustment. Snap is tied just above the ascender, extracting out up to 30" to eliminate any set up as well as any "dead spots" in the return action. Designed to maximize friction reduction with a bungee that terminates at the top of the Velox, travels down the channel to the bottom where it wraps around a shiv with stainless steel sealed bearings inside a machined aluminum block. Bungee returns up a second channel where it is tied to a snap. Bungee is replaceable in under five minutes with no tools.

On the right is the extended version giving you an additional 18" of bungee in the system for a total of 30". Double tube system allows 30" of in-line bungee to be contained within the unit for over 30" of elongation.

www.weaverarborist.com

#### PRODUCTS - ROPE STUFF





## RIGGING PLATES from SMC

[ED: SMC of Utah have introduced a completely new range of rigging plates and we say 'completely new' because, if you look at our Rigging Plates GUIDE in the new ARBORIST BUYERSGUIDE you'll notice that 3/4 of all plates are a variation on Petzl and Rock Exotica designs. With the exception of DMM, Eyolf and Kong they all follow a similar 3-size pattern. That's not to say that SMC's new offering is better but...they probably are. They've gone for angular, though still rounded, holes to minimise the torque problems we can see with round hole plates. The 5-hole and 8-hole plates are now out and the Origin TT is available later in 2023. This one is SMC's answer to the Rock Exotica Bolt but has two rather than one opening pin].

Origin 5 (\$33) Our lightest rigging plate and has just the right number of connection points to keep your rigging organized and it is ideal as a master point for litter bridles. The large connection holes allow you to easily rotate most locking carabiners. Origin 8 is our largest rigging plate's more complex rigging scenarios. The Origin TT (left) is purposefully designed to enable a mirrored, dual handle "shark fin" orientation of two simultaneously operated descent control devices for two tension rope systems (TTRS). The Origin TT features two independent connection points that secure your DCDs with triple-action locking "Smartpins". Large connection holes allow you to easily rotate most locking carabiners. The Origin TT is burly, with an MBS of 45kN in any direction. Manufactured with custom tooling to create textilefriendly rounded edges.

- Aluminum
- 5=4.1 x 3.3 x .5" (104 x 85.9 x 9.5mm) 8= 6.6 x 3.9 x .5" (168.9 x 99 x 12.7mm)
- Weight: 5= 4oz (113g)
  - 8= 9.3 oz (264g)
- 3 Sigma MBS 5= 36kN (8093 lbf)
  - 8= 50kN (11,241 lbf)
- NFPA G Certified / CE / UKCA
- Made In USA

www.smcgear.net





### TRAUMA KITS

PRODUCTS - FIRST AND

[ED: although this is legislated as a team requirement we may still have to bleat on about ALWAYS carrying a personal trauma kit on your harness rather than a simple first aid kit. Think of arborists as potentially sustaining injuries as extreme as military personnel. The difference is a CAT (Tourniquet) and trauma dressing and/or clotting agent. Most basic firstaid items are to enable you to deal with minor cuts and injuries and perhaps carry on working aloft, anything else that isn't debilitating can be dealt with back on the ground using the team kit. So a basic first aid kit is only paying lip-

service to a crucial requirement; a serious cut will need instant attention and a Bandaid ain't gonna do it. With a CAT and Cellox (or similar) infused dressing plus wound closure elements, either you or your first attending colleague is guaranteed to have the tools at hand to deal with the problem and initiate an evacuation in which you stand a reasonable chance of making it to ground alive. There are innumerable good first aid/trauma kits but bespoke arborist kits tend to be better orientated both to harness use and the likely traumatic injury. These kits from Native Arb in the UK and Mymedic in the US represent two useful sized kits – the smaller, neater Native Arb kit and MyMedic's larger but comprehensive micro-trauma kit though we would have preferred it to be more waterproof.]





- yourself and others. 1 x C.A.T tourniquet
- 1 x 1 metre long Haemostatic Gauze
- 1 x Military Field Dressing 10 x 19cm
- 1 x Resuscitation-Aid
- 1 x Gloves (Pair)
- 1 x Tuffcut Scissors

https://nativearb.co.uk

#### My Medic TFAK (Trauma First Aid Kit) US\$160

A micro trauma kit packed with essential life-saving supplies. Designed by medical and firearm professionals the kit has belt attachment loops on a tear-

away velcro panel for rapid access and deployment. Contains over 35 quality supplies, including 15 trauma items, such as compression gauze and pressure bandage, Nasopharyngeal airway, tuffCuts, chest seals, haemostatic dressing and combat tourniquet. Packable, all-in-one medical kit with top handle.

HSA/FSA approved. 20.3x12.7x10cm 8x5x4" 0.6kg/20oz

www.mymedic.com







#### CMI goes all BlackTail

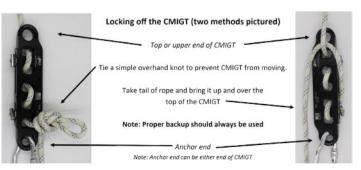
[ED: Proving once again that nothing much is new, it's all recycled from the last century is CMI's latest descender/lowering device which is virtually identical to the SRTe GoldTail made by Sydney's finest Boris Rogleja which was itself a variation on the other Australian classic, the WhaleTail. These devices had/have a huge heatsink and easy to adjust, variable friction (you simply unscrew one of the two gates and add or subtract a rope wrap even under load. These are quite large which is why the half-size mini GoldTails were also popular. Despite being called 'Gold'tails, the original SRTe versions were also available in black. CMI's fine resurrection is called the CMIGT which is presumably a nod to the GoldTail original.]

The five hole variable friction descender is easy to operate, can be threaded either direction into the device, and allows the user to increase or decrease friction.

- On long descents, 2-3 holes can be used.
   Once weight of the rope decreases, friction can be added by threading rope in the extra holes.
- The CMIGT should only be used with a locking carabiner. It should never be used with a non-locking carabiner or a non rated link.
- When used in stunt rigging as a belay for fast descent, end marks should be placed into the system to ensure the person cannot go beyond the determined stop position. If unsure, please seek professional help or training on setting rigging end marks.
- Whenever possible, avoid shock loading the device (lowering NOT Impact block)
- The CMIGT has been strength tested using an end to end pull.
   The minimum rated breaking strength is 19,500 lbs (87kN).
   Using a 5:1 safety factor, the safe working load of this product is 3,900 lbs (17kN).
- Weight: 1.6lb Width: 63.5mm2.5" Height: 295mm/11.625" Depth 22mm/0.875"
- Cost \$253

www.cmigearusa.com







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JAPAN	•	ODSK	5513-2 Nishi-machi	Nagano-Ken	396-0026	works-odsk.jp
NEW ZEALAND	NK *	TREETOOLS	8a Kerwyn Ave East Tamaki	Aukland	2013	treetools.co.nz
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UK South Coast		HONEY BROS (TREE-KIT)	Unit 3, Building 446, Aviation Business Park	Christchurch	BH23 6NW	honeybros.com
UK North East		GUSTHARTS	Milkhope Centre, Blagdon Seaton Burn	Newcastle upon Tyne	NE13 6DA	gustharts.com
UK North West			Unit 17 Wheathill Ind.Est. Holt Lane, Netherley	Liverpool	L27 0YA	skylandequipment.com
UK South West		SORBUS INTERNATIONAL	L1- L3, Commerce Park, Marshall Way,	Frome	BA11 2FB	sorbus-intl.co.uk
UK Wales Scotland NI		WANTED				
USA North-East		ARBORTECH SUPPLY	11494 James Madison St	Remington	<b>VA</b> 22734	arbortechonline.com
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USA North-East		GAP ARBORIST SUPPLY	835 PA-41	Gap	<b>PA</b> 17535	gaparboristsupply.com
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USA CA/NV/AZ/NM/TX		WANTED				
USA LA/MS/AL/OK/FL		WANTED				

STOCKISTS in this colour sell and/or can order: ArbClimber, Wilderness SAR & Technical Rescue magazines

Arb supply stores that stock ARBCLIMBER ALL have a wide range of rope-related equipment, including ropes, hardware, harnesses, helmets etc. as well as chainsaws, boots, clothing etc. Now that SRT/SRS is an accepted area of tree work, the rope-related equipment is often the same and even if it's not they can get it in for you. In the case of suppliers shown in red (opposite) that stock TECHNICALRESCUE and WILDERNESS SAR magazines as well as ARB CLIMBER, these are already rescue and access equipment suppliers of note so they can sort you out whether you're an arborist or a rescue agency. For rope-related equipment in particular, you should check out your local ARB supplier or Rescue supplier, if you haven't already, and be amazed by the amount of kit you recognise.

If you would like to stock our magazines (and aren't located next to our existing stockists), email us: admin@rescuemagazines.com



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#### FRICTION/CAMBIUM SAVER

by Adam Jones

riction savers, also known as cambium savers are intended to ease the flow of your rope in a moving rope system without the need to run directly on the tree's bark (hence 'cambium-saver') and to be remotely retrieved on completion of work from that anchor point. Released in early 2023, the NAJA is Petzl's newest and probably most simple friction-saver. Simple that is in comparison to the EJECT or some of the ART models, but possibly not the *Treesbee*, or similar ring type savers. The name Naja is taken from a genus of venomous elapids commonly known as cobras, and if you squint and drink heavily enough you'll see that same snake shape in the smooth mechanical form of the NAJA. As usual with Petzl reviews (and this is the last in a pile of products we had to get through after the Covid delays) we have nicked some of their images (on the left) because, let's face it, they do it better than we do. See if you can spot the difference between their images and ours....

Unlike simple ring type savers, the NAJA consists of a single metal component/frame endowed with a small diameter (18mm sheaved), high efficiency, sealed ball bearing pulley which reduces friction (pic overleaf), allowing the rope to glide through – those are Petzl's words but we couldn't put it better ourselves and we do like to recycle. This shaped metal frame is connected to a replaceable nylon strap. The strap is comparable to an Ultra Sling, with a series of stitched openings, which allow the user to select the best length for the chosen anchor



point, the standard supplied length for the strap is 1.5 metres (59"), with four different adjustment positions to adapt to different branch diameters. A 2.5 metre/63.5" strap is also available, which has six adjustment positions. An additional strap can be purchased, and either girth



hitched to the initial strap or as a direct replacement, to provide a greater length for anchoring around larger limbs. There are no metal rings or other components on the strap to cause snagging during retrieval, which sets this apart from all other friction savers currently available.

The NAJA cannot be installed from the ground-this means that you have to ascend to your TIP before placing the device. This is not a bad thing as it ensures that you will have to inspect what you're tying in to, which can only be good. How many times in the past have you ascended to your anchor point, set from the ground, only to find that it's sketchy at best?

To install the *NAJA*, pass the strap over the chosen limb(1) and insert the frame into the appropriate adjustment slot on the strap (2), ensure that it is correctly seated into that adjustment slot. It is important to NOT exceed 90° convergence of the strap legs. If you do there is a chance that the strap and running rope may come into contact and damage may occur, which will endanger the climber's safety.

For MRS/DdRT you will insert your rope's spliced eye through the frame from the stopper side (3) and clip it back into your system, you can check correct placement by referencing the markings on the side of the *NAJA* (4). Once you're connected, attach the accessory carabiner to your rope on the stopper side of the *NAJA*, the side that returns directly to your friction device (5). In doing











#### **GEAR REVIEW**



this you are readying the system for remote retrieval, from the ground. At this stage vou may also choose to attach a throwline to the provided loop on the back of the black retrieval sling. You may elect to re-ascend to your TIP on completion of aerial working, if you don't want the pre rigged throw line during working operations getting in the way. Petzl recommend the use of a soft retrieval, thus preventing the NAJA from falling to the ground, and possibly being damaged.

SRT/SRS systems can also utilise the NAJA. Initial set up is similar to the MRS preparation but you will continue to feed the spliced/ end of your rope through the frame until the end reaches terra-firma, plus some, At this point you then tie a stopper knot, either an Apline butterfly or, as Petzl suggest, a figure eight to fix your line from passing through the pulley. Don't overlook the need to clip the loop created back onto the standing part of

the line for security. You will then work on the rope leg which comes out of the frame on the stopper side.

Retrieval is achieved by attaching the supplied 21mm retrieval ball to the spliced eye of your climbing rope, not unlike most other cambium/friction saver device recovery approaches. Pull your rope out and the ball will pass through the pulley and catch on the accessory carabiner (pic above), freeing the frame and allowing its return to the ground. By maintaining some tension on the pre-installed throw line you can manage the descent speed and prevent potential damage. If you worked the tree SRS, the process will be a little different. Once safely on the ground, disconnect from your rope, tie both ends together to create a loop, and feed the line through until you can access your stopper knot. Untie the stopper knot and then reverse the feed direction until you get your connecting knot back. At this stage retrieval is no different, attach you ball and get your *NAJA* down – don't forget the soft retrieval!

Although 98% of the time, the *NAJA* will be working with just one climber in suspension, there may be an unfortunate occasion when a rescue is required. Rated as a type B temporary anchor device (EN 795: 2012 type B), for single-person use only, the anchor device is also compliant with CEN/TS 16415: two-person use in a rescue situation, EN 12278: 2007 for a pulley. As such the *NAJA* is rated to be used with a maximum load of 250kg/550lbs, so incorporation into a rescue system is within its working limits.



As with all life critical and aerial access kit, a good inspection regime should be observed, with pre and post used inspections in addition to mandatory, regulatory inspection and record keeping as required. Key inspection points should include the straps and associated stitching, the strap retaining screw is secured correctly and the pulley sheave operates smoothly. Also check the metal parts: absence of deformation, cracks, marks, wear, dirt, abrasion and corrosion.

The purchase and first use dates, along with serial number and inspection records are norms now in most places. If they're not, where you operate, don't let a good checks regime got overlooked. Your life may depend on it.

You won't be surprised to hear that we highly rate the *NAJA*. Once again *PetzI* have wandered into the fray lobbed their grenade and left to go work on something else new and probably golden coloured. We have a number of alternatives but have found the *NAJA* to be an asset for aerial operations, providing a quick and simple solution for cambium protection and frictional efficiency. To date we have not found the standard 1.5 metre strap to be too short, and not once has the retrieval been problematic. However, the soft retrieval has been neglected on many occasions, with either the need to get back to the anchor or just being forgetful cited as the rationale. As a great engineered solution to a potential problem, the ground fall prevention slot may not get as much use as intended or indeed, as it should get.



# ROPE & EQUIPMENT

FOR YOUR VERTICAL WORLD





Thanks to our colleagues at Arburistes in France for another excellent comparative article.

French-speakers can check out their website at www.arboristes-mag.com

COFFERNATIONS

& Integrated Communications

14

he use of chainsaws and wood chippers sometimes makes our jobs very noisy. Prolonged exposure and/or too high a noise level can cause tinnitus, or even deafness. It is also the cause of fatigue, stress and it can act on your nervous, cardiovascular and digestive systems.

In this article, we will focus particularly on noise cancelling and hearing protection that attach to protective helmets, called shells, mandatory for climbers and men on foot. An update on the new standards and a comparative table will help you better understand this essential PPE for your health.

Hearing protectors are category 3 PPE because hearing damage can be irreversible. Personal Protective Equipment (PPE) against noise are devices which reduce the harmful effects of noise on hearing and which are therefore intended to prevent any deterioration of hearing. There are several types of noise, which differ according to their frequency, expressed in Hertz (Hz) and the intensity of the sound, expressed in decibels (dB). Above 85 dB, the wearing of hearing protection is mandatory, a chainsaw having a noise level between 95 and 110 dB, it is important to choose the right anti-noise.



#### **ACRONYMS**

SNR: abbreviation of "Single Number Rating", this information is used to measure the degree of attenuation of the hearing protection of a PICB (Personal Protector Against Noise), of the earmuff or headband type.

RNR: environmental noise index.

dB: decibels.





Two types of hearing protection can be distinguished: passive and active. Passive shields reduce noise by mechanically blocking sound waves. They are ideal for situations with continuous noise levels and where communication between workers is possible. Active protections, on the other hand, electronically block the sound waves, they are recommended in the event of intermittent noise and when communication is impossible. These headsets use smart technology to help workers hear their surroundings and talk to each other in noise. Some also have Bluetooth or mini-jack systems to connect with other devices (telephones, tablets, etc.), however, their cost is much higher!

Before active technology existed, passive isolation was the go-to solution. Today, high-performance helmets borrow from both technologies in order to offer the best protection.

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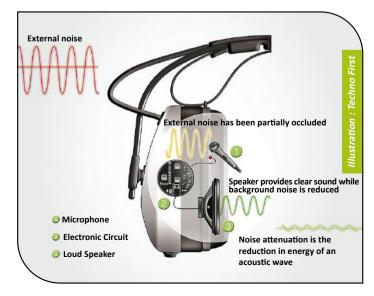
#### **HOW DOES IT WORK?**

The purpose of passive protection is to put in place the most airtight barrier possible between the ear and the outside world. Passive systems encompass the whole ear: they are circum-aural headphones. Early passive noise cancelling headphones were made of fibrous or porous materials such as mineral wool or glass wool. Unfortunately, these devices were not able to provide adequate protection against bass sounds. Today, we mainly use polyurethane foam and PVC, some helmets even have double walls or are sealed with liquid or foam.





In addition to this protection, so-called active noise cancelling headphones electronically filter noise and can amplify useful sounds. Originally, this technology was developed for airplane pilots to communicate with their control tower. It was in 1930 that the patent filed by the German engineer Paul Lueg formalised the hypothesis according to which the addition of an identical sound in phase opposition could cancel a noise. In other words, it is a question of interrupting the sound waves of the initial noise and that generated in phase opposition to obtain silence. This is how active noise cancelling headphones appeared. These types of helmets must incorporate a microphone to pick up the noise (1), an electronic component capable of analyzing the latter and a filter that processes the data (2), as well as a loudspeaker that will emit the corrective signal (3). A power supply is therefore necessary to make everything work. Thanks to its integrated microphone, the reduction system records harmful sounds, analyzes them and then generates a noise whose phase is exactly opposite before transmitting this signal via the headphones. Unwanted noise is therefore suppressed by cancelling the two signals.



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#### **STANDARDS**

Since 2016, European regulations relating to PPE have placed hearing protection on the same footing as respiratory and fall protection and consider harmful noise as so many dangers "of an irreversible nature" for health. Noise pollution, inseparable from professional environments, is a real danger whose effects on the body should not be underestimated. Too strong and/or long exposure can lead to more or less severe disorders, including deafness.

The implementation of the new PPE 2016/425 regulation (moving hearing protection to category 3 in the same way as respiratory protection or fall protection) took place over three years. The start of the calendar coincides with its adoption by the Member States in March 2016. In April 2018, products compliant with the old regulations (PPE 89/686/EEC) can still be marketed. Approved bodies certify products according to the new standard, and manufacturers can market them. Since April 2019, products on the market must comply with the new regulations. These regulations on hearing protection have certain concrete implications for individuals and companies:

- For the manufacturer: to carry out more rigorous quality controls, and to affix the new CE marking to its products and packaging. All PPE must be re-certified before April 21, 2019; said certification must be renewed every 5 years.
- **For security managers**: to ensure that equipment is purchased from approved suppliers, to check its traceability, and to train users in the selection of appropriate equipment.
- **For the user**: to consent to the correct wearing of appropriate protection.





It is the NF EN 352 standard which governs Personal Hearing Protectors (PICB). This standard establishes requirements for construction, design, performance and marking, as well as information for the user.

Decree No. 88-405 of April 21, 1988 indicates that for a level between 65 dB (daily exposure level) and 135 dB (peak sound pressure level), the provision of protection is mandatory. The employees concerned must be identified and training must be established. If the thresholds of 90 dB in daily exposure and 135 dB in peak exposure are exceeded, the employer is required to check the wearing of equipment. In general, a chainsaw at a noise level between 95 and 110 dB.

Since 2016, the exposure thresholds have been lowered and linked to an exposure duration. The first exposure threshold above which action is required is 80 dB for 8 hours. In this regard, be aware that a person who starts his chainsaw 30 seconds before putting on his helmet, received during this time, the equivalent of 2h40 of noise at 80 dB. It is therefore necessary to put on your helmet before being exposed to the surrounding noise.

Each protection is tested on a panel of 16 people by a certifying body, according to the current European standard EN 352-2. The resulting results (SNR, APVF, standard deviation, etc.) give the attenuation characteristics for these protectors. The effectiveness of hearing protection depends on the type of protection. Its average value is given by its SNR.

Maximum Sound Level dB(A)	Recommended SNR Value	
Under 90	12-20 dB	
90-95	20-25 dB 25-30 dB 30-35 dB	
95-100		
100-105		
more than 105	Special Analysis	





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		LITECOM WS PLUS	LITECOM BASIC	ADVANCE PROCOM
	RADIO SYSTEMS			STIHL
	BRAND	3M PELTOR	3M PELTOR	STIHL
	Approx COST inctax	€941	€563	€402
	NOISE SUPPRESSION (SNR)	32 dB	32 dB	31 dB
SPEC	WEIGHT/pair	475g	418g	390g
SP	EN 352	•	•	
	DURATION	20h	20h	17h
	MICROPHONE	Dynamic noise compensation	Electronic noise compensation	Active noise reduction
	USERS/CHANNELS	16 users + 121 sub-channels	8 users + 38 sub-channels	16 users
	RANGE	<3km	<3km	<600m x number of relays
COMMUNICATION	TRANSMISSION	Built-in two-way communication.     Transmission by voice detection (VOX) + Voice menu system.     Mini-jack input for telephone and external devices.	Built-in two-way communication.     Transmission by voice detection (VOX) + Voice menu system.     Mini-jack input for telephone and external devices.	"Intercom" conference system. Connection to smartphone via Bluetooth.     Simple and intuitive use even with gloves.
	AUDIBLE	<ul> <li>Sound modulation for listening to outside environment.</li> <li>Impulse noise protection.</li> <li>Built-in FM radio</li> </ul>	<ul> <li>Sound modulation for listening to outside environment.</li> <li>Impulse noise protection.</li> <li>Integrated FM radio.</li> </ul>	Sound modulation for listening to outside environment.     Impulse noise protection.     Integrated FM radio.     Helmet configuration using the ADVANCE ProCOM application.
R≺	CHARGE/INDICATION	Auto power off. Battery status indication.	Auto power off. Battery status indication.	-
BATTERY	BATTERYINCLUDED	Lithium ion Rechargeable	2x Alkaline AA	<b>=</b>
BA	PORTS/CABLES	FR08 + AL2AI.	•	<b>=</b>
	PROTECTION	Waterproof noise cancelling microphone.	Waterproof noise cancelling microphone.	Tough and impervious to sweat, dirt and rain.
	HYGIENE KIT	•		
	MICPROTECTION	•	-	-
	HEADBAND	<u> </u>		

#### **EAR DEFENDERS & COMMS**

	TUFFTALK M	PROTOS BT-COM	WORKTUNESPRO	PROTACIII
	SENA			
	SENA	PFANNER	3M PELTOR	3M PELTOR
	€440	€379	€130	€128
	24 dB	26 dB	31 dB	31 dB
SPEC	354g	>84g	351g	355g
S	•		•	•
	13h	12h	40h	100h
	Active noise cancellation (ANC)  Bluetooth: 4 users.	Ambient noise suppression	-	-
	Open Net: unlimited users. Group Net: 24 users.	4 users	-	-
	Bluetooth:<400m. Net Intercom:<1.1km (4.4km with 6 users).	Bluetooth<600km Intercom <1km	-	-
COMMUNICATION	<ul> <li>"Intercom" conference system.</li> <li>Connection to smartphone via Bluetooth.</li> </ul>	<ul> <li>"Intercom" conference system. Connection to smartphone via Bluetooth.</li> <li>Simple and intuitive use even with gloves.</li> </ul>	<ul> <li>Mini-jack input for telephone and external devices.</li> <li>Voice menu system.</li> </ul>	<ul> <li>Mini-jack input for telephone and external devices.</li> <li>Voice menu system.</li> </ul>
00	<ul> <li>Sound modulation for listening to outside environment.</li> <li>Impulse noise protection.</li> <li>Built-in FM radio.</li> <li>Headset settings using the SENA application.</li> </ul>	<ul> <li>Sound modulation for listening to outside environment.</li> <li>Impulse noise protection.</li> <li>Integrated FM radio.</li> <li>Mp3 player.</li> <li>Helmet settings using the PROTOS CONTROL application.</li> </ul>	Integrated FM radio.	<ul> <li>Sound modulation for listening to outside environment.</li> <li>Impulse noise protection.</li> </ul>
RY	3h to full charge	3h to full charge	Auto power off. Battery status indication.	Auto power off. Battery status indication.
BATTERY	Lithium polymer 1400mAh	•	2x Alkaline AA	2x Alkaline AA
BA	•	USB 5v DC, 200 mA	•	_
	-	Storage case	Protected electronic components	Protected electronic components
	-	-	<u> </u>	_
	-	-	-	-
		•		

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		X2	хз	X4
	PASSIVE SYSTEMS			
	BRAND	3M PELTOR	3M PELTOR	3M PELTOR
	Approx COST inctax	€31	€31	€47
	NOISE SUPPRESSION (SNR)	30 dB	32 dB	32 dB
SPEC	WEIGHT/pair	220g	234g	245g
SP	EN 352	•	•	•
	DURATION	20h	20h	17h
¥	CHARGE/INDICATION	Auto power off. Battery status indication.	Auto power off. Battery status indication.	-
BATTERY	BATTERYINCLUDED	Lithium ion Rechargeable	2x Alkaline AA	
BA	PORTS/CABLES	FR08 + AL2AI.		<b>=</b>
	PROTECTION	Sealing rings filled with a unique combination of liquid and foam. Electrically resistant.	Sealing rings filled with a unique combination of liquid and foam. Electrically resistant.	Sealing rings filled with a unique combination of liquid and foam. Electrically resistant.
	HYGIENEKIT	<b>=</b>		
	HEADBAND	•	•	

#### **NOISE CONTROL**

Does the hearing protection you use daily fit well? Are you sufficiently well protected, are your hearing protectors effective enough? Some manufacturers (such as 3M for example) offer to test your noise cancelling devices, which makes it possible to determine your level of protection thanks to precise and qualitative results. The test of both ears is done simultaneously, a good way to check the effectiveness and correct wearing of your hearing protection and thus guarantee an effective prevention and protection program.

#### REMEMBER

To maintain the noise attenuation values of your hearing protection, the foam and padding of your earmuffs and mic baffles should be replaced every six months if used daily. It is recommended that you replace your hearing protection every 3 years or when damaged [ED: that is almost certainly a recommendation from the manufacturer to sell more. In reality, if you are replacing the foams and liners and the outers are undamaged with no tell-tale UV fading or cracking they'll last for donkeys years.]



#### **EAR DEFENDERS & COMMS**

	Х5	PROTOS	SC3	V-GARD
			KINK IN THE REAL PROPERTY OF THE PROPERTY OF T	
	3M PELTOR	PFANNER	KASK	MSA SAFETY
	€53	€38	€32	€29
	36 dB	26 dB	29 dB	32 dB
SPEC	351g	250g	350g	403g
SP		•	•	•
	13h	12h	40h	100h
.Υ	3h to full charge	3h to full charge	Auto power off. Battery status indication.	Auto power off. Battery status indication.
BATTERY	Lithium polymer 1400mAh	•	2x Alkaline AA	2x Alkaline AA
BA	_	USB 5v DC, 200 mA	•	•
	Sealing rings filled with a unique combination of liquid and foam. Electrically resistant.	-	Electrically resistant.	Electrically resistant.
		•		
		•		

#### CONCLUSION

Classified as the fourth occupational disease in France according to the CNAM, the hearing risk is wrongly perceived as less dangerous, because it is not immediately visible (unlike, for example, working at height where a fall will be immediately obvious!), it is however not trivial.

Even if wearing hearing protection is mandatory, in the field, it is sometimes less obvious to apply. Beyond raising employee awareness of the risks of noise on their health, it is a question

of changing their perception of equipment, hitherto considered a constraint. There is no more effective solution than the general wearing of noise protection to limit damage to the hearing of workers, not to mention the comfort, design and communication options. It is the identification of the most exposed work areas (chippers and ground saws for instance), the characterization of noise sources and the risk analysis that will determine your choice of ear defenders.



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# BALANCING THE ECOSYSTEM SPROTECTING VULNERABLE ANIMAL SPECIES

### **An Arborist Perspective**

by Charlotte Ina Sterland



[ED: Oiii, where dya think you're going? Don't skip these pages just because there's no shiny metal on show. This is important stuff and even if some of it is not geographically relevant to you, look upon it, at the very least, as expanding your pudgy brain's ability to win the next pub quiz]

Forest ecosystems have a delicate balance of species in coexistence. As newer species are introduced over time, often naturally, or by humans; these ecosystems may be threatened. Endangered species' habitats may be affected by newcomers. Deforestation can also affect this fine balance.

For arborists tasked with removing or maintaining these trees, knowing which species are present not only ensures trees can be removed safely and legally, but that the ecosystem can continue to thrive.

Some trees need particular examination: Perhaps a tree has become a danger for humans, or needs to be removed for convenience. Arborists need to know which species to consider before getting into the branches; and signs to look for when up in them. Laws protecting wildlife vary hugely across the world and, in some countries, looking after species is more a cultural priority than a possible prison sentence. From Australia's western ground parrot, to the California Condor, there are many amazing and endangered species in territories which arborists and climbers might come across, and species lists are constantly changing, so worth being aware of.

In this article we look at some of the situations affected by wildlife laws and how they might affect arborists.

#### LAWS FOR WILDLIFE PROTECTION

The wildlife and countryside act (1981) protects rare and endangered plants and animals. The Act makes it an offence to intentionally; kill, injure, or take any protected species; take, damage or destroy any nest or place of shelter or protection, in use or being built; take or destroy an egg of any wild bird or to intentionally disturb animals using resting places; or to pick, uproot or destroy protected plants.

The Conservation of Habitats and Species Regulations 2017 also protects a range of plants and animals; referred to as 'European Protected Species' (EPS)13; and their habitats. It is an offence to: Deliberately capture, injure, kill or cause significant disturbance to a protected species, or to deliberately destroy the eggs to a protected species.

It is also an offence to damage or destroy protected species' breeding sites or resting places (such as a bat roost in a tree or a dormouse nest on a woodland floor).

By following these good practice guidelines; it is possible to do most things without a license. Penalties include fines and up to 6 months in prison; if carrying out an activity which impacts protected species without a license. Applying for a license is done through Forestry Commission local area teams. They carry out an initial assessment: Natural England make the final decision on wildlife licences and issue them through the Forestry Commission.

#### PROTECTED SPECIES

In the UK, the list of protected species includes the dormouse, all bats, the otter, great crested newt, the smooth snake and sand lizard. In Europe the list of 'European Protected Species,' defines which animals it is an offence to disrupt. The 2007 and 2010 amendments to the Habitats Regulations increased the protection for EPS, as well as removing the defence of 'incidental result of a lawful activity.' In 2017, changes made to the Habitats and Species Regulations required the increased Conservation of Offshore Marine and Habitats and species.

The main conclusions are that long term planning is necessary for conserving rare species. A systematic approach to the management of forestry would minimise the risk of an offence, where it is important to define what an offence is.

The crux of what is an offence is as follows: Disturbance is only an offence if caused deliberately. Deliberate could mean intentional damage or recklessness. 'Reckless' means that a person could have foreseen damage and taken steps to prevent it. Taking steps to plan to minimise the damage caused is one way of preventing this. Disturbance of animals in this case means, action which could 'impair their ability to survive, breed or reproduce, nurture their young, or, where necessary; hibernate or migrate. Greatly affecting the number of the species present or the distribution of them in some way could also upset the ecosystem

The overall aim is to protect the population, not every individual; since not all protected species are rare. Water diversity is also seen as highly important, even work might then endanger protected species. This kind of Good Practice would not require an EPS license.

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When assessing whether a species is likely to be affected by your actions, there are a few questions to ask yourself / your team:

Are you within the existing geographic range of the species?

- Does your wood contain suitable habitat for the species?
- Are there records of the species for this area or site?
- Is there any field evidence of their presence?
- If in doubt, assume it's there and follow the guidance.

#### **OBTAINING A LICENSE**

The UK forestry commission website publishes its requirements for Good Practice. Where these elements are upheld, it is fine to proceed with work, otherwise a license should be applied for. The following tests are required to obtain a license: There is not a problem if:

- The work is done to conserve wildlife, public safety, delivers the Government's woodland strategy and provides public benefit
- There is no satisfactory alternative
- The overall package of works will not be detrimental to overall population of the species.

Felling permissions are different in Scotland and vary across the world, but there is usually a protocol which depends similarly on the kind of trees and wildlife involved and the overall justification of the activity.

#### **Climber Safety, Natural Hazards and Pests** WASPS

A number of surprise hazards exist for arborists, most notably wasps and possums. Those who climb for fun also need to think about these hazards, especially where they are also getting groups of clients involved. Wasps are a danger for those working at heights, and really hard to avoid when wearing a harness and fully rigged into a system.

Wasps sting when distressed and in protective mode. They can be a particular hazard to those with allergies and, like pollen, this is something that suddenly develop as a cumulative response to previous exposures. So can be a real problem if disturbed by accident when they can be locally aggressive with the possibility of multiple stings. They also have a propensity to get into all kinds of clothing nooks and crannies. A concerted wasp attack can really cause a climber to take their eye off the 'safety' ball in an effort to escape. Wasps nest almost anywhere including in the ground around your target tree but they prefer to nest in fruit trees or trees where they can find sweet food.

While nests are part of a healthy ecosystem, since they eat other pests like caterpillars, if they are a hazard to the public (including in a private garden) they can be removed. Wasp nests move within 48 hours of the wasps arriving if the Queen wants to find a better place, so the key is to only remove the wasps once they have established a settled nest. Professional pesticide treatment is better than shop bought treatment, since stronger chemicals are more effective in removing the nest. Once a nest is well-established, it could be good to remove it if they are a danger to the public, and the use of pesticides will aim to cause minimal damage to the trees themselves.

[ED: Most hornets, unlike their smaller cousin the wasp, are docile, despite their menacing appearance but can be a considerable hazard to arborists in defence of a nest. The European Hornet (above and queen left) Vespa crabo (2-3cm/1-1.5" long) is a valuable part of the ecosystem so DO NOT KILL THEM if you can possibly help it. Asian Hornets in stark contrast are hyper aggressive and represent a significant risk to the populations of local honey bees as if populations weren't depleted nough. There are two types of invasive Asian Hornet the

enough. There are two types of invasive Asian Hornet the yellow-legged (queen right) Vespa velutinia (2.5cm/1"long), which is now seen in Europe and the Giant Asian hornet Vespa mandarinia (queen lower-right) not yet in Europe despite the frequent headlines but has been found in the USA. In either case the public are urged to report their presence such is their potential for damage to the indigenous ecosystem. They can eradicate entire bee and wasp nests in well under an hour. The yellow legged variety is not actually much, if any, larger than the European hornet and so can be difficult to differentiate whereas the Giant Asian Hornet are all unmistakably large being the size of a V.crabo gueen – (3cm/1.5"). In fact, in these images from the Natural History Museum with comparative scales their Giant seems a fair bit larger. The Yellow Legged Asian Hornet is noticeably darker around the head and the abdomen while the Giant Asian has a vellow/orange head and the European Hornet has a patch of red on it's otherwise yellow head. As arborists you should

#### **POSSUMS**

Possums make nests in trees and, while not likely to cause a fall as in the case of wasps, might be a hazard if they decide to bite, as they are known carriers of disease. Known to carry leptospirosis, tuberculosis, coccidiosis, spotted fever, tularemia, and other diseases, they can pose serious health threats when they invade urban environments.

familiarise yourself with the differences and aim to protect

domestic bee and hornet populations wherever possible.]

#### **FUNGI IN THE TREES**

Fungi in trees are not only a hazard for climbers as they can cause branches to rot, but also to wildlife that uses the trees. Fungi may be obvious, such as mushrooms growing out of a tree, or may not appear above ground. These visual signs depend on the fungus. Most result in thinning and discolouration or wilting of leaves. Tree fungi are hard to cure but can be treated. Prevention is key in forest management: making sure soil is well drained, boost the overall tree health with proper maintenance, aeration of the root plate in high traffic areas, change garden tools between plants, rake and remove leaves from yard, use preventative fungicides.

#### TREE DWELLING ANIMALS CONSIDERED PESTS

Some very cute animals, actually considered pests, are good to be aware of, as they can cause considerable damage to woodland. While their habitats are important, they may not be as endangered as meets the eye. Some deer species and grey squirrels have a significant impacts on woodland regeneration. Their activity can prevent the natural growth of forest. In North America and now Europe, **raccoons** prey on eggs, chicks and adult birds, and their impact is substantial, especially in wetlands. Rodents such as **chipmunks** can also affect the ecosystem and are a hazard to birds.

**Muntjac deer** are responsible for much forest destruction and are another species to look out for, when constructing a forest environment.

The small **Asian Mongoose** was introduced to Croatia in the early 20th century but has since reduced biodiversity by scavenging on various bird populations. If allowed to spread further, this creature would cause damage throughout Europe.

**Crows** also predate on beneficial tree species and can have a serious effect on the forest ecosystem.

#### **GLOBALLY PROTECTED SPECIES**

We take a closer lookout which species are protected in the UK, Europe, the US, Australia, New Zealand and Canada, where environmental policy and ecosystem balance is totally different, but some policy is global and signed by many different countries. Arborists in the UK, Ireland and to some extent New Zealand have the luxury of not being too concerned by dangerous snakes, large teethed/clawed mammals or too many biting/stinging insects but in South Asia, North America, Australia, Africa and parts of Europe there are some truly life threatening creatures to keep you on your toes. We're not really dealing with their danger to us in this article as much as the danger humans pose to them.

#### BATS & BIRDS IN THE UK

Bats have an extremely well protected status in the UK and further afield. Under the Wildlife and Countryside Act 1981 all UK bat species and their roosts became protected by law. Due to their low reproduction rates and long life-spans, bat populations are particularly vulnerable to a range of threats and in particular, human interference. It is illegal to capture, injure or kill bats, to disturb a roost or group of bats, or to damage a bat roosting place. Possessing or exchanging parts of a bat (dead or alive) is also illegal, as is obstructing access to a roost.

In the UK the Bat Crime Investigations Project is responsible for protecting bats and recording bat related crimes. They try to ensure that the public knows how to report incidents, as well as on improving policy and in raising awareness of the issues surrounding bats and their protection.

Surveying trees for bats is often more complicated than buildings as their roosts are hard to spot. Bats roost in a wide range of locations and are likely particularly drawn to the reason you may be working on the tree in the first place – fissures and cavities. Their presence can be identified primarily by droppings. Dark brown, or black; they vary between 4 and 8mm long. Very similar to mouse droppings; they crumble into fine powder, as they are made of fragments on insects.

The UK's Arb Association (www.trees.org.uk) is one organisation pro actively raising awareness and holds a two day symposium to learn how to identify bat roosts, and improve conservation of bats and the safety of those involved. The workshop included; bat ecology and roosting behaviour, advances in survey techniques, practicalities of surveying trees for bats and

compliance with legislation and industry best practice. Often requiring qualifications in tree climbing and ecology, bat roost surveyors are highly specialised.

#### **NESTING BIRDS**

Although hedgerow nesting has been protected in some countries where cutting is not permitted in Spring when most smaller birds are nesting, there are still plenty of others that nest in trees that may be particularly in need of protection like woodpeckers/Flickers and owls. Unlike corvids which are plentiful and nest in the extremities of branches, the more at-risk species tend to use locations in or close to the main trunk and often in the same kinds of locations as the bats. In the UK and much of northern Europe, It is an offence (in the case of the UK under Section 1 of the Wildlife and Countryside Act of 1981) to intentionally take, damage or destroy the nest of any wild bird while it is in use or being built, or to intentionally kill, injure or take chicks or adults, or intentionally take or destroy any eggs. Some birds will leave nests unoccupied by come back to re-use them. Selling wild birds or their eggs is a offence though some Mediterranean countries actively capture and even eat wild 'small' birds. In protected areas, methods for checking for nests should be incorporated into Good Practice working methods.

#### **USA**

In the USA, endangered species are protected under the national 'Threatened, Endangered and Sensitive Species' (TES) programme. The TES programme allows biologists and managers to maintain a healthy ecosystem; recovering threatened and endangered species and their habitats, as well as encouraging plant diversity on National Forest System lands. Exemplar initiatives include: Every Species Counts!, Carnivore Conservation, Great Plains TES Program, and Bats: Masters of the Night Sky and involve habitat improvement, monitoring, analysis, conservation planning and coordination with other resources. Closely coordinated with the Botany and Rare Plants, Fisheries and Wildlife programs, as well as other forest management programmes, initiatives exist to protect animals including bats and a number of other animals. Here are two interesting animal protection programmes to be aware of that just might impact your week or possibly create some in the case of the grouse.

#### **BATS**

White noise syndrome (Pd fungus) causes changes in bats that make them become active more than usual and burn up fat they need to survive the winter. Bats with white-nose syndrome may do strange things like fly outside in the daytime in the winter. Grants were made available (as of March 2023) for research into white noise syndrome and potential cures.

#### SAGE-GROUSE

Not something the average urban arborist would be concerned about but, what is a reversal of the usual problem for arborists where removal of trees represents a destruction of habitat, the Sage Grouse can often benefit from removal of trees since it prefers wide open prairies. These habitats, like so many large ecological areas (wetlands, heath etc.) are in decline and require



active woodland management
efforts to re-establish fringe
areas that have succumbed to
the intrusion of climax vegetation
although that is rarely as destructive
as human urban-industrial
expansion. The database of 'listed
species' showing species decline

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has the Sage Brush Grouse right up there. : The USDA Forest Service manages 5-8% of the sage-grouse population in the US. Fires burned roughly 260,000 acres of sage -grouse habitat on NFS lands in 2016-2019. Rules which prevent disturbance and avoidance of surface development in sage-grouse areas are key to this. The FS report (2019) ensures monitoring can continue to inform future forest planning.

#### **CANADA**

Endangered trees are protected under the federal Species at Risk Act (SARA) and any complementary provincial legislation. In general, endangered species cannot be destroyed. Forestry professionals are sometimes consulted in order to understand which are endangered. Canada's national parks protect the landscapes of the country. In 2004, the Canadian Government put together an Invasive Alien Species Strategy for Canada. This was to prevent new invasions, detect them if too late to prevent and then respond quickly to the problem and manage it in the future. Animals considered pests include ants, aphids, bats, bedbugs, ticks, ants and many other species. Pigeons and wasps are also pests. Gypsy moths are currently threatening Canadian forests.

A database of at risk species exists on the government of Canada website, from the Allegheny Mountain Dusky Salamander to the American Badger. The Migratory Birds Convention Act, 1964 set out rules to protect birds.

Conservation of polar bears is considered important and many ecological gift programmes exist to help Canadians give to these causes. A mapping tool exists to demonstrate areas covered by indigenous populations and forests, with a view to protecting the way it can be invaded by oil and gas explorers.

#### **AUSTRALIA**

Australia's national environment law protects species which are threatened by requiring those operating in these environments to apply for action to be assessed and approved in order to go ahead. A database of species is available on the Australian government website, along with information about their protection status, from 'endangered' to critically endangered or vulnerable.

The Bonn Convention (set up by Germany in 1983, of which Australia has been a member since 1991), lists and defines migratory birds, either by entire population or any geographically separate part of the population. Birds listed in Australia include the Christmas Island Frigatebird, as well as many sea birds. As part of this, the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) offers information on protected and threatened species, while a report on invasive species and feral animals is also available. The Australian Bird and Bat Banding Scheme publishes a periodic newsletter, which details results achieved and investigations under way with banding programmes; (putting coloured bands onto birds and bats in order to analyse where they go). For example, 297 of the Ailuroedus crassirostris (Green Catbird) were first banded in 1976 and last banded in August 2022, (when considered less at risk). There were 561 sightings of these birds in this time frame, with the maximum movement recorded as 9km, with the average time taken until second sighting (or recover) 6 years and 5.9 months. This species is on the 'least concern' list, i.e. it is not at major risk of extinction, but awareness of endangered animals in the area where an arborist is undertaking work might avoid awkward conversations in the case of a mistake.

#### WILDLIFE PROTECTION

#### **NEW ZEALAND**

New Zealand, (Aotearoa in Maori), known partly for having the fourth largest marine territory in the world, also has many interesting plants, birds and animals to protect, and places a high priority on indigenous population culture. The Kunming-Montreal Global Biodiversity Framework is an agreement to protect 30% of land and ocean globally by 2030, which New Zealand joined nearly 200 parties in signing up to on 19 December 2022, at the COP15 meeting. The Convention on Biological Diversity (CBD), (a global sustainability initiative set up in 1992 at a biodiversity convention in Rio de Janeiro) recognises Maori and other indigenous peoples as integral to sustainable management and conservation of nature. New Zealand is one of 196 parties to sign into this Convention and has been a member since December 1993.

With targets for forest restoration, tackling overexploitation of wild species, as well as for environmental subsidies and halting of pollution, the framework reflects an understanding that climate change and biodiversity loss are linked and must be addressed together. The CBD ( https://www.cbd.int ) includes information on national biodiversity strategy and action plan. The CBD has two additional agreements (also known as protocols): the Cartagena Protocol on Biosafety and the Nagova Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation. The Nagoya Protocol sets out rules on how to access genetic resources and associated traditional knowledge, and ensures the benefits of using genetic resources are shared fairly. There are implications for countries, organisations and individuals using foreign genetic resources in research and development. New Zealand is yet to decide whether to become a party to the protocol, which came into force in 2014. Key issues that require consideration include how New Zealand regulates the discovery and subsequent use of genetic resources, and protects matauranga Māori. There is growing interest domestically and internationally in New Zealand's genetic resources. Researchers and scientists are particularly interested in the country's unique species like native plants (e.g. manuka for its antibacterial properties), microorganisms such as bacteria that can withstand high temperatures, and certain types of algae that have industrial or pharmaceutical applications. There is also interest in Matauranga Māori (Māori traditional knowledge) which can signpost medically significant

New Zealand joined CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) and introduced corresponding legislation, the Trade in Endangered Species Act, in 1989. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) report (2019), is based on a review of 15000 government and scientific sources, assesses changes over the past five decades, providing a comprehensive picture of the relationship between economic development pathways and their impacts on nature. The report also examines future scenarios, including business as usual, as well as options involving more sustainable practices. It predicts that in almost all cases, negative trends for nature will continue to 2050 and beyond.

It can be a tricky balance between commercial necessity and conservation but arborists, more than most other industry sector have a duty of care to ensure that tree work does not adversely affect important and often rare species and can be a great asset in data compilation and population counts.

## my SRT/SR (R) Evolution

This article was first published last year by TCIA magazine following a request to Chris to précis the move towards single (main) rope working in the arb industry. Chris is a man with views that entirely reflect our own and with a similar career path albeit parallel because we diverged off very early on into rope access and rescue from our mountaineering and caving roots but we always stayed active in arb work. Not for nothing is Chris our go-to man for arborist rope-work because of his cross-discipline knowledge and experience providing a well-rounded viewpoint. So this article deserves another airing with a few added notes because older readers will certainly recognise the terms and techniques from his early foray into tree work and younger readers will be glad they weren't around.

Wow! Authoring an article about single rope technique(SRT) — where to begin? I guess the first thing would be to explain the reason behind the title, then describe some of the many fabulous developments I have had the privilege to see and be involved in.

First, I want to say a few things about the nomenclature of this particular climbing technique. The term SRT has been around for decades in mountaineering, caving, rock climbing and then industrialrope-access work. A few years ago, when it started to become more popular in the tree care industry, some well-intentioned leaders of our industry felt this acronym was not particularly suited to our line of work. This was because, in tree work, we also use a single rope for other climbing methods, such as DdRT (doubled rope technique), and then also may use a second rope for DRT (double rope technique). It was confusing, and we needed to simplify our terminology.

The new acronyms decided upon are SRS (stationary rope system) and MRS (moving rope system). I personally do not use these terms, because there is nothing stationary about SRS except the fall of the line (standing part) from your anchor

point in the canopy. While climbing, the lead portion (working end) of your line is constantly in motion and moving around. So technically, the SRS technique is also an MRS technique. I am also a SPRAT (Society of Rope Access Technicians) trained climber, and since they use the term SRT, I will continue to do so as well. Therefore, for the purpose of this article, the reader can consider SRT to have the same meaning and use as SRS, and DdRT to be the same as MRS. [ED: I'm with you Chris. Having been in at the start of rope access I'm still smarting that they changed the name from our own 'invention' of Industrial Mountaineering, admittedly a bit long-winded. For SRT, it's tricky to lose the term SRT when three of the four disciplines (access, rescue and tactical) are still using it to describe the same thing being described as SRS in arb work.]

The reason I used "(R)Evolution" in the title is because in the last 10 years, the industry has seen both a revolution and evolution in climbing techniques that has never – in its more than 100 years – been seen before. It truly has been an incredible time to be involved in tree work, and climbing in particular.

I turn 57 this year, and have been a climber literally since I was able to crawl.

#### by Chris Girard

Chris Girard sits on various Rope Industry Standards committees, is an ISA Certified Arborist, a Society of Professional Rope Access Technicians (SPRAT) Level 1 Technician and owner of Girard Tree Service, a 15-year TCIA member company based in Gilmanton, New Hampshire, USA.

My mother likes to tell the story about when, as an infant and learning to move about, I would be found on top of my dresser, having climbed out of my crib and onto the side of the dresser. It got so bad that she had to tie a fishing net over the top of my crib to stop my adventurous baby ascents into the unknown!

When I became a tree climber years later, I started out like everyone back in "the good old days" climbing DdRT. I used a traditional (closed) climbing system with a taut-line hitch as my attachment knot. It did not take me long to switch over to a split-tail climbing system, with a micro pulley and Blake's hitch attachment knot. (Photo 1)

Always inquisitive, I followed the industry closely and kept up with what was happening in the climbing world. I vowed I would learn all I could about proper tree care and climbing and become a certified arborist as I gained more experience.

Living in New Hampshire, I was lucky enough to learn that the National Arborist Association (now TCIA) HQ was less than an hour away from where I lived, and that they put out a monthly called *Tree Care Industry Magazine*. I subscribed and devoured every climbing article I could find.

Ascending the canopy back then certainly was not what it is today. We either footlocked, body thrust or, if it was a removal, spiked up the tree. Occasionally, we would use a ladder to begin our ascent and then switch to an alternate lanyard technique (ALT) until we reached our TIP (tie-in point). Having by then given up my childhood climbing methods, I always

Having a love for all forms of climbing,
I followed what was happening with climbers in mountaineering and caving (spelunking) and noticed how efficiently they were able to

stayed 100% tied off.

ascend and descend using mechanical devices. Knowing how inefficient footlocking is from an energy standpoint, I decided to use SRT caving techniques to ascend the tree and then switch over to my usual DdRT work-positioning system. I have since learned from SRT pioneer Tom Dunlap that other tree climbers also were using this method, and were calling it a "single-up, double-down" procedure.

I chose the European frog-walker system for its ease of setup and smooth ascent style. (Photo 2) Cavers had been using this system since Fernand Petzl started making mechanical ascenders and descenders in the 1960s, and the first ascender, the Jumar, manufactured by Jümar Pangit, came on the market in 1958. My frog-walker system consisted of a 7/16-inch (11mm) kernmantle rope (important for low elongation), hand ascender (with a tether secured to my harness bridge), chest ascender and foot ascender. This system was a variation of the "sit, stand" method of ascending, also known as the Texas climbing system (for a full description of both systems, see chapter 7 of TCIA's "SRT Best Practices for Arboriculture" manual) [ED: and for further detailed exploration of ascent techniques try to get hold of a copy of Padgett & Smith's ON-ROPE first

published in 1987]. The benefits of using the frog-walker system were immediate. It was a very compact system without a waste of energy (known in the climbing world as an "energy leak"), like I used to have with the footlock. The chest ascender also allowed me to keep a more upright climbing position on the line, which, again, added to the efficiency of the system.

One thing I always made sure to have with me while ascending was a way to descend in the event of an emergency. While many kinds of mechanical descenders were on the market at the time, settled on the simple, trusty figure-8 descender, with a Prusik loop backup set above. (Photo 3)

I would ascend on the frog-walker system, keeping my DdRT (split-tail system) clipped to a side D-ring on my harness. When I reached my TIP, I would just move my split-tail climbing system over to my bridge and do a changeover. I was then ready to begin work. I could leave the SRT line in the tree if another climber wanted to ascend, or just lower it back to the ground.

Remember, at this time there was no such thing as a multiscender tool like we have today, that allows you to ascend and descend as well as work off of an SRT line. [Actually Chris, in the 80s we did use the lesser known Troll ALLP descenders (right) and other 'bobbins' like the original Petzl Stop and unregulated Bobbin, in conjunction with a legloop on a handled ascender to travel up and down over shorter distances (so a kind of multiscender) pulling through the tail while ascending. A Similar, action to, though nowhere near as efficient as, today's dedicated arb multiscenders compare the fairly unsubtle edges on our ALLP (of which only 8 were sold in this first version) with the sleek metalwork of today's RopeRunner and Zigzag above!]

The *Unicender*, developed by mechanical-tree-tool genius Morgan Thompson of *Thompson Tree Tools* in Ithaca, New York, was still a ways off. There were tools in the industrial ropeaccess/sport world that I tried, such



Photo 1: The author employs a split-tail climbing system. Unless otherwise noted, photos by Rebecca Girard, courtesy of the author. In these photos, the author is shown inspecting his climbing system prior to ascent, and for that reason has not yet lowered his Z87-approved visor. Photo 2 below: European Frog-Walking System.



Photo 3: Figure-8 descender with Prusik loop backup.



as the *Petzl Grigri*. This did allow me to work and descend SRT, but it was not very conducive to the movements tree climbers encounter in the canopy on a daily basis, plus you always had to do a changeover from ascent to descent/work position before beginning your vertical tasks.

So I worked with my frog-walker change over system for quite a while before finding my next (r)evolution. The day I opened the April 1995 TCI Magazine and read the great Jeff Jepson's article, "A New Climbing Technique," I thought I was in climber's heaven! Jeff called this new technique single rope climbing, or SRC for short. (Available in the TCI Mag archives at tcia.org/TCI-publications/ tci-magazine/pdfs/04-1995-TCI-Mag.pdf.) As stated in the article, there are many variations of this technique, but the one I found most useful and next incorporated into my climbing system was a combination I called the frogwalker-moving-false-crotch system. (Photo 4) I could not find an acronym that would work for this technique! With this system, your SRT line acts as a moving false crotch while you are working in the tree. The SRT rope is anchored to the base of the tree, using whatever basal anchor system you choose. I used a mini Port-A-Wrap with a prusik backup. (Photo 5) This allowed my ground workers to lower me in the event of an emergency. They were all used to using a Port-A-Wrap, so there was no need to learn some new I owering system. One trend I saw when SRT was first making its appearance was the use of unnecessarily complicated lowering systems.

I would ascend using the frog-walker system, but with the moving false crotch, which was also my DdRT split-tail system, attached to my harness bridge and the lower hole on the handled ascender. My split-tail system would consist of a 1/2-inch, 24-strand climbing line attached to the bottom of the hand ascender with a micro-pulley and Delta screw link. I used an 8mm split-tail cordage tied off with a Blake's hitch. I also attached a split-tail backup above the hand ascender as security for when I would be working off the hand ascender.



The beauty of this system is that at any time during the ascent, you can stop and change over to your DdRT system, limb walk, work the tree and then return to SRT and either continue ascending or descend back down easily and efficiently. I used this system for a number of years and was incredibly happy with its performance.

#### THE TOOLS

Being a long-time member of the on-line tree care forum TreeBuzz. com (having joined back in 2003) allowed me to watch and learn what other openminded climbers were doing in our industry. ITCC World Champion Mark Chisholm and Tom Dunlap have done such a great service in helping us spread the word about new innovations through their online forum that we all owe them a great deal of thanks for their contributions to our industry. Around 2005, Dunlap started talking about a great tool for working the tree in SRT mode called the Unicender (above). In what can only be described as divine intervention/fate, Dunlap happened to see Morgan Thompson at a TCI EXPO with a prototype of the Unicender hanging from a line. Being the inquisitive climber he is, he went over





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#### **SPECIFICATIONS**

**APEX 1.5 Single Swivel Pulley** 

Model #: NFPA165120 Aluminum, Stainless Steel Material: Finish: Anodized, Blue/Grey 5.8" x 2.9" **Dimensions:** Weight: 10.8oz (306g) MBS: 38kN WII: 9.4kN Rope size: up to 13mm **Sheave Major Diameter:** 2.0" 1.5" **Sheave Tread Diameter:** 

\*NFPA-G Certified



investigate this odd-looking mechanical wizardry. Dunlap immediately saw the potential of this unique tool and, with the Tree-Buzz forum, was able to spread the word online. This, to me, is where the SRT "revolution" had its beginnings in the tree-climbing world.

This tool allows a climber to ascend, work the tree and descend all on one line, without having to do a changeover to a different climbing system. The Unicender acts as a mechanical hitch, and can easily be attached mid line in either an SRT or DdRT system.

Fast forward a few years and again SRT history was made. The venue was the 2010 Pittsburgh, Pennsylvania, TCI EXPO, and I had the honor of assisting Dunlap in the first SRT demo TCIA had on the trade-show floor. After our presentation, Dunlap invited Kevin Bingham, another SRT pioneer, to come up on stage and demo a new tool he had invented and was calling the Rope Wrench. Bingham's original Rope Wrench was, literally, a carved piece of wood with holes in it that the rope went through. It was shaped like a wrench and created a bend in the climbing line. When connected to your climbing hitch,

this tool would add friction above and lessen the friction below, at the hitch, allowing the climber to move easily up and down the line in an SRT mode. In a sense, it created a kind of DdRT system similar to my moving-false-crotch system, but was much less complicated.

Surprisingly, it took a long time for climbers to understand the simple physics behind the Rope Wrench and to fully grasp the concept that it was safe and provided potential for use in the canopy that we had only previously seen with the Unicender. Luckily, there were people in the audience who understood what they were seeing and got on board with Bingham and the Rope Wrench. I am proud to say that I am an owner of an original ZK-1 Rope Wrench made by Bingham and his company, Singing Tree

Rope Tools, in Detroit, Michigan, as well as a ZK-2 Rope Wrench. (Photo

6). Once the Rope Wrench took off, it went worldwide. It became so popular that Singing Tree had to have outside help to keep up with demand. Bingham teamed up with the North Wales company International Safety Components (ISC), which now manufactures the Rope Wrench and continues to put out a first rate piece of gear.

Never one to rest on his laurels, Bingham next produced another multiscender tool that he called the Rope Runner. This 100% mechanical device works well in both SRT and DdRT mode and performs similarly to the Unicender. It is great for commercial work because it is compact and easy to use, and the parts can be replaced after they wear out. Of course, being the gear junkie that I am, I had to have one and try it out. After experimenting with different ropes to see what worked best for me, I was able to add another climbing system to my collection. (Photo 7)

Shortly after Bingham's Rope Wrench made its debut, another SRT pioneer introduced another incredible mechanical wonder in 2012. Once again, thanks to TreeBuzz, we found out about Paul Cox and his Hitch Hiker SRT tool.



Photo 7: Singing Tree's Rope Runner.

Photo 8: The Hitch Hiker.



**32** 



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#### **ROPE TECHNIQUES**

Cox is an arborist who started working in trees in 1988 in England and relocated to the U.S. He owns and operates a tree care service and a tree tool company called RopeTech in the beautiful rolling hills of Virginia. Cox is also the inventor of the Rope Wraptor gas-powered ascender. This tool will effortlessly put a climber up in the tree, as well as prolong one's career in the tree care industry. One of his greatest contributions, and one for which he is not given the credit he deserves, is his introduction of the Sena Bluetooth helmets to the tree care

Photo 9: Rock Exotica Akimbo (pic courtesy of Philip Ruiz)

Photo 10: The Petzl ZigZag and Chicane.



industry. These really were, and are, a game changer, and anyone who has ever done crane work with one and then without one really knows what we were missing. I could go on and on about Cox, but let me tell you a little about his Hitch Hiker SRT tool. Back in 2012, I was lucky enough to be involved in the review of TCIA's original "SRT Best Practices for Arboriculture" manual, an industry first. Donny Coffey, CTSP and owner of Nature's Canopy in Tyrone, Pa., and Tchukki Andersen, CTSP, BCMA and TCIA staff arborist, worked extremely hard on this manual to bring us the information involving SRT that was starting to pour out worldwide on the climbing scene.

At that time, having known Cox for a number of years, I asked him if he could send me a prototype of the *Hitch Hiker* to try out and include in the manual. Cox graciously sent me one, and I was immediately impressed with it! It is a compact multiscender tool that allows a climber to ascend and descend easily, and also works great in SRT and DdRT mode. It incorporates a friction-hitch cord wrapped around an ingeniously designed aluminum "heat-sink" friction device. (Photo 8)

By this time there were so many diverse types of multiscender devices out there that I thought there could not be anything new coming out. Then I heard the 'hype' about the Akimbo and decided to try it. The original US master of metal Rock Thompson of Rock Exotica (no relation to Morgan) took arborist Jamie Merritt's unique multiscender tool and made it available to the climbing world. (Photo 9) It, too, works along the same lines as the Rope Wrench and Rope Runner, creating bends in the climbing line and adding friction to a mechanical SRT device. It also can be used in DdRT mode. I honestly do not feel I gave it enough

feel I gave it enough time to dial in which lines and settings worked best for me, so for now I have set it aside.

know there are countless climbers out there who swear by it, so it just goes to show there is an SRT system out there for everyone! After the Akimbo, I really did not want to try anything else out [ED: you can have too much of a good thing!]. I had a number of different SRT and DdRT climbing systems, and I would climb on one until I got bored and then switch to one of my other systems. I kept hearing about the combo of Petzl's Zigzag and its new Chicane, but being a loyal supporter of Bingham, I thought Petzl had just ripped off the Rope Wrench design. Then, around 2020, I thought, "What the heck, I'll give the Petzl SRT combo a try." (Photo 10)

Well, I could not have been more wrong about it! The Petzl Chicane, though similar in design and function to the Rope Wrench, is really designed and tested to work in combination with the Zigzag. It is larger and not as compact as the Wrench, and can be difficult to open onehanded, but the ascent and descent are really incredibly smooth. The Chicane can easily be removed, allowing the Zigzag to be used in DdRT mode. I do not look at it as a rip-off of the Wrench, but as a modification to a design, similar to the way people modified the first chainsaw to make improvements to it. The Petzl combo is currently my daily climbing system for both SRT and DdRT. I climb SRT 100% of the time, unless I am doing a crane removal. I forever gave up the body-wrecking footlock technique that for so long ruled the industry.

I know there are some climbers who still like to footlock, but all I can say is, try doing that daily at 55 years old and see how long you last!

We have many great, ingenious tree climbers out there to whom we owe a world of debt and who I am happy to call friends. I also am proud to have been a pioneer in SRT tree climbing, helping spread the word about this fantastic way to climb. I eagerly await the next gamechanging (r) evolution system.

Until then, climb on and climb safe!





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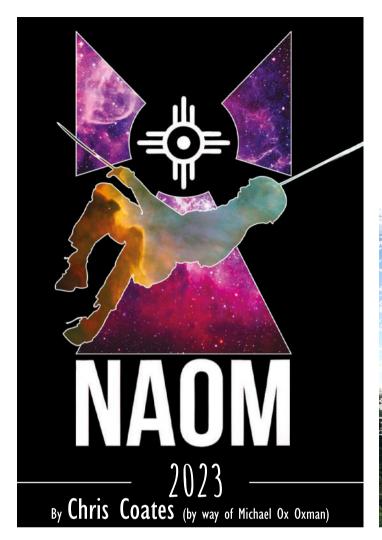


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[ED: Ox has been supporting the NAOM events since their inception and is keen to not only promote the next one in 2023 but have us include Arb guru Chris Coates' précis of his baby which some of you will have already seen. Regulars will know that we often feature competitions in ARBCLIMBER and NAOM is only one of many but they do have a flair for promotion and having Ox using his inside line in the magazine to help promote the event doesn't hurt. The competition rules are a work of art in themselves and for those interested in what it takes to

compete at events like this we've shown the full set of entry rules here. Already in 2023 there has been a competition at Davis Arboretum, Auburn University in eastern Alabama and for those in Canada or wanting to head further north, the next one is in Quebec in July.]



- We welcome and support people of all backgrounds, cultures, religions, sex, sexual orientation/preference, and climbing styles.
- Community is at the heart of what NAOM is about.
- The trees must always be protected and treated with the utmost respect at our event and everywhere.
- This is a tree climbing competition, safety is of the highest priority. It is our expectation that no competitor or volunteer be under the influence of drugs and/or alcohol during the event.
- Personal protective equipment is always required inside the ring and is required anytime you are climbing and/or working within a drop zone.
- Be respectful. Everyone deserves respect and positive intent is expected. Greet people with smiles!
- Everyone is expected to give their best effort to honor themselves and the safe, ethical & artful pursuit of competitive and recreational tree climbing.
- Respect all judges and techs in and out of the ring
- We firmly believe that trying is everything and winning isn't. Winning or losing with grace means so much
- Leave no trace. Please help us ensure that we clean up after ourselves and reuse, reduce & recycle.
- Bringing your own refillable water container is extremely helpful.
- We expect competitors and volunteers to show up early and on time for the event.
- In order to compete in ((NAOM)) the climber must have competed in 3 competitions
   \* Climbers who have volunteered twice at NAOM are allowed to register to compete with approval.
   \* There are 5 spots reserved for novice climbers who are local to the event, as an opportunity to learn.
- We reserve the right to ask people to leave the event and vacate the premises if they are found to be violating this code of conduct and ethics.



feel very fortunate. Thank you to all of the people who continue to support this event! I lean on a lot of great people and I'm super grateful for those who passionately give their time.

There are a few things that I'd like to share with everyone as this event continues to grow and expand. We have a strengthened focus on education during and proceeding the competition and looking to bring you some of the best speakers and minds from the Americas & beyond.



If you haven't had a chance to visit a North American Open Masters event this is the year. If you competed in the past or have been a volunteer I encourage you to come back again as we are always learning and working hard to make the event better. This year we put together our rule book and took it to print, still can't say how

happy I am with how it turned out. Please stay tuned as we will make revisions this year. Also the rule book will be available in

# **COMPETITIONS**

# QUALIFYING FOR THE MASTER'S MASTERS

- The top five competitors with the highest scores will move on to the master's master. If the
  competition is running 50 or more competitors the top 6 scoring competitors will move on to
  run in the master's master.
- If there are 2 or more women competing in the event, the top scoring female will be one of the qualifying 5 to run in the master's master.
  - \* If there is only 1 woman competing in an event she will move on to the master's master if she places within the top 5 scores.

WE LIKE FOR THE SCORING JUDGES TO DRY RUN THE EVENT THAT THEY'RE JUDGING.



Spanish and French this year. Stoked about that!

Over the past several years this event has challenged many of the best climbing arborists in North America to push themselves farther and sometimes even break boundaries in their climbing. At least this is the feedback that we receive from many climbers and volunteers.

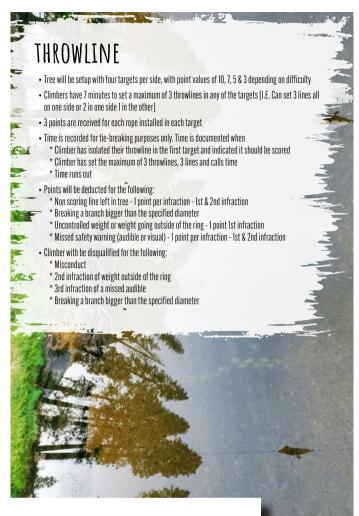
Please keep up the great work!

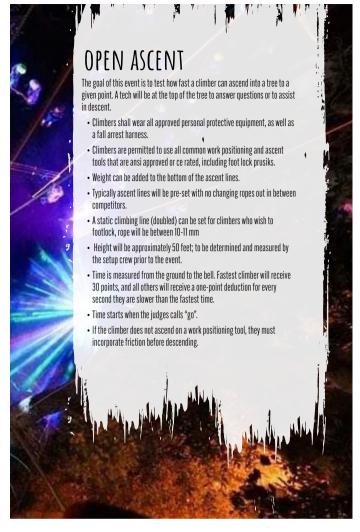
This event has changed the game for many reasons. NAOM still continues to offer the most in-Tree time of any tree climbing competition in the world. At least 60 minutes of tree climbing fun. I say if you're going to be at a tree climbing event for 3 days like the standard event, why not get as much as 60 minutes compared to 10 to 11 minutes of climbing. I'd like to lift up and thank all of the people who have helped bring to fruition the blind and sequestered aerial rescue event. Which has raised the standard by creating a more authentic and challenging experience that's every bit as educational as it is fun.

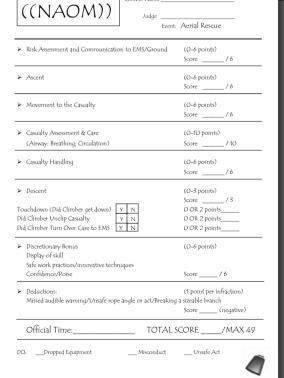
We are committed to being environmentally conscious, this year we will reduce the events plastic consumption, bottles and otherwise by 90%. We are strengthening our focus on the preservation of the trees that we use at every site and are

MA	STER'S PRE-LIMB
The goal and move	of this event is to challenge and test the climber's ability to safely set a climbing line in a tree, asce s smoothly throughout the crown of a large tree, move efficiently through all the objectives placed i and safely remove all equipment from the tree within the allotted time.
*1 *γ	rave 4 throws to score while setting a line st throw is worth 4 points, 2nd is worth 3, 3rd is worth 2, 4th is worth 1 ou also score points based on height (2-3 points)
• Once	e are 7 points available for setting a line. Aim high and choose wisely the climbing line has been safely installed competitors will be scored on how safe, secure, smooth ient the ascent is. 0-5 points available
• There * T * S * S	e will be 4 work stations in the tree (0-3 points each station)  ie in/redirect - (safe situation)  * 3 points for getting a stick in the target on the first toss, 2 points for second toss toss, 2 points available for the plumb gauge  * 0-3 points available for the plumb gauge
• A tot	al of 2 points is awarded for the completion of each station
	saw must be taped.
100	nds must be utilized to complete the handsaw and pole saw stations.
lanya	e are 62 possible points within the work stations. In order to complete a station the climber must $\sim$ ord in, call or signal warning & ring bell. pving all equipment from the tree within the time limit is worth 5 points
• There	orning an equipment from the dee within the time limit is worth a points are 0-5 discretionary points based on skill, smooth gear retrieval, safe practices, innovative or ent techniques, etc
	ctions will be given for missed audible or visual warning, unsafe rope angle or act, breaking a sizable branch
* B	pers will be disqualified for treaking a limb bigger than the specified diameter * Misconduct Insafe act * Dropped equipment
• Ther	e is a total of 84 points for this event.
	((NAOM))
	Judge  Event: Prelim Masters Tree:
	➤ Installing Climbing Line
	# Throws Height of Crotch  1st 2pt 2pt 4st 3 2 (1997)
	4 3 2 1 Score/MAX7  > Entry safe, secure, smooth, efficient (0-5 points) Score/ MAX5
	➤ Work Stations (Sections A-D: O-3 pts per box)  Polesaw Handbell Limbtoss Limbwalk
	A - Rope Angle
	> Station Completed (2 pts each)  V/N  V/N  V/N  V/N  V/N  V/N  V/N  V/
	Completion is defined as lanyarding in, calling (or signaling) warning, and ringing bell.  Additional three points available for 1º stick in target at limbtoss; two points for second stick.  Three additional points available for plumb gauge.  (Sconing team will total) Score/MAX 62
	➤ Removing gear from tree within time limit (O OR 5 points)
	Score / MAX 5  ➤ Discretionary Bonus (0-5 points)  Display of skill
	Safe work practices/Innovative techniques  Confidence/Poise  Smooth gear retrieval  Score / MAX 5
	> Deductions: (1 point per infraction)
	Missed audible (or visual) warning/Unsafe rope angle or act/Breaking a sizeable branch  Score(negative)
	Missed audible (or visual) warning/Unsafe rope angle or act/Breaking a steable branch Score (negative)  Official Time: / MAX 84

**EVENTS** www.rescuemagazines.com

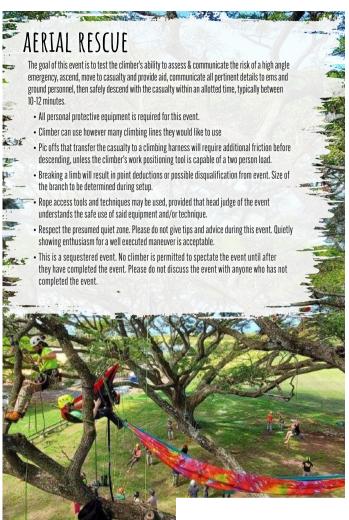








## COMPETITIONS



The goal of this event is to challenge and test the climber's ability to safely set a climbing line. ascend, move smoothly and efficiently through all the objectives placed throughout the canopy and then safely remove all equipment from the tree within the allotted amount of time. Begins with a visual tree assessment that includes noting hazards, expressing work related knowledge and creating an overall plan. 0-8 points available You have 4 throws to score to while setting a line 1st throw is worth 4 points, 2nd is worth 3, 3rd is worth 2, 4th is worth 1 \* You also score points based on height (2-3 points) • There are 7 points available for setting a line. Aim high and choose wisely Once the climbing line has been safely installed competitors will be scored on how safe, secure, smooth & efficient the ascent is. 0-5 points available There will be 4 work stations in the tree (0-3 points each station) Tie in/redirect - (safe situation) \* 3 points for getting a stick in the target on the Slack tending/management, rope tension first toss, 2 points for second toss \* Posture/balance/movement 0-3 points available for the plumb gauge \* Route planning to/from each station A total of 2 points is awarded for the completion of each station Handsaw must be taped. • In order to complete a station the climber must lanyard in, call or signal warning & ring bell. There are 62 possible points within the work stations. Removing all equipment from the tree within the time limit is 5 points There are 0-5 discretionary points based on skill, smooth gear retrieval, safe practices, innovative or efficient techniques, etc... Deductions will be given for missed audible or visual warning, unsafe rope angle or act, breaking a sizable branch. Climbers will be disqualified for Breaking a limb bigger than x diameter \* Ilnsafe act Misconduct \* Dropped equipment

committed to spreading the culture and ideals of good tree climbing safety and ethics. We have had the pleasure of hosting upwards of 200 different volunteers over the past 8 years.

Through generous donations, competition dues and sponsors over, \$180,000 has gone toward education, safety training, community building, sponsorships, lodging, food and entertainment. We have also generated an estimated \$200,000+ going toward local economies through arboretums, like the US National Arboretum, or city parks like Forsyth & Daffin Park in Savannah Georgia. The city of Wichita, Williamsburg Virginia and Jim Belushi's farm out in Eagle Point Oregon also

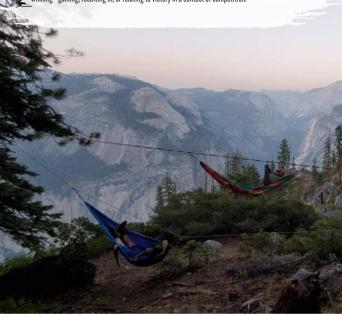
Judge	: Aerial Rescue
Risk Assessment and Communication to EMS/Ground	(0-6 points) Score/6
➤ Ascent	(0-6 points) Score/6
Movement to the Casualty	(0-6 points) Score/6
Casualty Assessment & Care (Airway; Breathing; Circulation)	(0-10 points) Score/10
Casualty Handling	(0-6 points) Score/6
➤ Descent	(0-3 points) Score/3
Fouchdown (Did Climber get down)  Y N  Did Climber Unclip Casualty Y N  Did Climber Turn Over Care to EMS Y N	0 OR 2 points 0 OR 2 points 0 OR 2 points
Discretionary Bonus     Display of skill     Safe work practices/innovative techniques     Confidence/Poise	(0-6 points)  Score / 6
➤ Deductions: Missed audible warning/Unsafe rope angle or act/Breaking	(1 point per infraction) g a sizeable branch Score (negative)
Official Time: TOTAL:	SCORE/MAX 49

((NAOM))	: Aerial Rescue
➤ Risk Assessment and Communication to EMS/Ground	(O-6 points) Score/6
> Ascent	(0-6 points) Score/6
➤ Movement to the Casualty	(0-6 points) Score/6
Casualty Assessment & Care (Airway; Breathing; Circulation)	(0-10 points) Score/10
Casualty Handling	(0-6 points) Score/6
➤ Descent	(O-3 points)
Touchdown (Did Climber get down)         Y         N           Did Climber Unclip Casualty         Y         N           Did Climber Turn Over Care to EM5         Y         N	Score / 3 0 OR 2 points 0 OR 2 points 0 OR 2 points
Discretionary Bonus     Display of skill     Safe work practices/innovative techniques     Confidence/Poise	(0-6 points) Score / 6
<ul> <li>Deductions:</li> <li>Missed audible warning/Unsafe rope angle or act/Breaking</li> </ul>	(1 point per infraction) g a sizeable branch Score (negative)
Official Time: TOTAL	SCORE /MAX 49

**EVENTS** 

## DEFINITIONS

- Tree a woody perennial plant, typically having a single stem or trunk growing to a considerable height and bearing lateral branches some distance from the ground.
- · Learning the acquisition of knowledge or skills through experience, study, or by being taught.
- Arboriculture the cultivation, management and study of individual trees, shrubs, vines and other perennial woody plants.
- Climbing the activity of using one's hands, feet and body to ascents a steep topographical object. It is
  done for locomotion, recreation, competition, and within trades that rely on ascension, such as emergency
  recrue.
- People a human being regarded as an individual or a collective group
- Homo sapiens the primate species to which modern humans belong
- Winning gaining, resulting in, or relating to victory in a contest or competition.



support local businesses, restaurants, hotels and artists from the tree climbing community.

Expect transparent finances, streamlined easy to understand scoring, with same-day posted results.

One of the things we are most proud of is our continued community engagement. Since 2017, each scoring judge has been required @NAOM to dry run their event both climbing and running a score sheet before the event begins on Friday. Doing this has strengthened our volunteer crew and has been a catalyst toward improving the abilities of many climbers, new and experienced.

All this happens while increasing the understanding of the rules and best practices of competitive tree climbing, and increasing confidence in well-vetted and accurate scoring. Our goal is to get everyone climbing and interested in tree climbing and competing. Creating a wonderful cycle of authentic grass roots growth.

Approximately 70% of the funds raised for NAOM come from the climbers, volunteers and small business owners from the community and Tree care companies.

- Cultures the customs, arts, social institutions, and achievements of a particular nation, people, or other social groups. As well as the knowledge, beliefs, laws, customs, capabilities, and habits of the individuals in the groups.
- Humility a modest view of one's own importance.
- Community a feeling of fellowship with others as a result of sharing common attitudes, interests, and goals.
- Love (n) an intense feeling of deep affection. A great interest and pleasure in something.
- Skill the ability to do something well; expertise.
- Work practice execution of specific duties and tasks while leveling potential hazards or risk factors that
  can compromise health and safety standards.

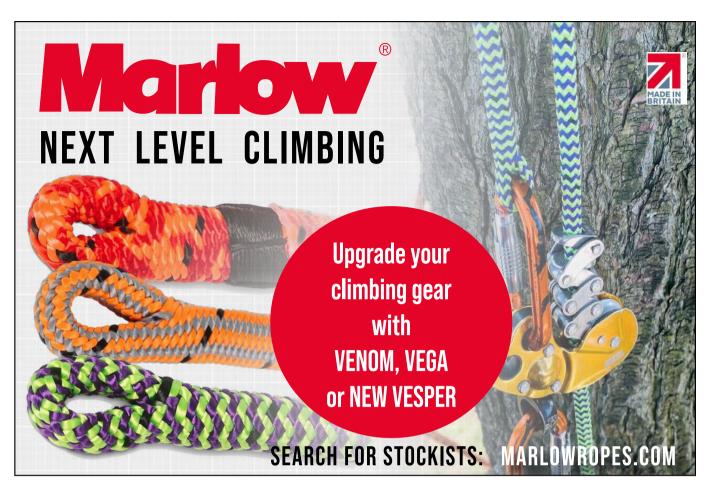


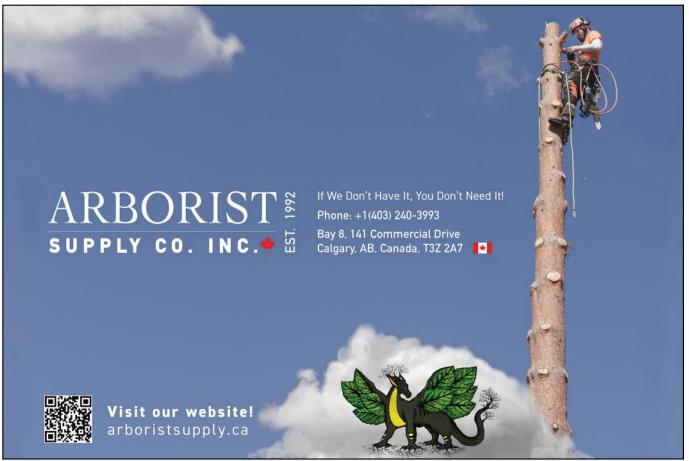


Things to expect from NAOM in 2023!

- Continued support through the (wire fund) that will sponsor two climbers one from Canada and one from Mexico @ each event;
- Expanding our network and involvement with new friends, artists and lovers of competitive Tree climbing into Mexico and Canada;
- Strengthening of environmental ethics and culture;
- Expanded education & training, CEU's etc;
- NAOM shirts and merch;
- Increased investment into our audio visual experience;
- Help with lodging for our scoring team & techs;
- 5 square meals;
- Swag for volunteers and climbers;
- An increase in safety and mitigation of liabilities;
- FUN!;
- A general desire for more @NAOM.

So... What are you waiting for? Come check out what has become one of the most exciting, organized and competitive tree climbing events on the planet. Don't miss your opportunity to volunteer or compete. Thanks! Big love to everyone!"









Redefining standards

Husqvarna

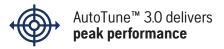
Designed for tree care professionals, by tree care professionals, our new T540 XP® Mark III features a remastered design for increased reliability, maneuverability and power. And it pairs perfectly with our new arborist climbing gear, creating an ecosystem of arborist solutions so you can be up early, down safely.

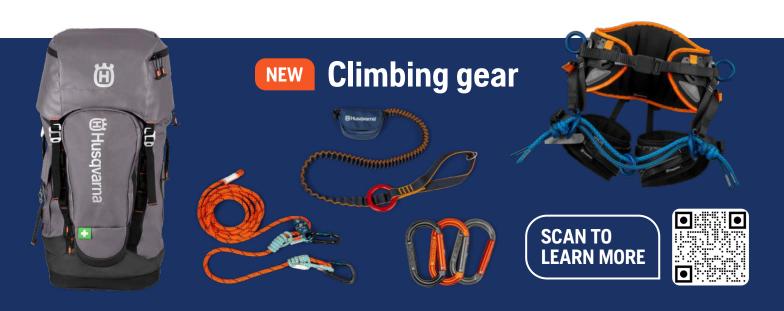




**Exceptional** power-to-weight ratio











Do you remember the original Whillans harness? If you do, you're probably from the UK and probably getting on a bit. Don Whillans, bless him, was a god in the mountaineering world and his Troll Whillans harness was, throughout the seventies and early eighties, the pinnacle of climbing harness design. As a mountaineer myself I felt that my trusty Whillans was just the thing for tree work since the Willans was already a renowned brand. Imagine my consternation on discovering that not only did I have the wrong Mr Whillans but that my version had a wicked, and I do mean wicked, central tie-in eye that came up between your legs [rather than having round

leg-loops) and consequently had the very uncomfortable tendency to trap a testicle or two (if you were male) and didn't tie into the two attachment eyes emanating from the top of the waist belt. It was also not very forgiving if you were in an unusual position and in arbwork an 'unusual' position is the norm. So, far from the mountains where Don Whillans plied his trade another Willans, Major 'Dumbo' Willans without the 'h' developed, amongst many other things the Willans tree harness which had a sit (or butt) strap that coddled the buttocks like a leg loop never could, at least not in those

days. The sit strap eyes then formed the central hardpoint and hey-presto your testicles could breathe again.
Having glossed over my harness faux pas by insisting that I was trialling mountaineering gear for tree surgery I was mighty relieved when Troll produced their full body Manchester harness with sit strap which, though a messy pile of webbing, I actually could use for tree

work without risking sterilisation. The venerable Willans is still made by the original Willans Harness Manufacturing company founded by 'Dumbo' in 1972 and now in its RW59 or T22 guise.



### with Bridge and/or Sit Strap

Coultant

**images NOT** 

to scale

2023: Harnesses was the first GUIDE we had in ARBCLIMBER in issue 1, written in 2011, published in 2012 and in the intervening 11 or 12 years it is amazing just how many things haven't changed. There have been many new harnesses and updates of course and some have dropped off the production schedules altogether although, even more amazingly the Whillans T from the 70s that we mentioned in the original intro is still being sold! So we thought it would be useful to run our original text and insert update text (in this burnt orange colour) where necessary. We don't have room for both sets of images but again the majority that we used to illustrate the introduction in issue 1 are harnesses that are still familiar today - the Teufelberger Tree Motion, Petzl Sequoia, Buckingham Ergo, CAMP Access and the widely rebadged Protekt TH models. You may need to keep reminding yourself that the text in black is over a decade old. Where a term or date has been updated from the original we have shown the changed word(s) in orange as well as all updated 2023 text. All images are of models available in 2023.

**2011**: In the US, the type of harness we're looking at in this article is still more commonly described as a 'saddle' with the term 'harness' often reserved for lightweight, full-body, fall-arrest harnesses. To avoid any misunderstandings we refer to all webbing, load-support harnesses, whether they be sit, full body or sit-strap harness as.... harnesses.



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But it now has lots of competition because by the mid nineties several climbing and industrial harness manufacturers had realised that they were missing a trick not catering for the tree industry and started producing arborist harnesses that combined the best features of the original Willans with the original Whillans. Well, OK maybe not the original Whillans but a modern mountaineering harness with all its gear attachments and padded, safely fitting leg-loops etc. Of course the Willans didn't have the field to itself because the standard for most arborists, especially in the US was (and still is) the partleather 'saddle' as exemplified by the Buckingham, Weaver and Bashlin Classic Saddles and still made by these same companies for their traditional clientele (Weaver pin & hole belts shown on the right) alongside their more modern designs but there's no doubt that both Weaver and Buckingham continue to design 'out of the box' to cater specifically for the US market but all are moving more towards Euro-style technical leg-loop harnesses. The Weaver Denali for instance has water buffalo leather and an unusual double waist belt arrangement utilising 4 roll bar buckles in addition to the central AustriAlpin Cobra buckle. On the right are three of Weaver's current product range, the insets are traditional leather saddles with pin & hole belt and leg loops while the main image (and this issue's front cover) is their latest model, the Stratus. This is particularly interesting because it not only follows the trend in North America towards technical leg-loop harnesses, this particular model is clearly a much lighter and trimmed down harness with minimalist webbing at the front but huge padded areas on the back of the legs and waist belt where they are needed when load is applied. It uses simplified lightweight rings for the 'pole-strap D-rings' and a minimalist multi-ring (4-hole rigging plate) as the bridge union.

#### THE FLOATING (SUSPENSION) BRIDGE

With any single-central hardpoint harness, as soon as you manoeuvre off the vertical you are fighting both the pendulum effect of the rope and the restriction of the harness giving a forced rather than balletic, transitional action. In the mid to late nineties a veritable revolution in arborist harnesses saw the introduction of the floating bridge also known back then as a glide or butterfly strap which connects two widely spaced eyes or rings. A round ring or D-ring can slide the width of this bridge allowing a huge amount of lateral rotation of the hips in continued comfort. If you compare the three Weaver harnesses on the right you will notice that there are three very different tie-in options. The top harness is Weaver's new Stratus with the now common rope bridge, in this case tied off with a double fisherman's knot. Most modern harnesses allow you to add a second bridge to give redundancy and/or quick access to a different length bridge. This is often tied into one end of the first bridge with a Fisherman's so that it looks like you have a quadruple Fisherman's on the same rope ends (see inset pic above of Edelrid's Tree Rex). You can do the same on the other end or have the two ends separated so that you can more easily adjust the length on one or both. Some use a single rope



## **MARKET GUIDE**

length that is doubled using a girth hitch on one end and a Fisherman's on the other. The two D-Rings on a length of unusually wide webbing is an early (and still popular) design for use with the Split Tail System but most harnesses now use a much narrower double layer of webbing or rope for the bridge. This is always connected to D-ring or shackle unions between both the leg loop risers and the waist belt and ensures that the meaty thighs as well as padded waist are each sharing some of the load some of the time.

As you can probably guess, this design has very much

taken a back-seat though there are still a number of US models and the venerable old UK *Willans* offering the D-rings on a sit-strap arrangement. Instead, virtually

all modern harnesses have made the bridge union into an attachment eye for both the bridge or multiple bridges and additional SRT (SRS), DRT (MRS)

and lanyard attachments. The use of double lanyards in particular has become the norm since the first article making use

of both side D's and bridge union eyes or D-rings as can be seen in the *Vega* harness above. The sit-strap style connection has been sidelined because of its restrictive loading forcing the legs together instead of being able to stretch and reach as demanded by modern arb gymnastics but it's interesting to note that the prominent bridge union D-rings like *Petzl's SRT* version of the *Sequoia* opposite enable the same use as that traditional sit-strap design.

A component we are seeing more and more is the openable ring which can be used as a sliding bridge ring but with increased cost over a standard ring is better used at the bridge union for multi-directional loading as distinct from the more traditional shackle. This is *Courant*'s version, *Odin*.

The bridge on all harnesses receives a lot of wear, much more than any other component since it has a continually moving connection and is a textile rather than hardware fixing. Some are user-replaceable as they are connected by shackles and some use a tied length of rope rather than webbing. This has the enormous advantage of being cheap and

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easy to replace and of being able to incorporate rigging plates, swivels or pulleys as a link between the bridge and your main line(s). Of course, these things will also work well enough on webbing which is often double thickness and around 20mm wide so hardware slides easily on it. Those using rope bridges offer you the option of simply replacing the bridge with your own and tying off with a fisherman's each end. Indeed since the first article it is common

for the harness to come with a tied rope bridge or even two bridges offering different lengths for different systems and

for double lanyard working. Many still offer a bespoke sewn end or special termination rope bridges like Petzl who also offer an optional adjustable length bridge shown on the left. We have already mentioned the Edelrid adjustment option

using a small aramid prusik. Another interesting design is the Komet or Miller/

Sperian Morpho. This harness
(below) has placed the bridge shackles into a captive eye created by twisting the leg loop-to-waist belt riser into a kind of figure 8. This allows you to adjust the position of the bridge up towards the waist or down towards the

legs. The Morpho is still available (pic below) and this form of dual-usage bridge union has evolved to become the norm with more and more harnesses unifying the leg riser adjustment with a bridge length adjustment tied back to the waistbelt instead of the Morpho's ingenious but less adjustable twisted length of webbing. Its use of a shackle was also ahead of its time though present on the Polish Protekta models rebadged by a number of arb companies. This is still seen on some models and on others has evolved into 'multi-rings' which are large D-rings with a number of additional eyes for tying in your rope bridge(es). Still others are making more and more use of openable rings like Petzl, Edelrid and Courant and these can be bridge unions, bridge rings or even Side D's or side O's would be more accurate.

#### SIT-COMFORT

Whether you use a wide sit strap, (a bosun's chair/batten seat) or you use individual leg loops in the climbing style is largely a matter of personal preference. Virtually all harnesses now offer both, but some leg loops are intended to be primarily loaded like the Ergovation and Tree MOTION

harnesses (Figs3&8) and some are simply a safety back up like the Willans (fig 5) and the Petzl Swing variant of the Sequoia (Petzl now has just the two Sequoia models – regular and SRT versions but

both can accommodate the rigid Petzl bosuns seat). The latter is an interesting design that doesn't appear to compromise the size/width of the leg-loop webbing while integrating the sit strap. The original sit-strap-only harnesses did, and do, have the distinct disadvantage of squeezing your legs together and limiting your movement dexterity in the canopy,

they also had an alarming safety drawback in that you could fall through it if the sit strap is not properly in place and you don't have a Blutostyle barrel chest. A more common problem was that of falling out of it if you inverted. Leg loops therefore became the norm to improve safety but many arborists still insisted on the extra

perceived comfort of the sit strap because it spreads the load across a wider area and tends to support higher up the thighs or even up to the buttocks. A trend adopted by Harkie and Komet and shown on the Dragon is an enhanced support leg loop which extends like a fore-sail further up the thigh and acts as a kind of 'bucket' -seat this was exemplified by New Tribe with their ProGear2 harness and then all of their later harnesses like the Onyx which is still available while stocks last but New Tribe ceased trading from January 2023 after owner and rec-climbing pioneer Sophia Sparks decided to take a well-earned retirement. The Courant Koala shown on the title page has elasticated straps in its leg loops that allows very simple insertion of a wooden bosun's chair, which can be fixed using webbing with buckles.

#### **BELT HARDWARE**

A high proportion of aerial tree work requires you to lean into the harness while restrained by the rope or pole strap rather than supported in it vertically and this latter function is common to all arb harnesses. Pole strap D-rings are mounted on each side of the waist band and allow connection of a pole strap or cinching rope that goes around the trunk and clips into each ring. Climbers can either lean against the pole strap/flip line using spikes for purchase or stand on a branch or platform. In fig 10 the use of a flip line enables this arborist to lean away from the cut while his mainline provides essential safety back up and further enhances his balance. Note that using an intermediate swivel allows plenty of rotation without applying torquing



serve to illustrate modern trends in arb harnesses and in some cases has yet to make it onto other designs. The first aid or trauma kit, which, like so many now is stowed around the back and could be tricky to access in a dire emergency so Edelrid have installed a quick-release on the front – that small yellow toggle above the bridge union.

This pulls the first aid kit off it's mounts but remains attached via a length of thin webbing and a retaining eye for that

toggle. You can easily access the contents but to detach the kit altogether you simply rotate the toggle and push it through the eye.

On the bridge there is a prusik cord length adjuster connected through 2 of the 6 eyes on their comprehensive Bridge union plate. This is simply a shortener NOT a means to connect the bridge rope(s) which will ALWAYS be tie with a double Fishermen's on BOTH ends. If you were to use the prusik as the attachment there is a chance your bridge ring could slide down to contact the prusik and not only allow your bridge to inadvertently increase in length but perhaps release altogether. Edelrid advise using the prusik adjuster on one bridge but have the ring around both rope bridges simultaneously to negate accidental release of the prusik. While we're on this prusik it has another fairly unique feature — it's a 6 mm Aramid so it's super-tough and can instead of a prusik be run as a backup bridge if you wanted to run with a single full size rope bridge. In the event you cut into your bridge this thin back-up offers you a good chance of survival but doesn't bulk up your front working area.

On the rear is a grey coloured, reinforced eye that is rated for fall-restraint NOT fall arrest – it's a means to limit your ability to fall over an edge if working at height although many are utilising that huge strength as their chainsaw attachment point! The TREEREX also has an embedded RFID chip, something that, as of 2023 was in around 10% of harnesses but will likely be in virtually all life-safety equipment by the end of 2024. The huge number of gear attachment points started by the Teufelberger Tree Motion range with its myriad of eyelets and carried on by the likes of Husqvarna has been modified on the TREEREX as small sewn web loops (eyes) capable of holding a small gear carabiner or to thread cord for a customized gear rack ala rock climbing harnesses of the 1980's. Finally the rope has a wear indicator thread in red to really show up when it's time to renew your bridge, however a white core to any coloured sheath would count as a wear indicator for rope bridges.

## MARKET GUIDE

pressure which might destabilise your stance. Pole strap
D-rings in themselves are not intended for full abseil/rappel
loading but they do lend themselves to side-loaded work
positioning despite manufacturers comments to the contrary.
In rescue we have seen the advent of side-Ds that fold back
flush to the waist-belt when not in use and in arbwork
this is a particularly useful feature in avoiding
snagging while climbing/descending or getting
out of the way of a falling section. The most

recent and prolific change to harness hardware is use of the Austrialpin style Cobra buckle – this is a push-clip design. It requires the top and bottom of the buckle to be depressed at the same time in

order to release and is therefore a very safe design. Variations of this include Petzl's two stage release where a button is depressed for initial release then a hook arrangement has to be manually unhooked to fully separate. Since the first GUIDE, the Cobra style quick-release buckle has become the commonest means of securing the waist belt and leg loops. We have termed this design as Fast-Clip and they all require two buttons to be depressed to release. Many use the Cobra original (shown in our

alternatives from the likes of ISC and Skylotec's Oktalock as well as many unbranded versions which we have termed 'Fast-Clip'.

tables as AA Cobra) but there are now branded

#### **CHEST HARNESSES**

You may notice that none of the harnesses in the tables later in this article feature a chest harness or chest section. This transforms a sit harness into a full body harness capable of being used for SRT-style ascending with a Croll or frog-rig and as mentioned earlier, of meeting the EN361 safety standards because it makes the harness much safer in a vertical fall but importantly for arborists, not necessarily in a 'swinging' or pendulum fall. Nevertheless this perception of safety has caused full body harnesses to be mandatory in some organisations.

We have therefore included a row to show which models have some form of integration for a purpose-built chest harness or top section and this will, more often than not, correlate with EN361 even if the model hasn't gone through the test process necessary to obtain that standard. Two words of warning though, firstly some chest harnesses like the Courant and Petzl models shown here are dedicated to the fittings on their harness and not necessarily able to be used on other sit harnesses and secondly 'tool suspenders' are NOT necessarily load bearing though confusingly some are. They are an American product intended to support your sit harness if you have a narrow waist or to help transfer the equipment load

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from your harness to the shoulders. The fact that the vast majority of arborists insist on a sit-only harness is partly a question of taste and function since mobility is essential but full bodies can restrict movement and increase snag hazards. However, as with all roping activities at height there are times when a chest section can be a life-saver.... literally.... and it can certainly assist in difficult cuts or rigging locations that require prolonged

inversion.

#### **MORE SIT COMFORT**

Padding on the waist belt, sit strap and leg loops has become progressively more pronounced as our asses have evolved from leathery old saddle thumpers to soft, pudgy, lazy boy recliner occupants. But it's safe to say that the days of the unpadded leather belt have been waning for some considerable time and padding is like a Friday night beer, the more you have the more you want and you don't care how embarrassing it gets. To be fair, modern padding no longer entails stuffing your mum's pillow between you and the hard, rough belt or sitstrap. Now it is mostly all about thermo-moulding that puts the padding into neat little sections just where you want them without adding unduly to the bulk and weight and

allowing the belt to bend without bunching up the padding. That's not to say that you can't still find the odd sprung mattress sewn to the waist belt and that these aren't actually still more comfortable but it does now clearly differentiate a modern harness. Another feature that has increased in size, apart from some of your bellies, which is the lumbar section of the waist belt. This is the physical width of load bearing webbing, not necessarily padding. This gradual widening is not unique to the arb world, we first saw a radical change in the size of the back section of waist belts when CMC Rescue brought out their Instructor harnesses in the last century and many now emulate that. You only have to spend some quality time manoeuvring around a tree to realise that efficient padding and a wide support belt make life much more bearable on a protracted job. Teufelberger's TreeMOTION recognised this trend and is currently the widest lumbar section of all Arb Harnesses but you can be sure that others will follow. And indeed they did though many have stuck with strategic widening and padding rather than super-sizing the waist and

widening and padding rather than super-sizing the waist and leg loops. Singing Rock's Arbo Master in the ad opposite for instance has kept things simple but greatly widened the very rear of the waist and leg loops without carrying the width on all the way round. It became obvious very early on that when loaded the front parts of the waist and leg loops are pulled away from the body and don't need the same degree of comfort width or padding.

#### **FEMALE HARNESSES**

There are two harnesses in this guide that are specifically designed for women. What? The third decade of the 21st century and we're still only peripherally catering to 51% of the





population? Is it pink? Nope, did you know that in Victorian times pink was for boys and blue was for girls? Apart from Bo Hammarstrand, female arborists don't need a variation based only on pink, they need better ergonomics. Recreational climbing and mountaineering have had 'female' designs since the 1980's but usually only in terms of sizing. Prolific harness designer

Sophia Sparks of New Tribe, tree climber of many decades, also never saw the need for a gender--specific harness but this may well have been because loadings are primarily vertical. With a noticeable increase in female arborists in just the last 10 years the different needs of modern gymnastic arborsim has highlighted some ergonomic inefficiencies in the standard leg-loop designs. The Simarghu Gemini incorporates an additional set of pelvic straps that cross

to the inside of the usual leg risers to alter the way load is applied. In the vertical plane it's still the leg loop taking the load but when you move into more horizontal (pole-strap) and diagonal (limb-walking) modes as well as rotational leaning, the pelvic strps give much better support between the lower abdomen and groin. Now defunct UK manufacturer ChampionGear also used these additional pelvic straps in their female version. Neither harness is/was available in pink.

#### **GEAR STORAGE**

This is a very personal thing as it is in all harness oriented trades; you've got all those carabiners, pulleys, slings, tethers, flip-lines, ascenders, prusiks, first aid kit, pruning saw, chainsaw etc. to think about. Many harnesses come with a good array of gear loops and the ability to add more yourself as well as attachment points for tool clips like the Petzl

CariTool (latest EVO version shown here) which spawned a host of similar resin and alloy, carabiner-syle hooks (shown opposite). These include Courant, CT, Edelrid and Protekt but also more complex metal alloy wizardry from Rock Exotica (TransPorter shown below) & C.A.M.P. CMI now produce the Shembiner which is a simple but extremely robust and easy to use chainsaw hook while Buckingham went down the even simpler route of a resin clothes-peg style clip. DMM have embraced the concept of organising gear more than most with three sizes of their Vault carabiner as well as fold-flat clips as shown in the insets opposite and their Parking Lot adapter plate for fixing all kinds of hardware in the orientation to suit you – we've shown a regular gear clip but this could just as easily have been angled using different attachment holes. Some harnesses, and again we'll use the TreeMOTION as an example, give you an infinite range of connection and carrying options, as you might expect of just about the most arbengineered harness on the market. Some arb harnesses like the Weaver Cougar, Edelrid TREEREX TreeMotion Pro and







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Essential have a rear belay loop in high vis red which is a fully load-bearing connection on which you could hang though it is more useful as a work restraint attachment but don't confuse a non-load bearing gear or suspender loop with this or there will be dire consequences and not for the first time.

There are basically 5 types of gear attachment:

- the rock climbing harness style gear loop which can take a whole line of carabiners, hardware and software. This might be rigid and stand proud for easier clipping (as indicated in our tables) or hang more conventionally flush with the harness.
- the metal ring or eyelet which, in a larger size, may be used for connecting your chainsaw, but we now see a number of smaller rings positioned around the waist and even on the legloops for attaching gear. None of these are live-load-bearing and are always in standard silver whereas life-support rings are often (though not always anodized to avoid confusion.
- the integrated metal clip or hook often with a sprung gate and with a larger load capacity to carry the weight of a chainsaw – this is usually situated around the very back of the harness.
- the webbing, leather or plastic 'slot' which will hold a carabiner or Caritool which in turn gives you more space into which gear can be clipped. Most harnesses now cater for such Carritool hooks and these have the gate clearance and load capacity to be used for a chainsaw so many in our tables do not show an entry in the dedicated Chainsaw Eye/Hook row since the Carritools enable you to position your chainsaw exactly where you want it.
- Smaller web eyelets on some harnesses which are just large enough for a small carabiner or a cord. The eyelets restrict movement of a gear carabiner and are ideal for attaching a snap gate carabiner into which you can quickly clip pretty much anything. If you use a bent gate rather than straight gate carabiner you can also take advantage of the original rock-climbing purpose which is rapid location and 'capture' of whatever you need to clip but conversely, beware of trailing your rope across the gate. Individual web eyes are also good for direct attachment of accessory bags like throwlines and first aid kits or for attaching cord and making more gear loops. The Edge harness from Sherrill Tree and the Edelrid Tree Magic (initially replaced by the Tree Core and now by the TREEREX) maximise use of wide gear loops making pretty much the entire width of the waist belt a clippable area so there should never be any excuse for fumbling. However, bear in mind that if you overload a gear loop with too many carabiners full of ascenders, descenders, pulleys flip-lines etc. it can become difficult to locate let alone unclip your required item – good management is key....now go and tidy your bedroom.

Some folk prefer to climb 'clean' with little or no attachments other than an integral metal clip for the chainsaw while others are ready for an assault on the North face of the Eiger. The TreeMotion sparked a move towards both customisable gear attachments and LOADS of gear attachments. In Teufelberger's case they were sensible enough to realise that having such a complex range of options needed improved organisation so they colour-coded their integral attachments points as GREEN for primary life-support (bridge, side-D's and Bridge Union Rings) and red for secondary life support

or more accurately, restraint and chest harness attachment points. Nevertheless, many harnesses using black as their base material on the waist belt would benefit from better contrast colouring even allowing for the fact that you are meant to customise your own attachment points using the various holes and eyes BEFORE you start climbing. The ArbPro Tree Access3 below and its 'parent' the CAMP Tree Access Evo have used contrast colours on their gear loops and webbing eyes that greatly clarify where to clip – compare these the Sherrill Tree Edge and the Notch Sentinel. Both are predominantly black with

#### **STANDARDS**

black fittings.

Leg loops are also the only way your harness will meet certain relevant safety standards like Europe's EN (European Norms) and the US's ANSI. In fact the numerically challenging ANSI

**A10.14-1991** quoted here by

some manufacturers was withdrawn a few years ago in favour of a 2004 version but that too is a far more generic standard relating to a number of components in addition to the harness. But I think you'll find ANSI Z359.0 and it's numerous offspring are starting to cover things. **EN813** on the other hand is quite specific in its requirement for a sit harness to maintain a 100kg mass safely upright after a 2m free fall on a 1m lanyard and for its load-bearing components to withstand a 15kN pulling force for 3 minutes, fairly easy for many it has to be said. That's if a manufacturer is inclined enough towards the European market to go through the expensive procedures required to acquire EN certification. Virtually all of the models in this guide could meet both **EN358** and **EN813** even if they don't say so. 'Standards' is actually a whole 'nuther article but since we're on the subject you won't see **EN361** quoted in the following tables because that's a fall-arrest standard requiring the addition of a chest harness to pass the drop test. Many of these harnesses have the option of a chest harness which is vital for some SRT systems and would thus meet the requirements of EN361.

**EN358** refers to the ability of the side D-rings to act in a work positioning role and to also not impart more than 15kN of force to your dainty waist after a 1m fall -always assuming that, even after all those doughnuts you still only weigh 100kg or 220lbs. **ASTM F887** is for personal climbing equipment and is a useful and detailed standard which includes a section specific to harnesses rather than being generic. **EAC** is for eastern Europe

#### **CHINESE HARNESSES**

We have not included any because we cannot yet verify the certification. They often mention CE certification but there's nothing to stop them saying this when it isn't true – it is up to the importer. So, none are included here despite the fact that one or two appear to have decent components and stitching. A description as a 'Half-Body' harness and a price tag too good to be true should cause you to be wary but expect to see properly certified, verified, rebadged models soon.







#### IN THE FOLLOWING TABLES:

Prices are for the specific version listed. Some models, have too many variants for us to list, key variants are shown in blue. Similarly, so many older designs are still popular that they remain in production but we have only shown key, lealoop with bridge or sitstrap harnesses.

Prices and weight etc, are for the base model with standard features NOT options. Any feature that is an option is shown as an outline squares  $\square$ 

ORIGIN: The manufacturer's country but not always where it's made in which case, if we know, there is an inset flag. **COST:** approximate, rounded up and inclusive of local taxes which are generally 20% in Europe. Costs are the Recommended Retail Price and can often be found for less at your stockist. Prices in orange are a currency conversion only (as of May 2023) not necessarily the selling price because they do not include import costs and duty.

MAX LOAD: This is most often determined by either the standard it meets meaning that the actual max load could be higher or by the limit on a component like the bridge. CHEST HARNESS: None of these harnesses includes a chest harness. If the same company supplies a chest harness it will be shown as  $\square$ NB: suspenders NOT for life-support but will stop you coming out when inverted. ATTACH PTS(Points): Not always necessary. Integrated attachment points for a chest harness- or suspenders, usually rings or sewn loops on the top edge which can also be used as gear attachment points.

**BUCKLES:** The specific type of buckle used for the waist and leg-loops. Many use the quick attach/release AustriAlpin Cobra as the gold standard but if they are a similar principle but unbranded we have called them 'Fast-Clip'. ISC has its own version and Petzl has a bespoke hook and push-fit combination buckle. Some US harnesses use a traditional pin & hole waist belt but these are not directly attached to. BRIDGE TYPE: The number and type of bridge which will be rope or webbing or a double layer of webbing - some are stitched into place but most are REPLACEABLE referring to the ability to self-replace once worn.

BRIDGE LENGTHS If a bridge is tied rope it will be ADJUSTABLE but some that have a sewn termination like the Petzl or ArbPro model opposite, can also be self-replaced so there may still be a green square in the above row. Webbing is always sewn so not adjustable for length but may still be replaceable. CONNECTION TO BRIDGE: The attachment method from your bridge to your climbing/descending system as supplied with the harness. May be an optional purchase from the same manufacturer (shown as an outline square) or you can simply attach direct with a carabiner, but most are a ring(s) BRIDGE UNION: is the means by which the bridge is secured to the harness - this may be a rigging plate, shackle or ring offering additional bridge attachment points or it may be sewn in and fixed though that is unusual these days. LENGTH ADJ: refers to the ability to alter the distance between the bridge union and the sides of the harness, in essence, to tighten the bridge. SRT D-RING EYE REAR BELAY: a centrally mounted D-ring or WEB EYE that is fully load-bearing and often used for SRT/SRS or as an ascender rig attachment point. Occasionally there may also be a load-bearing belay loop or sewn eye on the REAR but in arborist harnesses these are too easily confused chainsaw eyes that are not load bearing in terms of human weight...

POLE STRAP D's: large, load-bearing D-rings mounted on each side for attachment of pole-straps/flip-lines or lanyards. Many will FOLD FLAT to the waist to stop being snagged while working but this can also hinder clipping in.

GEAR LOOPS: are wide, integral attachment loops, often stiffened and together with SEWN EYES for attaching gear carabiners are generally rated to around 5kg each -

CUSTOM GEAR CORD EYES: are usually smaller than the sewn eyes mentioned above but can be one and the same if sufficiently spaced. They may be sewn loops or punched eyes capable of around 1-5kg loading on each eye. BASIC HOLES/EYES: smaller attachment points for small accessory carabiners, may simply be a hole or t-shape

punched in the waist belt. RINGS may be metal or reinforced

plastic(resin) usually rated from 1 to 10kg but those intended as chainsaw lanyard eyes may be stronger.

CARI-HOOK CARI-HOOK EYES: We've modified the Petzl trade name for a specialist tool carrying 'carabiner' (Cari-Tool) simply because its a good description and the only way we could get to fit! This could equally be called a Carry Hook or Tool Carabiner but it does refer specifically to the carabiner style hooks which can also be used for chainsaw attachment, CARI-HOOK EYE refers to slots or pouches in the webbing into which a Cari-Tool type hook can be slotted and are a strong option most often capable of taking a chainsaw. CHAINSAW EYE/RING HOOK: A dedicated higher load capacity webbing eye or ring or a hook typically able to hold 15-30kg/33-66lb but the CariTool style hooks take the place of a dedicated chainsaw ring or hook on most modern designs and many standard rings or sewn eyes can also do the job as they're often used as a chainsaw lanyard attachment point but verify the load capacity first. WAIST PADDING SWAMI: All of these harnesses are padded

so they will all have a black square but then a description which is basically mesh lined, single sheet foam or thermoform foam which looks segmented and ensures the harness padding doesn't bunch up and stays firm. SWAMI is a second inner belt sometimes elasticated, that holds your harness on while you adjust the main load bearing waist buckles.

ATTACH POUCH/FIRST AID: Adjustable strapping, eyes or elasticated cord, normally on the centre-top of the rear waist belt, to attach a first aid pouch (or anything other equipment you want to hand but a first aid kit is essential).

WAIST BELTPADDING HEIGHT: The width of the waist belt webbing - usually less than 2"/50mm. The max height of the padding is shown in orange and is not the same all the way round - most padding tapers from the back of the waist to guite low at the front. WAIST ADJUST: The method of adjustment of the waist belt based on the position of the buckles. Some are centrally mounted, most are on one side and you pull the end of the webbing then stow the loose end, some have a buckle on each side and you pull both sides simultaneously (or alternately as you wiggle your hips). **LEGS LOOP HEIGHT PADDING:** As above except on the leg loops

**ELASTICATED REAR ATTACH:** There is a **if** the straps connecting the back of the leg loops to the waist section are elasticated rather than normal webbing. Also refer to.... LEG RISER ADJ REAR: The Rear leg loop straps on the back of the harness can be adjusted for length and may also be elasticated (see above). FRONT The Leg riser at the front connecting the leg loops to the bridge union or direct to the waist belt can be adjusted for length -many will have bridge adjustment which secondarily affects the leg loop position but not a separate leg loop adjustment.

**RFID CHIP:** The harness has an embedded chip which can be read by a reader to provide inspection or inventory details. WEAR INDICATE: Primarily Pertaining to the bridge and indicates a warning colour showing through when the bridge becomes worn and needs replacement. In reality, most rope bridges have a white core and coloured sheath so will ALL have wear indication!

FIRST AID TRAUMAKIT: Indicates that this manufacturer supplies (or can supply as an option \( \bullet \) a first aid kit and/or a trauma kit - a trauma kit includes a CAT (Combat Application Tourniquet) and Cellox or similar clot-forming dressing/sachet.

SIT STRAP BOSUNS CHAIR: A sit strap is a continuous fabric strip that replaces or augments the leg loops. It can be integral to leg loop or run around to the front of the harnesses and be connected into via rings/D-rings. A Bosun's Chair is similarly a support eat but is stiffened/reinforced or may simply be a covered plank of wood. These also connect to the load support elements at the front of the harness and may have their own additional accessory loops/ hooks/pouches. None in this list are integral, any shown are options-only.

COLOURS/Trim: The main colour of the harness and any contrast or secondary colours

#### **IMAGES NOT TO SCALE**

**FITTINGS and ACCESSORIES** SHOWN MAY BE AN ADDITIONAL COST

#### **MANUFACTURER**

**MODEL VARIANT** 

ORIGIN

COST inc VAT/tax conv-only

**WEIGHT** 

**MAX LOAD** 

**WAIST SIZES** 

**LEG SIZES** 

SUPPORT

**STANDARDS** 

**CHEST HARNESS ATTACH PTS** 

**BUCKLES WAIST/LEGS** 

BRIDGE TYPE REPLACEABLE

**BRIDGE LENGTHS ADJUSTABLE** 

**CONNECTION to BRIDGE** 

BRIDGE UNION LENGTH ADJ

SRT D-RING/EYE REAR BELAY

POLE STRAP D's FOLD FLAT

**GEAR LOOPS SEWN EYES** 

**GEAR ATTACH CUSTOM GEAR CORD EYES** 

**BASIC HOLES/EYES RINGS** 

**CARI-HOOK CARI-HOOK EYES** 

CHAINSAW EYE/RINGHOOK

ATTACH POUCH/FIRST AID

WAIST PADDING SWAMI

WAIST BELT HEIGHTPADD

**WAIST ADJUST** 

LEG LOOP HEIGHT PADDING

**ELASTICATED REAR ATTACH** 

LEG RISER ADJ REAR FRONT

**RFID CHIP WEAR INDICATE** 

**EXTRAS** FIRST AID TRAUMA KIT

**SIT STRAP BOSUNS CHAIR** 

COLOURS/Trim

**NOTES** 

WEBSITE

COST: Approx & inc local tax/VAT £\$6

# ARBORIST SIT HARNESSES

	OFFI		BUCK	
ARB PRO	BASHLIN	BASHLIN	<b>BUCKINGHAM</b>	<b>BUCKINGHAM</b>
Tree Access 3.0	639 BBL 640 BBL	639 BBS 640 BBS	Agility 1480	BuckTree Alto Verde
 £302 \$377 €341	£323 \$360 \$402 €368	£323 \$360 \$402 €368	\$867-962	\$662-870
1.96-2.03kg/4.3-5.5lb	2.3-2.6kg/5.15-5.75lb	2.4-2.7kg/5.2-5.9lb	2.5kg/5.5lb	2.3kg/5lb
140kg/310lb	159kg / 350lb	159kg / 350lb	159kg / 350lb	159kg / 350lb
2 sizes 80-140cm/31.5-55"	5 sizes 71-112cm/28-44"	5 sizes 71-112cm/28-44"	5 sizes 61-112cm/24-44"	4 sizes 71-112cm/28-44"
3 sizes 50-75cm/19.7-29.5"	5 sizes 40-101cm/16-40"	5 sizes 40-109cm/16-43"	N/A	N/A
			_	
STS Fast-Clip	Pin&Hole/Fast-Clip	Pin&Hole/DblBack	ISC Fast-Clip	Fast-Clip
20mm Webbing	Fixed 44mm Webbing no	Integrated sit strap no	Sewn segmented Rope	Tied Rope
25/30cm no	30cm/12" no	51cm/20" no	30cm/12"	30cm/12"
Sliding Ring	2x Sliding AlloySteel D-Rings	2x Fixed AlloySteel D-Rings	Sliding Ring	Sliding Ring
Shackle <b></b>	Sewn/Fixed no	Sewn/Fixed no	4-hole + D-ring plate	4-hole plate
- 🔳 -				
8 4+2*			3 4	8 1
-	-	-	-	-
- 2	- 2(sliding)	- 2(sliding)	- 4	- 2
	4* (sliding) -	4* (sliding) -	□ 4	□ 4
<b>I</b> -	- 2 (sliding)	- 2 (sliding)	- 🗆	- 2 x6.8kg/15lb
	-	-		
Thermo-Form	Mesh/Foam	Mesh/Foam	Mesh/Foam	Thermo-Form
44mm/1.75" 19cm/7.5"	44mm/1.75" 20.3cm/8"	44mm/1.75" 20.3cm/8"	45mm/1.75" 25.4cm/10"	45mm/1.75" 17.8cm/7"
Double Sided	Central	Central	1x Front + 2x side	Central
33mm/1.5" 14cm/5.5"	44mm/2" 10cm/4"	44mm/2" 10cm/4"	25mm/1" 17.8cm/7"	45mm/1.75" 17.8cm/7"
- -	-	-		_
-				-
-				
			- 📙	- 🗆
- District (Const. / District		Display One on Display (AM) its	DII- <i>h</i> 2 1 1 C	PlI-Ar : I C
Black/Orange/Grey/Red	639 orange stitch=Alu	Black/Orange Black/White 640 white stitch=Steel	Black/Vivid Green  Bridge can be clipped into or length	Black/Vivid Green
*2 sewn load-bearing eyes on bridge union shackle	*Not designated eyes but 4 to 8 Cari-Hooks can be installed on belt	*Not designated eyes but 4 to 8 Cari- Hooks can be installed on belt	adjusted via separated sewn 'eyes' along its length. Hook&Loop on all web tails	
arbpro.it	bashlin.com	bashlin.com	buckinghammfg.com	buckinghammfg.com

urrency conversion only OPTION= or or N/A: info Not Given STANDARDS: EN358 = EN813= ANSI Z133= ASTM F887=

	IMAGES NOT TO SCALE			q p		
	FITTINGS and ACCESSORIES SHOWN MAY BE AN ADDITIONAL COST	BUR			BUC MP AN	
	MANUFACTURER	<b>BUCKINGHAM</b>	<b>BUCKINGHAM</b>	<b>BUCKINGHAM</b>	<b>BUCKINGHAM</b>	
	MODEL VARIANT	Buck Craft 17911	Ergovation SRT 16906/ 2/4	ErgoLite 17906 J17906	Ergo Pro 17905	
	ORIGIN		2.80.01.01.01.01.01.01.01	2.802.10 1/300	2.80 1.0 1/303	
	COSTinc VAT/tax conv-only	£390 \$487 €449	£802 \$1001 <b>\$1240</b> €923	£754 \$942 €869	£651 \$813 €750	
	WEIGHT	2.1kg/4.6lb	2.95kg/6.5lb 6.8lb	2.3kg/5.1lb	2.6kg/5.8lb	
	MAX LOAD	159kg / 350lb	140kg/310lb	159kg / 350lb	159kg / 350lb	
	WAIST SIZES	4 sizes 71-112cm/28-44"	4 sizes 71-112cm/28-44"	4 sizes 71-112cm/28-44"	4 sizes 71-112cm/28-44"	
	LEG SIZES	N/A	N/A	N/A	N/A	
i	STANDARDS	,	.,,,,	,		
	CHEST HARNESS ATTACH PTS					
	BUCKLES WAIST/LEGS	AA Cobra Fast-Clip	Fast-Clip	Fast-Clip	Double D	
ᆼ	BRIDGE TYPE REPLACEABLE	2x ¾"Tied Ropes		•	11mm Tied Rope	
АТТАСН	BRIDGE LENGTHS ADJUSTABLE	102cm/40"	<del></del>	•	N/A	
A	CONNECTION to BRIDGE	Sliding Ring	ed Ropes Jacketed Rope   m/40" 44cm/17.25" 30cm/12" no  sing Ring Sliding Ring (6 other options) -	Sliding Ring		
벌	BRIDGE UNION LENGTH ADJ	3-hole+D-ring plate		Shackle	4-hole plate	
	SRT D-RING/EYE REAR BELAY		- 🔳 -		-	
	POLE STRAP D's FOLD FLAT			*		
	GEAR LOOPS SEWN EYES	3 -	6 3*	5 1	4 -	
TACH	CUSTOM GEAR CORD EYES	-	-	-	-	
E	BASIC HOLES/EYES RINGS	- 2 (+2 waist attach rings)		- 2	- 2	
IR AT	CARI-HOOK CARI-HOOK EYES	□ 2	<u> </u>	☐ 4 +8 on seat	- 4	
GEAR,	CHAINSAW EYE/RINGHOOK	- 2 x6.8kg/15lb			- 🗆	
	ATTACH POUCH/FIRST AID					
ST	WAIST PADDING SWAMI	Thermo-Form -	Drilex foam 📕	Drilex foam	Drilex foam	
WAIST	WAIST WEB HEIGHTPADDING	45mm/1.75" 20.3cm/8"	45mm/1.75" 22.9cm/9"	45mm/1.75" 19cm/7.5"	45mm/1.75"17.5cm/7"	
>	WAIST ADJUST	Central(ish)	Central +2 side	Central +2 side	2x side	
(D	LEGS WEB HEIGHT PADDING	45mm/1.75" 12cm/5"	45mm/1.75" 15cm/6"	45mm/1.75" 15cm/6"	45mm/1.75" 14cm/5.5"	
LEG	ELASTICATED REAR ATTACH	<u>-</u>	-	-	-	
	LEG RISER ADJ REAR FRONT	-	<b>I</b> -	<b>I</b> -		
S	RFID CHIP WEAR INDICATE				 <u>-</u>	
EXTRA	FIRST AID TRAUMA KIT	- 🗆	- 🗆		- 🗆	
	SIT STRAP BOSUNS CHAIR		- 🗆	-		
	COLOURS/Trim	Black/Vivid Green	Black/Grey/Red	Black/Green	Black/Grey	_
	NOTES	Lightest Buckingham Arb Harness	Waist padding can be removed. SRT version uses a bridge conversion strap. *1 sewn eye (intended for the chest harness)+2 eyes on legs	*additional Smaller side-D on each side connects to the bridge union.		
	WEBSITE	buckinghammfg.com	buckinghammfg.com	buckinghammfg.com	buckinghammfg.com	
	O	/VAT £\$€=currency conversion	nonly OPTION= or or	N/A: info Not Given ST	ANDARDS: EN358 = EN	

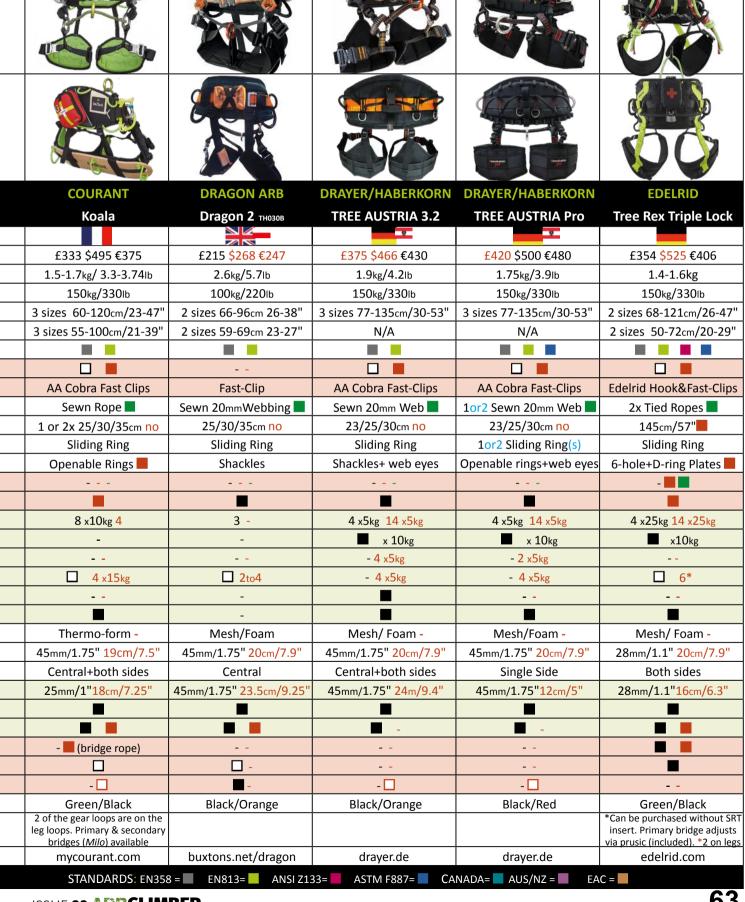
#### www.arbclimber.com





	IMAGES NOT TO SCALE				
	FITTINGS and ACCESSORIES SHOWN MAY BE AN ADDITIONAL COST				
	MANUFACTURER	CAMP	CAMP	CHAMPION	CLIMAX
	-				
	MODEL VARIANT	Tree Access Evo	Tree Access ST (was ANSI)	Female Male	Atlas Tree Basic
	ORIGIN	C204 6420 C205	C274 ¢450 C442		C140 \$174 \$450
	COST incVAT/tax conv-only WEIGHT	£384 \$420 €285	£374 \$450 €412	£403/366	£140 \$174 €159
-		1.96-2.03kg/4.3-5.5lb	2.23kg / 4.9lb	1.7kg /3.7lb	1.52kg/3.3lb
	MAX LOAD	140kg/310lb	140kg/310lb	120kg/264lb	140kg/310lb
	WAIST SIZES LEG SIZES	2 sizes 80-135cm/31-53"	2 sizes 80-135cm/31-53"	2 sizes 65-130cm/25-51"	1 size 80-127cm/31-50" 1 size 65-80cm/25-31"
	STANDARDS	2 sizes 50-75cm/20-30"	2 sizes 50-75cm/20-30"	2 sizes 45-75cm/18-29"	1 SIZE 65-8Ucm/25-31
	CHEST HARNESS ATTACH PTS				
Z.	BUCKLES WAIST/LEGS BRIDGETYPE REPLACEABLE	3-Bar/STS Fast-Clip Sewn Jacketed Rope	3-Bar/STS Fast-Clip *2xSewn Jacketed Ropes	Fast-Clips Tied Rope ■	Fast-Clips (2x waist)  Jacketed webbing no
SUPPORT	BRIDGE LENGTHS ADJUSTABLE	25/30* 32/37/42cm no	25/30* 32/37/42cm no	n/a no	30cm/12" no
J.	CONNECTION to BRIDGE	Sliding Ring	Sliding Ring	Sliding Ring	Sliding Ring
LFE 9	BRIDGE UNION LENGTH ADJ	Shackles+ Rope eyes	Shackles+ Rope eyes	3 hole Plates	Rings
=	SRT D-RING/EYE REAR BELAY	- III	Jilackies i Nope eyes	J Hole Flates	
	POLE STRAP D's FOLD FLAT	-		*	
	GEAR LOOPS SEWN EYES	8* 4	8* 1	3 x5kg 2 x5kg	3
ᆼ	CUSTOM GEAR CORD EYES	-	-	<b>■</b> x5kg	-
TACH	BASIC HOLES/EYES RINGS	- 2*		4* 2 x10kg	
RAT	CARI-HOOK CARI-HOOK EYES	□ 6	□ 6	- 6	
GEAR,	CHAINSAW EYE/RINGHOOK		1 x15kg	1 x35kg	
9	ATTACH POUCH/FIRST AID			1 X33 Kg	-
-	WAIST PADDING SWAMI	Mesh/Foam -	Mesh/Foam -	Mesh/Foam -	Mesh/Foam -
WAIST	WAIST WEB HEIGHTPADDING	44mm/1.75" 19cm/7.5"	44mm/1.75" 19cm/7.5"	40mm/1.5" 20cm/8"	45mm/1.75" 15cm/6"
Ĭ	WAIST ADJUST	Double Sided	Double Sided	Single Side	Double Sided
	LEGS WEB HEIGHT PADDING	33mm/1.5" 14cm/5.5"	44mm/1.75" 14cm/5.5"	40mm/1.5" 15cm/6"	45mm/1.75"10cm/4"
LEG	ELASTICATED REAR ATTACH	-	-	-	
	LEG RISER ADJ REAR FRONT	<b>-</b>	-		-
S	RFID CHIP WEAR INDICATE	■-	■-		
RA.	FIRST AID TRAUMA KIT				
EXTRAS	SIT STRAP BOSUNS CHAIR				- 🗆
Ш	COLOURS/Trim	Red/Black	Black/Red	Black/Green	Black/Red
	NOTES	*inc 2 small loops  *Metal rings are on leg loops	*bridge is 10.5mm rope &/or web* & can have 3-way swivel	DISCONTINUED  *Two additional eyes on each pole-	Available with integral swivel on
	-	web* or 10.5mm Rope bridge	*2 gear loops are on leg loops	strap D-Ring	SRT eye
	WEBSITE	camp.it	camp.it	champion-gear.com	productosclimax.com
CC	ST. Approx & inclosed tax	:/VAT £\$€=currency conversion	only OPTION- Or or	N/A: info Not Given	

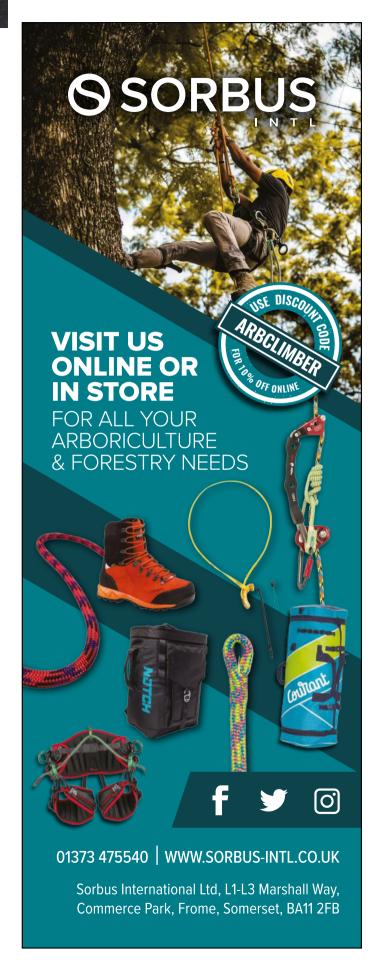
# ARBORIST SIT HARNESSES



$\neg$					~~
	IMAGES NOT TO SCALE				
	FITTINGS and ACCESSORIES SHOWN MAY BE AN ADDITIONAL COST				
	MANUFACTURER	HARKIE	HONEYWELL/KOMET	HONEYWELL/KOMET	HONEYWELL/MILLER
	MODEL VARIANT	Ascend A1	Butterfly II	DragonFly II	Morpho1 & 2
	ORIGIN			Drugerii i, ii	
_	COST inc VAT/tax conv-only	£253 \$315 €288	£275 \$432 <b>€313</b>	£307 \$380 €352	£376 \$468 €431
_	WEIGHT	1.9kg/4.2lb	2.3kg/5lb	2.35kg/5lb	1.76kg/3.9lb
	MAX LOAD	100kg/220lb	140kg / 308lb	140kg / 308lb	140kg / 308lb
	WAIST SIZES	3 sizes 75-132cm/30-52"	3 sizes 76-138cm/28-54"	3 sizes 76-138cm/28-54"	3 sizes 76-138cm/28-54"
	LEG SIZES	3 sizes 40-90cm/30-35"	n/a	n/a	n/a
	STANDARDS	3 31263 40-30011/30-33	II/a	11/4	11/a
	CHEST HARNESS ATTACH PTS				
	BUCKLES WAIST/LEGS	AA Cobra Fast Clip	Fast Clip	Fast Clip	Fast Clip
	BRIDGE TYPE REPLACEABLE	Dbl Web	Webbing	Webbing	Webbing or Cleated Rope
M	BRIDGE LENGTHS ADJUSTABLE	25/30/35cm no	25/30/35cm/ no	25/30/35cm <b>no</b>	25/30/35cm 90/110/130cm <b>no</b>
	CONNECTION to BRIDGE	2x Sliding Rings	Sliding Ring	-	Sliding Ring
벌 텔	BRIDGE UNION LENGTH ADJ	Shackle	Shackle =	Shackle <b>Shackle</b>	Shackle
	SRT D-RING/EYE REAR BELAY		Sildekie =	SHEEKIC	SHOCKIC
	POLE STRAP D's FOLD FLAT				
	GEAR LOOPS SEWN EYES	3 -	4 -	4 -	4 x5kg or 8 plastic eyes -
	CUSTOM GEAR CORD EYES	-	<u>.</u> -	-	-
Ĕ	BASIC HOLES/EYES RINGS		- 2	- 2	- 2
⋖	CARI-HOOK CARI-HOOK EYES	1x L Caritool 2	- 2	- 2	- 2
⋖Ⅰ	CHAINSAW EYE/RINGHOOK		- 🗆	- 🗆	- 🗆
	ATTACH POUCH/FIRST AID	-	<u> </u>	-	-
	WAIST PADDING SWAMI	Mesh/Foam -	Thermo-form -	Thermo-form -	Thermo-form -
S	WAIST WEB HEIGHTPADDING	45mm/1.75" 20cm/7.9"	45mm/1.75"18cm/7"	45mm/1.75"18cm/7"	45mm/1.75"18cm/7"
≱∣	WAIST ADJUST	Central	Single Side	Single Side	Single Side
	LEGS WEB HEIGHT PADDING	45mm/1.75" 23.5cm/9.25"	45mm/1.75"8cm/3.2"	45mm/1.75"8cm/3.2"	25mm/1"13cm/5"
(J	ELASTICATED REAR ATTACH	<b>3</b>	1311111/11/13 CCHI/312	-	
	LEG RISER ADJ REAR FRONT			■ _	<u> </u>
	RFID CHIP WEAR INDICATE				
<b>()</b>	FIRST AID TRAUMA KIT				
EXTRA	SIT STRAP BOSUNS CHAIR				
E	COLOURS/Trim	Black/Orange	Black/Green/Red	Black/Green/Red	Black/Green/Red
		DISCONTINUED.	,	Integrated sit strap version of the Butterfly, interchangeable	DISCONTINUED Plastic aeration sheet on rrear of waist. Rope bridge version has integral cleat adjuster
	NOTES	Hi-Viz panels on leg loops			
	WEBSITE	harkieglobal.com	sps.honeywell.com	with the Butterfly's leg-loops sps.honeywell.com	sps.honeywellcom

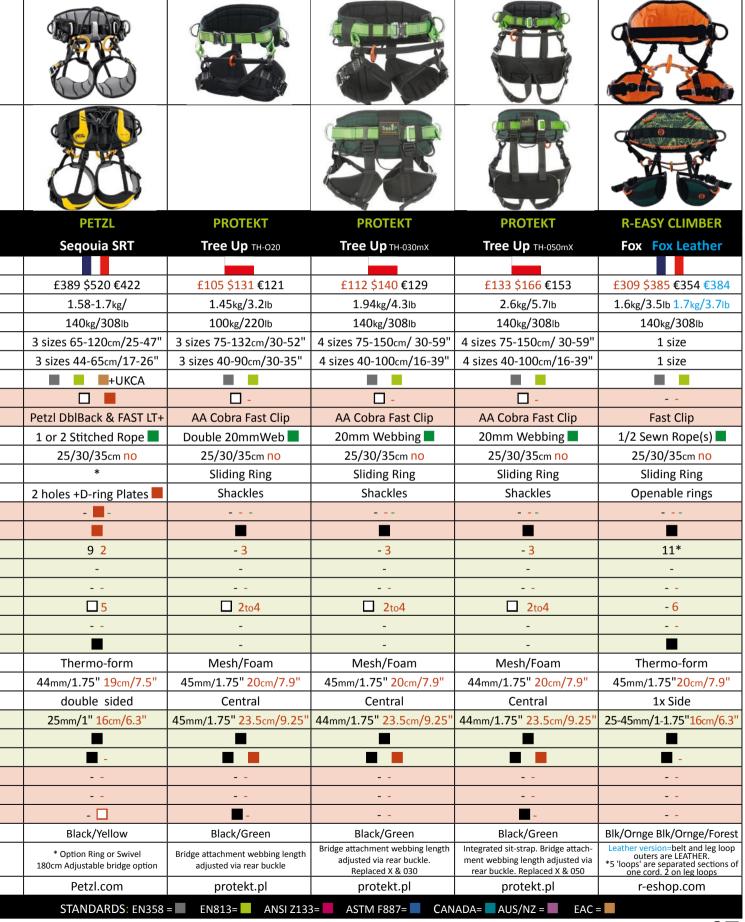
#### www.arbclimber.com



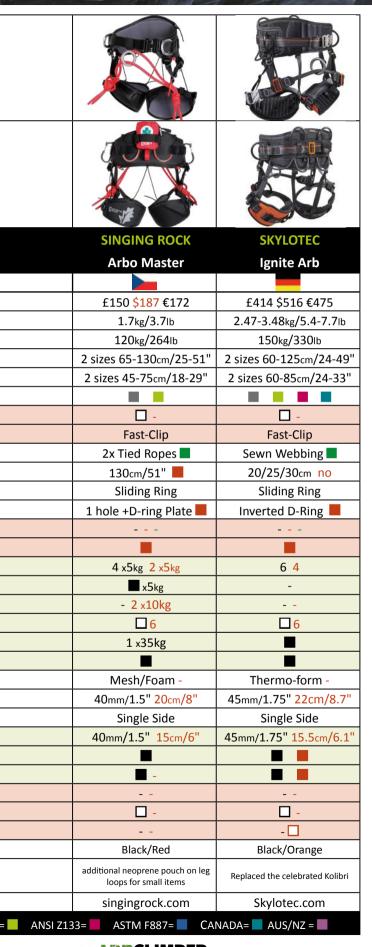


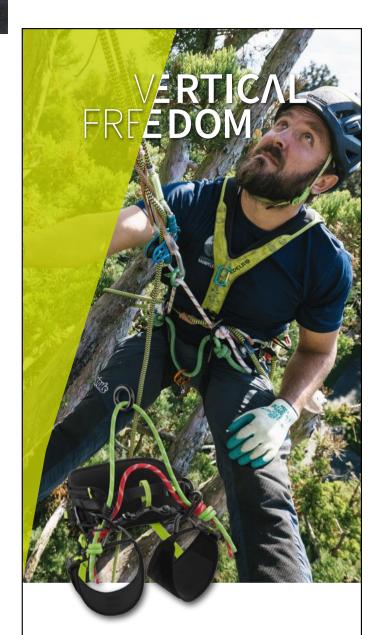
	IMAGES NOT TO SCALE				
	FITTINGS and ACCESSORIES SHOWN MAY BE AN ADDITIONAL COST	600		Natch	
	MANUFACTURER	JMP INTER	NEOFEU	NOTCH	PETZL
	MODEL VARIANT	Treeman SRT	ARB'O	Sentinel	Seqouia
$\vdash$	ORIGIN		AMB	<u> </u>	Jequala.
	COST inc VAT/tax conv-only	£227 \$283 €261	£281 \$350 €325	£415 \$450 €540	£365 \$450 €386
	WEIGHT	1.43-1.64kg/3.2-3.6lb	1.75kg/3.8lb	1.8-2kg/4.1-4.2lb	1.48-1.6kg/
$\vdash$	MAX LOAD	150kg/330lbs	1.75kg/3.8lb 140kg/308lb	140kg/308lb	140kg/308lb
	WAIST SIZES	2 sizes 70-110cm/27-43"	4 sizes 65-135*cm/25-53"	2 sizes 71-112cm/28-44"	3 sizes 65-120cm/25-47"
$\vdash$	LEG SIZES	2 sizes 45-70cm/18-27"	4 sizes 45-90*cm/18-35"	2 sizes 58-94cm/23-37"	3 sizes 44-65cm/17-26"
	STANDARDS	Z 312E3 43-70CH/ 10 27	4 31263 43-30 City 10 33	2 31263 30-3-4011, 23 37	3 312E3 44-03CHI/17-20
	CHEST HARNESS ATTACH PTS				T -
	BUCKLES WAIST/LEGS	Fast Clip	Fast Clip	Hooked Fast Clip	Petzl FAST & FAST LT+
AL	BRIDGE TYPE REPLACEABLE	Tied Rope	2x Tied *Rope	1x Tied Rope	1 or 2 Stitched Rope
TIC	BRIDGE LENGTHS ADJUSTABLE	35/45cm	35/45cm	106cm/42"	25/30/35cm no
CRITICAL	CONNECTION to BRIDGE	Sliding Ring	2 x Sliding Rings	Sliding Ring	*
	BRIDGE UNION LENGTH ADJ	3-hole plate	3 hole Rig-Plates	3 hole Rig-Plates	2 holes +D-ring Plates
LIFE	SRT D-RING/EYE REAR BELAY	5-Hole plate	3 Hole Mg-1 lates	3 Hole Mg-1 lates	Z liules +D-lilig riales
	POLE STRAP D's FOLD FLAT			•	
	GEAR LOOPS SEWN EYES	4 -	2 1	8 1	9 2
ТАСН	CUSTOM GEAR CORD EYES	4	2 1	0 1	-
	BASIC HOLES/EYES RINGS	- 2	6 + 1 on legs* (v10kg)	- 2	
A	CARI-HOOK CARI-HOOK EYES	- 4	- 6 + 4 on legs* (x10kg) - 6	- 4	<u>5</u>
GEAR	CHAINSAW EYE/RINGHOOK	- 4	- 0	_ —	
GE	ATTACH POUCH/FIRST AID		-	-	
_	WAIST PADDING SWAMI		Mesh/Foam	Mesh/Foam	Thermo-form
WAIST	WAIST WEB HEIGHTPADDING	45mm/1.75" 24cm/9.5"	44mm/1.75" 24cm/9.5"	45mm/1.75" 20cm/7.9"	44mm/1.75" 19cm/7.5"
×	WAIST WEB HEIGHT PADDING WAIST ADJUST	Single Side	1x Side	1x Side	1x Side
	LEGS WEB HEIGHT PADDING	45mm/1.75" 14cm/5.5"	44mm/1.75" 11cm/4.3"	25mm/1"14.6cm/5.7"	25mm/1" 16cm/6.3"
LEG	ELASTICATED REAR ATTACH	45mm/1.75 14mm/5.5	44mm/1.73 11cm/4.3	25mm/1 14.0cm/5.7	25mm/1 10m/0.5
=	LEG RISER ADJ REAR FRONT				
	RFID CHIP WEAR INDICATE	-			
AS	FIRST AID TRAUMA KIT				
EXTRAS	SIT STRAP BOSUNS CHAIR		- 🗆		- 🗆
Ğ	COLOURS/Trim	Black/Green	Black/Orange	Black Black/Lime Green	Black/Yellow
	NOTES	Blucky Green	*reinforced Plastic rings 10kg *largest XXL size on request	chainsaw hook can be moved to either side.	* Option Ring or Swivel 180cm Adjustable bridge option
$\vdash$	WEBSITE	jmpinter.com	*Aramid & Nylon bridges included neofeu.com	notchgear.com	Petzl.com
C			on only OPTION= or or		recentedin
66	_	VVALISE-currency conversion	TOTAL OF THE NEW TOTAL OF		LIMBER ISSUE 23

# **ARBORIST SIT HARNESSES**



	IMAGES NOT TO SCALE				
	FITTINGS and ACCESSORIES SHOWN MAY BE AN ADDITIONAL COST		5		
	MANUFACTURER	<b>ROCK EMPIRE</b>	SHERRILL TREE	SIMARGHU	SIMARGHU
	MODEL VARIANT	Skill Tree	Edge II	Fire - Male	Gemini - Female
	ORIGIN				
	COST inc VAT/tax conv-only	£164 <mark>\$205</mark> €188	£377 \$470-500 €430	£380 \$474 €436	£380 \$474 €436
	WEIGHT	1.79kg/3.94lb	1.9kg/4.2lb	2.5-2.6kg/5.5-5.7lb	2.3kg/5lb
	MAX LOAD	140kg/308lb	159kg/350lb	140kg/308lb	140kg/308lb
	WAIST SIZES	2 sizes 70-130cm/27-51"	4 sizes 71-112cm/28-44"	2 sizes 69-107cm/27-42"	1 size 66-86cm/26-34"
	LEG SIZES	2 sizes 54-80cm/21-31.5"	N/A	1 size 43-69cm/17-27"	1 size 43-69cm/17-27"
	STANDARDS				
	CHEST HARNESS ATTACH PTS			□ <b>-</b>	□ -
ب	BUCKLES WAIST/LEGS	Fast-Clip	AA Cobra Fast Clip	Fast-Clip	Fast-Clip
CRITICAL	BRIDGE TYPE REPLACEABLE	1x 11mmTied Rope	1x Tied Rope	1x Tied Rope	1x Tied Rope
\ <del>\</del>	BRIDGE LENGTHS ADJUSTABLE	130cm/51"	102cm/40"	125cm/49"	125cm/49"
	CONNECTION to BRIDGE	Sliding Ring	Sliding Ring	Sliding Ring	Sliding Ring
LIFE	BRIDGE UNION LENGTH ADJ	2 hole Plates	3 holes +D-ring	3 holes +D-ring	3 holes +D-ring
	SRT D-RING/EYE REAR BELAY				
	POLE STRAP D's FOLD FLAT			2x pairs	
동	GEAR LOOPS SEWN EYES	6 <b>2</b>	5 <mark>3</mark>	4 2	2 2
ATTACH	CUSTOM GEAR CORD EYES	-	-	-	-
A	BASIC HOLES/EYES RINGS	- 2	- 2		
8	CARI-HOOK CARI-HOOK EYES	□11	- 4	- 2	- 4
GEA	CHAINSAW EYE/RINGHOOK			<u> </u>	
	ATTACH POUCH/FIRST AID	-			
IST	WAIST PADDING SWAMI	Mesh/Foam -	Mesh/Foam -	Thermo-form -	Thermo-form -
WAIST	WAIST WEB HEIGHTPADDING	44+30mm/1.25" 17.5cm/7"	45mm/1.75" 20cm/8"	44mm/1.75" 17cm/7"	44mm/1.75" 17cm/7"
	WAIST ADJUST	1x Side	Single Side	Single Central	Single Central
ŋ	LEGS WEB HEIGHT PADDING	44mm/1.75" 12.5cm/55"	45mm/1.75" 14cm/5.5"	44mm/1.75" 17cm/7"	44mm/1.75" 17cm/7"
LEG	ELASTICATED REAR ATTACH LEG RISER ADJ REAR FRONT		<b>.</b>	-	-
	RFID CHIP WEAR INDICATE				
AS	FIRST AID TRAUMA KIT				
EXTRAS	SIT STRAP BOSUNS CHAIR				
	COLOURS/Trim	Black/Orange	Black/Grey or Black/Blue	Black/Red	Black/Red
		, •	22.7 2.27 3. 2.200, 2.100	The smaller size has the same gear	Has two additional pelvis straps
	NOTES			attach options as the Gemini. Bridge union adjust via buckle on waist-rear	from waist to legs . Bridge union adjust via buckle on waist-rear
	WEBSITE	rockempire.com	sherrilltree.com	simarghu.com	simarghu.com
CC	OST: Approx & inc local tax	z/VAT £\$€=currency conversion	nonly OPTION= or or	N/A: info Not Given ST/	ANDARDS: EN358 = EN813





#### The most versatile tree-care harness

### TREEREX TRIPLE LOCK

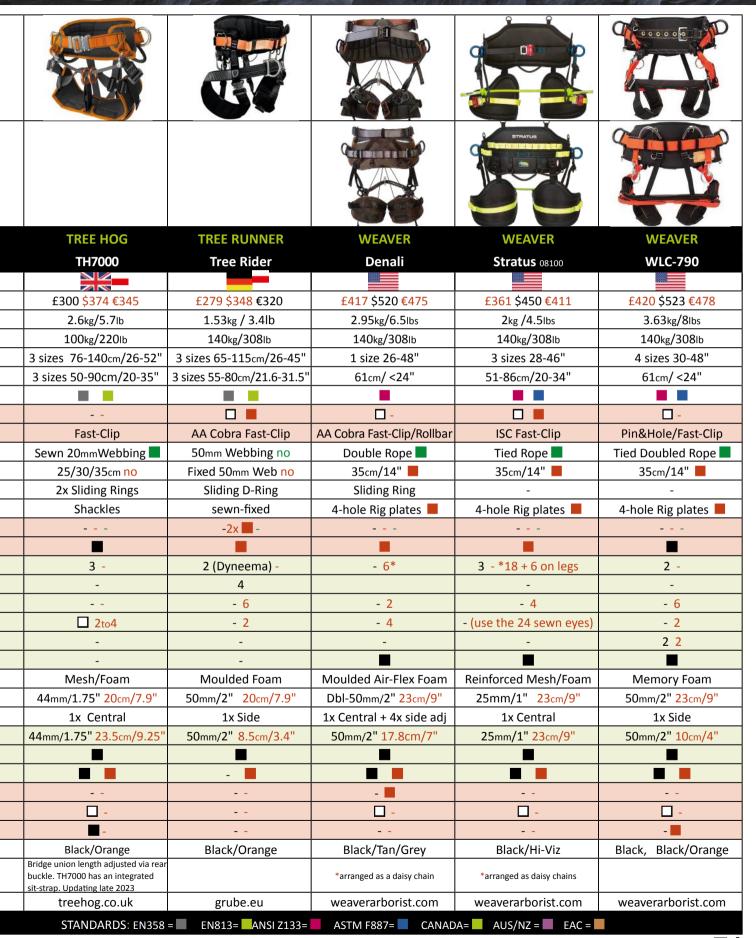
With a variety of rope bridge configurations and optional SRT BRIDGE for safe and comfortable working on single ropes. The innovative 3D Vent Technology, in combination with the wide, semirigid padding, ensures unsurpassed hanging comfort and at the same time good reathability. 4 large gear loops, numerous attachment possibilities for gear carabiners as well as a device for suspending a chainsaw round off the complete package of this unique climbing harness.

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	IMAGES NOT TO SCALE	TOTA	CO DO	Q P	
	FITTINGS and ACCESSORIES SHOWN MAY BE AN ADDITIONAL COST			q P	
	MANUFACTURER	STEIN	<b>TEUFELBERGER</b>	<b>TEUFELBERGER</b>	TREE HOG
	MODEL VARIANT	Vega Plus VS2	TreeMOTION Essential	TreeMOTION Pro	Razorback TH5000
	ORIGIN		**	-	
	COST inc VAT/tax conv-only	£430 \$592 €541	£356 \$500 €440	£472 \$625 €582	£252 \$314 €289
	WEIGHT	1.9kg/4.2lb	2kg/2.2lb	2.3kg/5lb	2.5kg/5.5lb
	MAX LOAD	150kg/330lb	150kg/330lb	150kg/330lb	100kg/220lb
	WAIST SIZES	3 sizes 76-98cm/	3 sizes 69-129cm/27-50"	3 sizes 69-129cm/27-50"	3 sizes 76-140cm/26-52"
	LEG SIZES	N/A	3 sizes 38-87cm/15-34"	3 sizes 38-87cm/15-34"	3 sizes 50-90cm/20-35"
	STANDARDS	+ UKCA			
	CHEST HARNESS ATTACH PTS				
_	BUCKLES WAIST/LEGS	AA Cobra Fast-Clip	Small Double Ds	AA Cobra Fast-Clip	Fast-Clip
S	BRIDGE TYPE REPLACEABLE	Sewn 20mm Webbing	1or2 Tied or sewn Rope	1or2 Tied or sewn Rope	Sewn 20mmWebbing
CRITICAL	BRIDGE LENGTHS ADJUSTABLE	25/30/35cm no	123/180cm 40/45/50cm	123/180cm 40/45/50cm	25/30/35cm no
	CONNECTION to BRIDGE	2x Sliding Rings	Sliding Ring	Sliding Ring	2x Sliding Rings
LIFE	BRIDGE UNION LENGTH ADJ	Openable Ring -	2x Hole + D plates	2x Hole + D plates	Shackles
_	SRT D-RING/EYE REAR BELAY				
	POLE STRAP D's FOLD FLAT				
I	GEAR LOOPS SEWN EYES	3 10 +2 on Leg Loops			3 -
ACH.	CUSTOM GEAR CORD EYES				-
AT	BASIC HOLES/EYES RINGS	- 2	14x 5kg/11lb -	14x 5kg/11lb -	
	CARI-HOOK CARI-HOOK EYES	_ *	- 12x 10kg/22lb	- 12x 10kg/22lb	□ 2to4
GEAR	CHAINSAW EYE/RINGHOOK		x 30kg/66lb	x 30kg/66lb	-
9	ATTACH POUCH/FIRST AID				-
ST	WAIST PADDING SWAMI	Mesh/Foam	Mesh/Foam	Thermo-form	Mesh/Foam
WAIST	WAIST WEB HEIGHTPADDING	45mm/1.75" 20cm/8"	25mm/1" 23cm/9"	25mm/1" 23cm/9"	44mm/1.75" 20cm/7.9"
>	WAIST ADJUST	Double Central	1x Central	1x Central	1x Central
G	LEGS WEB HEIGHT PADDING	45mm/1.75" 15cm/6"	25mm/1" 14.5cm/5.7"	25mm/1" 14.5cm/5.7"	44mm/1.75" 23.5cm/9.25"
LEG	ELASTICATED REAR ATTACH	<b>_</b> _			
	LEG RISER ADJ REAR FRONT	-			
AS.	RFID CHIP WEAR INDICATE	-			
EXTRA	FIRST AID TRAUMA KIT	<del>-</del>			
EX	SIT STRAP BOSUNS CHAIR	nle -1. Az-II	DI1/D	DI1/D	Diale/Orana Dille/Viles/Orana
	COLOURS/Trim	Black/Yellow	Black/Red Virtually all components	Black/Red Virtually all components	Blck/Orng, Blk/YlwOrnge
	NOTES	* any of the 10 sewn eyes will accept a Cari-Hook	replaceable. Openable side ring for replacement of hip/leg webbing	replaceable. Openable side ring for replacement of hip/leg webbing	Bridge union length adjusted via rear buckle. Updating late 2023
	WEBSITE	steinworldwide.com	teufelberger.com	teufelberger.com	treehog.co.uk
			·	N/A: info Not Given	

# **ARBORIST SIT HARNESSES**



	T				
	IMAGES NOT TO SCALE		Coop D		DO
	FITTINGS and ACCESSORIES SHOWN MAY BE AN ADDITIONAL COST				
	MANUFACTURER	WEAVER	WEAVER	WEAVER	WEAVER
	MODEL VARIANT	WLC-760	WLC-700 730	WLC-530 560	WLC-500
	ORIGIN				
	COST inc VAT/tax conv-only	£362 \$451 €412	£297 \$370 \$410 €338	£242 \$302 \$305 €276	£237 \$295 €270
	WEIGHT	3.2kg/7lb	3.63kg/8lbs	2.72kg/6lbs	2.72kg/6lbs
	MAX LOAD	140kg/308lb	140kg/310lb	140kg/310lb	140kg/310lb
	WAIST SIZES	5 sizes 66-122cm/26-48"	5 sizes 66-122cm/26-48"	4 sizes 76-122cm/30-48"	4 sizes 76-122cm/30-48"
	LEG SIZES	61cm/<24"	61cm/<24"	51-68cm/20-27"	41-61cm/16-24"
	STANDARDS				
	CHEST HARNESS ATTACH PTS				
	BUCKLES WAIST/LEGS	Pin&Hole/Fast-Clip	Pin&Hole/Fast-Clip	Pin&Hole	Pin&Hole
CRITICAL	BRIDGE TYPE REPLACEABLE	Tied Doubled Rope	Web-covered rope	Fixed 50mm Webbing no	No Bridge no
È	BRIDGE LENGTHS ADJUSTABLE	35cm/14"	25cm/10"	12" no	
	CONNECTION to BRIDGE	-	-	1 (2)x Sliding D-Rings	None 2x fixed D-Rings
HE	BRIDGE UNION LENGTH ADJ	4-hole Rig plates	ISC Al ring	Stitched no	Stitched no
	SRT D-RING/EYE REAR BELAY				
	POLE STRAP D's FOLD FLAT				
I	GEAR LOOPS SEWN EYES	2 -	2 -	2 -	2 -
ACH	CUSTOM GEAR CORD EYES	-	-	-	-
	BASIC HOLES/EYES RINGS	- 6	- 6	- 6	- 6
RA	CARI-HOOK CARI-HOOK EYES	- 2	- 2	- 2	- 2
GEAF	CHAINSAW EYE/RINGHOOK	2 2	2 2	2 2	2 2
Ū	ATTACH POUCH/FIRST AID			*	*
F	WAIST PADDING SWAMI	Memory Foam	Memory Foam	Leather/Memory Foam	Leather/Memory Foam
WAIST	WAIST WEB HEIGHTPADDING	50mm/2" 23cm/9"	50mm/2" 17.8cm/7"	50mm/2" 15.2cm/6"	50mm/2" 15.2cm/6"
≥	WAIST ADJUST	1x Side	1x Side	1x Side	1x Side
	LEGS WEB HEIGHT PADDING	50mm/2" 10cm/4"	50mm/2" 10cm/4"	50mm/2" 7.6cm/3"	50mm/2" 7.6cm/3"
LEG	ELASTICATED REAR ATTACH			-	-
	LEG RISER ADJ REAR FRONT			<b>I</b> -	■-
S	RFID CHIP WEAR INDICATE		- 🔳		
RA	FIRST AID TRAUMA KIT				
EXTRAS	SIT STRAP BOSUNS CHAIR		- 🔳		
	COLOURS/Trim	Black, Black/Orange	Black/Yellow	Red/White/Black	Red/White/Black
	NOTES	Endura braid rope bridge	the 730 has an integrated sit strap	WLC-560 has two sliding D-Rings WLC530 has one. £ cost increases with size of harness	£ cost increases with size of harness.  *2 of the rings are intended for pouch stowage.
	WEBSITE	weaverarborist.com	weaverarborist.com	weaverarborist.com	weaverarborist.com
CC	ST: Approx & inc local tax	/VAT £\$€=currency conversion	n only OPTION= or or or	N/A: info Not Given STAN	DARDS: EN358 = ☐ EN813=
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