



Mike Cichanowski, founder and owner of We-no-nah Canoe, Inc.

Thank you for selecting a We-no-nah...

If it is your first We-no-nah canoe, congratulations! You have joined a group of dedicated paddlers who share the satisfaction of knowing that they own the very finest of canoes.

Many other canoes are mass produced and sold by the thousands, but we make only a few hundred of each model per year. Each is professionally designed and carefully made. All are purchased by people to whom quality and performance are paramount.

If you have owned a We-no-nah before, be assured that your new one reflects the latest ideas in



design and construction. None of our models or techniques are static; we innovate on an ongoing basis. And whenever you choose a We-no-nah, you benefit from all of our many decades of intensive development.

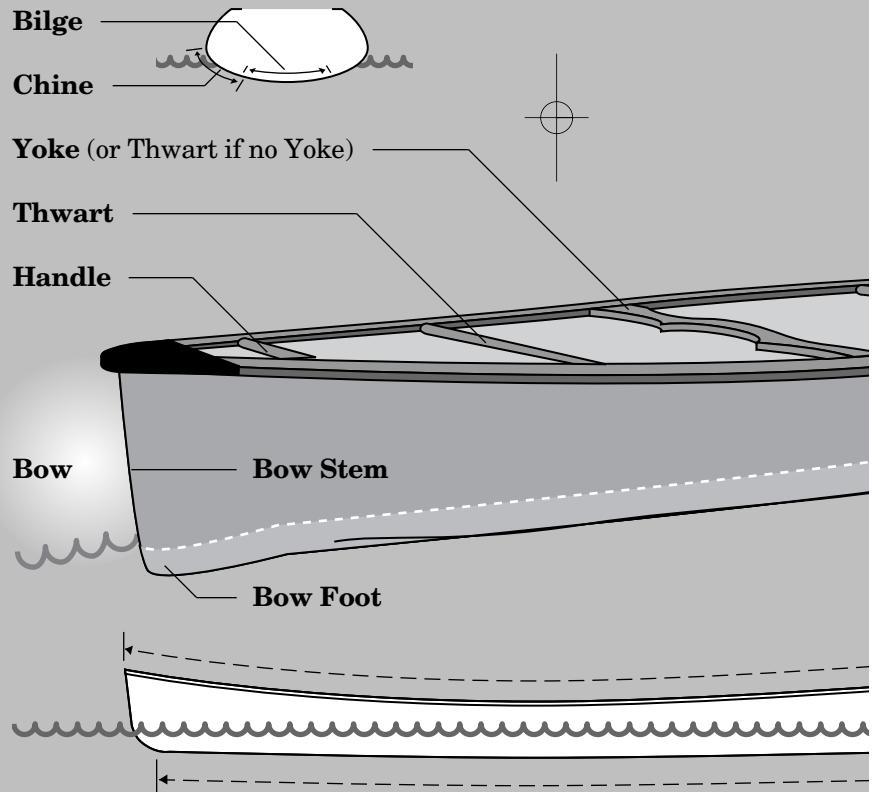
Unlike larger companies, we are not in the business of selling canoes. We are in the business of creating canoes that are good enough to sell themselves to discerning buyers. Thank you again for your purchase. We know that you will thoroughly enjoy it.

Sincerely,

Contents

Topic	Page	Topic	Page
Safety		Organizations	
■ For yourself	04	■ U. S. Canoe Association	61
■ For the canoe	10	■ American Canoe Association	62
Canoe Control		■ American Rivers Council	63
■ Introduction	16	■ Regional and local clubs	64
■ Basic skills	18		
■ Effects of wind	28		
■ For more help	31		
Canoe Paddles			
■ Introduction	32		
■ Types	33		
■ Sizing	34		
■ Technique	36		
Portaging			
■ Introduction	40		
■ Yokes & pads	41		
■ Technique	42		
Motorized Canoeing			
■ Introduction	46		
■ Square-stern hulls ..	46		
■ Conventional hulls ..	47		
Maintenance			
■ Wood gunwales	48		
■ Composite canoes ..	51		
■ Royalex® canoes	53		
Repairs			
■ Composite canoes ..	54		
■ Royalex® canoes	59		

Nomenclature



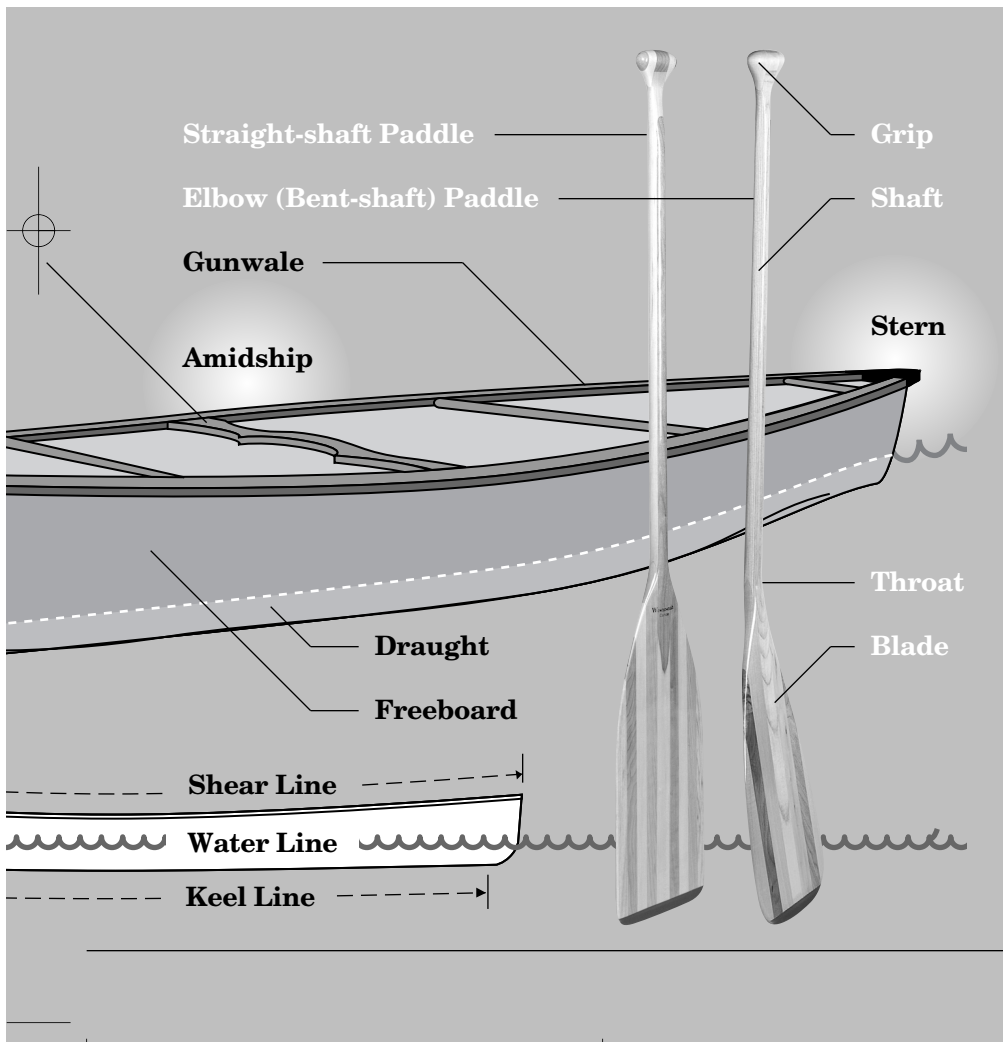
Warranty

If you ever have a problem with a We-no-nah, we'll do everything we can to solve it.

If our inspection shows one of our canoes to have a flaw that is not normal wear, we'll fix it or replace it, free. Take the canoe to your dealer. We'll pick it up and return it there. If the canoe

doesn't meet our high standards of quality, we'll repair it, or give you a new one, at our option.

To validate your warranty, complete the Registration Form in the back of this booklet and send it to us.



Safety

Protecting yourself

Topic	Page
<i>Launching</i>	<i>05</i>
<i>P.F.D.'s</i>	<i>06</i>
<i>Large waves</i>	<i>07</i>
<i>Dams</i>	<i>09</i>
<i>Sunburn</i>	<i>09</i>

A popular belief holds canoes to be unstable, but a canoe itself is very stable and will ride out the roughest water. Add some camping gear in the bilge and the canoe remains quite stable, or might even become more so. Put a couple of people in the canoe, though, and the picture changes dramatically. A canoe with occupants can be easily upset, especially if the paddlers' behavior is less than wise.

One reason is that people greatly outweigh a canoe. Two paddlers typically weigh *more than five times* what their canoe does. They also have a much higher center of gravity. Think of yourself on the lowest rung of a ladder versus the highest. Only one thing changed: the height of the center of gravity.

Standing in a canoe is inviting a capsiz.

People tip canoes over due to their weight and height. Thankfully, people can also keep canoes upright. The basic guidelines are: keep your weight balanced in the center of the canoe; don't make rapid movements, especially to the side; and stay low in the canoe. If you ever want to stand up in a canoe, you should have a very good reason, because you will definitely be inviting a capsiz. A few other topics call for a specific discussion, too.

Launching and landing at shore:

Many people cause trouble by how they launch (and land) a canoe. Do it with the canoe *parallel* to shore. Don't beach it bow-first like a bass boat or cabin cruiser. A canoe is not a big, wide boat. Nor does it have a prop in back that needs clearance. But you'll see people run a canoe into shore just like a motorboat, then exit by crawling up the center. This isn't kind to a canoe. It's also asking for a swim. With its (narrow) bow on shore, its (narrow) stern in the water, and its (wide) amidship in mid-air, a canoe has about the stability of a quarter while balanced on edge.

Launch and land parallel to shore.

The safe way is to enter and exit from the side with the canoe parallel to shore. To get in, crouch keeping your weight low, grasp the gunwales, and step into the center. To exit, do the reverse, stepping out toward shore.

Yes, you may get your feet wet. But you're canoeing, not going to dinner in \$250 shoes. Wear sneakers, or take your shoes off. Get your feet wet, because by crawling up the center of a beached canoe, sooner or later you'll get much more than just your feet wet.



Enter and exit from the side, keeping your weight low and supporting yourself with the gunwales.

Launching and landing at a dock:

This process does seem intuitive to most people, so we'll touch on it only briefly, just to be thorough. To launch – again, with the canoe parallel to the dock – sit on the dock, swing

***Anyone
who can't
swim well
must wear
a PFD at
all times.***

***Hypother-
mia can
exhaust
you in five
minutes.***

your feet into the center, lean over and grasp both gunwales, then slide your butt off the dock onto the seat. To exit, lift yourself using the gunwales just far enough for your butt to clear the dock, swing it over and sit on the dock, then swing your feet out. Here you can wear your Gucci loafers, if you feel like it.

Always have good PFD's readily accessible:

Always have good PFD's (Personal Flotation Devices) handy, even for proficient swimmers. Our advice is to always wear them, but we know that some people won't. Therefore, *at the very least*, wear your PFD when canoeing on rapids, cold water, or any threatening conditions such as wind, waves, boat wakes, etc.

Most places, of course, require that you have a PFD for each person in the canoe. Most places also specify what is an acceptable PFD. But these legal requirements are the bare minimum which often will not provide real safety.

Obviously, anyone who can't swim fairly well must *always* wear a PFD. To avoid it would be foolish. But even good swimmers must wear PFD's if there could be a sudden capsizes, or if you could have difficulty putting on your PFD.

Rapids are a prime example. The current may swiftly carry your PFD away. Or, you could break an arm and be unable to put it on. Or, you could be knocked unconscious.

A less obvious – but very dangerous – threat is posed by cold water. It will stun you, causing you to gasp for air, but possibly getting water, too. In this condition, you won't have an easy time putting on your PFD.

But you *definitely* will want your PFD on in cold water due to the risk of hypothermia. It can strike with amazing speed, causing complete exhaustion and drowning in minutes.

Water carries heat away from your body much

faster than air does. (This is why a swimming pool feels cold at 72°F.) Your body temperature begins to drop within moments of immersion in cold water. Exhaustion is the first symptom, making it very difficult to swim. Unconsciousness can occur in as little as five minutes. Death may follow quickly, either from hypothermia itself, or from drowning.

Always wear your PFD to canoe on cold water. The Red Cross also suggests using a wet suit on really cold water, but we're pretty sure you don't have one, so our advice is simply to avoid canoeing if the water is cold enough to pose a serious threat of rapid hypothermia.

**How to choose
a good PFD:**

While you can buy a legally-acceptable PFD for just a few dollars, doing that is not a wise idea. A few dollars will buy a PFD that either isn't designed to be worn (seat-cushion type), or that is too uncomfortable to wear, even when you really need to (May West type).

On the other hand, you need not spend a princely sum to get a PFD that is safe. Buy a U.S.C.G.-approved PFD. Beyond that, get one comfortable enough that you will wear it when the occasion demands. Size is important, as are the freedom to move your arms, and a jacket that isn't too hot in strong sun.

Selecting PFD's for small children is more crucial. Get a design that will hold a child's head out of water even when unconscious.

**Canoeing safely on
large, wind-driven waves:**

It won't surprise you to learn that even 3' whitecaps are entirely safe if viewed from shore. And until you are a practiced paddler, shore is exactly where to view them from.

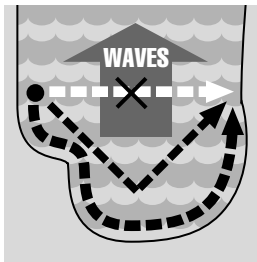
The first rule of canoeing safety is to avoid conditions that you aren't sure that you can

***Wear your
PFD when
canoeing
on cold
water.***

***Buy a
PFD that
is comfort-
able to
wear
when you
need to.***

Go where the waves let you go safely.

It is often wise to take a longer, safer route than to expose yourself to large waves on open water



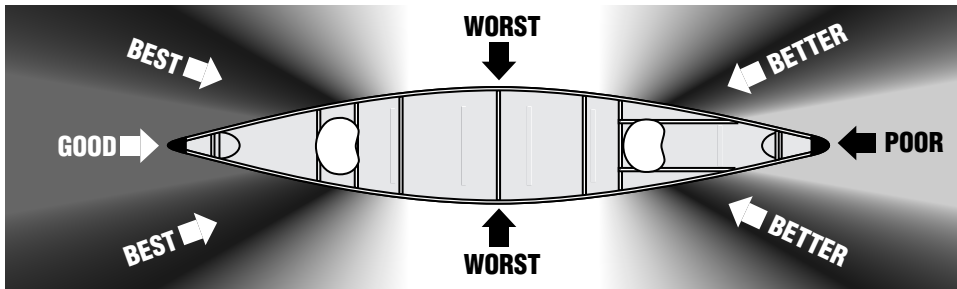
master. Canoeing isn't often dangerous, but to err on the side of safety and avoid a situation that is questionable is the wise choice.

You can minimize exposure to large waves by hugging the sheltered shore where waves have no opportunity to develop. While this may make you go farther than the direct route, the paddling should also be easier.

If you must tackle large, wind-driven waves, go where the waves let you go most safely. This, too, may mean taking a longer route.

Avoid large waves directly from the sides. These cause strong side-to-side rocking that you must react to quickly to maintain balance.

Waves from directly in front are better but cause strong fore-and-aft rocking. Very large waves also may swamp the bow. Waves from the stern are less troublesome because you are traveling with them, which reduces their speed relative to you. (Be leery, however, of routing straight out from the lee shore with a wind directly behind you because the waves will grow rapidly as you go out.)



You are safest with large waves coming from the quarters or the stern (dark areas on the schematic.)

The safest way to meet waves is from the quarters (meaning, at an angle). Quartering waves cause some rocking side-to-side and fore-and-aft, but not a high degree of either.

When on waves, also keep the center of gravity low, and trim the canoe properly for the waves. To lower the center of gravity, place the heaviest gear low in the bilge. Lower your

own center of gravity, too, by kneeling on the floor rather than sitting on the seats. (This is also a good, firm stance to paddle from.) To trim the canoe, move weight fore or aft. This is discussed in the section on “Canoe Control.”

Paddling near dams and spillways:

Avoid dams and spillways because they are very deceptive and always dangerous.

Upstream, the current speeds up because the flow-rate of the river remains the same while the effective size of the channel is reduced. You may find yourself in a current so strong that you cannot avoid going over the dam.

Downstream, the water is very turbulent. It can swamp even sizable boats, and can easily do it to a canoe. Further, a PFD may not float you to the surface of the highly-aerated water.

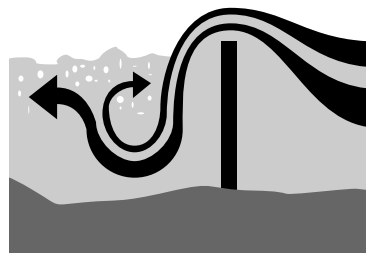
Do not approach dams and spillways from downstream, either. The problem is that the current often flows upstream nearing the dam. This is called a “hydraulic,” and it may carry you into the dam where your canoe will capsize or fill with water and sink. Some types of rapids do this, too, but nearly *every* dam and spillway can. Therefore, portage around all dams and spillways, and stay close to shore upstream to avoid strong current.

Avoiding sunburn:

If you are chuckling that we put “sunburn” in the safety section of this book, that just means you haven’t yet burned to a crisp while canoeing, which is an amazingly easy thing to do.

Sunlight reflected off the water greatly magnifies your exposure. Think of it as being like going to the beach and sitting on a mirror. You can burn very badly, very quickly. Wear a hat, suitable clothing (long sleeves and pants), and/or sunblock. If you get too hot, don’t take off clothing. Splash yourself often with water.

Always portage around dams and spillways.



Avoid dams and spillways because the current is strong, turbulent, and aerated. A dam or spillway is likely to be the most-dangerous obstacle you’ll ever face while canoeing.

Protecting your canoe

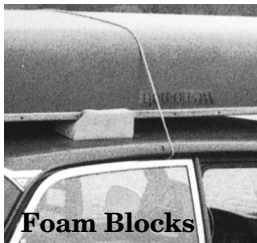
Topic Page
Car topping 10
Storage 13
Towing 14
Air flotation 14
Skid plates 15

People usually paddle in moderate conditions that can't do catastrophic harm. That's why we think canoes are more at risk in transit and storage than while canoeing. In fact, we've *never* seen a canoe damaged as badly from use as from flying off a car. But hauling and storing a canoe can be safe, if you follow a few guidelines that are mostly common sense.

On the water, a canoe can sometimes be at risk, and you can add Air Bags or a Skid Plate as a defense. Although these are not relevant to many people, evaluate their use since they do give added safety in certain situations.

How to haul a canoe safely on your car:

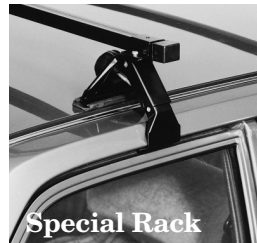
There are many systems to haul a canoe on a car. All can work fine. Or, all can fail, perhaps leading to the destruction of your canoe!



Foam Blocks



Quick-n-Easy



Special Rack

All these ways to car-top can work, or can fail! The difference is in how well you tie the canoe to the car.

The issue is not what type of carrier to use, it is that you use sturdy ropes or straps to lash the canoe... and that you use *enough* of them!

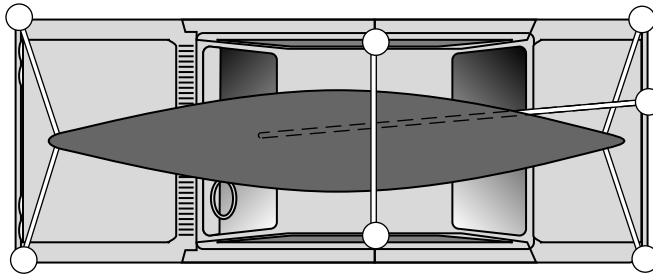
Don't use Bungees, rubber straps, or anything elastic to secure the canoe. If we hear someone telling how their canoe flew off and was wrecked, we ask what was used to tie it down. 90% of the time it was elastic cords. Most of the rest of the time, if good ropes or straps were used, there were just too few of them.

Ropes should be nylon, braided, $\frac{5}{16}$ " or $\frac{3}{8}$ " thick. Don't use waterski or clothesline rope since you can't tie tight knots in those. Straps should be at least 1" wide, webbed, with buckles. How many to use, and where to affix them, depends on the carrier. In no case, however, should you have less than three.

Although foam blocks can be used with any car having rain channels or not, they are the least secure carrier that requires the most aggressive tie-downs. Foam block kits are readily available and usually have four blocks, fasteners that attach to the car, and ropes (although sometimes too few ropes.) We have a very good kit in our catalog that has plenty of straps instead of too few ropes.

Use nylon rope or straps... not elastic or rubber cords!

The blocks are grooved to fit on the gunwales. After installing them, invert the hull onto the car and

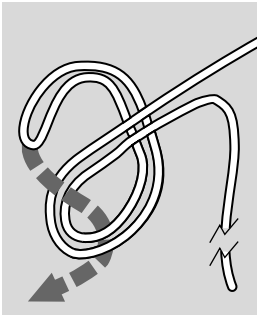


tie it down. Three lines are too few in this case because you can rarely tie to anything that is both truly secure and is *near the canoe*.

To make the use of foam blocks safe, you need 7 attachment points for the ropes.

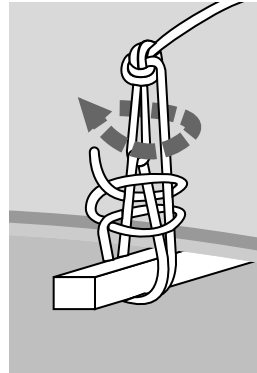
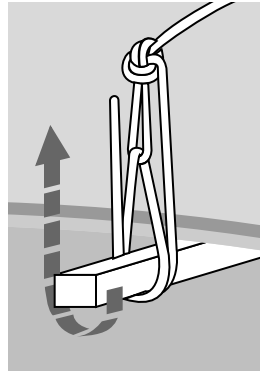
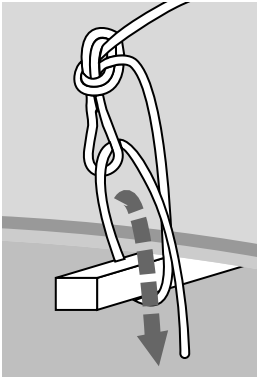
Since the blocks can slide, using too few ropes will let the canoe move, loosening up. Use seven attachment points, which means a minimum of four ropes. Tie the canoe to widely-spaced points at the front and rear, tie one or more lines over the top, and tie a line to keep the canoe from sliding during a sudden stop.

The ropes also need to compress the blocks, holding them securely in place. This can be a bit tricky. One good way is to tie loops into the ropes to use for tensioning purposes. The plan is to pass the rope from the canoe through the attachment on the car, pass it back through the loop in the rope, then pull everything tight



before tying your knot. It's easier to do this than to explain it, so see the diagram.

Using loops, you can tie the canoe tightly and shouldn't have it loosen up. But it's wise to check in a few miles, and periodically thereafter. If the ropes are loosening often, you are



Tie loops in the ropes to use for tensioning. What type of final knot you use is less important than getting enough tension before tying the knot.

doing something wrong, because even with foam blocks a canoe can be tied to stay tight.

But if seven attachments, four ropes with loops, and periodic checking sounds like a lot of effort... well, it is. Yet that's what's needed to be safe for more than just a couple of miles.

To simplify car-topping while protecting your canoe, you need a good, sturdy rack.

Don't use racks that affix with suction cups and straps.

Incidentally, those universal types that affix to the car with suction cups and straps are *not* good, sturdy racks. We advise strongly against using them, but if you do, lash the canoe to the car just as firmly as for foam blocks.

If your car has rain channels, you can get a good, sturdy rack that mounts quickly, stays on tight, and is low-cost. "Quick-n-Easy" brackets mount to the rain channels. You make crossbars from 2x2's or 2x4's that you cut to length and affix using carriage bolts. (To carry two canoes, make the crossbars 6'3.")

With a rack, you need fewer ropes or straps since you're tying the canoe mainly to the rack

which, unlike foam blocks, is well-secured to the car. Use three lines, two across the top tied tightly to the rack, and one tied to the front of the car for safety if another one fails.

If you have a car without rain channels but want a good rack, you'll need one designed for your specific car. These are made by a few aftermarket companies (see *Canoe & Kayak Magazine* to find them), and some cars can be fitted with racks by the auto maker or dealer. Typically these are costly but are excellent racks that are safe with just three ropes.

To protect the gunwales, affix carpet or other padding to the rack, or put temporary pads between the gunwales and the rack. There are several things you can use, and one of them is foam blocks. Pull the ropes tightly enough to compress the blocks to get a secure set-up.

With a good rack, by the way, there's no need to place the canoe in the center of the vehicle. Offsetting it toward the passenger's side has advantages. It's easier to load and tie the canoe, which is also less prone to block the driver's view of overhead signs, stoplights, etc.

To save time, get good tension, and eliminate troublesome knots, use straps with cam-type buckles to secure the canoe. We offer 12'-long straps that are shown in the back of this book. Although straps work best used with a rack, they can be used with foam blocks by passing the straps through the doors inside of the car. You still need seven attachment points as if using foam blocks with ropes, but you'll get better tension and reliability with the straps.

Storing your canoe to keep it safe:

There are probably lots of weird ways that a canoe in storage can be damaged, but two common problems are avoidable: 1.) heavy stuff falling on the canoe, 2.) wind blowing the canoe away. For these reasons, and because



“Quick-n-Easy” brackets make a good rack easily but are only for cars that have rain channels.



Cam-type straps hold the canoe more securely than ropes and are easier to use.

It's best to store a canoe indoors.

sunlight will fade the finish, it's best to store a canoe indoors for any lengthy time.

“Heavy stuff” includes more than you might think. Tree branches and chimney bricks are heavy stuff, but so are icicles and a foot or two of wet snow. Don't put a canoe halfway under the eaves; that's asking for junk to land on it.

If storing a canoe outdoors, tie it down. A canoe – even a bulky one – weighs little compared to its surface area. It doesn't take much wind to send a canoe sailing. And due to Murphy's Law, you can expect it to hit something unfortunate (such as an attorney).

Towing a canoe with a powerboat:

Don't tow a canoe with a powerboat

Canoes tow very poorly behind powerboats. The sharp bow of a canoe is easily disturbed by the prop wash and wake of the boat. At any speed above dead slow the canoe will weave, buck, and rock. If it hits a wave awkwardly or takes on water, which it easily could, you risk doing *catastrophic* damage to any canoe.

To tow a canoe, use another canoe or a rowboat. To transport a canoe with a powerboat, you must get the canoe into or onto the boat. Do not tow a canoe behind a powerboat except in an *emergency*, and then tow it at idle speed.

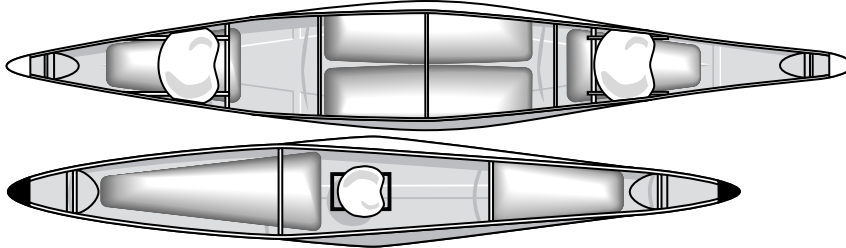
Using Supplemental Air-flotation Bags:

Air bags float a swamped canoe higher.

All of our canoes will float if filled with water. If swamped in rapids, however, a canoe must do more than merely float, it must float *high* in the water. Supplemental Air-flotation Bags accomplish this, and we recommend them if you are canoe on rapids of Class-3 or greater.

Among the worst damage that can strike a canoe is a “wrap.” It happens if a hull filled with water lodges sideways in rapids with its center against an obstacle. The strong current tries to wrap the canoe around the obstacle.

Although air bags can't eliminate the danger, they can diminish it. Firstly, they float the hull high enough to clear some obstacles that it might otherwise hit. Secondly, they lessen the chances of a wrap. By floating high, the



water pressure on the canoe is reduced, even if the canoe remains stuck. Better still, the hull is apt to free itself by sliding off to the side of the obstacle, or by climbing up on it.

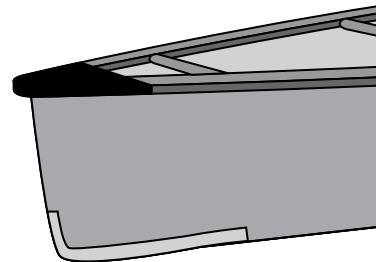
Top: four air bags in a tandem canoe.

Bottom: two air bags in a solo canoe.

Air flotation bags are available from us. Three styles are offered for use with solo or tandem canoes. See our catalog for details.

When to use Skid Plates:

A Skid Plate is an extra piece on the bow of a canoe that adds protection against rocky impacts. We don't favor the routine installation of a Skid Plate because it diminishes the performance of a canoe while usually being unnecessary. But rapids are a different story.



Many people add a Skid Plate to a composite canoe for use on rapids, but owners of Royalex® hulls rarely do, thinking that their canoe is indestructible. This isn't quite true.

A Skid Plate can be a wise addition to a canoe that will be used in rapids, especially a Royalex® canoe, although that may surprise you.

A Royalex® hull is almost impervious to blunt impacts but, unlike a composite canoe, can be cut by a sharp rock. Fitting a Kevlar® Skid Plate to a Royalex® canoe can be wise because it is very good protection against cuts.

We offer Skid Plate Kits for our canoes. The kit has mounting instructions, or you can get them beforehand to learn the process.

Control

Why bother, anyway?

Topic Page
Importance of 16
Basic skills 18
Effects of wind 28
For more help 31

Making a canoe go where you want isn't difficult – at least, it needn't be. Sure, there are fancy skills you can learn: special strokes such as posts and braces, steering by leaning the hull or using the current, plus a few others.

But such techniques are typically *unnecessary*. You can control a canoe well enough for most waters with a small number of simple skills.

So, if controlling a canoe is easy, why do many people fail? The answer might be avoidance.

Since most people go canoeing casually for fun, few want to invest much time in learning how to paddle well. In response to this, unfortunately, many people invest no time at all.

You need not make a big investment of time, but you'll be *much* happier if you make at least a small one. Permit us to explain why.

Some control is needed for safety:

We won't dwell on this topic, but having adequate control of a canoe can sometimes be crucial for safety. If you can't reliably make a canoe go where you want it to, then you also can't reliably avoid trouble when needed.

If it's so easy, why do people fail?

The big, obvious dangers such as waterfalls aren't really the issue – you'll probably stay far away from them. It's smaller, unexpected threats you'll need to dodge... a tree fallen in the stream just around a blind bend, or the kid on a jet-ski who's not paying attention.

Canoeing isn't often dangerous, and you don't need to be an accomplished paddler to be safe. But you do need to have at least enough skills to avoid unexpected problems occasionally.

Effective control reduces your effort:

Because a canoe is powered by you, not by a motor or the wind, having good control of its direction will minimize your effort to travel.

You'll see lots of canoes (yours?) that proceed in nothing like a straight line. They travel in an endless series of linked turns, veering in one direction, then the other, over-correcting each time. This is what a downhill skier does seeking to *increase* distance and reduce speed. It may be wise for a skier. It's not for a canoe.

How much farther you go depends upon how badly you zig-zag, but 25% (or more) isn't uncommon. Why paddle 25 miles if the trip is only 20? If you learn to keep the canoe on course, you'll avoid paddling needless miles.

Having control makes canoeing more fun:

It's unclear to us how paddlers who are wandering semi-uncontrollably around a lake or river can be having any fun. They aren't going where they want to go; they are going where they don't want to go; and they're expending lots of effort to get this unrewarding result.

Fun? How so? Frustrating is more like it. And this may explain why some canoes are used a few times, then parked forever. But canoeing can be fun, and will be more fun, if you spend a little time learning to control the canoe.

*You need
some skill
to avoid
trouble.*

*Don't
paddle
25 miles if
the trip is
only 20.*

*Canoeing
will be
more fun.*

How to control a canoe

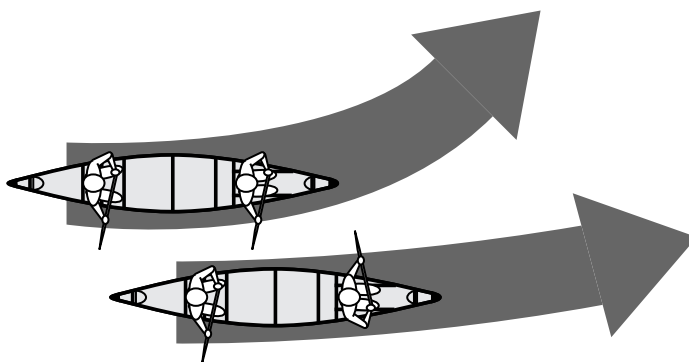
Don't fight drift, learn to use it!

Canoes tend *not* to go straight. This is slightly troublesome, since going straight is the preferred route a great majority of the time.

In a tandem hull, the stern paddler has more leverage than the bow paddler does. So even if they paddle on opposing sides of the canoe, it drifts slightly away from the side on which the stern person is paddling (i.e., stern person is paddling on the right, canoe drifts left).

Solo canoes are similar but more extreme.

Since the solo paddler is near the pivot point of the hull, and because no one is paddling on the opposing side for balance, a solo canoe drifts *strongly* away from the paddling side.



This is also the case for a tandem hull if both people paddle on one side; instead of just drifting a little, the canoe drifts a lot.

How much a canoe drifts is governed by if the paddles are on the same or opposing sides of the hull.

In most cases, controlling a canoe is a matter of *minimizing* (not “eliminating” but “minimizing”) a canoe’s natural drift in order to go straight, and of *using drift* in order to turn.

It’s that simple! And while new paddlers are often frustrated because a canoe drifts, they’re missing the point. A canoe will drift – accept that fact, and don’t fight it, learn to use it!

Wind is a similar issue. It can effect a canoe badly, minimally, or beneficially. You must

deal with wind just as drift, meaning: *minimize it* when needed, *use it* when possible.

We'll get to the specifics shortly. But first, one topic applies to tandem canoes alone, and it is so important that it must come before all else:

Paddling tandem is a *team* effort!

The magnitude of this point can't be overstated! People who are paddling tandem can not take independent, unexpected actions if they want to succeed in controlling a canoe.

And for people to work as a team, productive communication is required. The decisions about what to do must either be made jointly by *communication*, or they must be made by one person and *communicated* to the other.

As you can imagine, this may cause problems for certain pairs of people – specifically young siblings, but even a few adults. We won't elaborate, except to say that, occasionally, specific persons can't paddle well together since they can neither share authority nor delegate it.

A true inability to work together, however, is uncommon. Most people could coordinate fine, they simply aren't doing it... which might be because they didn't know they needed to.

With any paddling partner, you must decide together upon "the plan." A common plan, but not the only workable one, is for the better-and/or-stronger paddler to occupy the stern, to make the decisions, and to give needed instructions to the person in the bow, who does *only* what he/she has been told to do.

There are some reasons for the stern person to be in charge: 1.) The stern person can see the bow person, but not the reverse. 2.) The stern person can speak to the bow person more easily than the opposite. 3.) The stern person, by virtue of having greater leverage, has more control over the canoe in typical situations.

Deal with wind the same as with drift.

Communication is required.

Decide together upon "the plan."

Establish who's in charge.

The bow person has advantages, too, the main one being a better view. But if the bow person sees an obstacle, he/she should first alert the stern person, rather than taking independent, unexpected action to avoid the obstacle.

If having the stern person be in charge works for you, great. But if some other plan makes more sense in your case, that's fine, too. The details of your plan aren't so important as that you have a plan, and that you stick to it.

Just by deciding who's in charge, you'll make progress in gaining control of the canoe.

To control a canoe takes just 4 strokes.

Four, basic paddle strokes:

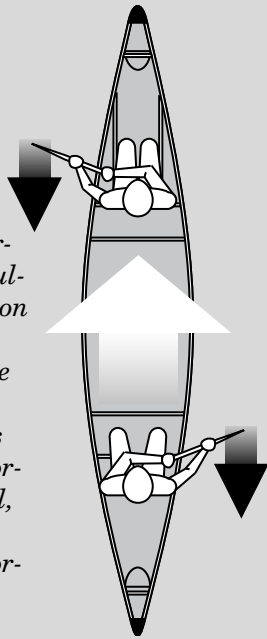
In nearly all cases, you can control a canoe using just four paddle strokes. They are:

1) Forward, 2) Backward, 3) Sweep, 4) Draw.

And for people who perform their forward strokes well, they will only occasionally need to use the other three types of strokes.

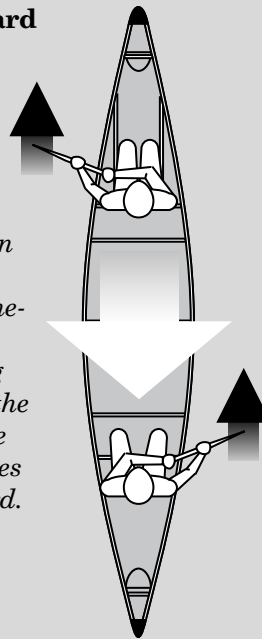
Forward

Paddle forward simultaneously on opposing sides of the hull. The canoe goes straight forward (well, almost straight forward).



Backward

Paddle in reverse simultaneously on opposing sides of the hull. The canoe goes backward.



Performing forward strokes well means several things. The bow and stern persons should paddle *in unison*, performing strokes that are of the same duration and pacing. In other words, the paddlers should be synchronized.

Although short, fast strokes are more effective than long, slow ones, you can do as you like... provided both paddlers are together. People may have differing preferences about the paddling rhythm, but you must find one that is acceptable to you both. And you may need to vary it to speed up or slow down the canoe.

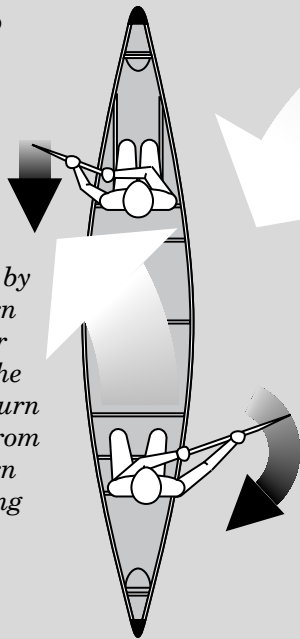
In addition to being in unison, you should nearly always paddle on *opposing sides* of the canoe. There are some exceptions to this, but only when you need to turn sharply. To go straight – which is usually the goal – the paddlers must be on opposing sides of the hull.

Finally, you should switch paddling sides often, which also means that you must switch sides in unison. This won't happen by acci-

***Paddle
in unison
and on
opposing
sides of
the canoe.***

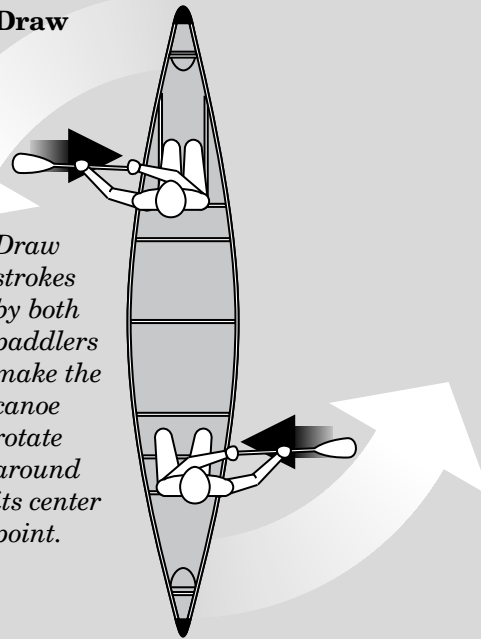
Sweep

Sweep strokes by the stern paddler make the canoe turn away from the stern paddling side.



Draw

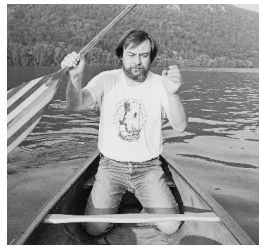
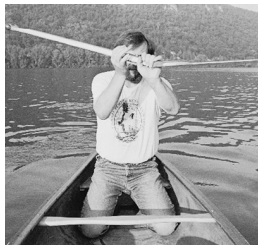
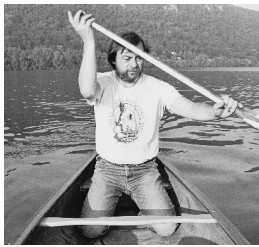
Draw strokes by both paddlers make the canoe rotate around its center point.



Switching sides is the easiest means of control.

dent. You need to establish an oral signal, upon which both paddlers switch sides together. Some people say “hut” or “hup,” others say “switch.” What the signal is doesn’t matter, as long as you decide upon one.

Although some people think that switching sides is too much trouble to bother with, it is actually the *most effective tactic* available to control a canoe. Switching sides takes about as much time (and less effort) that performing one paddle stroke, so we don’t understand how it constitutes being “too much trouble.”



Switching sides is a simple act that, after a few repetitions, is as fast and easy as stroking the paddle

And to not use switching requires you to use some other control strategy, all of which are *more work!* By switching sides appropriately, you can keep a canoe on course, avoiding the effort spent to recover after it has wandered.

How to make a canoe go straight:

As we said, a tandem canoe tends to drift, even when both persons paddle on opposing sides. You seldom can eliminate this totally, but you usually can minimize it so much that the drift becomes *virtually nonexistent*.

Pick a target to aim for.

Before explaining how, a word of advice: It’s often helpful to have a reference, a target, by which to judge direction. In many cases – on a sizeable lake, for example – it’s hard to tell if the canoe is going straight, drifting a little, or a lot. Pick a tree, rock, cabin, or whatever, to aim for. This alone will improve your success.

Be aware, also, that two factors influence how much your canoe tends to drift, and hence

how much action you must take to control it. The two factors are: the design of the canoe, and the match-up of the paddlers.

(Wind and waves can also play a role, but we'll explore those in the next section.)

Some canoes are more apt to track straight than others. Longer canoes track better than shorter ones, and canoes with straight keel-lines track better than ones with rocker.

We'll skip the technicalities of why, but we will say that you must invest more inputs to control drift with some canoes. If you have a canoe that is short and/or rockered, it will require more attention to keep on track than would a hull that is long and straight.

If your paddlers vary greatly in strength, or in paddling skill, these too can influence the tracking. Putting a much-stronger paddler in the stern will amplify the tendency to drift away from the stern-paddling side.

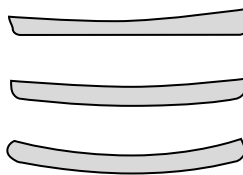
But this "problem" may be an advantage in disguise. If putting the stronger paddler in the stern amplifies drift, then putting that person in the bow *minimizes* it. This is precisely what many male-female or adult-child teams do in competition. Swapping the bow and stern roles usually is only partially effective, and it may cause other problems, but it's worth trying in order to learn the outcome.

Normally, though, to keep the canoe on course you will paddle on opposing sides, and you will switch sides periodically. To make this work, the key is knowing ***when*** to switch!

Here's the answer, and it's a simple one: switch paddling sides *before* the canoe drifts perceptibly. In other words – anticipate!

It seems, however, that some people hope a magical transformation will occur, and the canoe will begin to go straight on its own. So, after the canoe has veered off course, they do

Longer canoes go straighter than short ones do.



A canoe with a straight keel-line (top) tends to go straighter than one with some rocker (middle), and tends to go much straighter than one with lots of rocker (bottom).

The key is knowing when to switch sides.

***Don't give
the drift
time to
begin!***

***Discover
the proper
frequency
by experi-
menting.***

something to recover, then ignore the issue, expecting the canoe to go straight thereafter.

Trust us: It won't happen.

A canoe always tends to drift away from the stern-paddling side. But – here's the crucial point – it takes *time* for drift to develop. The canoe will go straight briefly, then will begin to drift, and then the drift will grow!

If you switch paddling sides early enough, the drift *never has time to begin*, and it won't grow out of control. Viola! You go nearly straight!

If you try this on the water, and it doesn't work as well as you hoped, we can predict the problem: You aren't switching often enough.

How often must you do it? We can't state the answer as a number of strokes. It differs with the canoe, the paddlers, and sometimes the conditions. You must discover the frequency by experiment. If you are veering badly, you must switch more. If you are having no problems, you can try less to see what happens.

Once you are familiar with a certain canoe and partner, you will know from experience how often to switch. Some pairs then set a standard – every ten strokes, for example – to avoid announcing each switch; they both do it every ten strokes. If a change is needed, it can be announced by calling a new number, or by calling for switching to be suspended (the reasons for which are in the next section).

So far, this discussion has concentrated upon keeping a tandem canoe on course, but you use the same technique – switching sides – in a solo canoe. In one sense a solo is harder to control; it drifts more abruptly because you are paddling only on one side. In another sense, however, it's easier to control because coordination between two people isn't needed.

To keep a solo on a straight course, you must switch sides *very often*. While a typical switch-

ing frequency in a tandem canoe might be eight-to-twelve strokes (more or less), in a solo canoe it may be five strokes, or even fewer.

But with any canoe, solo or tandem, switching too often doesn't cause trouble. Doing it too seldom does cause trouble, and it must be corrected to gain effective control of the canoe.

**How to make
a canoe turn:**

Many times, to make a canoe turn is a piece of cake. Since a canoe always tends to drift, you can often "make" it turn merely by letting it drift. Select the paddling side(s) to favor a left-hand or righthand drift as needed, then *don't switch* paddling sides until the turn is done.

See there... Piece Of Cake!

Well, truthfully, there's just a little more to it than that. When turning, you may need to control how *sharply* the canoe turns, and you will need to make it *stop turning* eventually.

To sharpen a turn, you can take several steps. Before using any of them, however, know that your turn will sharpen naturally, even if you do nothing. This is due to "rotational inertia."

If you want to turn left, for example, the bow person paddles on the left side, the stern person on the right. This sets up the canoe to drift left, but it doesn't start immediately.

At first, inertia resists the turn. Shortly, however, your paddling strokes overcome the inertia, and the canoe begins to turn left.

Now it has inertia – rotational inertia – that makes it want to *keep turning*. So before you use even more steering effort, anticipate what will happen if you merely let the turn develop.

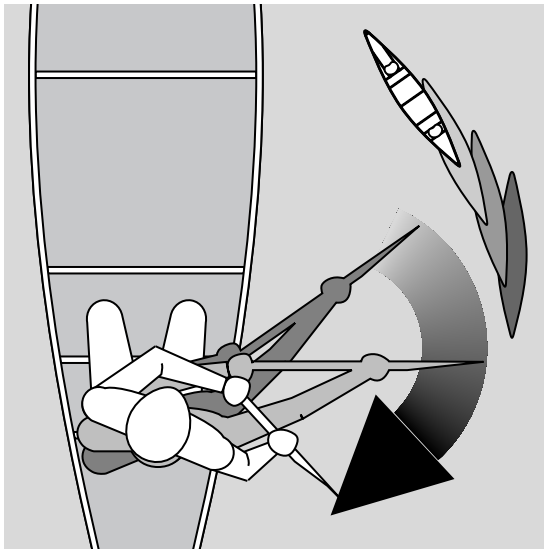
If, however, you do need to accelerate turning, the simplest method is the "Sweep Stroke."

While it can be performed by both paddlers, the sweep stroke is usually performed by the

*Turning
is a piece
of cake.*

*Inertia
resists a
turn, but
then sup-
ports it.*

stern paddler. It makes the canoe turn more strongly away from the stern-paddling side.



To perform a sweep stroke, the paddle is not pulled straight back parallel to the centerline of the canoe. Instead, the stroke begins near the hull, sweeps outward, and then back in, making an arc of about 90°.

When the stern paddler alone performs a sweep stroke, no special action is needed from the bow person, who keeps paddling normally as before. If

The Sweep Stroke if used by the stern person makes a canoe turn more sharply away from the stern-paddling side. The sweep is your stock-in-trade to increase the speed of a turn. You will also often use it – after switching sides – to stop a turn at its finish.

the stern paddler is the one who's in charge, no instructions need to be given. The stern paddler simply performs as many sweep strokes as need to get the desired result.

To achieve even more steering if needed, however, the bow person must become involved. Communication is then required.

The next step in the hierarchy of steering is for the bow person only to switch sides so that both are paddling *on one side* – that being the opposite side from the direction of the turn.

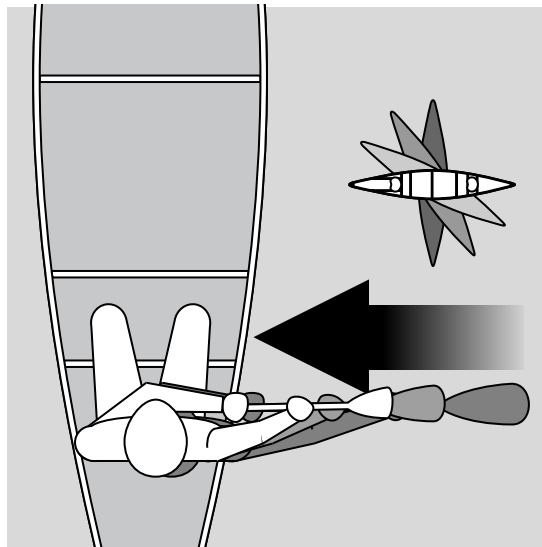
The two paddlers can perform standard forward strokes, or one or both of them can perform sweep strokes, depending upon how rapidly you need to turn. With both paddlers performing sweep strokes on the right side of the canoe, it will turn *very strongly* to the left.

Up to now, all the steering methods described are done with the canoe in motion. However, the most extreme steering action – the “Draw Stroke” – is used with the canoe stopped, or nearly so. With draw strokes, you can spin the

canoe around its center, quickly aiming it in an all-new direction as much as 180° away.

To perform a draw stroke, reach straight out from the canoe with the paddle and pull water directly toward yourself.

One paddler alone can perform draw strokes to achieve sharper turns, but the way to actually spin a canoe around its center is for both paddlers do draw strokes simultaneously on opposing sides. It is done with the canoe at rest or moving slowly because it causes a very sharp turn which is unstable at higher speeds.



Use the draw stroke only rarely, but be familiar with it, and practice it with your partner, because the draw stroke – while it does have other uses – is most valuable in threatening situations to aim away from trouble quickly.

One last tactic is available to turn. We list it at the end because, while it works well and has some uses, it is not a strategy to employ often. We are referring to the fact that one person (usually the bow) can *stop paddling* while the other person keeps paddling.

If you are turning left, the bow is likely paddling on the left, the stern on the right. If the bow removes the paddle from the water completely, the canoe will turn more sharply left.

The problem is that this makes one paddler do all the work when two are available for it. Nevertheless, to stop paddling is sometimes an effective tactic that you probably will use, especially to maneuver in a slow, tight area.

Draw Strokes are used by both persons on opposing sides while the canoe is stopped or moving very slowly.

Use draw strokes to escape quickly.

Stop a turn by initiating one the other way.

How to stop a canoe from turning:

Upon reaching your new heading, you may find that the canoe wants to keep on turning. This, again, is due to rotational inertia. To stop a turn, you defeat the rotational inertia.

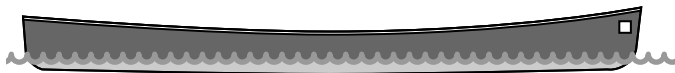
Thankfully, it's easy to do. If you have been turning left, assign the bow person to paddle on the right side, the stern person on the left. With this set-up, the rotational inertia will subside on its own after a few moments.

But to avoid turning too far, you may wish to end the inertia quickly. To do this, the stern person performs a sweep stroke on the left. One stroke is often enough, but two or three may be needed to set the canoe straight.

What you are really doing is ending a lefthand turn by initiating a righthand one, but not letting the righthand turn develop.

How to cope with wind:

Wind has a large influence because a canoe, unless it is badly overloaded, has much more area above the water than below it. A canoe



typically draws 3-5" of water but has 8-12" of

Wind effects a canoe strongly because the area above the water is much greater than the area below it.

freeboard. The wind has lots to push on, but there's not much in the water to resist.

Obviously, you can't stop the wind, so you must make it effect you in the least-harmful or (occasionally) the most-helpful way. This is done by "trimming" the canoe for the wind.

To "trim" a canoe means to adjust its balance properly *front-to-back*. You can trim a canoe to be level, bow-high, or stern-high. It nearly always should be level because canoes are designed to perform best that way. The wind, however, sometimes favors a different trim.

When you are in a canoe, though, you can't see how it is trimmed. Someone on shore or in another canoe could tell you, but only if they know what to look for. If a wind is blowing, however, the way that it effects the canoe will reveal how the canoe is trimmed.

To adjust the trim, you move stuff fore or aft. If you are on a trip with gear, shuffling it around appropriately in the hull can work.

The heaviest "thing" in a canoe, though, is usually the paddlers. The purpose of adjustable (sliding) seats is to easily move the paddlers to

alter the trim. If you have no sliding seats, you can still

move the paddlers somewhat by having them sit near the fronts or backs of the seats, or by kneeling on the floor ahead of the seats.

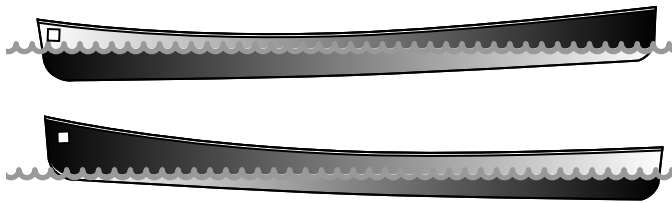
In calm conditions, a canoe should be level. In most winds, it should also be level. And while good trim is important in a calm, it is *critical* in a wind. If the wind gives you baffling steering problems, the cause is likely that the canoe isn't level, but you were unaware of it.

If either end of the canoe is too high in a wind from the sides or quarters, the wind will push the high end in the direction of the wind.

If the bow is too high, the wind pushes harder on it, turning the canoe *away* from the wind. If the stern is too high, the wind pushes harder on it, turning the canoe *into* the wind.

Slight errors in trim cause surprisingly large steering problems because the error is compounded. Not only is one end of the canoe too high, the other end is too low. And while the high end has increased freeboard to catch the

To "trim" a canoe is to balance it front-to-back.



The canoes in these drawings are rotated only 2° from horizontal. They show how much the freeboard and draught change front-to-back due to a slight error in trim.

A wind pushes the higher end in its direction.

***Equalize
the wind
pressure
all along
the hull.***

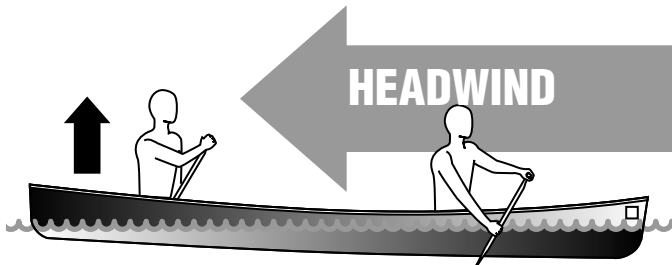
wind, it also has decreased draught to resist. At the low end, the opposite happens.

That's why an error in trim isn't one simple windage problem, it's four related ones. And even in a moderate wind, the result may be deflection you can't overcome with steering.

To correct the trim, move weight toward the end that is being blown off course. For example, if the canoe is turning away from the wind, the bow is too high. Moving weight forward lowers the bow and raises the stern, shifting the wind pressure toward the rear.

What you seek to find is the balance point at which the wind pressure is equal all along the length of the hull. You can do this best by experiment, and when you find the optimum trim, the wind – while it will push you sideways – will stop having a steering effect.

While you usually want the wind to have no steering effect, in two cases you should *use the wind* to help you steer. These two are a direct



headwind or a tailwind. A headwind is very troublesome; it can quickly turn you far off course.

In a direct headwind, trimming the stern a little high will keep you headed into the wind.

In a direct tailwind, do the opposite.

A tailwind can do the same, although the effect is not as strong. In these cases, changing the trim can help you avoid being blown off course.

In a headwind, trim so the stern is slightly high. This increases wind pressure on the stern, keeping the bow pointed into the wind. Don't overdo this, however, because you need enough bow freeboard to cope with waves.

In a tailwind, trim so the bow is slightly high. With this set-up, the wind will catch the bow and blow you right where you wish to go.

Where to get more help

We haven't tried to explain all of the ways to control a canoe. Instead we've presented a set of basic skills that you can use to begin canoeing safely and enjoyably on moderate waters.

If you wish to learn more – which we highly recommend – there are many places to go:

Try the bookstore, library, or magazine stand. There are lots of books about paddling (we have some in our catalog), and entire magazines are devoted to it. These have good articles about technique, plus ads for more books.

Video tapes are just a little harder to find. We have one, and others are offered in magazines. Try the video section of your library, too.

The best learning is hands-on, however, and there are good opportunities to get it in most areas where canoeing is prevalent.

The groups offering some form of canoeing instruction may range from local Red Cross chapters and Y.M.C.A.'s, to canoeing clubs, to professional full-time paddling schools.

Ask your dealer first. Many offer training. If not, they should know if it exists nearby. You can also contact national groups, such as the United States Canoe Association and/or the American Canoe Association. Many states and provinces also have associations. To find professional schools, look for ads in magazines.

Incidentally, don't be surprised if someone teaches other basic paddling methods than ours. Our scheme is a good one, especially to use with our canoes. But there are other ways that – while requiring more effort – can be effective. Use whatever canoe control methods are the most effective and enjoyable for you.

Try the bookstore, library, or magazine stand.

Many canoe dealers offer training.

Paddles

Do you need a good paddle?

Topic Page
Importance of 32
Straight vs. bent 33
Proper size 34
Good technique ... 36

To paddle a canoe takes about 500 strokes per mile. This fact alone should illustrate clearly that what paddle you use – and how well you use it – plays a large role in canoeing

Firstly, don't skimp when buying paddles. You've spent a substantial amount on a canoe, which you won't enjoy using very much if you have heavy, awkward, ineffective paddles.

The best paddles are light, strong, comfortable, efficient, and long-lasting. All of these virtues – especially lightness – are highly desirable, and all of them cost money.

Should the value of lightness not be obvious, we'll amplify it. A good paddle weighs 1¹/₂-2 pounds (some are even lighter). A poor one is twice that, or more. To paddle 10 miles takes about 5000 strokes. After each one, you lift the paddle out of the water and replace it back in front of you. So, with a 4-pound paddle, a 10-mile trip requires you to move 20,000 pounds of weight while simply recovering the paddle, exclusive of propelling the canoe!

Don't waste your effort on recovering a heavy paddle through the air; invest your effort on propelling your canoe through the water!

A good paddle weighs just 1¹/₂ - 2 pounds.

Beyond choosing a high-quality, light-weight paddle, you also need to select its type and size wisely. Then you need to maximize its benefits by using the paddle most efficiently.

Straight-shaft vs. Elbow (bent) paddles:

The Elbow (or bent-shaft) paddle has its blade angled *forward* from the shaft by about fifteen degrees. This has several advantages over a conventional paddle. Some of the differences are technical, and we'll skip over those.

One feature that's easy to explain, however, is that an elbow makes the ending (and strongest) part of your stroke much more effective.

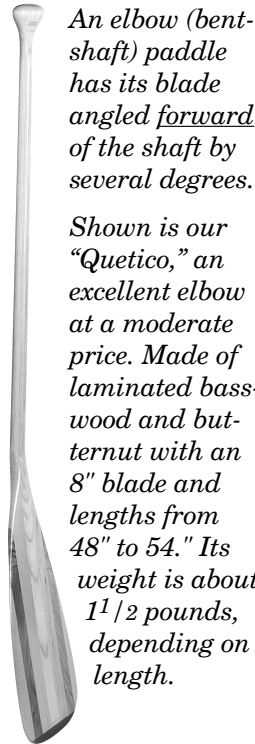
Once a straight-shaft paddle passes behind you during a stroke, you begin lifting water instead of just pushing it. This still gives some propulsion, but much of your effort is wasted pulling the canoe down into the water instead of driving it forward. Since the blade of an elbow is cocked forward, the end of a stroke doesn't lift the water nearly as much.

To make an elbow work properly, of course, you must hold it correctly. If given no instruction, however, almost everyone seems inclined to hold it backward.

If the bend in the blade faces the rear instead of the front, the end of your stroke lifts even more water, and thereby is even *more wasteful* of your energy.

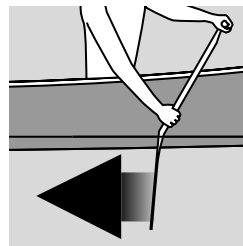
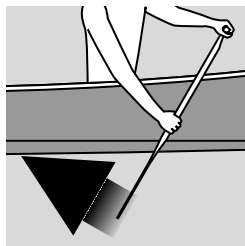
Used properly, an elbow transmits more of your force into going forward. But you may have avoided "those fancy paddles," thinking that they're intended only for advanced canoeists. Actually, the opposite is true.

Experienced paddlers tend to use short, fast paddle strokes that are performed mostly in



An elbow (bent-shaft) paddle has its blade angled forward of the shaft by several degrees.

Shown is our "Quetico," an excellent elbow at a moderate price. Made of laminated bass-wood and butternut with an 8" blade and lengths from 48" to 54." Its weight is about 1 1/2 pounds, depending on length.



A straight-shaft paddle (left) wastes effort lifting water at the end of the stroke. An elbow (right) doesn't.

***An elbow
paddle
helps new
paddlers
the most.***

front of their bodies. These people don't waste much effort lifting water. Newer paddlers, however, tend to take long, slow strokes that extend well to the rear. This is precisely the case where an elbow helps the most, thus it is of *greater* benefit to inexperienced paddlers.

Another misconception is that elbow paddles are special-purpose tools to go faster on calm water. While it's true that elbow paddles are the choice of most marathon canoe racers, their motives aren't all that different from yours. They achieve speed by paddling fast, and by going *very far* for each stroke.

Doesn't going very far for each stroke sound like a good ideal on a regular basis? You don't have to paddle fast to accomplish that, only to paddle well, which an elbow will help you do.

The only advantage a straight paddle has is to do special strokes (such as a brace) on white-water. Thus, a straight paddle is the special-purpose tool; an elbow is the all-around one.

If you haven't yet tried an elbow paddle, you should. Then if you still like a straight paddle, that's fine, some people do. But most who try an elbow prefer it and wouldn't go back.

**Getting the
proper size paddle:**

Having a paddle that is the right length is very helpful. You do have some leeway; it can be too long or short by a few inches. But if it's off by about 6" or more, the paddle forces you to hold it in ways that prevent using it well.

There are a couple of published guidelines that deal with proper paddle sizes. We'll mention some of these, but primarily to discount them, because there's only one truly reliable way to find the best size, and that's by trial.

The Red Cross has said that, with the blade on the ground, the grip of a paddle should be at your eye level. Wow! You could almost pole

***The best
way to
find the
right size
is by trial.***

vault with a paddle that long! Upper chest level, not eye level, is much more like it.

The United States Canoe Association says that the shaft – the part of a paddle from the grip to the throat – should be 6" to 8" longer than your arm with fingers extended. This is more realistic, but still on the long side.

These guidelines recognize that different size people need different length paddles, but they ignore other issues that matter, such as the height of the seats in your canoe, and whether you sit or kneel to paddle, to name just a few.

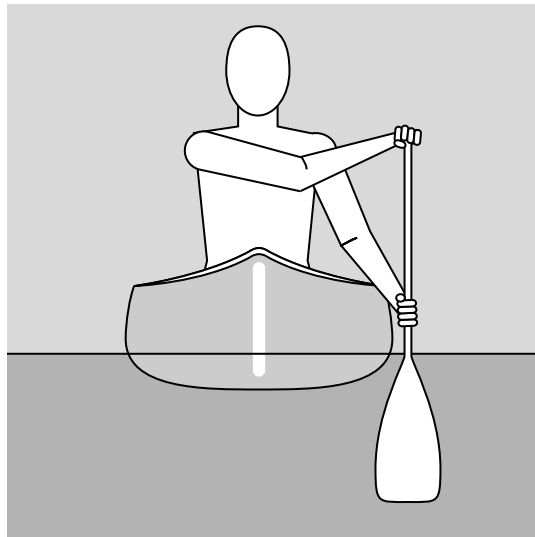
The way to identify the right size is this: When you are in your canoe on the water, the grip of your paddle should be at *shoulder level* when the paddle blade is immersed in the water up to its throat.

What this means, of course, is that ideally you should take your canoe on the water to try various paddles *before* deciding upon what size to buy.

But if that isn't possible, you can simulate the situation on land and take measurements.

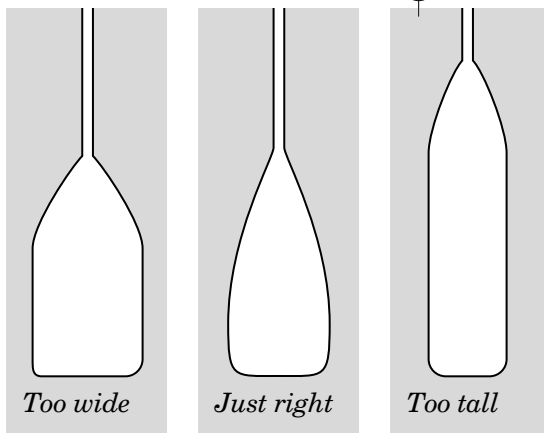
Put the canoe on the ground (on grass, please, not asphalt or gravel) and get into it in your normal paddling position. Measure from the ground to your *shoulder*. This will tell you about how long your paddle shaft should be from the throat to the grip. The dimension will be too long by a couple of inches since the canoe will sink that far into the water. But by taking that into account, you can estimate a shaft length that is very close to optimum.

Several factors influence the proper size.



A paddle is the right length for the paddler and the canoe if the grip is at shoulder level when the blade is immersed in the water up to the throat.

Having the grip at shoulder level is also the way to hold the paddle in use.



Paddles not only have differing lengths, they also have differing blades. Historically, blades were quite long and narrow, but some modern ones are very short and wide. Either extreme is problematic, and the best blade

size is the midground which is neither too long or short, nor too narrow or wide.

The best blade size is at the median of length & width.

Very long blades hit bottom more readily in shallow water. This destroys your stoke and harms the paddle. Very wide blades are awkward to handle and force you to reach farther out from the canoe. A blade with a width of 7½" to 8½" and length of about 18" to 19" is a good compromise that avoids the extremes.

Using your paddle effectively:

Although paddling a canoe can be very tiring if you do it poorly, this need not be so. Using the paddle well will increase how far you go for the effort spent. You'll use less effort to go any distance, and paddling will be less tiring.

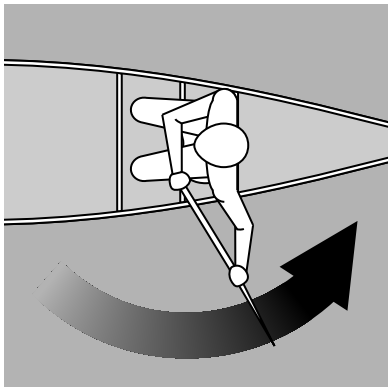
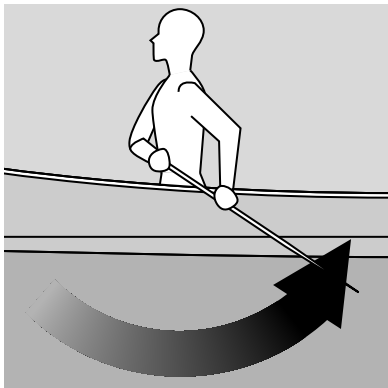
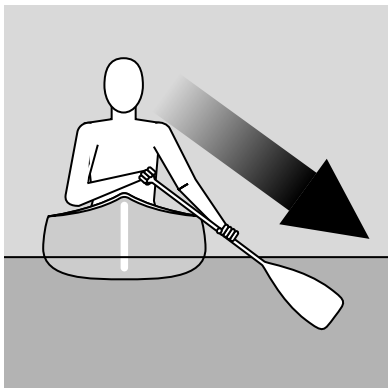
How much less tiring is difficult to say. But people who paddle very well can do it all day without apparent exhaustion, while people who paddle very poorly get tired in a hurry.

Conditioning plays a role, but technique is as important. It's easy to explain good technique in general, because it has only two aspects:

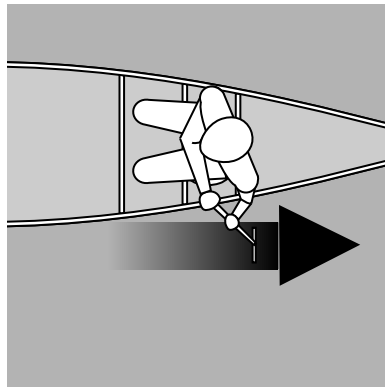
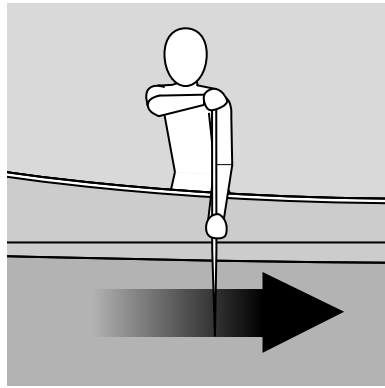
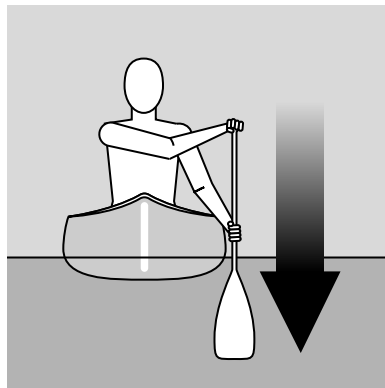
- 1) Use the paddle in ways that give the *most propulsion* for the amount of effort.
- 2) Distribute the effort by using as *many muscles* together as possible.

Putting these principles into use, however, requires being alert to your actions until you become habituated to using good technique.

▼ Poor Techniques

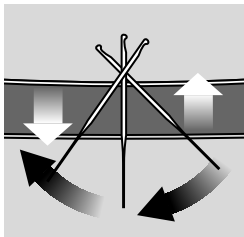


▼ Good Techniques

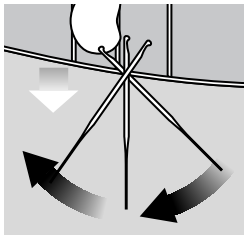


* *These illustrations are greatly simplified and exaggerated for clarity. Probably no one paddles as badly as the left column, nor as perfectly as the right column. In order to paddle well, your actions need to look less like those on the left and more like those on the right.*

Keep the paddle as near to vertical as possible.



This motion wastes energy by making the canoe rise and fall.



This motion wastes energy by making the canoe want to turn.

To get the most propulsion from each stroke requires doing a couple of things that don't seem obvious, but are once they're explained.

The paddle should be as nearly vertical as is possible, as often as is possible. "Vertical" means front-to-back, and side-to-side. Many paddlers seldom have it near vertical in either way, and much of their effort is wasted creating directional forces other than forward.

It's common to see people move their paddles in an arc front-to-back, somewhat like the paddlewheel of a steamboat. First the paddle pushes down on the water, then pushes back on it, and finally lifts it up. With this motion, much of the effort is not driving the canoe forward but is making it bob up and down.

Swinging the paddle in an arc sideways is wasteful, too. It amounts to doing a sweep stroke by accident. This gives turning forces that are counterproductive to going straight.

To help you avoid these problems, some books suggest that you adopt an imaginary view of the paddle. They say to regard it as a pole which is firmly anchored and sticking straight out of the water. Then, because you can't move the pole, you pull yourself up to it.

If this method helps you, fine. But it may not, if it suggests that the paddle must *always* be *perfectly* vertical. You can't do that, nor should you try. You want to keep it as near to vertical as is *practical*, which probably means keeping it much closer to vertical than you have been.

In addition, use the paddle as *close* to the canoe as possible, and use it *parallel* to the centerline of the hull. The further out you reach to paddle, the more your strokes try to turn the canoe instead of pushing it forward. Moving the paddling in other than a straight line to the rear also has this effect. Such actions may be useful if you're trying to turn, but they are very wasteful otherwise.

The final point, and a crucial one, about how to paddle well is what muscles to use for it.

The obvious answer – your arms – is the wrong one. Most people do use only their arms, and many really use only one at a time to apply power. This will tire you rapidly.

Good paddlers apply little power with their arms. They mostly use their back and shoulder muscles, which are stronger. And when they use their arms, they use both together.

To explain this technique is difficult, which is unfortunate, because if you can learn it, you will paddle farther, faster, while tiring less!

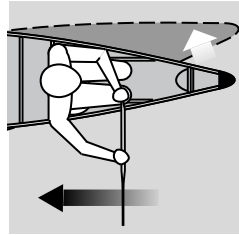
Firstly, your arms stay nearly straight. You might have a slight bend in them to hold the paddle, but you *don't* move the paddle by flexing your arms. Not much, anyway. You *do* move it by bending and turning your upper body, possibly extending down to your waist.

Imagine that your arms are sore, and it hurts to flex them. To paddle in this condition, you would naturally shift the effort away from your arms onto your shoulders and back. This is *exactly* how you should paddle all the time!

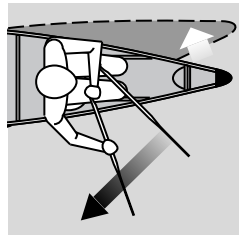
To tell if you are doing it, however, note your body positions while paddling. If you are applying power mainly with your body not your arms, your shoulders will rotate quite a bit relative to your waist, but your arms will move very little relative to your shoulders.

You do use your arms, but not to paddle as such. Your arms are comparatively weak, so you limit their use to an easy task, that being to *recover* the paddle between strokes.

We hope that this explanation is clear. But if not, try to discover the technique for yourself while paddling. Or, find qualified hands-on instruction, because learning to spread the effort among more of your muscles will greatly improve your enjoyment of canoeing.



Paddling far out from the hull creates turning forces.



Paddling not parallel to the hull creates turning forces.

Do less work with your arms and more with your shoulders and back.

Portage

How to portage with less trouble

Topic Page
Introduction 40
Yokes and pads .. 41
Good technique ... 42

Although its dictionary definition is wider than this, when we say “portage” we mean specifically the act of *one person* transporting an upturned canoe carried on the shoulders.

Most canoes are portaged, at least to some degree, even if just from the garage to the car. Where good skills are crucial, though, is on longer treks over bad ground and on slopes.

Having a light canoe is advantageous, especially as conditions worsen. The wise choice of portage yokes and pads is important too, as is the use of techniques that keep portaging from being more difficult than it need be.

Don't try to portage alone in a wind

Practicing in easy conditions is very helpful, both to assess and improve your skills. You may find that portaging is impractical for you. More likely, however, you'll find that portaging is easier than you thought, and that a little practice quickly improves your abilities.

A word of caution, however: Wind can cause big trouble when portaging. A canoe when held aloft in even a moderate wind has too much surface area for one person to control. To transport a canoe in a wind, play it safe and have two or more people carry the canoe.

Portage yokes and pads:

Portage yokes range from very simple to quite elaborate. Not everyone needs the optimum set-up, but having at least a good set-up eases the task of portaging substantially.

The yoke that is most-commonly fitted to our tandem



canoes is a basic, ash one that has some sculpting but no padding. It is an economy yoke that is suitable for short, easy portages.

Our basic, ash yoke for tandem canoes. It can be mounted to be permanent or removable using hardware available from us.

For more difficult portages or greater comfort, this yoke can be upgraded by fitting pads to it.

Two types of pads are available from us to mount to our basic yoke. They attach easily, either with temporary clamps, or by drilling a couple of holes. Both types adjust for spread side-to-side, which is a good feature that some very-expensive yokes don't have.



If your We-no-nah

Canoe has our basic yoke, the easiest, least-costly upgrade is to order pads from us to fit it. Your other option is to replace the yoke with an improved (although more-costly) one.

These pads fit our basic yoke. Both adjust side-to-side.

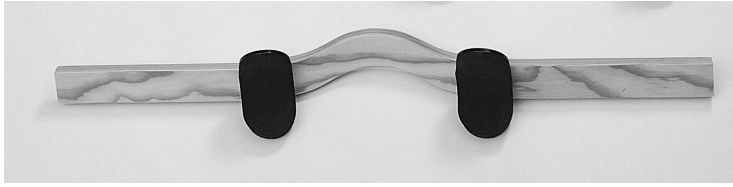
If your canoe has no yoke but you want to add one, you have several choices. You can mount our basic yoke, either with or without pads.

The clamp-on style (left) mounts temporarily and is for occasional use.

Hardware is available from us to mount our basic yoke permanently in place of the center thwart, or to mount it so as to be removable.

The bolt-on style (right) is sturdier, more comfortable, and semi-permanent.

We offer another type of tandem yoke that has more durability and greater comfort. This is our laminated yoke that has pads which are



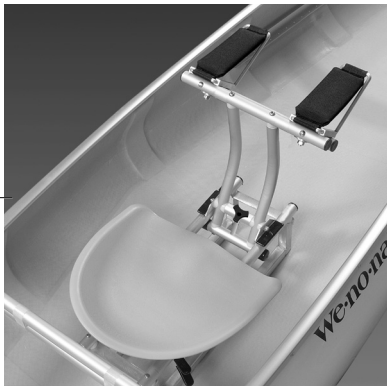
adjustable and removable. It is contoured to give greater clearance for your neck, and it can be mounted permanently or

Our best tandem yoke is hand-made from 7 laminations of wood. It is deeply contoured, has adjustable pads, and is extremely durable. It weighs 2 1/2 lbs.

temporarily using hardware from us.

Mounting a yoke to a solo canoe is different since the yoke must go where the seat is. Thus the yoke must be removable, and it must elevate the canoe to clear your head.

We have an excellent, aluminum solo yoke that goes on and comes off in seconds because there are no fasteners. Leverage alone holds it in place. It has adjustable shoulder pads and it provides ample clearance for your head.



Portaging successfully:

Portaging is rarely easy, but it need not be overly difficult. A problem that many people have is fighting with the canoe to control its balance while portaging. This makes carrying the canoe much more arduous than it need be.

Getting the canoe onto your shoulders and balanced properly is crucial to success.

Our solo yoke is made for quick mounting and removal. Built-in extensions give proper clearance.

There are some fancy-looking ways to get the canoe onto your shoulders alone, but these are impractical for many people. The easiest tactic is for two people to perform the task. Your partner lifts an end high off the ground, while you walk under the canoe to engage the yoke.

When two people aren't available, one can use a similar means, but it's *quite a bit* trickier.

You don't want to fight with the canoe.

If your yoke faces the bow (as it should), lift the stern above your head. Keep lifting the canoe by the gunwales as you *slowly* move to the yoke. You repeatedly push the canoe into the air a bit, moving forward 6"-1' each time. For various reasons, this gets harder as you

near the center. Practice is needed, but many people can do it, especially with a light canoe. Be aware that, on hard or slippery surfaces, the canoe will skid forward as you lift it, and you may need to butt it up against something.

Once the canoe is on your shoulders, it should balance so that the back is a little heavier than the front. We'll say *how much heavier* shortly. But for now, accept that you don't want the hull level; you want the front higher.

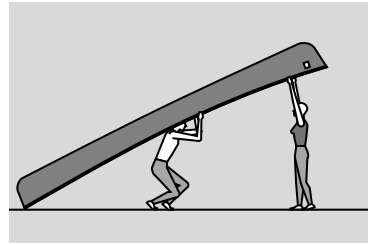
An obvious reason is that you can see ahead better if the front end of the canoe is higher. A reason that isn't obvious is that you can control the canoe's balance much better that way.

To portage a canoe, you carry its weight on your shoulders using the yoke. You also use both hands to grasp the gunwales in front. You will use your hands to steer the canoe left or right, but this isn't their primary use.

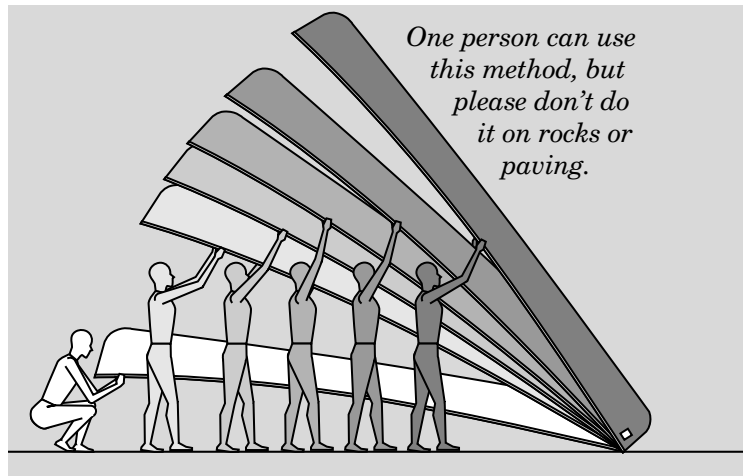
You mainly use your hands to balance the canoe front-to-back. But you *don't* do this in the way that you probably are thinking.

Looking at a photo of portaging, you might think that the person was using his/her hands to partially support the weight of the canoe by pushing up on the front. Or, with equal logic, you could think that the person was pulling down on the front. But *neither* of those things should ordinarily be happening!

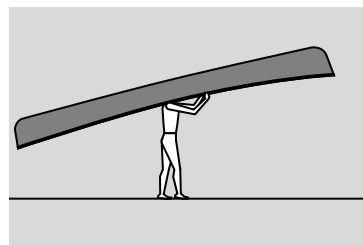
Use your hands to balance the canoe, but use only the *weight* of your hands (and arms) rest-



With two people, one lifts the canoe while the second moves into position.

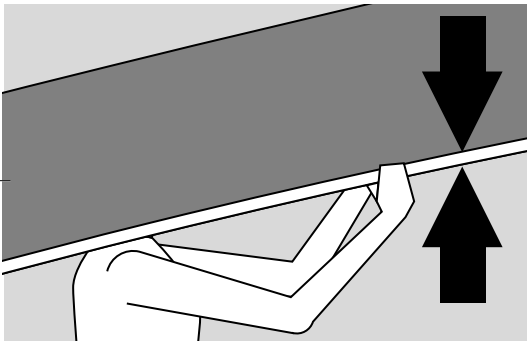


One person can use this method, but please don't do it on rocks or paving.



When portaging, you want the front end of the canoe higher than the back end.

***Use only
the weight
of your
hands to
balance
the canoe.***



The canoe is perfectly balanced if just the weight of your hands on the gunwales in front keeps the canoe at the desired angle. You shouldn't need to apply force up or down while standing still – those actions are reserved to control the canoe while you are in motion.

ing on the canoe. You typically apply no force up or down with your muscles while standing still; those actions are used only to control the canoe *if* it pitches while you are walking .

This leads to the explanation of how much more of the canoe's weight should be behind you while portaging: There must be just enough extra canoe weight behind you that it will be *exactly offset* by the weight of your hands and arms when you grasp the gunwales in front of you. With the canoe balanced this way, you are ideally prepared to control it.

For contrast, consider a canoe on your shoulders with so much weight in front that you must support it with muscle power. If while portaging you stumble so as to pitch the front up, it would pitch strongly, because you are already pushing up on it. Even worse, if you stumble so as to pitch the front down, you may not be able to keep from falling forward, since you are already over-balanced in that direction.

On the other hand, if the canoe were balanced with too much weight behind, the situation would be reversed, but equally uncontrollable.

With the canoe balanced properly, you are not “pre-loaded” either forward or backward. Thus you can react quickly and effectively to any pitching motions that happen while you are walking. After a little practice, this becomes quite natural; then you can concentrate on your route and the terrain while portaging, instead of fighting with the canoe.

At this point, you may be wondering how to achieve this optimum state of balance. In most cases, it's a fairly easy thing to do.

Firstly, the yoke must be placed in the canoe properly. If your We-no-nah was made with a

yoke, its location is proper, providing that nothing was done later to alter the balance.

If you install a yoke yourself, mount it about an inch in front of the center thwart, which you must remove. This will put it very near to the optimum balance point. You do have some margin for error, but just an inch or two.

The way to tell if your yoke is poorly placed is if you can't balance the canoe properly using the fine-tuning methods that follow. If the canoe is always front-heavy so that you must keep it balanced by lifting the front, then the yoke must move forward. If the back end is always too heavy, the yoke must move back.

We can't say how much to move the yoke; that depends on how far off it is. You can only find the proper yoke location by experimenting.

With the yoke placed properly (or very close to it), you can fine-tune the balance of the canoe while it is on your shoulders in two ways:

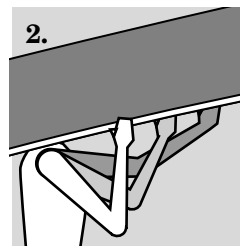
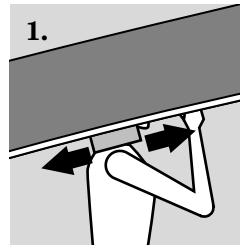
- 1) You can *move* the canoe fore or aft on your shoulders. Little movement is possible, so you can't fix a large imbalance. This is for fine-tuning, and it works better with a padded yoke that helps keep the canoe where you put it. Bounce the canoe up slightly with your body, then shift it fore or aft while weight is off your shoulders.
- 2) Since you add weight to the front of the canoe with your hands, you can control *where* you add it. If you need more down-force in front to balance the canoe, move your hands forward. This, too, is only for fine-tuning, not for large adjustments.

By using both adjustments, you can usually get the canoe into nearly ideal balance. You don't need to achieve perfect balance, but you should try to get quite close to it.

Portaging will then be as easy as possible, because you aren't fighting with the canoe.

The yoke must be placed in the canoe properly.

Fine-tuning



Motors

Useful only in limited situations

Topic Page
Introduction 46
Square-stern 46
Conventional 47

Unless you are careful, motorizing a canoe can be asking for trouble. If you wish to do it, you must be aware of the potential problems.

One is that any motor has more power than any paddler. Since a paddler can upset a canoe by applying muscle-power unwisely, a motor is even more prone to cause trouble.

A motor also may be heavy. And since it must mount outside the canoe, a motor's weight can easily cause a large imbalance, unless you do something specifically to compensate for it.

For these reasons, we strongly recommend against using even a small outboard motor on a canoe. You can use a trolling motor successfully, providing that you are sensible about it.

Square-stern canoes:

Instead of a pointed stern, a square-stern hull has a transom in back to mount a motor. This design does reduce the problems with motorizing a canoe, but it doesn't eliminate them.

While transom-mounting keeps the motor's weight centered side-to-side, the canoe may be much too heavy in the rear. If so, the bow

Use only a trolling motor on a canoe.

will ride far too high. This will reduce directional stability, will increase wind deflection, and will exaggerate the impact of waves.

You must offset any weight in the back with enough weight in front. If you are alone, this may require carrying deadweight in the bow for no reason other than to balance the canoe.

A square-stern canoe can use a slightly larger motor, but we stress “slightly.” A 2-or-3HP outboard is risky, and more so if its weight isn’t counterbalanced. We suggest using only a trolling motor, even on a square-stern canoe.

Conventional canoes:

To motorize a conventional canoe presents the problem of where and how to mount a motor. There are ways to do it, but they are necessarily makeshift, and fraught with compromise.

If there’s a way to mount a motor directly behind, we haven’t seen it. What we have seen that works marginally is to extend a mount off the side. You’ll need to make something that lashes, clamps, or screws on *firmly* across the hull, and which has a surface outside to mount the motor. You must place the motor as close to the canoe as possible, and you must aim it directly forward or backward.

In no case should you use even the smallest outboard motor like this! A trolling motor is the limit. Even then, you must be careful.

Although a trolling motor is light, its weight off the side can be trouble. Counterbalance it side-to-side (and front-to-back) if needed. And while a trolling motor isn’t overly powerful, its force on the side can make a canoe behave strangely. Use low power for trolling only.

Trolling – not transport – is the *only proper use* of a motor on a conventional canoe. Our advice is to paddle to the fishing spot, then use the motor only to maneuver around it.



While a square-stern canoe is designed to mount a motor easily, this doesn’t solve all the problems of motorizing a canoe.

Trolling, not transport, is the proper use for a motor

Upkeep

Wood gunwales

Topic Page
Wood Gunwales .. 48
Composite hulls . 51
Royalex hulls 53

Wood gunwales need regular maintenance. And if you've never had a canoe with them before, you're likely to find they need considerably *more* upkeep than you expected.

This isn't unique to our wood gunwales; it applies to those on a canoe from any builder.

Water and sun together are very tough on wood. Protective finishes are required, but the effectiveness of the various types differs, and the life of any of them can be short, depending on how you use and store your canoe.

To preserve wood gunwales, store your canoe indoors. If that's not possible, at least keep it away from moisture and sunlight. If stored unwisely, wood gunwales can weather just as fast in storage as they would have in use.

Preserving new wood gunwales:

When we build a canoe with wood gunwales, we apply three coats of finishing oil at the factory. This is enough to make them look nice, but it is *not intended* to be the final finish!

The other parts of our wood-trim package, such as wood thwarts and seats, are var-

***Store
a canoe
with wood
gunwales
indoors.***

nished, which is how we receive them, and they need no further attention when new.

Wood gunwales are different. We make our own, and we apply only enough oil to protect them *in transit*. Our intent is to leave you the freedom either to apply more oil to complete the finish, or to use another finish if desired.

An oiled finish is attractive but not very durable. If oil is your choice, however, apply *three or more coats* to new gunwales. Furniture oils work but need very frequent touch-up. Try to find an oil that at least *claims* to be for exterior use. Lightly rough the gunwales with medium-fine steel wool or sandpaper between coats. Use a tack cloth to remove the debris.

In the future, you'll need to apply at least one coat of oil each year, but you'll probably need to apply more, depending on the conditions.

Watch the gunwales closely for weathering. Pay special attention to the underside of the gunwales on the outside of the hull. This area gets the most exposure to moisture, and it is difficult to penetrate with sufficient oil.

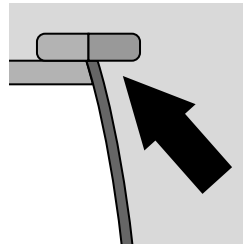
Before applying oil, and between coats of it, rough-up the gunwales as described earlier.

Varnish or urethane are more durable but harder to apply, and many people dislike their appearance. Not only are these longer-lasting, they seal openings that oil would not. If this is your choice, apply three or more coats of exterior-grade Spar Varnish or Spar Urethane.

Because varnish and urethane are much thicker than oil, more-aggressive sanding is needed between coats. Try to keep the coats very thin and even. Irregularities will still develop, however, and to get a smooth finish you must sand down the high spots down.

The use of a tack cloth is especially important here because extensive, goopy deposits will collect when sanding varnish or urethane.

You must apply a finish to new wood gunwales.



The area underneath the gunwales, on the outside of the canoe, gets high exposure to moisture, tends to stay damp, and is difficult to refinish.

You might get a few years from these finishes, especially from urethane. Or you might not get that much life, depending. Watch the gunwales closely, especially the troublesome area.

Restoring old wood gunwales:

If your wood gunwales ever need a full restoring, you face quite a task. It's not difficult but is very tedious, even with power tools.

Sand the gunwales down to bare wood. You won't be able to do this very well under the gunwales inside the canoe, but that's alright, because this area isn't prone to weathering.

The crucial spot, as always, is under the gunwales on the outside. Use a vibrating detail sander there, and put masking tape on the hull to protect it from the sandpaper. When you're done, apply the finish of your choice.

For the greatest durability – albeit with the greatest effort – we suggest five or six coats of oil, followed by as much urethane. Even this finish, however, will need periodic attention.

A final note: It's much wiser to lavish effort on preserving wood gunwales than it is to let them deteriorate and then to restore them.

Preserve your wood gunwales instead of restoring them.

A warning about wood gunwales on Royalex® canoes:

Wood gunwales do not expand and contract with temperature changes, but a Royalex canoe does. Unless special care is taken, this can cause the hull to crack during storage in cold climates, and this type of damage is usually unrepairable.

For un-heated winter storage, loosen the screws holding wood gunwales to a Royalex canoe near its ends so that it can contract without being restricted.

Composite canoes

Several things can diminish the “new” look of your canoe without truly harming it. Which of these may occur depends on how you use and store the canoe. After cosmetic deterioration has happened, it can often be improved, but only within limits, so it is better to prevent problems than to try to reverse them later.

Exposure to sunlight:

Sunlight will effect your canoe differently, depending upon its type of finish. If you have a colored (“gel-coat”) finish, sunlight tends to fade it. Darker colors may fade quite a bit, governed by the amount of exposure, while lighter colors may fade hardly at all.

If you have a natural Kevlar® (“skin-coat”) finish, sunlight tends to darken it. While this surprises some owners, it is perfectly natural.

Although fading or darkening aren’t truly harmful, you may wish to forestall them. And storing your canoe indoors – or, at least, out of strong sunlight – is the best thing you can do.

The periodic use of a good cleaner/wax is valuable, too. There are some products made specifically for use on gel-coat, but standard automotive cleaner/waxes will also help to protect the finish on your canoe.

How often you apply wax is, we think, more important than which wax you use. Wax your canoe at least once a year, but probably more. And always clean it thoroughly – including waxing the canoe – after any lengthy trip.

If the finish of your canoe has faded, you can restore it somewhat by polishing using the procedure explained later under “abrasion.”

Store the canoe out of the sunlight.

Wax your canoe at least once a year, but probably more.

Rinse off the canoe, especially if you've been on salt water or taken a long trip.

You can polish out the wear caused by abrasion.

Dirt, grit and grime:

Frequent waxing will go far to keep your canoe looking new, but wax won't remove certain types of dirt, and the process of waxing itself can cause scratches if the hull is gritty.

Rinse the canoe inside and out periodically, and especially after you've been on salt water or taken a long trip, or if you intend to wax it.

Unfortunately, rinsing won't clean oily goop, such as pine sap. Nor will waxing remove it, but will spread it around into a bigger mess. Try using household spray cleaners, especially the ones meant for bathroom use. Some of these have a citric acid component which is, we suspect, what seems to make them work better for a gel-coat finish and the types of gunk that collect on a canoe.

Small scratches from abrasion:

By abrasion we don't mean deep scratches but the minor wear that may happen if, for example, you repeatedly run the canoe hard onto a sandy beach. Firstly, you can avoid doing that, but not all abrasion can be avoided, so you may wish to polish out the wear later.

Because the gel-coat color layer on a canoe isn't thick, you don't want to make matters worse by polishing through it. After a thorough cleaning, first try polishing by hand using the mildest automotive finish restoring product – usually called “buffing compound.”

If this isn't strong enough, you can escalate to a powered buffing machine and/or to the use of a more aggressive product such as “polishing compound.” Actual “rubbing compound,” is even more aggressive, so only use it with care.

If you have used a more-aggressive product during the process, finish up with buffing compound, and then apply a good coat of wax.

Royalex® canoes

Because Royalex canoes don't have a glossy finish, preserving their new appearance is fairly easy, but there are a few things to do.

Rinse the canoe periodically, and always after you've been on salt water or taken a long trip. Clean pine sap and other scummy deposits using household cleaners or alcohol.

Royalex canoes don't fade quickly, but it is wise to store them out of strong sun, and to use protective products. Standard automotive cleaner/waxes will help, but a product that contains more UV inhibitors will provide better protection from sunlight.

Concerning scratches: The color of a Royalex canoe is not impregnated throughout the material but is a surface layer. Therefore, scratches will reveal a different color.

Minor scratches might be polished out with automotive products such as "polishing compound" or "buffing compound." Because these are mild abrasives, be careful to avoid polishing through the entire color layer.

Another way to repair scratches is using paint. We offer spray paint to match our Royalex colors. First sand the surface with very fine sandpaper, paint it, and allow the paint to cure overnight, then apply a protective product if desired.

If you have scratches deep enough that you wish to fill them, sand the area with fine paper, fill the scratch with an epoxy putty, then sand and paint as described above.

Because Royalex canoes are quite flexible, the fasteners that secure various parts may loosen. Check and tighten them periodically.

*Paint is
available
to match
Royalex
canoes.*

*Check &
tighten
fasteners
if needed.*

Repairs

Composite canoes

Topic Page
Composite canoes 54
Royalex® canoes .. 59

Our composite canoes are painstakingly made using superior materials and methods. They are tough hulls that aren't easily damaged. Should the unexpected happen, however, a big advantage of a composite canoe over any other type is that it can be repaired quite easily, by ordinary people, using basic techniques.

Composite canoes can be repaired quite easily.

We'll give a brief description of some types of repairs here, but we have also produced a special videotape on this topic that you may want to see before starting any significant repair.

How to repair a gel-coat finish:

Gel-coat is thickened, colored polyester resin that is sprayed into the mold before a composite canoe is made in it. The gel-coat is not a structural part of the hull; its only purpose is to impart the canoe's color and smooth finish.

A gel-coat finish can acquire scratches, cracks, or blisters. Scratches come, of course, from scraping sharp objects. Surface cracks can happen if the hull is bent or twisted. Blisters are caused by moisture or dirt trapped under the gel-coat during manufacturing. Blisters, however, normally won't appear until after a

canoe is used. So if they are present, we aren't aware of it when a new canoe leaves our shop.

None of these problems are structural. They can be left alone, but if you wish to repair them, the materials are available from us.

The shelf-life of our Gel-coat Repair Kits is limited, so order one only when needed, and specify the precise color of your canoe, since we have offered differing shades at times.

The repair procedure is as follows:

- 1) Remove loose gel and deepen scratches with a utility knife. Sand the area using #600 wet-and-dry sandpaper until the shine is removed. Clean the area with acetone or lacquer thinner. (Acetone is highly flammable and must be used with care.)
- 2) Place a little more than enough gel to fill the area on a piece of cardboard. Add hardener at four to five drops per teaspoon of gel. Mix thoroughly for about a minute using a paddle. (The hardener is a toxic irritant – avoid all contact with your eyes, and excess contact with your skin.)
- 3) Using the paddle, apply the gel mixture immediately and spread it into the repair. Remove any excess with a knife or with acetone. Dry the repair for two to four hours to allow full shrinkage. (To impart a smoother finish, cover the area with wax paper or cellophane while drying.)
- 4) Using a sanding block, and while applying water liberally, sand with #320 or #400 wet-and-dry sandpaper until the repair is almost level with the surrounding area. Finish wet-sanding with #600 sandpaper.
- 5) Polish the repair with a mild automotive finish restoring product such as “polishing compound” or “buffing compound.” Use a powered polishing machine if desired. Finally, apply automotive cleaner/wax.

Surface scratches, cracks, or blisters can be left alone.

- 6) With colors other than white, a few weeks of aging are needed for the repair to reach its proper color. If your canoe has faded, some difference may remain between the color of the repair and the canoe, but you may be able to match the colors more closely by polishing the entire canoe.
- 7) If you need to recolor a large area, gel-coat can be sprayed from an automotive gun. Explaining how to make such a large repair is beyond the scope of this book, so contact your dealer, or contact us directly.

How to repair structural damage:

A composite canoe is usually damaged in one of two ways. Compression cracks can occur if the canoe is high-centered on a log or rock, or if something heavy lands on it while upturned in storage or transit. Holes are uncommon and are usually caused by serious mishaps.

Holes must be repaired, of course, but a crack may not if it doesn't leak. Use judgement, but it's wise to be safe and to repair a crack.

For a composite canoe with structural damage, it's usually better to strengthen the hull on the inside rather than the outside. Very rarely will a structural repair be needed on both sides. Typically you can patch the inside, and touch up the gel-coat only if you prefer.

All the needed materials including cloth, roving, resin, catalyst, gel-coat, interior color, gunwales, and ribs are available from us.

The repair procedure is as follows:

- 1) Remove the gunwale(s) if needed.
To remove aluminum gunwales, drill out the rivets using a $\frac{3}{16}$ " bit. To reinstall them, use a rivet gun. If new gunwales are being used, drill new holes in the hull for them. Place the gunwale on the hull, and drill through the flange and the hull

A crack can be left alone if it doesn't leak.

together. Space the holes about 9" apart.

Wood gunwales are a trickier problem. On standard-weight canoes, the gunwales are only screwed on. Removing them isn't difficult, but replacing them is. On ultra-light canoes, wood gunwales are *screwed and glued* in place. You must chisel them off, which will destroy them. With either type of wood gunwales, the most practical approach is to remove the wood gunwales and rivet on new aluminum ones.

- 2) Remove any loose pieces from the damaged area. Rough the inside of the hull with a disc sander or by hand sanding. It is unnecessary to remove all the interior color coating, but roughing the surface will improve the adhesion of the repair.
- 3) Apply a quality masking tape (such as 3M, cheap tape leaves adhesive residue) to the outside of the hull covering the area of the repair. The tape prevents resin from leaking to the outside. If the hull is misshapen due to the accident, you may be able to reform it by hand, and use tape to hold it in position until the repair dries.
- 4) Cut several pieces of cloth an inch or so larger all around than the damage. (A Kevlar canoe need not be repaired using Kevlar cloth, unless weight is important) The number of pieces needed depends on the type and/or location of the damage.

To repair a crack, three pieces are typically sufficient for adequate strength.

To repair a hole, you need as many pieces of cloth as the number of layers used to build the hull in that area. All our composite canoes are made from varying numbers of layers, totalling up to seven in the areas of highest stress. So to repair such an area, you need that many pieces.
- 5) Mix resin and catalyst in the ratio of $\frac{1}{2}$ pint resin to $\frac{1}{2}$ teaspoon catalyst. The

precise ratio isn't critical to the strength of the repair, but it will change the drying time, perhaps causing the resin to dry before you are done, or causing the repair to dry very slowly, especially in low temperatures. If you are not concerned with slow drying, use slightly less catalyst.

- 6) Using a small (1/2" to 1") paint brush, coat the damaged area entirely with resin. Then apply one layer of cloth, pushing it into the resin to become saturated.
Apply more resin and cloth alternately until you are done. (If you wish to match the appearance of a hull who's inner layer is woven roving, apply roving at the end.)
- 7) Dry the entire lamination simultaneously. This should happen in a few hours at room temperature, but the time can vary greatly at temperatures below 60°F or above 80°F. To be safe, leave the repair at least overnight before disturbing it
- 8) If you have a Cross-rib or Center-rib hull, broken ribs can be repaired or replaced, but it's not often necessary. The rib adds no strength; the cloth laminated around it does. Thus a rib can be repaired simply by patching over the crack. In severe case, the rib could be ground out and replaced. Please contact your dealer or us directly before making this type of repair.
- 9) Outside structural repairs are rarely necessary and are difficult to finish with gel-coat. But should an outside repair be needed, start it after the inside repair is done. Please contact your dealer or us directly before making this type of repair.
- 10) To finish the repair on the inside, sand it smooth, mix inside color coating with catalyst, and brush it over the repair.
- 11) The exterior can be touched up as noted earlier in the section on repairing gel-coat.

Royalex® canoes

Royalex canoes are very difficult to damage, and they seldom need substantial repair. This is fortunate because, unlike with a composite canoe, making any large-scale repair to a Royalex canoe is necessarily makeshift.

Dents are fairly uncommon because, being quite flexible, Royalex will usually absorb an impact and spring back. If a dent remains, however, you can often repair it easily by heating and pushing the dent out. (Sometimes a dent will pop back on its own when heated.) You can try a hair dryer if you like, but it probably won't be powerful enough. Ask at a hardware store about renting an industrial-type heat gun. Use it *very* sparingly.

A few other things do happen to Royalex canoes with some degree of frequency. The most common is damage or wear on the very end of the bow. You can install a Kevlar Skid Plate (page 15) beforehand to protect against this, or you can install one afterward as a repair.

To match its appearance to the canoe, you can paint it using spray cans available from us.

Royalex canoes can also be cut by sharp objects. This rarely happens near the center of the canoe where it is quite flexible, but it may happen near the ends which are quite stiff.

Small cuts or punctures can be repaired by filling with adhesive products meant to repair shoes. The one that we use is called "Shoe Goo," although there probably are other brand names. This can be sanded after drying, but not very well, so try to be neat when you apply it. Use a paint scraper, popsicle stick, or something similar to apply the adhesive and clean the excess away quickly before it has

Dents can usually be popped out with heat and pressure.

Small cuts can be fixed with shoe adhesives.

*Repair
large cuts
or holes
just like a
composite
canoe*

had time to dry. If you wish, you can paint over the repair after it has dried overnight.

A large gouge might be patched with shoe adhesive, but if it is substantial enough to weaken the structure, it is best to repair the gouge as if it were cut entirely through.

Large cuts or holes (both of which are very rare) can't be fixed with shoe adhesive, nor with any sort of Royalex-like material. This is the point at which fixing a Royalex canoe becomes makeshift, because you must repair it as you would a composite canoe, by adding layers of composite fabric bonded with resin to the inside and/or the outside of the canoe.

Unfortunately, the composite repair will not adhere to the Royalex canoe as strongly as it would to a composite canoe. Moreover, the differing expansion/contraction rates for the repair compared to the canoe will constantly be taxing the adhesion of the repair.

To achieve success, you must use epoxy resin. Other types won't stick well to a Royalex canoe. Also, you must thoroughly sand the area, because the adhesion will be purely mechanical (not chemical), and it needs all the "grip" it can get. Finally, make the repair no larger than absolutely necessary in order to minimize the variances in expansion/contraction caused by temperature changes.

A gouge can be repaired on one side only, but repair cuts or holes both inside and out using basically the same procedure as described on page 56 to repair a composite canoe. Use epoxy resin and about three layers of fabric (both on the inside and outside for cuts and holes.) Then sand and paint if you wish.

Gunwales can be replaced by drilling out the rivets and pop-riveting new ones on as described for composite canoes on page 56. End caps are also available from us and can be easily replaced by drilling out the rivets.

*Gunwales
can be
drilled
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new ones
riveted on.*

Groups

Valuable resources

Whether your interest is instruction, camaraderie, competition, exercise, environmentalism, or anything else related to canoes and paddling, organizations exist that can help you. We highly endorse the nation-wide groups that are listed here, and we've been favorably impressed with most of the regional or local clubs that we've encountered.

Being that we are dedicated paddlers, we are very supportive of any group seeking to preserve the environment and, especially, to protect our waterways. Some organizations, such as "American Rivers," exist just for this purpose, but many other paddling organizations have some environmental activities, and we strongly encourage your participation.

United States Canoe Association:

Organized in 1968 as an educational, non-profit organization dedicated to unifying paddlers, the U.S.C.A. is the governing body of sit-down-style marathon canoe racing.

The group also encourages paddling as a recreational sport, not just a competitive one. Their activities include conservation and

Topic Page

<i>U.S. Canoe Association</i>	61
<i>American Canoe Association</i>	62
<i>American Rivers Council</i>	63
<i>Regional and local clubs</i>	64

The USCA governs marathon canoe racing.

preservation programs, training clinics, races, cruises, and camping trips. The U.S.C.A. is active in educating the public to safety precautions, and in formulating standards of excellence in the design of cruising canoes and kayaks, paddles, and other paddling equipment. Generally speaking, their mission is to develop a sense of camaraderie among all paddlers of watercraft.

We-no-nah Canoe is affiliated with the U.S.C.A., and we encourage membership.

With your membership, you will receive the USCA Canoe News, the bi-monthly publication of the organization. Members are invited to contribute articles, photos, reports of extended trips, and other materials which may be of interest to the membership

The organization can be contacted at:

United States Canoe Association, Inc.
John Edwards, Executive Director
1929 Arrowhead Dr. NE.
St. Petersburg, FL 33703
Phone: (727) 522-3348
E-mail: canoechamp@aol.com
Internet: uscanoe.com

*The ACA
promotes
safe and
enjoyable
outdoor
activities.*

American Canoe Association:

Since 1880 - longer than any other recreational organization in U.S. - the American Canoe Association has been dedicated to the protection of the nation's waterways, and to the promotion of safe and enjoyable outdoor activities. The ACA is committed to the advancement of canoeing, kayaking, and rafting as wholesome lifetime recreation.

A national nonprofit organization, the ACA provides programs and services in waterway conservation and access, amateur athletics, safety education and instruction.

With more than 50,000 members and other

affiliates, the ACA is the largest organization of its kind and is affiliated with the Professional Paddlesports Association, and Paddlesport Publishing, Inc., publishers of *Paddler* and *Paddle Dealer* magazines.

Annual membership dues in the ACA are \$25 for an adult and include a subscription to *Paddler* magazine.

The organization can be contacted at:

American Canoe Association
7432 Alban Station Blvd., Suite B-232,
Springfield, VA 22150
Phone: (703) 451-0141
Fax: (703) 451-2245
E-mail: aca@acanet.org
Internet: www.acanet.org

American Rivers:

American Rivers is a national conservation organization dedicated to protecting and restoring America's river systems. The group was founded in 1973 to expand the number of rivers protected by the National Wild and Scenic Rivers System. Based in Washington, D.C., American Rivers also has regional offices in Phoenix and Seattle.

The group has preserved more than 22,000 miles of significant rivers, and over 5.5 million acres of riverside lands. In addition, its programs address flood control and hydropower policy, endangered species, western instream flow, clean water, and urban rivers.

The staff works with conservation groups, local citizens and businesses, and federal, state, and tribal agencies to provide technical support to strengthen conservation efforts.

American Rivers, Inc. is a nonprofit organization with a membership of 18,700. Annual publications include a quarterly newsletter, annual report, and an in-depth report on

American Rivers is dedicated to protecting rivers.

North America's Most Endangered and Threatened Rivers. The group receives funding through contributions from members, corporations, and private foundations.

The organization can be contacted at:

American Rivers
1025 Vermont Ave. N.W., Suite 720
Washington, DC 20005
Phone: (202) 347-7550
Fax: (202) 347-9240
E-mail: amrivers@amrivers.org
Internet: www.amrivers.org

*There are
more than
250 local
and
regional
clubs*

**Regional and local
paddling clubs:**

A recent edition of the *Beginner's Guide to Canoeing and Kayaking* (published annually by *Canoe & Kayak Magazine* and available at newsstands) lists more than 250 paddling organizations. They are located in more than 40 states, and in most of the Canadian provinces. In addition, we are certain that there are hundreds more clubs which were not included in that list.

If you are located even remotely near water, therefore, the chances are that a paddling club exists somewhere near you. To find one, ask your We-no-nah dealer, or get a copy of the *Beginner's Guide* mentioned above.

You could also query members of local chapters of Ducks Unlimited, Trout Unlimited, Izaak Walton, or other outdoor and/or environmental groups. Inquire at the Y.M.C.A. or other exercise-oriented groups, too

The size and scope of paddling clubs varies, of course, but many have some form of instruction program, and most sponsor some type(s) of outings or races. All of them will certainly have lots of good ideas about where you can go to enjoy paddling your new We-no-nah canoe.