Naturally Superior Adventures Paddling Centre

# Paddle Canada Level I Sea kayak Skills

*Participant's Handbook*

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**PADDLE CANADA Level I Sea Kayak Certification Course**



## Welcome

We assembled this sea kayak manual to provide you with some background on sea kayaking theory, safety and skills. However, it is by no means comprehensive or complete and is no substitute for hands on instruction from a qualified instructor. If you have suggestions and improvements, please let us know at rock@naturallysupeior.com or 1-800-203-9092.

Distances

| | Nautical Mile (NM) | KM | Mile |
|---|---|---|---|
| Nautical Mile (NM) | 1 | 1.85 say 2 | 1.15 say 1.2 |
| KM | 0.54 say 0.5 | 1 | 0.62 say 0.5 |
| Mile | 0.87 say 0.9 | 1.61 say 1.5 | 1 |

| COURSE CHECKLIST | | Comments |
|---|---|---|
| | | |
| **FOUNDATION** | | |
| Parts of the kayak and kayak design features | | |
| Kayak outfitting for personal fit, control and safety | | |
| Paddling clothing in different water and weather conditions | | |
| Paddle design and selection | | |
| Common Injury prevention & Paddler's box | | |
| Proper care of the paddle, PFD and kayak | | |
| | | |
| **BOAT MEETS WATER** | | |
| Lift and carry | | |
| Launching & landing beach or dock | | |
| Efficient forward paddling over 100 metres. | | |
| Stop the kayak within 2 strokes (count one side). | | |
| Reverse Stroke for 20 metres in a straight line | | |
| Sweep strokes : Forward & reverse sweep & 360 | | |
| Sweep stroke on the move | | |
| Edge control while turning & paddle straight on edge 5 metres | | |
| Regular and sculling draw stroke 2 metres sideways | | |
| Stern Rudder | | |
| Draw stroke the kayak sideways while moving forward | | |
| Demonstrate a Low & high brace.<br>Simulate a flip & demonstrate proper low brace technique. | | |
| | | |
| **PADDLER MEETS WATER** | | |
| Eskimo rescue: Bow, stern, side or paddle .<br>Rescuer moves in from 5 m. | | |
| T-rescue + raft, re-enter & pump techniques | | |
| Unassisted re-entry: paddle float may be used. | | |
| Contact tow without the use of a towline. | | |
| | | |
| **GROUP DAY TRIP** | | |
| Gear, food and shelter list | | |
| Float plan/emergency response plan | | |
| Obtain a weather forecast | | |
| On water communication ~ Paddle & whistle & hand | | |
| Roles of leadership, home boat, and paddling buddies. | | |
| Group pulse + feedback measuring | | |
| Signalling and communication devices | | |
| Hypothermia | | |
| What to do if stranded overnight | | |
| | | |
| **ENVIRONMENTAL** | | |
| 3 negative kayaker impacts and mitigation | | |
| Identify characteristics of 2 local species | | |

# COASTGUARD REGULATIONS

Required Gear for Human-powered pleasure craft (i.e. canoes, kayaks, rowboats)

*Every boat must be equipped with a:*

- Department of Transport approved Personal floatation device
- Propulsion device (paddle)
- Bailing device (750 ml size) (pump/bailer)
- Sound signalling appliance (ie pea-less whistle)
- a floating heaving line of at least 15 metres length

Also:

- A watertight flashlight or three pyrotechnic distress signals (other than smoke) if paddling (say) within an hour of dawn/dusk or in periods of restricted visibility.

- A magnetic compass if the canoe or kayak is navigating out of sight of navigation markers.

Additional Requirements:

A vessel less than 9 m (20 feet) must carry 3 flares if it is possible to paddle more than 1km from shore (singles)

A vessel more that 6 m (19.5 feet) (ie double) must carry a watertight flashlight. If the vessel can operate more than 1 nautical mile (1.852km) from shore then 6 Type A (Rocket Parachute), B (Multi-Star) or C (Hand) Canadian-approved flares are required.

A vessel between 9 m (29.52 feet) and 12 m (39 feet) i.e. Voyageur Canoe, must have a lifebuoy attached to a 15 m buoyant line.

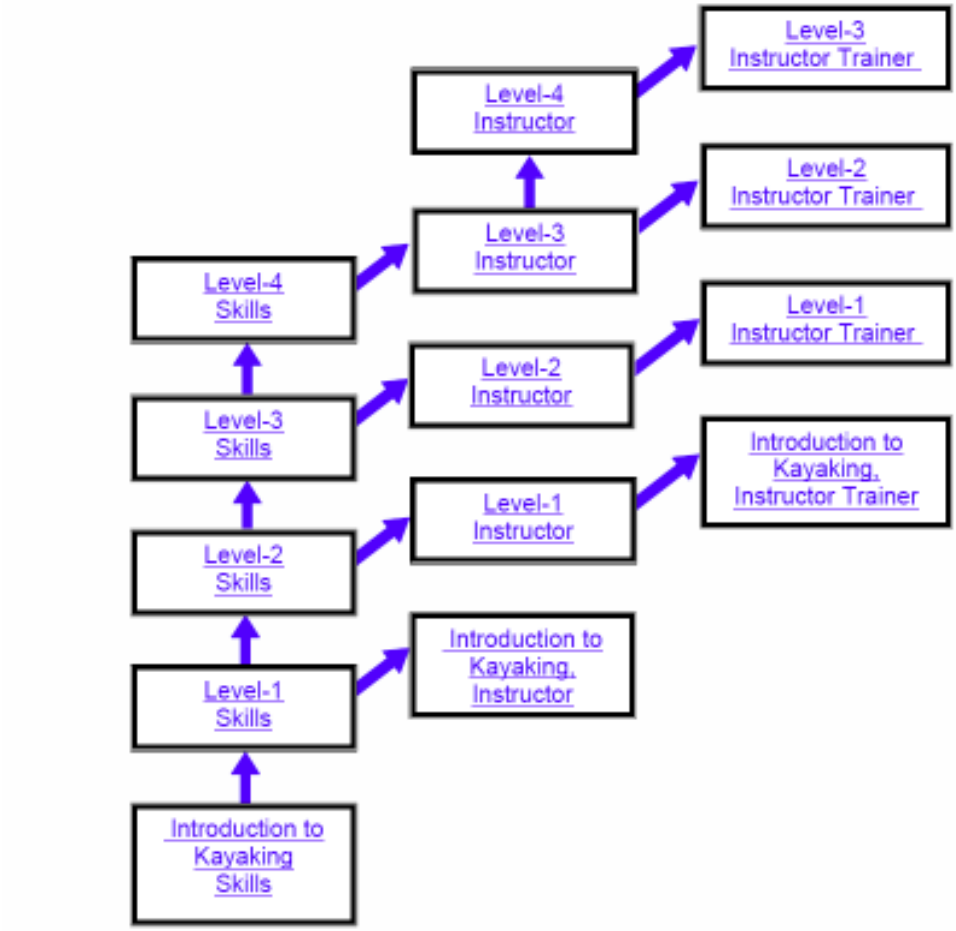
Potential fines: $100 per missing item

US and foreign paddlers in Canada can use a US coastguard approved PFD and visa versa and are exempt from meeting safety equipment requirements provided the vessel is registered or licensed in that country and not principally maintained and operated in Canada

Guided Excursions:
If you are leading or guiding a trip, teaching a course, or on the water in any type of leadership position (volunteer or paid), you are now classified as being on a “guided excursion” and thus fall under new and additional regulations. Note that this includes instructors, guides, club volunteers, and teachers as well as paddling schools, boy scouts, girl guides, schools, church groups, camps and outfitters, or any other commercial or non-profit organized group on the water.

Please refer to the Transport Canada website for more detailed information on required equipment for all vessels: http://www.tc.gc.ca/eng/marinesafety/tp-tp511-equipment-1140.htm

The Paddle Canada Sea Kayak System




**Introduction to Kayaking: (8 hrs):** Introduces the novice to paddling in enclosed sheltered waters and calm conditions. Skills covered include a controlled wet exit, forward & turning strokes, assisted re-entry.

**Level-1**: Day paddling skills in sheltered waters (12 hrs): Provides the theory and skills for a daylong sea kayaking trip in sheltered waters and light winds. Includes: controlled wet exit, efficient forward & turning strokes, edging, introduction to bracing, unassisted re-entry, and Eskimo rescue.

**Level-2**: Overnight touring and intermediate boat handling (4 days): Provides the theory and skills for proficient kayaking at sea in moderate open sea conditions, including overnight camping. Includes: touring, risk assessment, efficient bracing, sculling for support, combined strokes, sustained paddling, introduction to rolling, kayak tripping with overnight camping, moderate winds and sea conditions.

**Level-3**: Seamanship and leadership in multi-day touring (4 days ):Provides the opportunity to develop leadership, risk-assessment, decision-making, judgment, group management, and general seamanship in the context of a multi-day journey.

**Level-4**: Extended touring along an exposed coast (5 days ): Provides the theory and skills for leadership in kayaking at sea in advanced conditions, open ocean, during extended periods. Includes overnight camping, rolling at sea, strong wind, ocean swell, surf landings, and strong current.

**Level 1 Course Content:**

**1. Paddling Knowledge**
- Parts of the kayak, the different boat shapes and their effect on the kayak in the water
- Kayak outfitting for personal fit, control and safety
- Paddling clothing in different water temperatures and weather conditions
- Paddle design and selection
- Common Injury prevention
- Proper care of the paddle, PFD and kayak
- Kayaking resources

**2. Rescue skills**
- *Wet exit*
- *Retrieving a swamped kayak*
- *Eskimo rescue*
- *T-Rescue*
- *Towing – simple contact tow*
- *Unassisted re-entry – paddle float allowed*

**3. Technical Paddling Skills**
- *Lifting and carrying the kayak in a safe and appropriate manner*
- *Entering / Exiting the kayak with the kayak in and out (beach) of the water*
- *Forward Stroke 100 meters in a straight line*
- *Reverse Stroke for 20 metres in a straight line*
- Forward and reverse sweep pivot turn in both directions *360 degrees*
- Draw Stroke moving the kayak sideways *2 metres*
- Low and High Brace, simulate a capsize and demonstrate proper low brace technique
- Edge the boat and paddle *5 metres* while on edge and use edge while turning
- Stern Rudder to be used in calm conditions

**4. Course Evaluation for Paddle Canada Certification**
Your Rescue skills, paddling skills and knowledge will be graded Pass, Weak or Fail. Normally you must achieve a pass on all areas although one weak is permitted provided other areas are strong.

Our hope is to provide you with recommendations on how to improve your paddling progression. The following criteria will be used in grading for this course:

1. Oral testing throughout course
2. Practical evaluation throughout course
3. Group awareness and self control
4. General attitude

## PADDLING KNOWLEDGE

a. A Brief History of Sea Kayak Design

Siberia & the Aleutian Islands are considered the birth place of the sea kayak or "qajaq" which has a history spanning at least 4,000 years. During pre-contact times, as many as 40 different designs were used throughout the arctic in Canada, Alaska, Siberia and Greenland, each evolved according to specific hunting, transportation and environmental conditions. Two main design types are used in modern sea kayak design as follows:

Traditional West Greenland Kayak and Gear

Greenland Style Kayaks: In the summer of 1959, Ken Taylor made a private one-man expedition to Western Greenland and brought a kayak back to Scotland. This particular kayak excited special interest because it was a more moderate example of the West Greenland type and served as a prototype for the British "Anas Acuna" designed by Frank Goodman of Valley Products. Goodman later designed the "Nordkapp" having a basis in the West Greenland kayaks, but incorporating elements of standard boat design, with a round bilge capable of the extra payload required. Many modern boats can trace their design lineage from this root.

Aleutian Style Kayaks: Modern Aleutian or West Coast designs were built in 1865 to according to sketches of Eskimo kayaks but it was not until the mid 1960's when 17-year-old George Dyson, son of physicist Freeman Dyson, arrived on the North West coast of Canada that interest in the kayak was rekindled. After traveling to Alaska and rediscovering the marvellous sea kayak in museums, he returned to British Columbia, Canada where he began constructing modern day replicas of the ancient kayak using aluminium and nylon.

*b. Kayak Types*

Sea Kayaks: The sea kayak is an indigenous arctic craft, its modern incarnations reflecting its original use. Traditionally, the sea kayak was a hunting boat meant to ply challenging coastal environments. Today, the sea kayak is still used for coastal exploration: it is seaworthy, swift, manoeuvrable and able to carry gear.

Greenland Origins Style: British sea kayaks: Typically low to moderate volume, long and narrow boats – were originally created for challenging rough water expeditions along rough coasts. Brit boats are usually constructed of fibreglass laid up in a durable and heavy manner, and feature cramped cockpits, fibreglass bulkheads, small rubber hatches, a well organized network of decklines, rigging, end toggles, a skeg, and a compass recess. Sea kayaks designed in the United Kingdom are typically better representations of arctic kayaks than their North American counterparts.

Aleutian Origins: North American sea kayaks: Originally designed to cruise the calm, island-sheltered waters of the Pacific Northwest. These boats are distinguished by wider, deeper designs with large and comfortable cockpits. The original North America designs often ignored the important safety features of decklines, rigging, and end toggles, and directional stability was achieved through a foot-

operated rudder. Hatches on these boats are large and often less than watertight, bulkheads constructed of caulked plastic or foam.

Lake Tour kayaks: Typically shorter in length and sometimes without sealed bulkheads, these boats are most appropriate for recreational day use on inland lakes and wide rivers.

Sit-on-Tops: Sit-on-tops have evolved significantly during the past few years from relatively short recreational day tour boats to included craft highly specialized for different purposes including fishing and wave surfing.

River Kayaks and play boats: Much shorter in length these riverboats are designed to be very manoeuvrable and perform in river situations. These boats may have displacement hulls or planning hulls.

Hybrids: With modern materials and technology some interesting designs are appearing including sea kayak with adjustable rocker permitting paddlers to change boat performance characteristics according to paddling conditions and personal objectives. Still relatively new, the practicality of these boats in not yet clear.

*c. Sea Kayak Materials*

Low Price Range: Plastics:
Most recreational touring kayaks are made of polyethylene. They are relatively inexpensive, durable, slip easily over rocks and can be moulded into complex shapes. Plastic kayaks typically weigh 15% more and cost 40% less than composite. Though difficult to repair, it is rare that they are damaged. There are two types of polyethylene kayaks:

Linear—short chemically bonded together, lighter, stiffer, stronger, easier to repair, recyclable; and
Cross-linked—better impact resistance, not as stiff, usually require reinforcement.

To make a plastic hull manufacturers use one of two processes:

Rotomoulding—powder polyethylene is poured into an aluminium mould and heated until it melts, then is rotated until inside is covered with a layer of plastic. This all takes about a half an hour;

Blow-moulding—involves feeding plastic pellets into a screw-driven extruder that produces such extreme pressure that the pellets become semi-molten without additional heating. The pressure forces molecules into a dense package. A boat-sized tube of semi-molten material then emerges from the extruder about ten minutes later.

Mid Price Range: Thermoform:
These kayaks are made using a relatively new process, which uses plastic sheets of compatible hybrid plastic materials to form a kayak over a mould like a blanket, rather than inside one like roto-molded polyethylene kayaks or composite kayaks. The outer surface of thermoform kayaks is harder than polyethylene and provides better abrasion resistance.

Thermoform kayaks have an appearance similar to fibreglass, are very durable, slightly heavier and offer on water performance is similar to composite boats.

Higher Price Range: Composite Materials: Sophisticated material made by encasing cloth in resin (often epoxy) forming layers for strength and typically covering with gelcoat (pigmented resin) for UV

protection and cosmetic reasons. Construction methods include hand-layup and vacuum bagging. Composites are more vulnerable to impact and cracking than plastic, but are easy to repair, stiffer, and will generally last longer. Composites have sharp, efficient lines but this comes at a higher price. Three cloth materials are typically used:

Fibreglass: About 15% lighter (typically 55-60 lbs) and 40% more expensive than plastic

Kevlar: About 25% lighter than fibreglass (typically 40-45 lbs) and 30% more expensive than fibreglass. Boats can be as easy to repair as fibreglass and as stiff, but more impact resistant.

Carbon/graphite: Most expensive, and even lighter than Kevlar

Wooden Kayaks:
Made of long thin planks of wood glued together called (called strippers) or with marine-grade plywood. The hull is usually covered inside and out with fibreglass cloth and resin. These boats can be moulded into highly complex shapes and have potential to be very lightweight. There are numerous kits available.

Folding Kayaks:
Fabric skin of coated nylon or canvas stretched over a wooden or aluminium frame. These kayaks have been around since the turn of the century. They fold into two or three duffels for travel or storage Performance-wise, they are less responsive than hardshell kayaks and they are very expensive.

Inflatable Kayaks:
Serious kayakers once scoffed at these boats, but now better designs and bombproof materials are available. Inflatables are compact, portable and perform best on white water; they tend to be sluggish on flatwater.

Seal Skin and Driftwood: Traditional Inuit-style—custom fit to the paddler, no screws, nails.

**d. Sea Kayak Design:**

Designing a craft that functions well on the water surface with wave dynamics is challenging. Trial and error of some of the oldest kayak designs often works best. Different designs can result in significant differences in boat handling characteristics in different conditions.

Since each boat design is a compromise in some way there is not a boat design that does everything well. For example, a kayak cannot excel in rough water and be super stable in calm water nor can a boat be very fast and able to turn easily.

The issues of initial stability versus secondary stability, tracking versus manoeuvrability and hull cross section are what really set hull designs apart. Basic Design features include

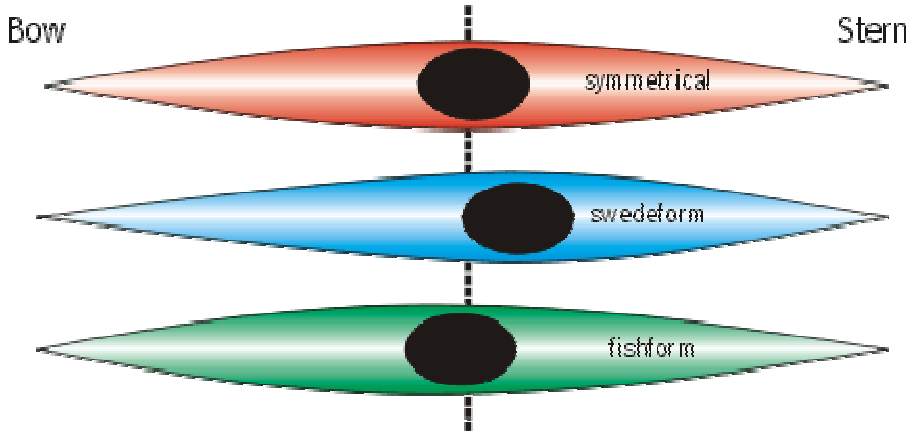
Hull shape forms:

- Symmetrical: The widest part of the boat is halfway between bow and stern and volume is evenly distributed fore and aft. Some of the finest all round sea kayaks are very symmetrical.

- Swede form: The widest part of the boat is behind the midpoint. The longer, more slender hull entry results in a wetter ride, tend to cruise at slightly faster speeds, and feel as though they

have slightly better stability, but they will require more effort to turn, tend to broach on waves and come upwind (weathercock).

- Fish form: The widest part is in front of the midpoint. With greater bow area and smother exit these boats often have a dryer ride with more lift when in big seas plus improved tracking in rough conditions. These boats tend to have cockpits and tend to weather cock less

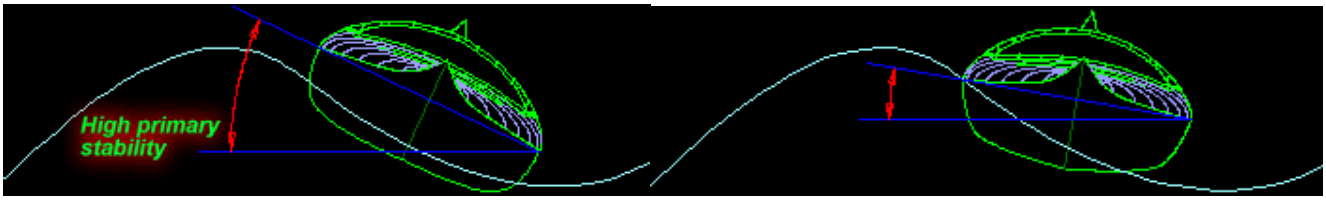


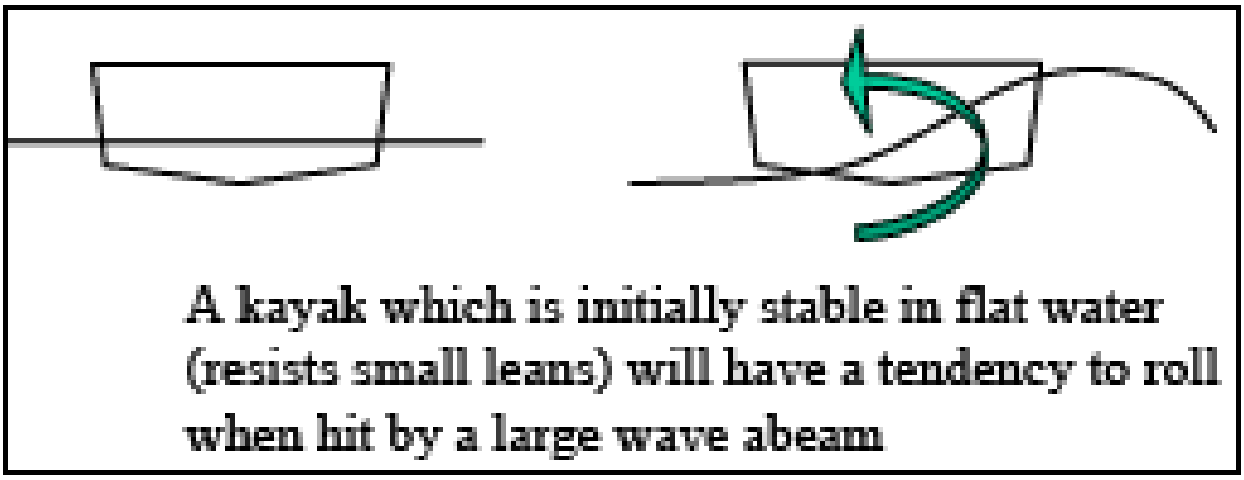

Initial or Primary Stability vs. Secondary Stability

Kayaks that are very stable on flat water are said to have high Initial or Primary stability. Typically these kayaks have a wide flat bottom that resists even small degrees of lean. For example they are great boats for photography when in relatively calm water.

Secondary Stability is the maximum degree of lean before the kayak becomes unstable. Rounder, elliptical, and 'flared' V shaped sections typically have less resistance to small degrees (low Initial stability) of lean and this becomes an asset in larger chop and waves since the kayak is less rocked by waves passing under the hull.

A kayak with high initial stability in flat water will tend to roll when sideways on a wave whereas a kayak with low initial stability will have more of a tendency to stay upright. When leaned into the wave, the flared side of the kayak (and its associated volume) offers buoyancy and support. Such a kayak is said to have lower primary stability but good secondary stability.





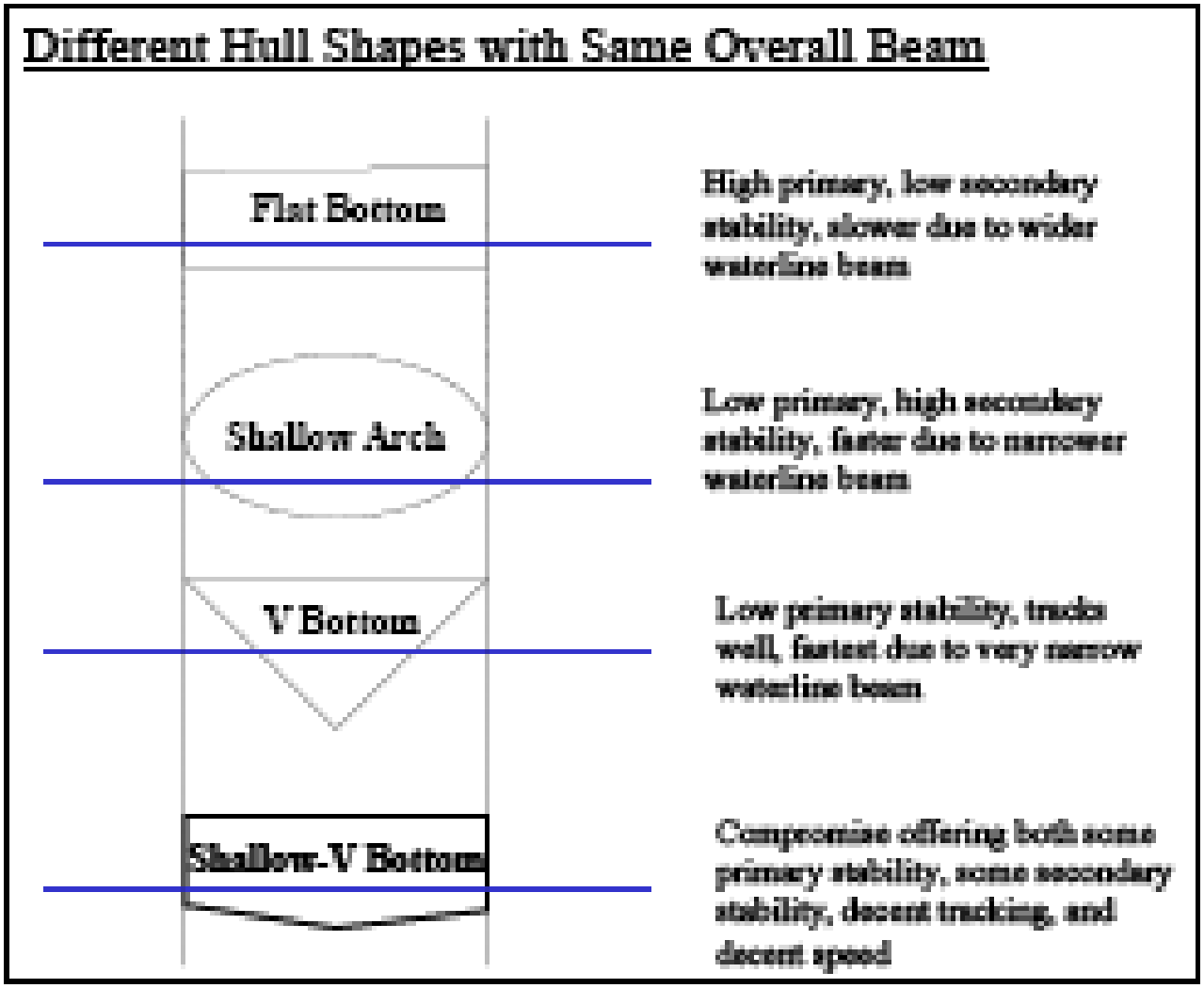

Sea Kayak Cross Section
The cross section of the hull also contributes to the initial and secondary stability in a kayak.

A hull with a flat cross section feels very stable in smooth conditions and with increased wetted area is a slower boat. A completely rounded hull is very fast but is equally very unstable in all paddling conditions. Cross sections also change moving away from the mid-section of the boat further modifying boat performance.

Most hulls therefore are a compromise between the two extremes according to the designer's objectives and typically include:

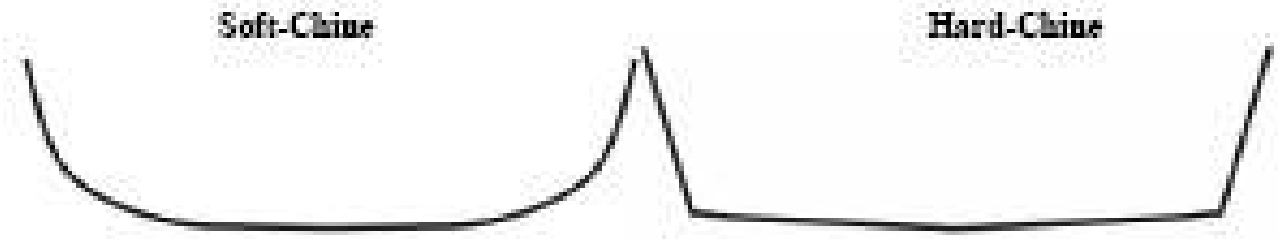
*V-bottom kayaks*: Vee bottom hulls are quite common in touring kayaks. They feel less stable in clam water but provide the most secondary stability and will feel more stable when leaned or in rough water. Typically, hey are fast, efficient, track well and provide a lively feel with a comfortable level of stability for experienced paddlers or those aspiring to be

*U-bottom kayaks* are a compromise between flat and V-bottom hulls and provide a good compromise between initial and secondary stability. They can require some experience determining far the kayak may be leaned before capsize. They offer good all around performance and are suitable for wide range of paddlers and skill levels.

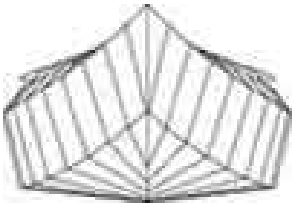



Chines

The chine is shape of transition between the bottom of the kayak and the sides of the hull and the point of secondary stability.




*Soft and Multi Chines*: A kayak with a soft chine has a smooth transition between the bottom of the hull and the sides. Soft and multi-chine or kayaks hail from Alaskan and Canadian waters. This design provides for less wetted surface area for the same waterline length and therefore are about 3% faster than hard chine designs at cruising speeds.

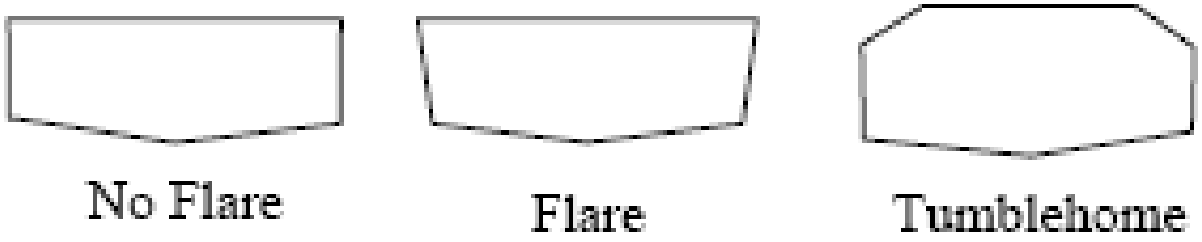


*Hard Chines*: Single chine kayaks have a well defined hard edge where the hull starts to turn up toward the side of the kayak. This design hails from Greenland.

When leaned over a hard chine functions as a keel. Since the chine is curved the boat will carve a pronounced turn at a lower lean angle than with a soft or multi chine boat.

Flare
Flare is the angle of the kayak's side outward from waterline towards gunwales. Boats with flares sides have greater secondary stability but less initial stability and are easier to lean into a wave or lean for a turn.

Many wider kayaks have sides that curve inward near the deck thus creating a narrower beam at the deck. This helps maintain the stability of a wider kayak but allows the paddler to more easily reach the water.




Bow Flare: Many designers add flare to the bow of a kayak to increase volume and lift in rough water and surf conditions. The bow flare keeps them from burying there bows in rough water and surf conditions

Length and Waterline

The overall length of a kayak matters, but the waterline length is most important for boat efficiency. Other things being equal, a longer waterline results in a faster kayak because longer kayaks:

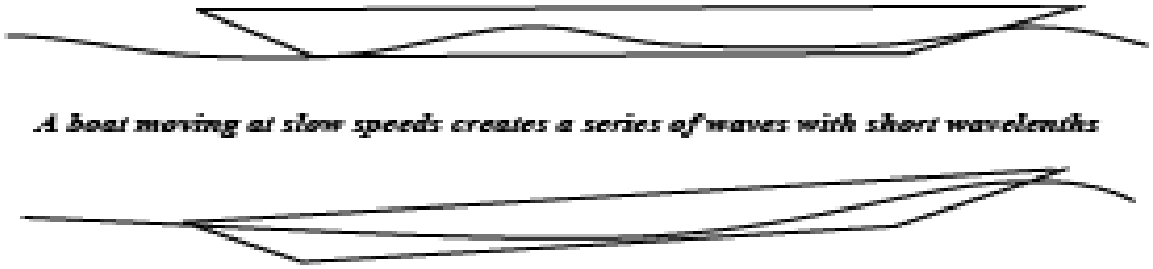
- Have a higher hull speed and ride their own bow wave more efficiently
- Follow a more streamlined passage through rough water since they can span waves instead of riding up and down in the wave action, allowing more glide.
- Have a larger submerged 'lateral plane' resulting in a bigger bite in the water to resist turning (yaw) while the kayak is upright and saving additional paddling energy for course correction Leaning the kayak on its side, changes the shape and size of the plane which allows the paddler to turn and manoeuvre

Longer kayaks also have a larger carrying capacity permitting extended trips.
Shorter kayaks are more manoeuvrable and fun when poking around and often easier to handle both in and out of the water. Because the wetted surface of a shorter boat is small, the hull is often easy to move through the water at cruising speeds. However, at high speeds, the shorter boat will not be as fast as a longer boat.

**Hull Speed: Why longer kayaks are usually faster (all else being equal)**

Beginning at about 3 km/hr waves develop forming a wake always at 39 degrees. Waves are also created underneath the boat and the size of wave is the square of speed (i.e. by doubling your speed the wavelength is quadrupled). At a critical speed, called the Hull Speed, the length of the wave will equal the length of the boat, and to go faster, the paddler must paddle against gravity out of the trough created by its own wave. . A kayak's hull speed is approx 1.34 times the square root of the waterline length in feet. For example:

(1) 13 ft. waterline: 4.8 knots hull speed, 8.9 km/hr; 5.5 mph
(2) 17 ft. waterline: 5.5 knots hull speed; 10.2 km/hr; 6.3 mph; 15% greater
(3) 20 ft. waterline (double kayak): 6.0 knots; 11.1 km/hr; 6.9 mph; hull speed!



*A boat moving at slow speeds creates a series of waves with short wavelengths*

Typical Bow Shapes
Greenland style which is distinctly long and narrow with upswept ends. In rough water conditions the upswept bow lengthens the waterline of the boat allowing it to cut through waves more easily keeping momentum. The degree of lift that this type of bow gets in rough conditions depends on the flair in the bow of the boat.

West Coast style which tend to have a lower more plumb profile which provides a longer waterline to maximize hull speed and reduce the negative effects of crosswinds.

Rocker
Rocker is the degree of upward curvature of the hull between bow and stern of the kayak. Whitewater kayaks typically have a lot of rocker (banana shaped) which reduces the boast waterline facilitating hull manoeuvrability.

Sea kayaks typically have little rocker resulting in good tracking and an efficient hull. Manoeuvrability is gained by hull designs which introduce rocker by leaning the boat on edge and reducing the waterline

Boat Volume:
A bigger volume kayak will usually result in a dryer ride although it is more susceptible to wind resistance and weathercocking

**Weathercocking**

Weathercocking is the tendency of a kayak to turn into the wind when moving forward and is caused by the interaction of the wind on the paddler+kayak and the water on the hull.

When a kayak is being paddled forward and being pushed sideways by the wind, the pressure distribution on the hull results, then there is more pressure on the downwind side at the kayak's bow and less on the downwind side of the stern. The stern is blown downwind and the paddler perceives that the bow is turning into the wind or weathercocking.

There are a number of ways a paddler can to counteract weathercocking including:
- Deploy the rudder or skeg which will increase downwind resistance at the stern
- Not carrying things on the deck will also help a lot.
- Change the load distribution so the stern is deeper creating more lateral resistance
- Use a stronger or sweep stroke on the windward side or extend the paddle to windward
- Tilt the boat to windward so that chine and boat design work steer the boat downwind
- Reducing speed will reduce weathercocking and speeding up will cause more.

*d. Kayak Parts*

End Toggles/Handles: End toggles at a kayak's bow and stern provide handholds for swimmers in surf and rescues. Carry handles are located on the kayak's deck, aft of the bow and fore of the stern, and are less convenient (and may be a liability) to swimmers in surf and rescue situations.

Deck fittings: Ideally, deck fittings should be recessed into the deck to minimize finger smashing.

Decklines: Sea kayak perimeter lines are essential in maintaining control and re-entering a capsized boat in rescue situations. The best decklines are made from quarter-inch polyester line. Reflective lines are also available. Note that deckilnes are best a little loose to assist in grabbing in rescue situations.

Deck rigging: Allows gear to be stored on the deck of a sea kayak, or can assist self-rescue. Quarter-inch bungi cord is strong yet compact. Webbing can be installed just aft of the cockpit to hold a paddle blade to facilitate paddle float self-rescues as bungie cords often do not work well.

Hatches: Hatches provide a means of watertight (hopefully) storage for gear. Sea kayaks usually have a 2-hatch – 2 bulkhead configuration providing storage areas fore and aft that are not accessible to a solo paddler on the water. Many manufacturers also add paddler-accessible, smaller, day hatches just behind the cockpit and P&H has added a very small hatch to a sealed compartment just in front of the cockpit.

Hatch covers: There are a growing number of hatch cover options, but most are either single rubber covers or a combination of neoprene and fibreglass/plastic covers. Hatch covers that are convenient and seal well are hard to find.

Bulkheads: Bulkheads typically seal the hatch areas from the open cockpit. So long as one bulkhead compartment (hatch) remains watertight, the kayak will float. Plastic boats typically have caulked plastic or foam bulkheads and it has proven difficult for manufactures to ensure a long-term seal. Composite boats typically have composite bulkheads made of fibreglass, which is extremely rigid,

watertight and durable, but makes the kayak prone to damage where the stiff bulkhead meets the deck and hull.

Skeg: A cable or rope-controlled retractable fin drops like a centreboard just fore of the boat's stern and allows for better tracking. Skegs displace storage area in the rear compartment, are subject jamming with sand or gravel, and their control cables are prone to kinking.

Rudder: A metal fin attached to the stern of the kayak; when deployed, it allows the paddler to steer the kayak with his or her via a cable connecting the rudder to the foot peg. Because of its location at the very stern, the rudder may exit the water in large seas. Additionally rudders can significantly affect a paddlers foot bracing capacity although weakness has been for the most part resolved with the use of gas-pedal (or similar) style bracing designs. Many paddlers use the rudder in place of paddling technique.

Cockpit: The cockpit forms the union between paddler and kayak, allowing for boat control; its "coaming" rim secures the spray skirt. There are 3 variations of coamings:

- Ocean Coaming: Very small and circular to help maintain hull structure and reduce skirt leakage or implosion in surf conditions.

- Oval Coaming: Allows for easy access to the kayak seat permitting larger sized or less skilled or more claustrophobic folks.

  Keyhole Coaming: A compromise between Ocean and Oval Coamings.

Thigh Braces: Located at the front of the coaming are thigh braces, which actually are closer to your knee and provide additional means of transferring human movement to the boat.

Seats: Kayak seats consist of a vide variety of designs and materials. Good seats optimize comfort and the connection between the paddler and boat. Seat backs vary from solid thick units to simple seat bands. As paddlers develop good paddling posture and become more skilled and they often exchange the comfort of high backed seats for smaller seat backs, which facilitate rolling and rescue re-entry manoeuvres.

Footpegs: Act to "lock" the paddler in the kayak and, in the case of rudder-steered boats, offer directional control. They are adjusted by moving along a sliding locking rail or with adjustable straps.

Fixed pegs – once adjusted, these footrests offer a firm platform to brace the feet while paddling. These are typically found on skeg and rudderless boats.

Moving Pegs are connected to cables attached to the rudder. Once adjusted for proper boat posture, the footrests may slide on a cable or tilt fore and aft to allow for steerage.

Hybrid: Some manufacturers (i.e. Seaward) manufacture pegs that are fixed on the bottom to allow proper bracing and are moving on the top to permit rudder control

e. Kayak Selection

Despite manufacturer's claims otherwise, no one kayak that excels in every kind of condition or for every paddler's skill level. Kayak design is a series of compromises in a multiple of design options in an effort to achieve a boat that will be optimal in a range of conditions and paddler skills.

Determine your present and future paddler type by considering the following questions:

1. Where do you intend to paddle your kayak most of the time? Creeks and shallow rivers? Small lakes? Large bodies of water? Oceans? Anywhere and everywhere?

2. How much time do you expect to spend kayaking on average? An hour? Five hours? All day? Weeks at a time?

3. How far do you expect to travel in your kayak on average? A mile or two? Five miles? As many miles as possible before the sun goes down? Across whole hemispheres?

Try as many boats as you possibly can and in a variety of paddling conditions. Best way is to go to a sea kayak symposium where manufacturers will have a variety of demo boats available. Try to understand and compare different boats in the key areas of initial vs. secondary stability; tracking vs. manageability, materials and price

Don't spend it all on your boat! A decent paddle and good paddling clothing are critical to a great paddling experience.

Accept that as your paddling skill gets better you may want to paddle in more challenging conditions and the performance you want from your boat will change.

## 2. KAYAK OUTFITTING FOR PERSONAL FIT, CONTROL; AND SAFETY

Spray skirts:
Nylon with waterproof coating skirts are prone to leaking at seams but are more breathable, cool
Neoprene is waterproof but warm to wear, tunnel hot and pressure on bladder (some are adjustable).
Combination neoprene deck with nylon tunnel skirts are a more breathable yet waterproof option.

PFD (Personal Flotation Device):
Life jackets: Designed to keep an unconscious person face-up in the water are regulation colours and uncomfortable to wear and paddle

PFDs are far better suited for paddling and swimming. A growing number of paddling-specific PFDs are available. Safety, fit and convenience features include knife or strobe attachment tabs, quick release towing belts, whistles, reflective strips, adjustable waist and shoulder straps, pockets, and hydration systems.

Knives:
When rope and water are mixed it's good to have a knife handy. In paddling typically knives may be mounted on a PFD and are available in specialized formats (i.e. bear claw). Keep knife for emergency use only (not for spreading peanut butter) so it's sharp in the case you really need it.

Compass:
Hand held and deck mounted compasses are available. Deck mounted compasses can be used when both hands are needed to paddle and because they are mounted forward of the paddler help with sighting and reduce the possibility of sea motion sickness. For night paddling an efficient way of illuminating the compass is necessary.

Pumps:
Deck or bulkhead-mounted pumps are very efficient and allow the paddler to maintain paddle control while bailing the kayak. They can be operated with a deck mounted hand pump, foot operated or electric operated. They cannot be shared between kayaks.
Handheld pumps, though prone to clogging and breaking, are efficient and versatile and may be used by several paddlers to assist in bailing a swamped kayak. They also are less expensive.
Paddle floats:
Inflatable paddle floats are advisable in conditions where hypothermia is of less concern for the solo paddler, or greater support is necessary. Solid foam floats have the advantage of being instantly deployable, but they are bulky and offer less floatation than inflatable models.

Stirrups:
Sometimes in deepwater rescues swimmers have difficulty getting out of the water on to the top of their boat. Stirrups are lengths of webbing/rope that are used to assist the paddler re-entry in both solo and assisted rescues. Some paddle floats have integrated stirrups. Also carrying a 4-metre loop of strong webbing will serve as a suitable rescue stirrup. Commercial varieties with solid footsteps are also available.

Communication/Signalling
Marine-specific communication equipment includes locator beacons, flares and strobes for one-way emergency signalling, and two-way marine band radios, cellular telephones and satellite telephones for general and emergency use. All signalling devices must be in contrast to the surrounding environment.

| Signals: One-way Communication<br>Note that signals are of no use unless there is someone who will see/hear it | |
|---|---|
| Paddle | Paddle horizontal: WAIT<br>Paddle vertical: COME TO ME<br>Paddle vertical with sideway motion: EMERGENCY COME TO ME |
| Whistles | Should be a pea-less design and attached to the PFD.<br>I blow: WAIT/PAY ATTENTION<br>3 blows: COME TO ME/EMERGENCY |
| Flares | Flares are most effective at night, but they are also visible in brighter conditions.<br>Flares should be handled with care. Water and flares do not mix. |
| Strobes | A universally recognized distress symbol.<br>Battery powered, waterproof, PFD-attachable models are available. |
| Beacons alone | Handheld signal units that can be triggered to broadcast identification data on an international frequency to satellites and emergency response specialists. Include EPIRB, 406 personal locator beacons, SPOT and Delorme locator beacons which can broadcast fixed or track locations to Google earth and send ok, help and 911 messages. |

| | |
|---|---|
| Mirrors | Work extremely well over long distance if sunlight is available. |
| Two-way Communication | |
| VHF Marine Radio | A means of two-way communication that is effective for emergency and general communication and includes weather channels.<br>Handheld units operated on line of sight;<br>Coastguard monitors channel 16. Weather channels (Wx) also available |
| Cellular telephone | As service expands to more remote areas, cell phones are becoming an increasingly popular means of two-way communication. |
| Satellite telephones | Provide an effective means of two-way communication anywhere in the world. |
| Beacons with smart phone connections | Spot, Delorme Inreach, etc typically connect with Bluetooth technology to smart phones allowing two way text messaging. |

| | | |
|---|---|---|
|  |  |  |
| SPOT device | Delorme Inreach | ACR Personal Locator Beacon |

Tow systems:
Efficient tow systems are helpful when dealing with sea sick, weaker, tired, injured paddlers and you wish to keep group together. Additionally to move or anchor boats from drifting into rocks or maintaining rescue boat position into wind/waves. Towline systems are typically designed for either short or long tows. Towlines may be mounted to the kayak stern deck, coaming or to the paddler's body. Essential Towline Features include:

- Quick release mechanism
- Easily deployed yet unobtrusive
- Means of absorbing shock
- Floating line and floatation supporting clips
- Effective, non-corroding clip

Paddle leashes:
In rough water rescues, it is difficult for the rescuer to use both hands keep control of their paddle. Paddle leashes are available, making for less worry during rescue situations. Paddle leashes may attach the paddle to the kayak or to the paddler; some are made of long cord, others of elastic coil.

Reflective Cord and Strips:
Features added to kayaks and paddles to assist with visual impact in low light and night situations.

Navigation Tools: These include map and compass and GPS. You need to know how to use properly if planning extended trips.

### 3. PADDLE CLOTHING

Paddling clothing must balance the demands of the air and water boundary to achieve safety. Water temperature is a primary concern: without proper immersion-wear, hypothermia will soon result. But air temperature also enters the equation: in hot weather, full immersion-wear may be restrictive, threatening hyperthermia in the paddler.

| Type | Description and use |
|---|---|
| Dry suit | One-piece, totally waterproof suit with wrist, ankles and a neck gasket; constructed of coated nylon or waterproof-breathable fabrics. Warm layers must be worn underneath. Totally water proof fabric also keep water moisture in and after a period of paddling will soak the wearer. Gore-Tex or similar is optimal, but very expensive. |
| Wet suit | One/two-piece neoprene suit designed to keep a layer of water next to the skin. Paddling specific “Farmer John/Jane” models are best. |
| Semi-dry | Includes drytops (a paddling specific jacket with latex neck and wrist gaskets), paddling jackets (latex or neoprene wrist gaskets; no latex neck gasket) and paddling pants (latex or neoprene ankle gaskets); typically constructed of coated nylon or waterproof-breathable fabric. |
| Warm weather | Jackets, shirts, pants and hats designed to block UV radiation and to be quick drying; typically made of nylon or polypro. |
| Footwear | Paddling-specific neoprene booties are best; strapped sandals may become tangled in foot pegs. |
| Handwear | Neoprene dominates: pogies attach to the paddle shaft and are warm but restrictive; gloves or mitts aren’t as warm but are more versatile. |
| Hat | 40% of body heat loss/protection from sun/glare: regular or neoprene (warmth in rolls) |

Some key Clothing Considerations

a. Dress in Layers: Add/remove layers to keep your body at optimal operating temperature
b. Wear hydrophobic (water hating) materials like polypropylene. Cotton holds water and will contribute to heat loss from the body due to evaporative cooling.

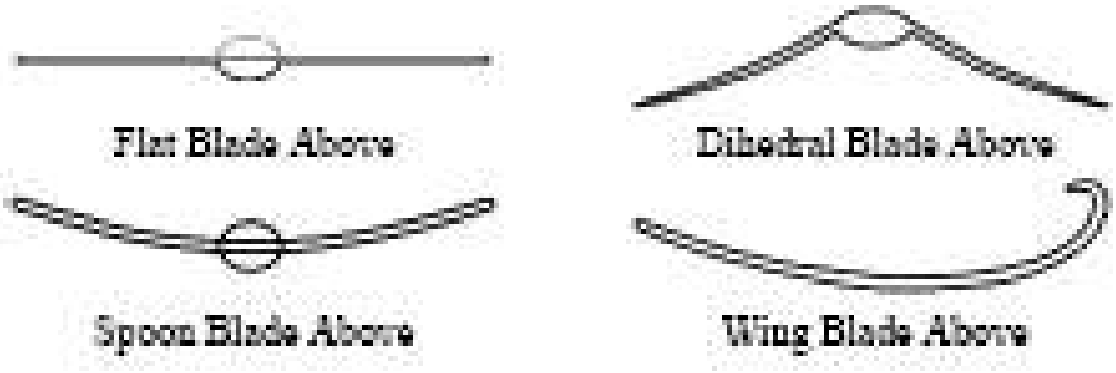
### 4. SEA KAYAK PADDLES

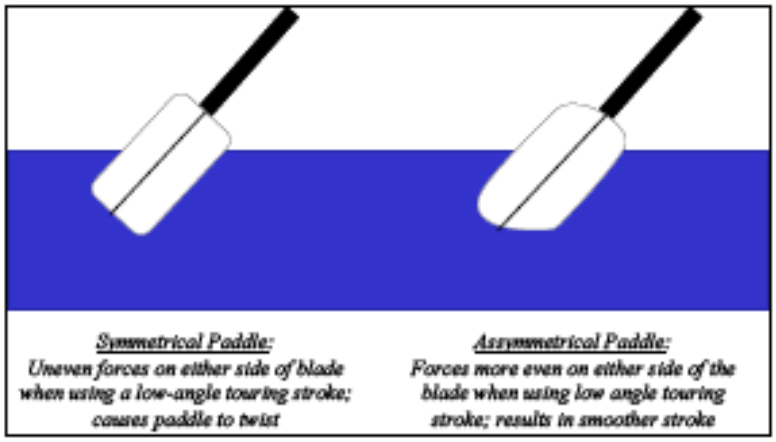
There are three main paddle designs including the traditional Greenland style, the most commonly used Euro blade style and specialized Wing blade styles. An efficient, comfortable, properly fitting paddle is one to a good paddling experience. Paddles have three functions:

Enter the water: Enter water without making waves or splashing or drawing air with it.

Grip the water: Move boat forward instead of pushing water back. A **curved blade** is most efficient to enter the water and cups water through the stroke. **Dihedral or similar** blade shapes reduce flutter resulting from eddies behind the blade. **Wing** Blades are very specialized blades designed specifically for efficient forward paddling. **Asymmetrical** blades allow equal forces of rotation on either side of the blade (since blade enters water on an angle) and result in a smoother stroke.

Exit the water: Easily exit the water at a place where energy is fully used moving boat forwards and not in turning action.




Feathering: Though traditional blades were not feathered there some advantages and disadvantages to feathering your blade. Feathered blades can help with torso rotation facilitating an efficient stroke. They can also be much more efficient when paddling into the wind. However, for some they can contribute to wrist injury. Most sea kayak blades have an adjustable Ferrule which offers a degree of paddle offset. Good systems will not become loose and wobble over time.

Swing Weight: Swing weight is the dynamic weight you lift during a stroke. Light weight blades have significantly lower swing weights compared with heavy blades. Paddle shaft weight has much less impact. When buying a paddle the low total weight is less important than low swing weights so be sure to compare several paddles and note the differences.

Shaft Size: A Paddle shaft diameter with properly fit allows a paddler to maintain a light grip, thus dramatically reducing fatigue while increasing comfort and control. Some manufacturers (i.e. Werner) offer two shaft sizes (diameters), standard and small

High and Low Angle Paddling Style: In sea kayak touring there are two common, yet different, paddling styles. These styles correlate to the angle of the shaft in relation to the surface of the water.

Low Angle: “More Options”

Most people enjoy the low angle style of paddling as it allows them to use good technique i.e. torso rotation and focus on core strength, but also spend more time on the water if just relaxing and recreating. With your hands in a lower position, think about your top hand shoulder height as you take your stroke, you put significantly less pressure on your upper body, arms and shoulders.

Low Angle paddles have longer and narrower blades designed to pull through each stroke with the right amount of surface area for good power while maintaining a smooth forward stroke.

*Paddle Length: Low angle - guidelines*

-6 feet and under use 220cm.
-6'1" and over use 230cm
-If your kayak is over 28" wide add 10cm to the height length of the paddle

High Angle: -"more commitment to technique, but more efficient."

High paddling is typically a more aggressive style of paddling with a faster cadence and a larger variety of strokes being used on each paddle outing. The top hand is about at forehead height and the blade travels closer to the kayak resulting in better tracking. This requires more emphasis on proper torso rotation since more pressure can be put on your shoulders in this higher angle paddling style. High angle designs have short wide blades for a powerful catch and stroke with a slight dihedral for smooth linking strokes.

*Paddle Length: High angle ~ Guidelines*

-6 feet and under use 210cm.
-6'1" and over use 215cm
-Kayak width generally does not come into play since most high-angle paddlers are in more narrow light touring and touring kayaks.

Paddle info compliments: wernerpaddles.com

Wider boats–especially tandems–demand longer paddles; crankshaft paddles are typically sized shorter than shorter than comparable straight shafts.

Bent Shaft vs. Straight Shaft: The key benefits of a Bent Shaft include a natural alignment of the wrist (if held properly) reducing strain and fatigue. Additionally, some bent shaft paddles catch the water a bit further forward, furthering efficiency. Typically, bent shaft blades are more expensive.

With a straight shaft paddle a paddler can maintain a natural wrist alignment by lightly loosening the outer fingers of the non-control hand during a stroke. Straight shaft paddles are less expensive allow a paddler to move their hands along a predictable, straight, and continuous grip area.

Holding the paddle properly:

Left and right handed feather offsets
Hold paddle on you head and make a 90-degree angle with elbows
Hold and twist paddle with main hand and let other hand allow for free rotation

Blade Efficiency: The efficiency of the blade is a function of its shape, size, and your body's physical attributes. The right size for you is determined by how you paddle. If you naturally paddle at a high stroke rate, say 50 to 60 strokes per minute, you will want a smaller blade in the order of 140 square inches. If you paddle slowly or do a lot of braces and such 160 square inches or so will be better. Why?

People are biomechanically better suited for fast motion at lower power than they are for slow powerful movements. If your stroke is slow you need large area but if it is fast, you are better off with less area. Since the size of the blade is so intimately tied to how you paddle, your best course is to try a large number of blades until you find the one that is most comfortable

**5. INJURY PREVENTION AND KAYAKER'S SAFETY**

Hydration:
One of the easiest ways to prevent injury is to ensure proper hydration on the water. Dehydration results in uncoordination, weakness, headaches and dulled mental activity all causes of injury. Your body can absorb 250 millilitres every 15 minutes (1 liter per hour). Urine colour is a good measure of body hydration; it is best if it's relatively clear.

Stretches and warm ups
The best routine for sea kayaking is a combination of activities that gently warm up and stretch muscles. Key areas that relate to paddling needs include:

Side flexibility/strength to support leans, tilts and hip flicks
Mid body twist to support torso rotation
Neck and shoulder flexibility to reduce risk of injury

Paddler's Box:
The paddler's box is a range of body/arm paddle/paddle shaft motion that maintains the body in a strong integral position. In general, this is the area in the front of your chest, below your chin and extending to approximately the front of the coaming. Your arms remain bent and strong when in the paddler's box and therefore there is much less likelihood of injury.

Commonsense:
Kodak moment injuries are also described as Darwin's effort to remove stupid people from the gene pool before they have a chance to reproduce. Another variation is the Sunday night syndrome where paddlers take unwise paddling risks in an effort to finish a trip on Sunday evening in order to be at work Monday morning.

Hypothermia:
For paddlers in cold-weather, cold-water climates, hypothermia is a primary concern. Note that hypothermia is follows a distinct progression of stages. The following table describes the symptoms of these stages and provides suggestions for prevention and treatment:

| HYPOTHERMIA PROGRESSION | Symptoms | Prevention | Treatment |
|---|---|---|---|
| Cold Response | Feels cold, shivers, reduced blood flow to the extremities. | Selecting proper clothing and reducing exposure to the elements. | Remove from the environment, remove wet clothes, add insulating layers, provide warm drinks and high-calorie foods. |
| Mild Hypothermia | Intense shivering, altered mental status and decreased body temperature. | Identifying and treating the symptoms of cold response. | Same as cold response. |
| Severe Hypothermia | Patient becomes unresponsive. | Identifying and treating the symptoms of mild hypothermia. | Requires immediate evacuation and medical treatment. Wrap the patient in warm insulating layers and evacuate. |

Average temperature of Lake Superior is 5–10 degrees Celsius
Water transports heat away from your body 25 times faster than air

Signs of Hypothermia:

Mild: can answer questions intelligently, complains of being cold, probably shivering, may slur words, loss of interest in activity ~ body working to heat body ~ remove from exposure, warm fluids, direct heat

Moderate: confused and illogical, sleepy/doesn't want to move, clumsy/stumbling, leaves clothes open, stops shivering, signs of muscle stiffness ~ body conserving heat to internal organs ~ warm with body temperature at the heat loss areas of the body

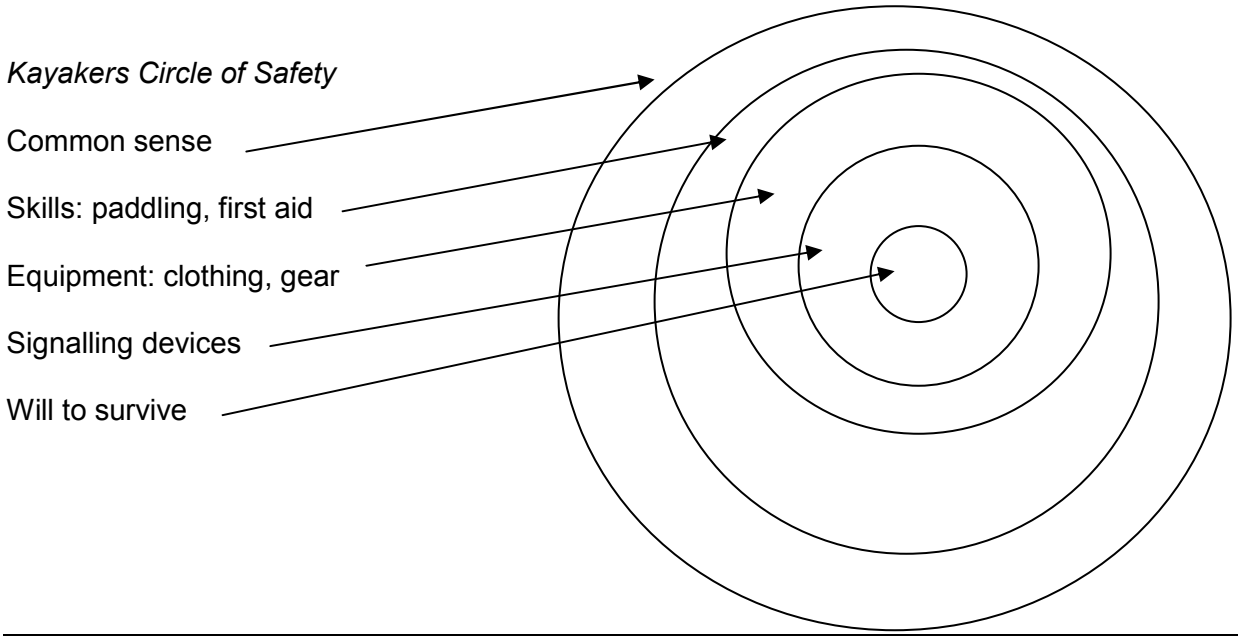
Severe: barely conscious or unconscious, slow shallow breathing, weak, slow irregular or absent pulse, pale, very cold, perhaps bluish skin. Warm heat loss parts of body (pits, groin), no fluids, evacuate to help.

Cold Water Considerations: Recent research suggests three stages of really cold water immersion:

- ☐ For one minute following immersion is a time of shock to the body and you need to keep in mind that this period will end.
- ☐ The next ten minutes are when you will have enough strength and body warmth to rescue yourself after which time cold may significantly hinder your ability to effectively do much.
- ☐ You will continue for the next hour before severe hyperthermia but it will be very challenging to undertake a self rescue.

Clothing:
Be sure to have appropriate clothing for the conditions to be paddled including hat, sunscreen, glasses, paddling gloves, etc Proper clothing combined with high energy food are significant in preventing the onset of hypothermia.

Fuel:
Regular snacks and solid meals on paddling excursions will go a long way to ensuring that you have enough fuel to meet physical demands.



**6. PROPER CARE OF PADDLE, PFD & KAYAK**

Paddle: No one wants to be up the coast with a broken paddle. You can extend your paddle life by:
Entering/exiting your boat with minimal weight on the shaft
Keeping the ferrule area clean and free of sand
Minimize amount of edge contact with hard and abrasive surfaces

PFD:
Annually protect with 303 or similar UV and mould protection.
Store in dry and clean area
Replace when damaged or text on label is no longer legible

Kayak:
Protect exterior from wear by lifting instead of dragging and launching afloat
Do not strap down overly hard on trailers etc damaging the exterior structure
Annually maintenance check and protect with UV inhibitors
Store in natural shape or with straps around bulkheads

## 7. KAYAKING RESOURCES

These Resources are available at the Naturally Superior Adventures Paddling Shore:

*a. Books*

- Sea Kayaker Magazine's Handbook of Safety and Rescue (Ragged Mountain Press, 2003) by Doug Alderson and Michael Pardy.
- Sea Kayaker's Savvy Paddler. (Ragged Mountain Press, 2001) by Doug Alderson.
- Sea Kayaker's Deep Trouble: True Stories and Their Lessons from Sea Kayaker Magazine (Ragged Mountain Press, 1997) edited by Christopher Cunningham.
- Sea Kayaking Illustrated (Ragged Mountain Press, 2003) by John Robison.
- The Complete Book of Sea Kayaking (Globe Pequot, 1995) by Derek Hutchison.

*b. Videos:*
Gordon Brown -
Kevin Whitley
Performance Sea Kayaking

*c. Magazines*
Adventure Kayak Magazine (www.rapidmedia.com)
Sea Kayaker Magazine (www.seakayakermag.com)
Wavelength Magazine (www.wavelengthmagazine.com)

*d. Websites*
Paddle Canada www.paddlingcanada.com
Paddlinginstructor.com
Great Lakes Sea Kayak Association http://glska.cjb.net
Paddling Ontario www.paddlingontario.com
Paddling.net (www.paddling.net)
Environment Canada Weather Office (www.weatheroffice.ec.gc.ca)
Leave No Trace (www.lnt.org)

## RESCUE SKILLS

**1. Wet Exit**
Capsize, tuck forward, reach around boat, bang side of boat three times, move hands back and forth along the hull, pull spray skirt cord, easily summersault forward out of the boat and surface comfortably. Being sure to hold your paddle and the boat, flip the boat right side up to help facilitate rescue. Move to the front of the boat if participating in a deep water t rescue.

**2. Retrieving a Swamped Kayak:**
Swim out 25 metres to a swamped kayak and swim it back to shore. Drain water from a boat in pairs first by turning boat to dump water out sideways, then by using knees to lift and teeter-totter the boat to remove water.

**3. Assisted Rescues**
In assisted rescues, simple and reliable strategies result in efficiency; effective communication is paramount. Rescues demand creativity: a thorough knowledge of fundamental techniques will allow you to adapt to changing and challenging conditions.

Wet or dry? Very cold water suggests getting the swimmer back into the boat as rapidly as possible with a wet rescue – the cockpit can then be pumped dry – but the kayaker's lower body then remains immersed in the icy water; in many situations, draining the kayak before re-entry with a dry rescue is just as efficient. If you decide on a wet rescue, form a raft upon re-entry and co-operatively remove the water with several pumps.

*a. Eskimo Rescue*
Used more in white water situations, it is an excellent method to develop comfort in your boat upside down in water which is a preamble to rolling. It is also a great trust exercise. Flip over and without exiting the cockpit, be rescued by another paddler; bow, stern, side or paddle presentation may be used. Completing a successful Eskimo rescue is not required to pass Flatwater, but it is nevertheless important. Failure to complete a successful Eskimo rescue requires that the candidate demonstrate a higher than average competence in other rescue skills in the course.

*b. T-Rescue*
Reliable in the largest non-breaking seas, drains the water from the capsized kayak, facilitates re-entry, and ensures post-rescue stability. But in order to be effective, communication is essential. After a wet exit in deep water the victim, with the aid of a rescuer, will empty the cockpit of water by means of a bow tip-out. After draining, the swimmer's boat and the rescuer's boat are brought aligned – ideally – in a bow to stern orientation. The rescuer leans over the support the swimmer's boat, while the swimmer uses a strong scissor kick to propel his or her body on to the back deck. The swimmer then slides into the cockpit, all the while stabilized by the rescuer. Attach the spray skirt and continue paddling.

A stirrup can facilitate re-entry in the case of a weak, fatigued, large-bodied, or less agile swimmer. The stirrup sling consists of 4 metres of webbing or rope secured in a loop with a water knot. The rescuer loops the stirrup around his or her paddle, which then is braced beneath the rafted kayaks. The stirrup is then draped over the empty kayak, and forms an effective step for the swimmer to use in a side-by-side re-entry. Alternatively the stirrup is braced around the coaming of the rescuee's boat.

**4. Rafting-up**
Rafting: Raft up in a group to form a stable platform.

## TECHNICAL PADDLING SKILLS

**1. Lift and Carry**
Wearing PFD while carrying will help prevent injury in the case of a fall. Lift boat by using toggle and with a hand holding the hull of the boat. Toggle lines/straps have been known to wear and break potentially damaging the boat and the paddler's feet.

**2. Entering and Exiting a Kayak:**
Depending on the paddler's flexibility and balance, there are several ways to enter the kayak. Launching in gently sloping, shallow water is easiest. The kayak should be at least partly floating when launching.

The paddle-brace outrigger approach is easiest and requires the least dexterity. The paddle is braced behind the coaming of the kayak and acts like an outrigger. Favouring the side of the outrigger paddle, the paddler then enters the boat one leg at a time, sits on the back deck and slides into the cockpit. Use your hand like a claw to hold the paddle to the rear of the coaming. Be sure that more weight is on the outrigger side during entry.

The cowgirl/cowboy method is quicker but requires good balance and flexibility. The paddler straddles the boat and sits in the seat, then places one foot at time into the cockpit.

**3. Paddle Strokes:**
When paddling consider:
- What the blade is doing
- What the boat is doing
- What your body is doing

The bio-mechanics of paddling a sea kayak can be divided into five components:

| Component | Description |
|---|---|
| Posture | Ensures that the larger muscle groups (stomach, back and shoulders) are being used efficiently. Proper posture increases paddler stamina and minimizes the likelihood of injury. |
| Paddle | The paddle acts a link between the paddler and the water, and acts to propel or manoeuvre the kayak. |
| Torso | Using the larger muscles of the stomach and back maximizes power and stamina and minimizes the likelihood of injury. |
| Arms | The arms actively move the paddle through the water, and control the finer details such as blade entry, exit and angle. |
| Lower body | Securely braced on the foot pegs, thigh braces and seat, the lower body connects the paddler to the kayak and allows for better boat control. |

*Stroke Review*

| Stroke | Uses | Key Points |
|---|---|---|
| Forward Paddle | Moves you forward | -torso rotation – power from belly/thighs<br>- paddle forward (coaming) with straighter arms<br>- transfer power by pushing on foot pegs<br>- upper hand level – sweep the shelf<br>- paddle in at toes and out at butt<br>-elbows up – chicken wings<br>-smooth splash free catch, then add power<br>-paddle blade angle can follow wake of kayak<br>High angle: forehead ~ low angle: shoulder |
| Forward Pivot | Turns boat away from paddle side while the boat is more stationary | -rotate body with stroke, look at the blade<br>-straight arms<br>-low angle<br>-in at bow, out at stern<br>-tilt same side as sweep |
| Reverse Pivot | Turns boat away from paddle side while boat is more stationary | -straight arms, wind up<br>-look at blade<br>-rotate<br>-start with low brace<br>-tilt same or opposite side of blade |
| Draw/Sculling | Moves boat sideways | -rotate and look where you are going<br>-keep paddle vertical / water moves under boat<br>-keep kayak level or test tilts either way<br>- draw paddle say 6in from boat, rotate wrist, slide away with wrist open forward, repeat<br>-figure 8 movement in water(sculling): torso rotation<br>Adjustments to draw point according to conditions |
| Forward Sweep | Turns boat away from paddle side while the boat is underway and maintains forward momentum | - look where you want to go<br>- use knees to turn boat<br>- sweep mostly in forward ¼ - 1/3 |
| Stern Rudder | Turns boat while in motion: used when surfing; initiates low brace turn; keeps the boat on course | -maintain paddlers box<br>-blade is parallel to the boat or twist to turn<br>-rotate body and keep arms straight (slight bend) |
| Reverse Stroke | Moves the boat backwards | -look behind one shoulder<br>-start with the low brace at stern<br>- most efficient with paddle from stern to hips/butt<br>-can use blade as bow rudder<br>-can use edge to help steer |
| Stopping | Stops or slows you down | -tap, tap, stop, stop<br>-tap the water once on each side with the non-power face and the do a hard reverse stroke on either side |
| Low Brace | Recovery in most situations | -hands down, elbows up<br>- 90 degree contact water, then power down<br>-knee initiated hip flick/head bob – get boat level<br>-motorcycle wrists |
| High Brace | Recovery when low brace fails and in big waves | -hands up, elbows down<br>-maintain paddle parallel to water for optimal support<br>-power face down, contact water, then power down<br>- Maintain paddlers box<br>-knee initiated hip flick/head bob – get boat level |
| Edge, tilt, | Assist turning, manoeuvrability and rough water, side surf paddling | -body centre of gravity remain over boat<br>-lift one knee up, relax the other<br>- establish degrees ie 1, 2, 3 of tilt in teaching |
| Sculling | For support and stability in wavy situations | -paddle moving in figure eight motion at surface<br>-reach far out away from your boat |