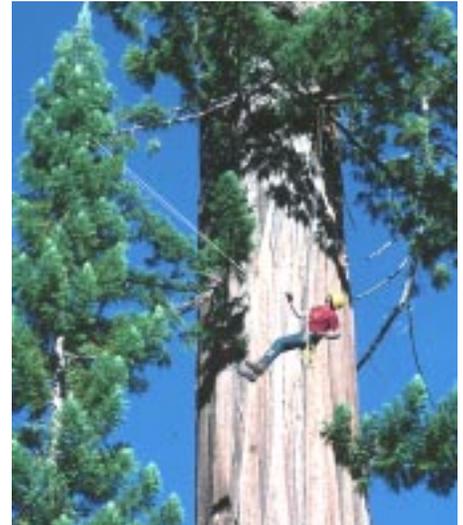


# CLIMBING GEAR

Here's a synopsis of the basic gear we use to climb trees with. The pictures included are only to illustrate the techniques and ideas behind the use of these tools. On the last page is a list of suppliers where said gear may be obtained.



## THE CLIMB LINES

These are the lines a climber will use during traversing and rappelling. They constitute the bulk of the weight in an outfit of climbing gear. For the serious climber I suggest no less than three climblines ranging from 120, 200 and 300 feet apiece. Too short of a line can leave you stranded up in a tree!



Listed rope diameters are somewhat misleading. As a half inch line will actually be closer to five-eighths inch in diameter. For working applications a half-inch climbline affords long life and durability. For strictly sport climbing purposes a person can get by just fine with the smaller diameters. Like the three-eighths or seven-sixteenths. These lines are much lighter and will relieve you the burden of carrying or packing a long line.

I'll give you an example to illustrate. A three hundred foot by three-eighths inch diameter climb line will run near ten pounds. The same in half inch diameter will run twenty one pounds. So, there's a huge difference in weight. But by nominal measure you're looking at only one-eighth-inch difference!

When I first started climbing all we had was manila rope. It was Tubs' brand, firm lay and of good quality, but would leave many splinters in our hands when it was new. Today, we have a broad choice of synthetic lines to chose from. Their long wearing and very affordable too.



The braided synthetics are no doubt the popular choice today. Braided rope isn't known to rotate. It can, but only if there's some inherent twist in it to begin with. Hand coiling a line will introduce some inherent twist no matter what kind it is. When freely suspended on a twisted rope a person will rotate or spin. And it can make you dizzy enough to get sick if you can't stop from spinning.

Twisted rope has its redeeming qualities. For one it's easily spliced. Which makes it useful in the manufacture of rope constructed items. Like flip-lines, safeties, slings and even climbing saddles. Braided rope is not so easily spliced. And

some types can not be spliced at all. Braided rope is also notorious for creeping. That is, it can pull through a climbing knot if it's not secured back. You got to watch braided rope for that! Now the twisted rope, once it's set, is not as prone to creeping.

The rope you buy at the hardware store is soft lay construction and can not meet the demands and requirements you need in a line to climb with. The leading manufactures of climbing

rope offer it in firm lay construction. Whether twisted or braided you can feel the difference when you compare it to the soft lay rope. Firm rope is the most durable and stronger of the two. It also tangles less and holds its knots better without seizing.

Hard rope is the strongest and stretches the least. Though, it's more suited for rigging applications, and is not desirable for use as a climbing line. It's too stiff to throw, roll and handle during climbing procedures. For use as a static line in single line technique it is very well suited for that application.



## THE SAFETY LINES

These are the shorter lines a climber uses around the trunk; to climb amongst the limbs and through the tops with. All have a snap on one end and a device on the other for length adjustments. The safety lines are attached to the saddle D rings via a removal fastener and/or adjustable tail. These lines have had many names, lanyards, flip lines, safeties, buck straps, scare straps and even daisy ropes. No matter what you call them they're an essential item needed to climb trees with. A fully complemented outfit of climbing gear may include



up to half a dozen safety lines. Why so many? You'll understand after this discussion about them.

Climbing requires redundancy. That is, in climbing procedure, while fixing a line ahead a person should have another one securing them. Which means a minimum of two safety lines. For the most part a person can get by with two safeties and one climblines. That will offer redundancy in most of the situations it's needed. Such redundancy techniques are referred to as "double crotching."

A larger diameter rope is preferred for the safety line. Because you're holding, pulling, and hoisting yourself with them all the time. Anything less than half inch would be murder on the hands after several hours of that. I use five-eights-inch diameter safeties for all around climbing. Though, I've switched over to half inch diameter when trying to lighten up my gear for a hike into remote areas.

In the tops of the redwoods, the length of the safety really shouldn't be less than twenty feet. That length will complete the loop over a limb ten feet above your belt rings. It'll also fit around a top of five foot diameter. From experience though, the particular tree will dictate the lengths needed.



Incorporation of a steel core into the safety line is not needed for recreational climbing. It's an optional feature of choice for climbers that cut trees for a living. It was used exclusively by the old time climbers that hand-chopped their trees. And understandably they needed steel core.

Snaps are a necessary evil in this tree climbing. They're a mechanical device we depend on a lot, but which have a wistful history of failing. I will enlighten you how they are likely to fail later. In spite of their short coming



climbing trees would be more dangerous without snaps on the safety line. They offer a speedy means of attachment once you have the end of the line in your hand. Without a snap you'd have to knot the bitter end of the line every time to set it.



Any safety lanyard you purchase over the counter today is outfitted with a locking snap on the end. I feel this is not entirely safe in itself. Such snaps have a duo-mechanical feature. That doubles the possibility for mechanical failure. But worse, these snaps require a special grasp to trip them open. You can take the old style snaps and lock them to a D ring in an instant. But you can't as easily with the locking type. During climbing procedure the snap of a safety is continually engaged and disengaged. In awkward places these locking snaps can hinder attachment to the D for the special grasp needed to open them. Especially with heavy gloves on. Locking snaps do have their place, but not on the business end of the safety line. I don't recommend them there.



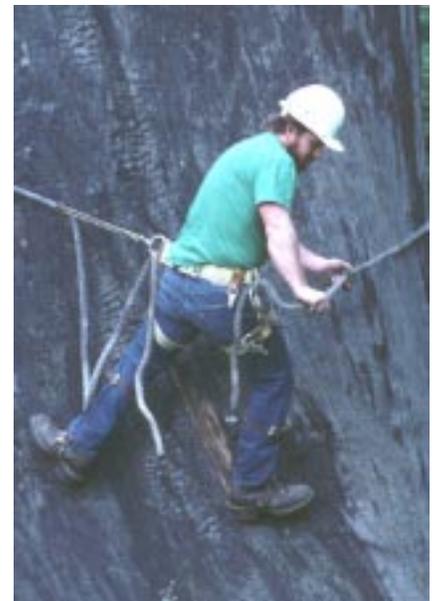
One end of the safety line is adjustable for lengthening purposes. There are several ways to accomplish this. The taut-line hitch, or prussic tail method, the slip knot method and the mechanical ascender method. I prefer the taut-line or prussic tail myself. As it takes just one hand to slip the knot for length-



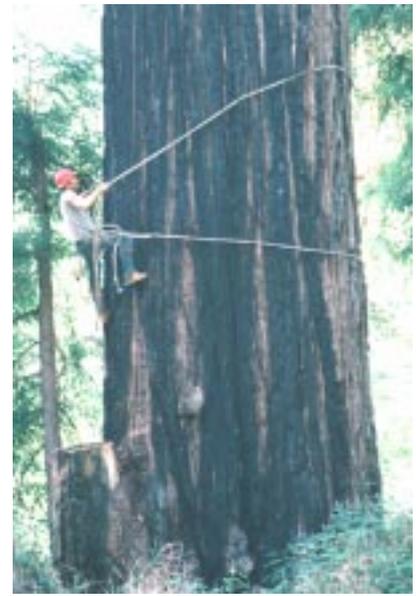
ening out the safety. And it's very fool proof too. The slip knot method requires a climber to loosen the knot and then feed slack through to make adjustments. However sure the method may be, it takes two hands to do and is terribly slow. The ascender method is quick and sure, but it's a mechanical device and requires the use of both hands to work out adjustments. Particularly so whenever there's tension on the mechanism.

Either method for adjustment can be fashioned to fix permanently, or detachably to the D rings on your belt. The adjustable end is seldom engaged or disengaged on a regular basis. So, here I can condone using a locking type snap, or locking type carabiner for the means of attachment.

As mentioned, snaps have a wistful history of failing. Here's how and why. (1) Weak springs are culprit to tripped snaps. Over time the springs will become weak. Now, I've replaced the springs in my snaps when they get soft. Though, some people contend, "If the spring is weak the entire snap should be replaced." (2) Bent keepers can make a snap fail. Even with a strong spring a bent keeper can stick open. Push the keeper all the way open and let go of it. It supposed to "snap" shut. If it sticks! Use a screwdriver to spread its cheeks to relieve the bind that may be making it stick.



Now, be aware! Letting the snap end of your climblime fall out of the tree can be damaging to the keeper! (3) Bark and foreign material can cause a snap keeper to stick open or closed. Keep an eye open for this too. Because



slinging a safety over limbs or around the trunk can jam bark and other debris into the keeper mechanism. (4) Line entanglements and hardware clash can cause snaps to trip and roll out of the D rings. Whenever aloft and you chance to hear a snap keeper click! Stop! Make no move! Other than to secure your position. Then find out why the snap keeper clicked. Otherwise, the next move you make may be your last! In thirty-one years of climbing I've had snaps fail on me three times. And one of them was a locking snap!

## THE FLIP LINES

The flip lines we use to scale the redwoods with can be up to fifty feet long. Now, consider that length in one inch diameter rope. It comes to about 13 pounds. When wet to the saturation point the weight can more than double. And some big trees may require double flip lines. A calculator isn't needed to add up the weight a full compliment of safety lines and other climbing gear can total up to.





On the long flip lines consider using an adjustable tail on each end. This way length adjustments can be carried out on either side. A couple of reasons make it preferable. For one, you have the advantage of being able to let out line on one end and take it up on the other. This allows you to move around the trunk without having to scoot the line. When a flip line gets stuck in the bark this feature gives you the chance to get around and free it. Plus, double-tail ends allow you the opportunity to work the line equally right or left handed.



I'll tell you this about flip lining these big trees, you can get the line stuck in the bark and not be able to go up, down or around to free it. It can be exhausting to overcome and leave a person stuck on the side of the tree. Now, getting out of such a predicament can come by knotting the ends of the flip line together and tying-in to it. And then rappelling out of the tree. But know this! A climblines running over another line like that can cut it! Especially during a rapid descent. Rappel out slowly if you're forced into having to do it. Better yet, fix the climblines through a fastener on the safety. Such as a snap or carabiner. That will solve the cutting tendency.

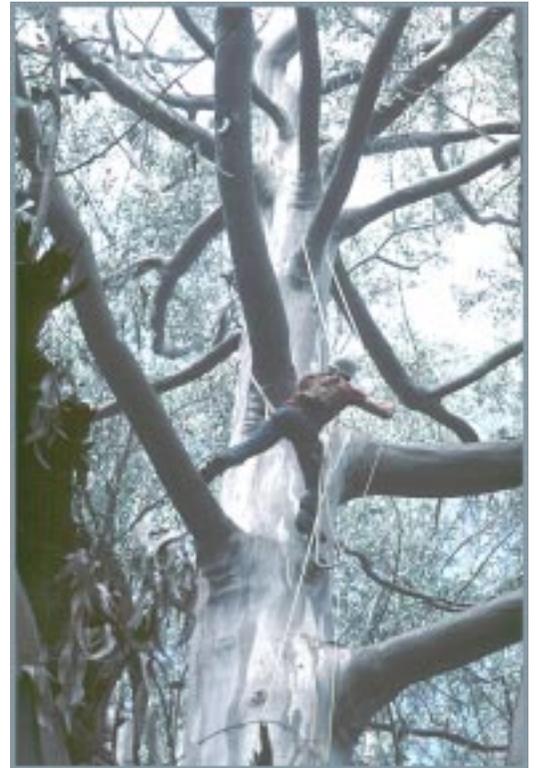
## THE THROW LINE

Consider the throw line absolute. It's simply a fine line with a weight on one end a climber throws over limbs in out of reach places. Specifically for fixing your climb line in places you can't throw it to. A proficient person can heave a throw line over limbs 50-60 feet up with good accuracy. Such a throw line would be made up of 100 feet of eighth inch firm polypropylene and a weight of about 8-10 ounces. Now, up in the tree long throws are not the rule. You can get by fine up there with just 30-40 feet of line and a 2 to 4 ounce weight.

A variety of throw weights are available through arborist supply outlets. The most popular are the throw bags. Available in different sizes and colors. They're made of nylon duck, filled with gravel or shot and have a ring eye on the end. Consider having a few on hand. A hard weight, covered with foam rubber, has been available for a long time. Their heavy though, and get stuck in tight crotches too easily. For obvious reasons, avoid using hard bare weights.

As far as the line goes, just about any can be used. Though, I recommend the one-eighth inch firm polypropylene, twisted or braided. Such line is light, firm to hard, throws farther, tangles less, coils better and slides easily over limbs.

Unless I'm rappelling, I don't bother to coil the throw line up in the tree. I just let it hang off an accessory snap on my belt. It keeps the line straight and stretched out. Which makes it easier to coil and throw when I'm ready to use it. When not using the throw line coil it up neatly to keep it from tangling. Now, there's some cute little nylon duck bags for stuffing your throw line in to store'em. Though, I don't feel they're absolutely necessary.



When a throw line becomes kinky from knots, line tangles or improper storage pull it **tight** between two points and tie it off. Then let it set like that for a while. This will remove any kinks or twists in the line and make it coil neatly afterwards.

For consistent accuracy in your throwing ability you need to know a little about coiling the line. It matters a great deal. A set of coils full of kinks and tangles is culprit to bungled throws. Remember a stretched out line will coil the neatest. For long throws consider progressive coiling. For example, using a hundred foot throw line. Begin with coils of about eighteen inches and finish with progressively smaller coils at the weight end. This allows all the coils to mesh together in your hand and not tangle in the bunch prior to the throw.



When heaving the weight and line from the ground the most common method used is the lob. Holding the coils in one hand let the weight dangle from the other about 12-18 inches. Swing it back and forth to line up for the shot then heave the weight when you feel it's right. Like everything, it does take practice. Up in the tree you're often restricted to using an overhand or sidearm throw. The same as you'd throw a ball. With either method, when the weight reach's the objective limb let it run and pull the line over. Then, fix your climb line to it and pull it through.

The means of attaching the climblines to the throw line can come by using a series of hitches, tucking between lays, and by nail knotting. Using conventional knots to join the lines together works only if you're pulling them through a smooth open crotch.



When pulling the lines through a narrow crotch you must use one of the other defined methods. With a twisted throw line the method of tucking the climblines between the lays is a quick and easy means of attachment. With either method you may opt to serve the entire connection with vinyl tape. Thus ensuring a smooth and able pass through of the line connection.



## AUXILIARY LINES

A person should not go climbing any tall trees without some kind of back up lines. Specifically a line that will reach the ground in case their climblines doesn't. I always carry one to two-hundred feet of eighth inch polypropylene in my pack. Also, I carry a fishing reel with over a hundred yards of forty pound test monofilament on it. With it I can retrieve a line on the ground from the top of the tree. The reel is ultimately handy for retrieving something to eat or drink from the ground too. It can be used to estimate the height of the tree by marking the line after letting the weight run to the ground. Then later you can pull the line off and measure the distance.

The reel is a climb line saver too. Many climbers have had the misfortune of getting their lines stuck in the trees when pulling them out. I'll explain how it happens. When the end of the climblines falls out of the tree it picks up a lot of speed and can wrap itself tightly around a incidental limb during the fall. It can get stuck there and require a climb back up the tree to free it. It would be foolish even to consider climbing up a rope stuck like this! By tying the fishing line to the climblines before pulling it out you can apply drag and control its fall out of the tree.



A short piece of three-eighths diameter line, five feet long can save the day. How? On stubs and drooping limbs a climblines can run off. You can draw and wrap that short piece of line around those things to act as a stop, or secure a fastener too. Thus affording a safe tie-in point where otherwise one is not. Moments like these are encountered in the region of the last limbs of the tall trees.

## THE CLIMBING SADDLE

When I first started climbing trees there was a very small selection of saddles and belts to choose from. In fact, all of the old timers I worked with were making their own saddles back in the 60's. Today we have practically an unlimited selection



of climbing saddles to choose from. There are

three major types. The butt belts, seat saddles and leg saddles. I won't get into a discussion about the first two. I'll get straight to the type of belt best suited for climbing trees with. And that's the leg saddles. These belts will give freedom of leg movement when suspended by the climb line. The other saddles tend to

pinch the legs together when suspended by the climblines. It's a distracting feature for a climbing saddle to have. Particularly during traversing. You need freedom of movement for the legs to spread and lock around limbs in many traverse situations.

Most climbing saddles manufactured today are designed around work standard specifications. Which makes many of the production belts unnecessarily heavy and bulky. For sport climbing purposes a person can get by with a lot less weight and bulk.



Also, in the production saddles, you'll find no matter what kind you decide to climb with, they will all vary widely in how each is constructed. That is, the type of material

used and the way it's fashioned together. There's probably been no less than ten different ways in which I have seen just the leg saddles constructed. Of which, many lacked the utility and creature comforts you need in a climbing saddle. Though, in recent years I've seen much improvements.



The fit of the belt is very important. If it don't fit you well then it will not serve you well. Too loose of a belt is prone to shifting and slipping over the hips. Especially the seat types. They can slip to the knees or arm pits and put you in a dreadful predicament. If the belt is too tight it can quickly wear in and cut off your circulation. The beginner is not likely to know what the proper fit feels like. So, try buying a saddle from a local supplier that would allow a return on your purchase after a trial run with it.



I've heard there's a couple manufactures around that will build you a custom climbing saddle to meet your specifications. Not knowing what kind of materials they use I could only guess it'd be primarily for the fit. It could be expensive in comparison to the cost of a production belt. But I've made my own climbing saddles for years, and can attest to how much better a custom belt can fit and feel. It's multiple choice now. In the old days we had no choices.

## THE CLIMBING SPURS

I'll bet the spurs were highly acclaimed by the industry when they first came on the scene. Though, today the attention they receive is not so much acclaim as more disdain. In the tree care industry the use of the spurs is totally frowned upon. And for good reason too. The wounds the spur points inflict on the tree when penetrating the bark and entering the cambium provide entry points to pests, disease and wood rotting organisms. There's no denying it. But there is degrees of it.

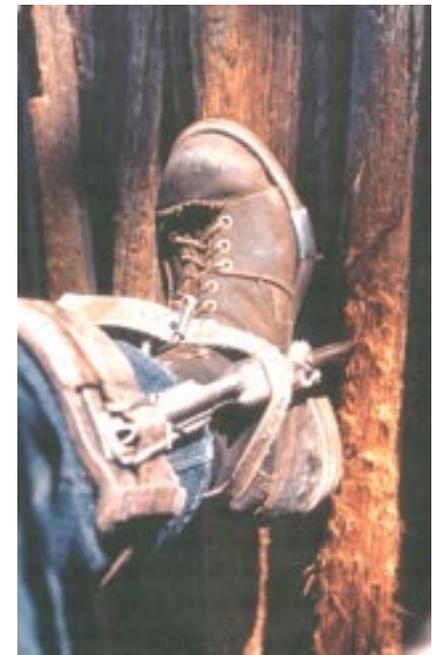


Isolated spur wounds by themselves will be found to heal satisfactory and have nil effects on the overall health or well being of a tree. Pictured right is an isolated wound in Douglas fir four years after healing over. On the left, a tan oak, are two wounds that occurred in the same area ten years apart. They too healed satisfactory. In contrast to these examples, multiple penetrating



wounds in close proximity to one another can inflict serious damage to localized areas in a tree. For any wound to occur though, penetration into living tissue has to occur first.

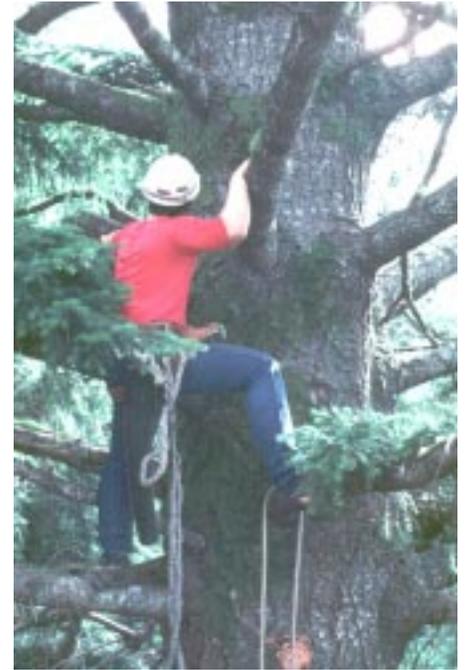
Now, the bark on the big redwoods is so thick and firm the points of the climbing spurs can not penetrate it. If there's no penetration into living tissue, then the tree can not be injured by using the spurs to climb them with. In spite of this many people still contend, "The spurs leave marks in the bark." In thin bark trees that does hold true. But not in the redwood. After a season or two of weathering the minuscule marks from the spurs blend in with the color and texture of the bark. And in effect they disappear.



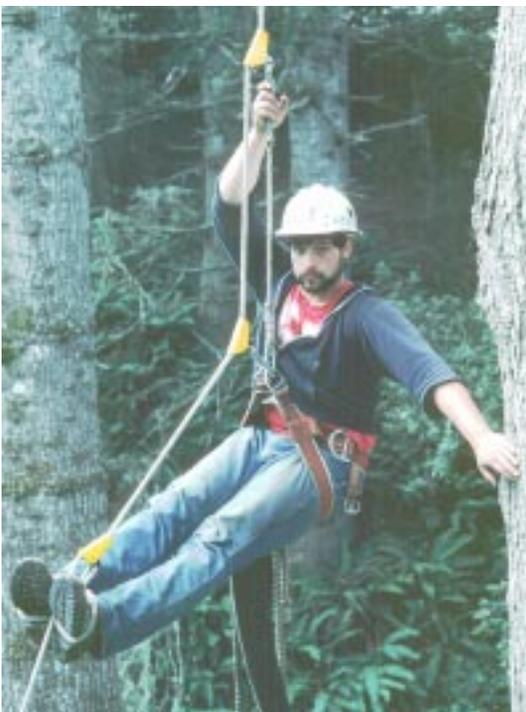
All controversy aside. Climbing with the spurs is not advised for the faint of heart. It takes years of experience and a certain swagger to be confident to climb with them. There are hazards plausible to oneself when ever climbing with the spurs. For one, a person can prick, poke, pierce, puncture or gash themselves terribly with the spurs. But the most imminent hazard of using the spurs is called kicking out. That's the event where the point of the

spur cuts out of the bark. You'll take a fall! Just how far is dependent upon a number of things.

While free climbing, your hand holds will be all that keeps you from falling if the spurs cut out. If you don't have a firm hold on the tree, you're going down. While flip-lining up a tree, a fall can be arrested by clinching the safety tightly to the trunk. Easily done on trees of large diameter. Such falls are generally very short. However short they may be, a person can still get their knuckles torn and get banged up against limbs or stubs. As such are the risks assumed when using the spurs to climb with.



All spurs have a certain amount of mechanical fasteners holding all their parts together. Nuts, bolts, screws, tapered pins, rivets, buckles, split rings and the like. All of which require periodic inspection and maintenance. Over the years I've seen the spurs come apart and leave a couple climbers in stressful situations. That goes to show the reasoning behind periodic inspections, and keeping on top of all your gear.



## THE ASCENDERS

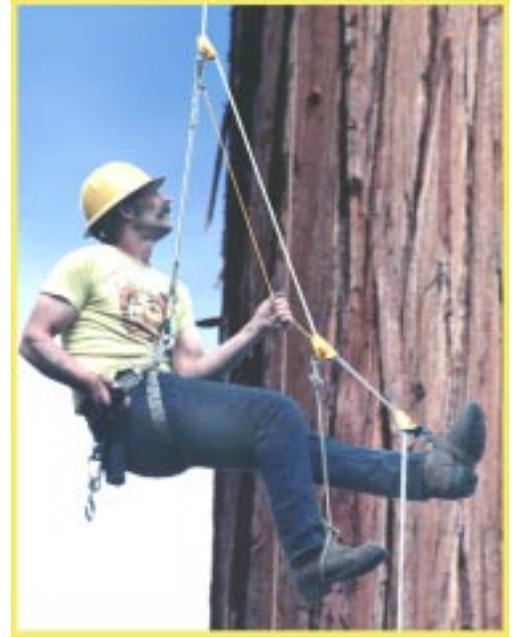
These one way cam lock devices that rock climbers use are a god send for the tree climber. They're used more in single line techniques where a climber ascends up a rope already fixed in the tree. In recent years these devices have found their way into many allied uses. For one, some climbers use them as an adjustment apparatus on the safety lines. One specific type for that purpose is called the Micro-adjuster.



So many different kinds of ascenders are available, and they're all quite expensive. In spite of the cost though, you shouldn't even consider climbing

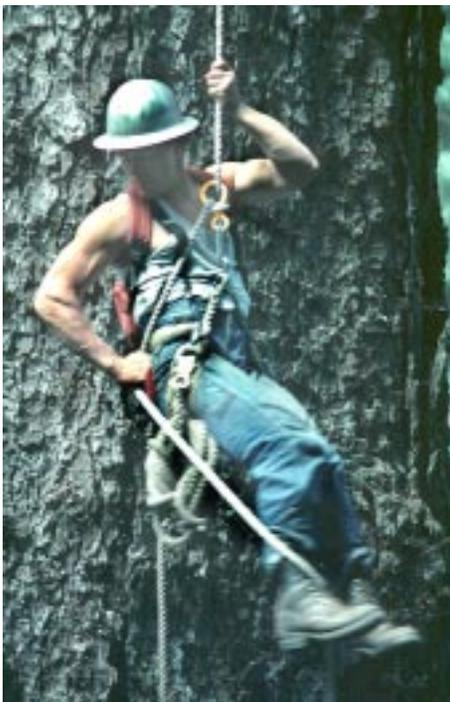
the tall trees without them. Because once a line is set in the tree, called a fixed line, the ascenders is all you'll ever need to get up in it again.

Probably the least expensive of these devices is the Gib's ascender. (pictured on the previous page) Two are all that's needed to climb a rope with. One for the hands to push up on and lock onto the line. The other for the feet to push off on. As a redundancy measure a person should use one more. I feel one ascender should always be connected directly to the belt for the line to run through.

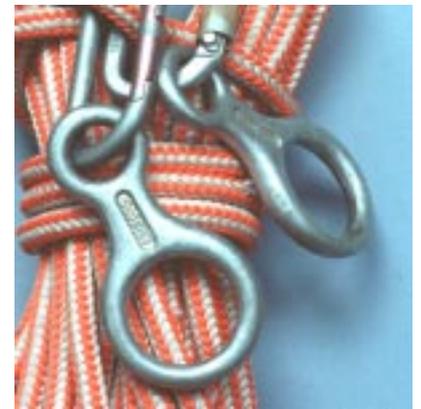


There's several ways to use the ascenders to climb a rope with. One, called the "Frog" is pictured on previous page. Another, called "Rope-walking," is pictured here. Heights in excess of 100 feet have been achieved in less than thirty seconds using these devices!

## THE DESCENDERS



Now the descenders are used for belaying and rappelling. There's some odd kinds available out there. But the most common you'll find is the figure-eight. There's different styles of figure-eights too. They all work on the same principal by creating drag on the line so you can come down it safely. When using these devices to rappel with be very attentive. You will go into a free-fall if you



lose your tether on the feed side of the line. To aid in the prevention of that I've connected two figure-eights together in series. It's redundant and slow, but makes it safe for beginner climbers. As with every tool related to climbing, proper training in its use and application is a must before going aloft.

## CARABINERS AND QUICK-LINKS



These are the fastening devices for your lines and tools. There's just so many different kinds of these devices available. I prefer the aluminum type to keep the weight of my gear down. Avoid using the non-locking type carabiners as a life-line fastener. I've seen their gates trip open too easily from line entanglement, and even broken off from hardware clash. The steel "quick links"

you find in most hardware stores can be used in lieu of the more expensive alloy biners. These secure by a threaded nut. Use only the three-eighths size or larger for climbing with. Remember this! It is possible for any of these devices to unscrew or unlock. But the biggest threat you should look out for is yourself. Because you can forget to screw or lock these devices shut in the beginning.



## THE SLIP HOOK



Now, here's a common item you can get at any hardware store. It comes in real handy during traverse procedures. You'll feel like a real buccaneer when using it too. Without one, to accomplish some traverse's you'll often fashion a wad on the end of the climblines and heave it into the limbs of an objective tree. That in hopes it will stick there and afford you the means to get across. It does work, but the chance of the wad pulling out and you winging back to the tree you just come from is about equal to the success rate. After heaving the slip hook over a limb in the objective tree you can manipulate it to hook around its own line. And, as

long as there is tension on the line the hook is not going to let go. I heated this hook and bent the eye around ninety degrees. It hooks the line much better this way.

## THE LAG EYE

Here's an easily obtainable item that could prove useful in climbing procedure. Now, I don't condone hammering fasteners into any tree just for the convenience sake. But I'll tell you, after thirty some years of climbing and working in the trees I have never seen any harm inflicted on any tree from any fastener at all. The reason why is. The entry point of the fastener is sealed upon its placement. The lag eye can afford you a secure tie-in point anywhere on the tree where one may never be had at all. In aerial rescue this feature could provide a speedy exit out of the tree and possibly mean saving a life. In a tree that's climbed regularly the lag eye will alleviate the repeated wear of ropes running over the same limb, or through the same crotches every time the tree is climbed. So, in spite of the connotations the lag eye may project, it really isn't a bad thing to a tree. Strategically placed, just one or two in a tree can offer a life time of low impact climbing on the tree. To keep the tree from growing over the lag eye unscrew it a half turn every so many years.



## THE LINE GUN

I fashioned a line gun out of a device used for training dogs to retrieve plastic dummies. Called a Retrieve-R-Trainer. It's .22 caliber powered. The projectiles are available in canvas and foam rubber. The .22 caliber loads come in three charge settings and makes it somewhat flexible in its power range. The only modification to this device was the addition of the reel seat to set the spinning reel on. Use only a spinning reel with a manual bail. Automatic bails will trip from the shock of firing and break the line. I use forty pound test monofilament and have never had line breakage yet. It's possible to set a line over a limb 160 feet up with this device. Though, its accuracy leaves a lot to be desired, it will get a line in a tree.



The 45-70 naval arms line gun is the epitome of all hand-held line firing gizmos. This is a serious device used by the coast guard, utility companies and rescue agencies. Every thing about it is expensive. The line, projectiles and loads are big ticket items. About \$25 per shot.



Line re-winders are available but cost over \$400 themselves. However expensive it may be to operate on a per shot basis this gun can set a line over a 300 foot tall tree without any problem. I've shot lines across canyons with this gun many times and can attest to the awesome power of it.

## THE CLIMBERS BACK PACK

Climbing any tall tree can end up being an all day affair. And since a person may be out of reach of the ground for the better part of it, a light pack to carry provisions in becomes a necessity. In my pack you'll find extra throw line, weights, a knife, vinyl tape, a reel, a figure-eight descender, camera, pen, note pad, measuring tape, a couple of short straps, and something to drink. Also, I have a compass and thermometer attached to the lanyard ring. A few times I've taken a walkie-talkie to communicate with the ground. It sure beats yelling. After five or six hours in some of these trees I've used all of that stuff. These little day packs are light and come in a nice variety of styles and colors. The shoulder straps on most are thin and flimsy and you may feel the need to beef up the pads to make them more comfortable. After getting to the top of a tree use one of your short straps to hang the pack off a limb.



## SAFETY GEAR



It's important for every person who climbs trees to use the recommended minimum daily requirement of personal safety gear. Hard hat, safety glasses and gloves. It won't always save your ass, but I can attest after thirty years of climbing, it can make it a lot less painful in the long run. When I first started sport climbing I didn't always use safety gear. And by it I got rapped on the head, grit in my eyes and had my knuckles skinned back numerous times. Almost all of which could have been prevented if I was only wearing a hard hat, safety glasses and gloves. Unfortunately, the reason why I didn't use those things was because we were climbing in the parks, and a hard hat, safety glasses and gloves is a beacon to a park ranger that something phony is going on. It's really too bad that it had to be that way.



## SUPPLIERS OF CLIMBING GEAR

Most of these suppliers have great catalogs with current pricing.

**Bailey's Discount Wood Cutters Supply**, P.O. Box 550, 44650 Hwy 101, Laytonville, California 95454. 1 (707) 984-6133

**Charly's International Tree and Woods Gear**, P.O. Box 1282, Manhattan, Kansas 66505. 1(785) 537-9821.

**Hall's Safety Equipment Corporation**, P.O. Box 230, Rt. 173, Grove City, Pennsylvania, 16127. 1 (412) 458-7202 Hall's is a good source for hard to get items. Particularly replacement parts for all types of climbing spurs.

**REI (Recreational Equipment Incorporated)**, 1700 45<sup>th</sup> Street East, Sumner,

Washington, 98390. 1 (800) 828-5533

**Sherrill Inc. Arborist Equipment & Supply**, 3101 Cedar Park Rd.,  
Greensboro, NC 27405. 1 (800) 525-8873

**Sierra Moreno Mercantile Company**, P.O. Box 292, Big Pool, Maryland  
21711