



# **Deep Cove Rowing Club Safety Handbook For Rowers**

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## Introduction

This handbook describes the safety policies and procedures to be followed by participants in rowing programs conducted by the Deep Cove Rowing Club. These policies and procedures are based upon the best practices and guidelines established by Rowing Canada Aviron (RCA) and other rowing clubs. The policies and procedures have been modified to take into account the unique aspects of the Deep Cove environment.

Rowers and coaches are the principal audience for this handbook. This handbook focuses on information you need to know in order to be safe. The information in this handbook may save your life or the life of somebody you are coaching.

Parents of young rowers should read this handbook. Rowing has a long track record of safety, but it is a water sport and there are inherent dangers. This handbook will help you to properly assess those dangers. It will help you to prepare your child so they can row safely.

If any errors are noticed, please notify the safety committee via email at [safety@deepcoverowingclub.com](mailto:safety@deepcoverowingclub.com).

## Acknowledgments

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## Environment

### Flow Patterns

Many rowing clubs establish traffic flow patterns on the body of water where they row. A flow pattern reduces the risk and severity of collisions between rowing shells by ensuring that all shells in close proximity to each other are traveling in the same direction.

For a number of reasons, the Deep Cove Rowing Club has chosen not to enforce a flow pattern.

The body of water available to the Deep Cove Rowing Club is extensive. The style of rowing is oriented towards rowing long distances of 10 km or more over a non-repetitive course rather than repetitive patterns in a confined space. Given the extent of Indian Arm and the possible number of courses, the risk of collision between rowing shells is very low.

Indian Arm weather and water conditions can vary significantly depending on location. Safety is enhanced if a course is chosen to take into account prevailing weather and water conditions at the time of a rowing session.

The Deep Cove Rowing Club does not allow unaccompanied rowing. Because a coach accompanies all rowing shells and the rowing shells in the session are all traveling in the same direction, the risk of collision between rowing shells is low.

Rowing shells must share Indian Arm with large numbers of kayaks, paddleboards, personal watercraft, ski boats, sailboats, yachts and various other types of recreational watercraft. Coaches frequently have to choose a course that avoids as much as possible encounters with third party watercraft. Since these watercraft cannot practically be made to follow a flow pattern, it is necessary for rowers to adapt dynamically to maximize safety.

Nevertheless, there may occasionally be situations where a coach decides to establish a flow pattern for a particular rowing session. One such flow pattern is a counter-clockwise flow from Panorama Beach out to the south 5 knot buoy, onwards to the north 5 knot buoy and then in to Panorama Beach. Rowers are required to follow any flow pattern established by the coach for a rowing session.

### Wind

In the Vancouver area, bad weather is often associated with winds out of the southeast. Good weather is associated with winds out of the northwest. Winds will blow into the cove from the direction of Belcarra and Port Moody during bad weather. Winds will blow out of the cove from behind the boathouse during good weather. Like all generalities, there can be notable exceptions.

Indian Arm is partly sheltered from the wind by the surrounding mountains. If the weather forecast is calling for up to 20 kph (10 knot) winds, there will normally only be a light breeze

in Indian Arm that is suitable for rowing. Between 20 and 35 kph (10 – 20 knots), rowing may occur if care is taken (e.g. rowing on windward shores to avoid the waves kicked up by the wind). Beyond 35 kph (20 knots) there will probably be white caps and rowing will likely be cancelled.

Indian Arm is susceptible to outflow (Squamish) winds. These are winds that race down from the mountains and out of the coastal inlets at high speed. They will occur when there is a high pressure area over the interior of the province and a low pressure area offshore. Outflow winds can arise very quickly and are dangerous. The marine weather forecast should mention whether outflow winds are expected.

### Water Temperatures

Between November and April, Indian Arm water temperatures are between 40°F and 50°F (see Appendix A for details). In May, June, September and October, water temperatures are between 50°F and 60°F. In July and August, water temperatures are between 60°F and 70°F.

Hypothermia is a risk at any of these temperatures. The following table<sup>12</sup> shows how the risk increases with reduced water temperature and increased time in the water.

Water temperature (°F)	Loss of Dexterity	Exhaustion or Unconsciousness	Expected Survival Time
32.5 – 40	< 3 minutes	15 – 30 minutes	30 – 90 minutes
40 – 50	< 5 minutes	30 – 60 minutes	1 – 3 hours
50 – 60	10 – 15 minutes	1 – 2 hours	1 – 6 hours
60 – 70	30 – 40 minutes	2 – 7 hours	2 – 40 hours

The situation is not as optimistic as indicated by the above table. Rowers tend to be thinner than average and will cool off faster. People who are swimming or treading water will cool off faster compared to somebody who is not moving. A rower, who capsizes in March and has to tread water without a PFD or lifejacket, will lose dexterity in less than 5 minutes, become exhausted or unconscious in 15 – 40 minutes and drown shortly thereafter.

### Daylight

Appendix B provides the approximate local time (i.e. PST and PDT) of the start of morning civil twilight, sunrise, sunset and end of civil twilight in Vancouver for different dates during the year.

From fall through to spring, late sunrises and early sunsets will curtail early morning and evening rowing. The risk is more serious for evening rowing, because, if there is an emergency, responders face increasing darkness whereas the light is improving in the morning.

<sup>1</sup> Retrieved from

<http://www.theensign.org/uspscompass/compassarchive/compassv1n1/hypothermia.htm>

<sup>2</sup> See also [http://www.shipwrite.bc.ca/Chilling\\_truth.htm](http://www.shipwrite.bc.ca/Chilling_truth.htm)

The mountains surrounding Indian Arm block light from the sun near sunrise and sunset. Consequently civil twilight will start later in the morning and end earlier in the evening than indicated in the preceding tables. Sunrise and sunset similarly occur later and earlier respectively.

### **Night Rowing**

The recreational rowing program experiences darkness during evening rowing in the fall. The masters rowing program experiences darkness during the morning in the spring and fall.

Rowing at night can be magical, but extra caution is required. Docks, buoys, crab traps, floats, debris in the water and moored boats are very hard to see. Some landmarks (e.g. Grey Rocks) are hard to distinguish from similar looking backgrounds (e.g. Cove Cliff). Recreational and commercial boaters will not be expecting rowing shells to be out on the water in the dark.

The risk of collision can be reduced by:

- choose a course that does not hug the shoreline in order to avoid docks and most of the crab trap/mooring floats
- learn where the buoys are located
- learn where boats typically moor
- learn the typical paths followed by commuter boats
- use navigation lights on the rowing shell
- wear a flashing light

The coach can usually see obstacles better than rowers and can call out a warning. For this to work, rowers must be grouped close enough together that the coach can see what is ahead of all the shells and, most important, the rowers can hear the coach. Don't spread out too far apart in the dark.

### **Floating Debris**

Floating logs, branches and other debris are common in Indian Arm especially after a winter storm, heavy rain or a higher than usual tide. Debris can range in size from small branches to whole trees. Portions of docks that have broken away have been seen in the past.

Debris is common between Admiralty Point and Burns Point when heading towards Port Moody.

Debris floats low in the water and is often dark in colour. Debris is very hard to see when taking a quick look over the shoulder.

### **Buoys and Floats**

Two white buoys with orange markings (the "5 knot cans") are located at the mouth of the cove: one on the north side and one on the south side. When leaving the cove or returning to the cove, watch carefully for these buoys.

There is another 5 knot can in Bedwell Bay two thirds of the way down towards the southern end.

Throughout the shallower portions of Indian Arm, rowers will encounter floats anchored to the bottom. They range in size from 6 inches to three feet. The small ones are used to mark the locations of crab traps. The large ones are used to moor boats.

Floats are hard to see when taking a quick look over the shoulder. Despite their often bright colours, a float will only be seen when it is relatively close to the rowing shell. It is common to have close misses or grazing hits with the smaller floats.

### Navigation Lights

Navigation beacons (white pillars that may be topped with red or green lights) are used to mark rocks or shallow water. These beacons and any associated exposed rocks represent a risk of collision for rowing shells.

Watch out especially for the following beacons:

- south end of Pretty House Island (Lone Rock Pt)
- entrance to Bedwell Bay
- immediately south of Hamber Island
- south of the public wharf in Belcarra Bay

It is especially important not to cut in between the beacon at the entrance to Bedwell Bay and the shore. There is a rock ridge extending from the beacon to shore that is hidden just below the water surface at certain tide levels.

### Frequent Rough Water

When rowers leave Deep Cove southwards towards Cates Park, there is an area just around the corner from the Cove where the shoreline is fairly steep. This is Cove Cliff.

The water immediately offshore from Cove Cliff is frequently rougher than other nearby waters. It may be due to the prevailing wind blowing in the opposite direction to the tidal current. The result is short steep waves that are worse than elsewhere.

If water conditions are generally marginal, it would be prudent to avoid this area by choosing a course further offshore.

### Docks

Rowing shells frequently row on the north side of Deep Cove from the marina into Panorama beach. The northern shoreline of Deep Cove, between the marina and Panorama Beach, appears to be fairly straight at first glance. It is curved however. A straight course from the marina to Panorama Beach does not follow the shoreline. Numerous rowers in the past have unconsciously followed the shoreline. As they near Panorama Beach, they look over their



shoulders only to discover that they are racing directly towards the docks on the north side of Panorama Beach.

When returning at the end of a row, one has to be cautious about the government dock. There is usually only about 50 – 100 feet between the government dock and boats moored on the south side of the cove.

There are numerous docks throughout Indian Arm. If you find yourself having to constantly look over your shoulder for docks, you are rowing too close to shore.

### **Rocks**

Rocks that are awash, shallowly submerged or otherwise hard to see are located at several locations throughout Indian Arm. The great majority of these rocks are located close to shore.

Admiralty point lies at the entrance to the channel leading to Port Moody. There are two rock shelves offshore of the point. The inner shelf is typically exposed at low tide. The is only exposed at the lowest of tides. Both shelves can be just underwater at intermediate tides. The outer shelf can be just underwater at low tide. The outer shelf is especially dangerous because the covering sea growth is dark green in colour making the shelf almost impossible to see, even when you are almost on top of it.

Stay at least 100 feet off Admiralty point at higher tides and 150 feet away at low tides.

There is an unnamed point on the west side of the arm, south of Deep Cove, at the boundary between the Dollarton residential area and Cates Park. At higher tides, the water offshore of this point appears to be clear. Hidden in the water are a number of isolated boulders. At middle tides, these rocks lie just under the water surface. The rocks are dark and impossible to see.

Stay at least 150 feet off the exposed shoreline at this point.

On the west side of Racoon Island (the Deep Cove side of the island), there are two sets of rocks. One of the rocks is due west of the north end of the island. These rocks are near the surface at moderate tides and exposed at lower tides. The rocks are about half the length of Racoon Island offshore. Few rowers expect to encounter rocks this far offshore of the island.

When heading towards Twin Islands from Deep Cove, coaches and rowers should avoid the area on the west side of Racoon Island by always passing the island on the south and east sides. If you are returning to Deep Cove from the north side of Racoon Island, always head directly for the west shore of Indian Arm well north of Pretty House Island until you are at least one length of Racoon Island offshore of Racoon before turning to head directly for Deep Cove.

## Beach Launching

The Deep Cove Rowing Club launches rowing shells from the beach in front of the boathouse or from Panorama Beach during regattas. Rowers have to wade into the water sufficiently far to place the rowing shell into the water without damaging the fin keel.

The water in early spring and late fall is cold. The rocks on the beach are sharp. The rocks at Panorama Beach are covered with razor sharp barnacles. Stinging jellyfish have been known to wash ashore. Proper footwear is necessary to protect your feet and ankles.

## Kayakers, Paddleboards and Canoes

The Deep Cove Rowing Club shares the boathouse with the Deep Cove Canoe & Kayak rental shop. When the weather is nice, there are swarms of people walking around on the beach and waterfront walkway. The beach in front of the boathouse can be jammed with kayaks, canoes and paddleboards (collectively referred to as kayaks hereafter). In the water, just off the beach, out to the end of the government dock, kayakers will be leaving and returning. Some of the people in the kayakers will be paddling around in random directions getting used to the feel and handling of their boats. Many of the people using these boats have little, if any, boating experience. It is extremely common for them to be oblivious to the presence of rowers.

Many kayakers do not notice a rowing shell until it is too late. Kayakers regularly make sudden turns to pass in front of a rowing shell while grossly underestimating the speed of the shell. The course followed by kayakers can often be best described as aimless meandering.

Rowers often do not notice kayakers. Unless there is a group of kayakers talking amongst themselves, there is little or no noise. If the rowers do not look over their shoulder often enough or do not look over both shoulders, they may not notice the kayak(s).

Kayakers can be encountered at any time and at any place during a rowing session. They are most commonly found on the west side of Indian Arm: between Deep Cove and Pretty House Island and between Deep Cove and Cates Park. They will also be found at Jug Island, Racoon Island and Twin Islands. They will occasionally be encountered out in the middle of Indian Arm.

It is important that a careful watch be kept. A kayaker can be seriously injured or killed if the tip of a rowing shell being driven at speed hits them. The rubber ball on the bow of the rowing shell will not protect the kayaker.

Try to stay away from kayakers, especially the ones that appear to be inexperienced. If this is not possible (e.g. near the beach), slow down while passing the kayakers.

Deep Cove is home to several dragon boats. They will be out practicing during evenings and weekends. Normally the dragon boats are steered by experienced helmspersons with good judgment, but there have been exceptions. Dragon boats and rowing shells travel at sufficiently high speeds that the separation between boats can quickly disappear.

Outrigger canoes occasionally visit Indian Arm from Port Moody. They will be encountered on the east side of Indian Arm between Admiralty Point and Jug Island.

### Recreational Power Boats

Indian Arm is popular with recreational boaters. Wakeboard and water ski boats are common. Small to large yachts and sailboats are common in the summer and will be encountered at all times of the year. Personal watercraft (jet-skis) will be encountered at times. There are even two or three cigarette boats that frequent Indian Arm in the summer.

Also included in this category are commuter boats. They are small bare aluminum power boats that are used to ferry residents between Deep Cove and homes up Indian Arm. Commuter boats commonly dock at the marina on the north side of the cove and at the government dock. Commuter boats are common at all times of the year and are especially frequent during early morning sessions.

Recreational boats can be a problem due to their wake. Most of the recreational boaters have no idea how unstable a rowing shell is. They frequently pass nearby. They seldom alter speed to minimize wake. The few that do slow down often make the problem worse because they slow their boat to a medium speed that generates more wake than at high speed. They are not doing any of this deliberately. They just don't understand the relative dynamics of their own boats versus rowing shells.

Large wakes are best handled with the rowing shell either parallel to the wake or at 90 degrees to the wake. Being parallel to the wake is best if the crew knows how to use their oars to stay upright. The whole shell will ride up the face of the wave and down the back side. When the rowing shell is 90 degrees to the wave, it will cut through the wave. Some water will enter the rowing shell as the wave travels the length of the shell but it should not amount to more than an inch or two for smaller to midsize wakes.

Encountering a large wake at anything other than parallel to the wake can be disastrous. The rowing shell is too long and heavy with rowers to lift up over the wave, so the wave curls in over the side of the shell as it travels the length of the hull. The result is a swamped rowing shell. The Emergency Procedures section discusses how to handle being swamped.

Encountering wakes at any angle other than parallel to the wake is hard on the rowing shell. The large waves do not properly support the long narrow rowing shell with its load of rowers. There is a risk of over-stressing the hull. It is conceivable that the rowing shell could snap in the middle.

Collision with recreational watercraft is a constant risk. Rowing shells are hard to see at the best of times, less so in marginal weather. Recreational watercraft operators have widely varying experience and judgment.

Close encounters are most frequent with wakeboard/ski boats and commuter boats. Both types of boat frequently travel at high speed.

There is a common assumption that power boats are required to yield right of way to human propelled craft, but this is not the case. The regulations only specify right of way for encounters between power vessels and between power vessels and sailing vessels. They do not specify any requirements regarding human propelled craft.

Recreational craft moor in varying numbers on the south side of Deep Cove. Their position shifts with wind and tide, because they are anchored or attached to a mooring buoy. When heading out and coming back in, it is necessary to keep a watch for these boats.

A few recreational craft also moor off Panorama Beach. When practicing race pieces into Panorama Beach, a course must be chosen that avoids these boats.

### **Commercial Boats**

Commercial boats include freighters, tugs (with and without barges) and fish boats. Freighters anchor south of Boulder Island. Freighters and tugs will be encountered under way anywhere between the Iron Workers Memorial Bridge and Port Moody. Tugs will also be encountered assisting freighters in the moorage south of Boulder Island. Very infrequently a tug will be encountered hauling a barge up or down Indian Arm. Fishing boats can occasionally be seen under way or anchored anywhere in Indian Arm. There is one crab boat that visits Deep Cove on a daily basis in the summer.

Most boaters believe that the normal maritime rules of the road apply to large commercial boats. In open waters that is true. In Vancouver harbour (including Indian Arm), it is not true. Transport Canada delegates authority for setting local rules to the port authorities of major harbours. The local rules for Vancouver harbour<sup>3</sup> state that “[small craft] including those under oars should keep well clear of all commercial vessels underway and not impede their passage. In addition, a vessel at anchor or berthed at a terminal may be expected to move without warning and a safe distance should be maintained.”

Regardless of the rules of the road, rowers must stay clear of commercial boat traffic. Commercial boats do not stop quickly and they cannot steer around a rowing shell in the tight (for them) confines of the harbour and channels. Being run over by a commercial vessel has a low probability for survival.

Tugs towing barges on the end of a tow line can be especially dangerous. The tug can stop relatively quickly, but the barge has no brakes and cannot stop at all. The barge will run over both the tug and the rowing shell.

Tugs may be encountered pushing a barge. Some barges have a notch in the rear where the tug can nestle for pushing. This combination can both steer and stop, but it would be foolish to assume that either will happen quickly.

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<sup>3</sup> Vancouver Fraser Port Authority, Harbour Operations Manual, section 6.4.1

Another dangerous combination is a barge being pushed by a tug attached to the barge near the rear of one side. The tug may have very poor visibility forwards towards the opposite side if the barge blocks its view. If you can't see the tug wheelhouse, they can't see you.

The center of thrust is offset from the center of drag, so the tug can only push the barge in a straight line by vectoring its thrust (either directly or via the rudder) off to one side<sup>4</sup>. This means that it probably has a restricted ability to turn in one direction to avoid a collision. If the tug tries to stop the barge quickly, the tug and barge may veer alarmingly to one side.

Given the inertia of these large vessels, it is a mistake to think that there is plenty of time to cross in front of them and get clear. If the rowing shell capsizes for some reason in the path of one of these vessels, everybody will only be able to watch helplessly as the commercial boat runs over the rowing shell despite every effort to stop.

Early morning and late evening rowers must watch carefully for tugs towing barges in the dark. The tug will be well lit. The barges are often very poorly lit and difficult to see. If a vessel is suspected of being a tug, look for white lights on a mast. One white light indicates that the tug is underway with no tow. Two white lights displayed vertically one above the other indicates the tug is towing one or more barges on a short towline. Three white lights displayed vertically one above the other indicates the tug is towing one or more barges on a towline such that the tail end of the last barge is more than 200 metres behind the stern of the tug<sup>5</sup>. Rowing shells must not cross behind a tug with two or three vertically oriented white lights.

Commercial boats are especially likely to be encountered in the channel beyond Admiralty Point leading to Port Moody. When rowing in this channel, stay on the north (Belcarra/Anmore) side of the channel. The channel makes three slight turns to the left (at Admiralty, Burns and Carraholly Points) when heading towards Port Moody. Rowers commonly do not notice these turns and continue straight out into the middle of the channel where they are then in the path of commercial boats. Watch for these turns and stay close to the shore.

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<sup>4</sup> <https://towmasters.wordpress.com/2011/06/02/tugboat-how-to-towing-alongside-101/>

<sup>5</sup> [http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,\\_c.\\_1416/FullText.html](http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1416/FullText.html), Rule 24(a)

## Safety Equipment

### Rowing Shells

According to the Collision Regulations<sup>7</sup>, each rowing shell must carry the following safety equipment:

- if the rowing shell is operated after sunset or before sunrise, navigation lights meeting the following requirements:
  - red (port) and green (starboard) sidelights that are visible from dead ahead to 22.5 degrees abaft the beam on the respective sides of the boat visible for one mile
  - white sternlight that is visible in an arc 67.5 degrees to either side of dead astern visible for two miles
  - alternatively, the sidelights and sternlight may be replaced by an electric torch or lighted lantern showing a white light

It is important to note that the above rule refers to sunset and sunrise, not the available light. In the period of civil twilight, there will still be plenty of light, but the rowing shell must have its navigation lights turned on.

In accordance with RCA safety guidelines, each rowing shell must have the following safety equipment:

- a white ball of not less than 4 cm. diameter made of rubber or material of similar consistency on its bow, unless the construction or nature of the rowing shell is such that the bow is properly protected or its shape does not represent a hazard
- heel restraints to prevent shoe heels from lifting more than three finger widths
- a 'quick release' mechanism to simultaneously disengage the Velcro strips holding feet into both shoes

The Deep Cove Rowing Club requires the following additional safety equipment to be carried in each rowing shell:

- if the rowing shell is operated after sunset or before sunrise, a waterproof flashing red or white light worn on the head or upper body of each rower (see Rowers – Preparation for Rowing)

In addition to the above safety equipment, a cox may optionally wear a PFD, but only if the combination of shell design and worn PFD allows unrestricted egress from the rowing shell in the event of a capsize.

Rowers do not wear PFDs while rowing, because the oar handles will get caught in them. At best, the rowing rhythm is disrupted. In the worst case, a caught oar handle can cause the shell to capsize. The coach carries PFDs for rowers in the coach boat.

The Deep Cove Rowing Club does not permit rowing without an accompanying coach boat (safety craft). If unaccompanied rowing were allowed, there are additional requirements for safety equipment (in addition to PFDs) to be carried on the rowing shell.

### **Coach Boat**

Because the nature of rowing precludes carrying necessary safety equipment in the rowing shell, there are special regulations for rowing shell safety equipment. According to the Small Vessel Regulations<sup>6</sup> and the Collision Regulations<sup>7</sup>, a coach boat accompanying rowers on the water is considered to be a safety craft and must carry the following safety equipment for the rowing shell:

- a PFD or lifejacket for each person (rowers and coxswain) on board the rowing shell with the most persons on board
  - the PFDs and lifejackets for the coach boat occupants are not included in this requirement

The Deep Cove Rowing Club requires the following additional safety equipment to be carried on each coach boat:

- a cell phone or a marine VHF radio
- first aid kit
- warming blankets

### **Boathouse**

The boathouse is equipped with additional safety equipment:

- first aid kit
- four warming blankets

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<sup>6</sup> <http://laws-lois.justice.gc.ca/eng/regulations/SOR-2010-91/FullText.html>, section 222

<sup>7</sup> [http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,\\_c.\\_1416/FullText.html](http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1416/FullText.html), rule 25

## Normal Procedures

### Qualifications

All rowers must be able to tread water for 10 minutes in the event their rowing shell capsizes. All rowers must be able to swim 50 metres in case they need to swim to the coach boat or a rescue boat.

Each rower must read this Rower Safety Handbook before they participate in a rowing program.

### Deciding Whether to Row

A coach, or approved substitute, and a coach (safety) boat must accompany all rowers on the water. If a coach does not show up for a rowing session, the rowing session must be cancelled. There will be no exceptions to this policy.

Because a coach and coach boat must accompany all rowers, rowers will not use a rower's out/in logbook.

Rowers are encouraged to check the weather forecast before attending a rowing session. Rowers should evaluate their rowing skills against the anticipated weather and water conditions. If the weather or water conditions are marginal, rowers may decline to row without affecting their standing in a rowing program.

Appropriate weather forecasts and the webcam can be accessed on the web page set up for each rowing program at <http://www.deepcoverowingclub.com/>.

The Deep Cove Canoe and Kayak club has a webcam that can be used to check current conditions in the cove.

### Preparation for Rowing

Rowers should bring the equipment in the following checklist that is appropriate for the anticipated rowing conditions:

Equipment To Bring	When To Bring
Care or Services Card number	Always
Emergency contact telephone number	Always
Layered, close fitting clothing: - stays warm when wet - has full length pocket closures on front of torso	Always
Pogies (mitts with extra hole for oar handle)	Late fall, early spring when air temperature below 5° C
Footwear for beach that fully encloses foot	Always
Head covering	Cold and/or sunny



Drinking water	Always
Sunscreen	Sunny or light overcast
Waterproof flashing light	Before sunrise, after sunset

Rowers must always bring their Care or Services Card number with them. In the unlikely event that medical attention is needed, emergency or otherwise, the hospital or medical clinic will need this number.

Rowers should carry an emergency contact telephone number. If a rower is injured and can't communicate, police, fire or ambulance personnel will use the telephone number to notify the rower's family or somebody else who can speak on their behalf. An emergency contact telephone number can be carried on a wallet card. It can also be entered into a mobile phone by creating a contact named ICE or that has ICE in the name<sup>8</sup>.

Proper clothing is important to avoid both hypothermia and heat prostration (hyperthermia). Spray from splashing oars or rain can soak clothing causing heat loss. When a rower first goes out on the water, they are generating very little heat and can quickly get cold. Once rowing commences, the situation can reverse as the rower generates substantial heat. Rowing on a hot day can generate heat faster than can be effectively removed leading to hyperthermia.

The solution is to wear multiple thin layers that can be added or removed to control warmth. Choose fabrics that will stay warm when wet. If rain or substantial spray is anticipated, a very light breathable waterproof jacket may be appropriate.

Between November 1 and April 30, rowers are not permitted to wear shorts, T-shirts or other clothing that is not suitable for cold weather and water conditions. Between December 1 and March 31, rowers are strongly encouraged to wear some type of head covering.

Clothing must be snug fitting and pockets on the front of the torso must have zippers or some other form of full length closure. At the finish of the rowing stroke, the oar handles are pulled in and lowered next to the torso. The oar handles will snag in any loose fabric or open pockets. During the rowing stroke, the body and seat move forwards and backwards on the slide rails. Loose fitting shorts or pants will jam in the rails. A long shirt or jacket will also jam in the rails. In a quad, snags and jams are embarrassing and disruptive. In a single, they can cause the shell to capsize.

Proper footwear is required to protect the rower's feet from rocks, barnacles and other beach hazards. Footwear should completely cover the foot. Neoprene kayaking booties or boots are good choices.

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<sup>8</sup> [http://en.wikipedia.org/wiki/In\\_case\\_of\\_emergency](http://en.wikipedia.org/wiki/In_case_of_emergency)

Flip flops are not a good choice, because they do not protect the foot and they don't stay on. The weight of the rowing shell being carried on the shoulders grinds the flip flop into the beach causing rower and flip flop to part company.

Rowers are strongly encouraged to bring water. Rowing generates lots of sweat and it is easy to get dehydrated. On a hot day this can quickly lead to hyperthermia.

On days with little or no cloud cover, sunscreen is strongly recommended. Rowers receive UV rays directly from the sun but also UV rays reflected off the water. It is not unusual for the underside of a chin or nose to get burned due to reflection off the water. A rower will burn much faster on the water than on land. For a given interval out on the water, burns will be more severe than on land.

If rowing will take place after dusk or before dawn, each rower must bring and operate a waterproof flashing light. The flashing light must be worn on the head or upper body. The rowing shells carry regulation navigation lights. Experience has shown however that flashing lights can be seen at a greater distance by other boats. Waterproof lights are required, because salt water will quickly disable a non-waterproof light. If a rower ends up in the water, and possibly separated from the rowing shell, a flashing light is their best hope for being found by the coach. Flashing lights that use LEDs or xenon bulbs are the best choice. Flashing lights can be acquired at Mountain Equipment Coop, bike stores and other outdoor equipment retailers.

Rowers must arrive at the boathouse no later than the scheduled time for a rowing session. Young rowers must arrive no earlier than 15 minutes before the scheduled time of a rowing session. Coaches and the Deep Cove Rowing Club shall not be responsible for supervision of young rowers who arrive outside of this interval.

Coaches assign rowers to rowing shells and arrange for rowing shells to be launched at the start of a rowing session. Reorganization due to a late arriving rower can significantly delay the start of rowing. Adapting to the disruption can compromise the safety of participants and third parties. Consequently, late arriving rowers will only be accepted at the discretion of the coach. Coaches and the Deep Cove Rowing Club shall not be responsible for supervision of young rowers that arrive late and are not accepted.

Because rowing involves strenuous exercise, it can trigger or exacerbate an existing medical condition (e.g. diabetic shock). The coach must be informed about any medical condition that might cause loss of consciousness, inability to row or inability to maintain balance of the rowing shell. The coach should be told what symptoms to look for. Having a medical condition will not prevent a rower from participating, but it is prudent to ensure that the coach is prepared.

Prior to commencing a rowing session, rowers must check the safety equipment in the rowing shell.

The shoes in the rowing shell have heel tiedown laces or straps to prevent the heels from rising too far and trapping the foot during a capsize. The heel tiedown laces must be adjusted so the heel cannot raise more than three finger widths above the footrest.

Feet are held in the shoes by the shoe tongue and Velcro closures. Many shoes have a quick release strap running between the Velcro closures on both shoes. By pulling on the quick release strap, the Velcro closures are disengaged simultaneously on both shoes. The quick release strap must not be tangled and it must be easily accessed.

The bow and stern of a rowing shell have large air cavities that keep the shell afloat if it capsizes. The cavity may have a vent plug or cap that can be removed to drain water from the cavity and allow air in. The plugs or caps must be reinstalled before rowing to preserve shell buoyancy.

A cox may choose to wear a PFD in the rowing shell. A PFD shall only be worn if the combination of shell design and worn PFD allows unrestricted egress from the rowing shell in the event of a capsize. Some rowing shell designs have the cox lying down inside the hull with decking covering their lower body. A PFD can get jammed in these shells preventing the cox from easily exiting.

### **Launching and Landing**

Before carrying a rowing shell down to the beach or back to the boathouse, each crew must assess whether they have the necessary strength and dexterity to carry the shell. If there is any doubt, ask the coach or other rowers for assistance. It is safer for you, the public and the shell to ensure that there are enough people to safely carry the shell.

When carrying a rowing shell, all crew members, and especially the bow and stern crew members, must keep a watch out for pedestrians. Yell out warnings to grab the attention of pedestrians and make them aware of the rowing shell's presence. A pedestrian can be seriously hurt if they are hit in the head or elsewhere by the tip or side of a rowing shell.

When the beach is congested with kayakers, it is imperative that a path down to and back from the water be carefully planned. The best strategy is to carry the rowing shell so it is parallel to the water's edge and go straight down between the kayakers to the water or back up from the water. All crew members must have a clear path and good footing between the kayakers. Each crew member must watch not only their own footing but ensure that other crew members will not be forced into a situation where they have nowhere to step causing them to trip or let go of the rowing shell. At times it will be necessary to carry a rowing shell over the heads of kayakers seated in their boats on the beach. Extra care is required in these situations to avoid dropping the rowing shell.

Once the rowing shell has been launched from the beach, or when a rowing shell is returning to the beach, a careful watch must be kept for kayakers padding in random directions. Most of them have little or no experience. Experience has demonstrated that they do not watch where they are going and have a very poor ability to judge relative boat speeds. It must be expected that a kayaker will dart across the path of the rowing shell without warning and

without enough speed to avoid a collision. Rowing shells must maneuver at a dead slow speed at all times between the beach and the outer edge of the government dock when kayakers are present.

Rowers will only place their feet in the rowing shell shoes after they have pushed off from the beach. The shoes must not be done up so tight that the feet will not slip out if the rowing shell capsizes. If kayak booties are worn on the beach, remove them before placing your feet in the shoes. The rubber and neoprene components of the booties can catch on the shoes and prevent your feet from slipping out.

### **On Water Conduct**

Rowing shells must not proceed beyond the marina docks in Deep Cove until accompanied by their assigned coach. While waiting for the coach, try not to impede the passage of boats trying to reach or leave the government dock.

Coxes shall maintain a continuous watch for hazards ahead of the rowing shell. If a rowing shell does not have a cox, the bow person shall frequently check over their shoulder for hazards ahead of the rowing shell. It is imperative that the bow person checks over both shoulders instead of just the right or just the left shoulder. It is not possible to see all hazards by just checking over the one shoulder.

Unless otherwise directed or allowed by the coach, rowing shells shall stay together in a group. The coach's voice only carries a limited distance over water. Once a shell gets beyond this distance, it will not be possible for the crew to hear warnings about imminent collisions or other problems.

For any rowing other than racing in a regatta, rowers must remain within visual sight of the coach at all times. Beyond 500 metres, it is difficult for the coach to see what is happening. Unless directed otherwise by the coach, rowers must remain within 500 metres of the coach. If a rowing shell goes beyond this range ahead of the coach, it must slow down or stop to remain within range. Between November 1 and April 30, rowers must remain within 500 metres of the coach without exception. Except in an emergency, rowing shells shall not leave the group and return to Deep Cove on their own.

During a regatta, race officials or safety boats will be stationed on the course in sufficient numbers to maintain visual contact with racers. Rowers are not required to verify visual contact with the officials or safety boats.

All rowing shells must return to the vicinity of the coach under the following circumstances:

- a rowing shell capsizes
- a rowing shell stops and is being attended by the coach boat for a longer interval than would be usual for coaching instruction

The reason for this policy is that a serious emergency may be occurring (e.g. a heart attack). If so, the coach will be focusing their attention on a victim and will not have time to keep track of, locate and retrieve rowing shells.

If a problem or an emergency occurs that necessitates a return to shore, all rowing shells and the coach shall return to shore together. No rowing shells shall return to shore unaccompanied by the coach unless explicitly directed by the coach. No rowing shells shall remain on the water unaccompanied by the coach unless explicitly directed by the coach.

## Emergency Procedures – General Principles

### Priorities

The first and paramount priority is the safety of rowers and coaches. Recovery of equipment is a distant second priority. Equipment can be replaced. Lives cannot be replaced.

No equipment shall be retrieved until the health and safety of all rowers has been assured. Rowers shall not retrieve equipment unless it is safe to do so.

### Attracting Attention

If rowers are in distress and need assistance, they shall repeatedly raise and lower outstretched arms. Contrary to previous guidelines, arms should not be waved overhead as this is not considered to be a distress signal.

At night, rowers shall hold a steady light in their hand while they are raising and lowering outstretched arms. A steady light should be used, because the raising and lowering motion may not be detectable as such with a blinking light.

### Rower Buddy System

During rapidly degrading water conditions or an emergency, rowers shall use a buddy system to ensure that:

- All rowers are tracked through to the end of the situation or emergency, so nobody gets left behind or goes missing
- Each rower has somebody else who can help them survive if they are injured or suffering from hypothermia

Rowing shells shall manoeuvre to form groups of two or three rowing shells. As long as the rowing shells in a group remain upright and able to row, they shall remain together until the situation or emergency has been resolved.

Groups are formed in case the rowing shells have to proceed to shore unaccompanied by the coach. The rowing shells in the group can keep track of each other and provide assistance to each other while the coach is unavailable.

If one or more of the rowing shells in a group has swamped, capsized or is otherwise unable to row, the other rowing shells in the group shall remain with the disabled rowing shell(s) until they are explicitly released to proceed by the coach. The coach will only release the remaining shells in a group if there are at least two rowing shells remaining in the group or the single remaining rowing shell can be attached to another group. Otherwise the single remaining rowing shell shall remain with the disabled rowing shell(s) until the disabled rowing shell(s) are able to row again or the coach has recovered the rowers.

Within a rowing shell, rowers shall form buddy pairs or threesomes so they can help each other if the pair or threesome ends up in the water.

Adjacent rowers in a double or quad shall form a buddy pair (e.g. 1 and 2 seat, 3 and 4 seat). A cox shall join the closest buddy pair to form a buddy threesome. The rower of a single shall join a single rower, buddy pair or threesome of a nearby rowing shell. If a single rower joins a threesome, the four rowers and/or coxes shall split up into two buddy pairs with each rower and cox confirming to the others that they understand the new pairing arrangement.

A larger group is split up into smaller buddy pairs and threesomes, because in a large group, it is easier for one person to slip away unnoticed. A rower's attention is naturally drawn to the group rather than a separated rower. When there are only two or three people in a buddy group, it is much easier to keep track of the one or two other people.

If a rower is separated from their normal buddy pair or threesome, they shall join the nearest pair or threesome. If the rower joins a threesome, the four rowers and/or coxes shall split up into two buddy pairs.

If a buddy pair or threesome ends up in the water, the pair or threesome shall:

- stay with each other
- keep track of each other
- talk to each other to maintain morale
- assist each other

Until a buddy pair or threesome is extracted from the water, they shall distribute themselves on opposite sides of the rowing shell. The buddy pair or threesome shall hold on to each other across the top of the rowing shell until the coach arrives. Holding on to each other is important to ensure that an exhausted rower or cox does not slip away without being noticed.

The coach will recover buddy pairs or threesomes as a unit. Nobody in a buddy pair or threesome shall be left alone in the water. There shall be no exceptions to this policy.

### **Stay With The Rowing Shell or Swim To Shore?**

If rowers end up in the water, they will be faced with the question of whether to stay with the rowing shell or swim to shore. Conventional wisdom is to stay with the shell. In a very few circumstances, swimming to shore may be a practical choice.

There are many problems with trying to swim to shore:

- Rowers do not wear a PFD or lifejacket. If a rower becomes exhausted or is immobilized by cold water, they drown.
- Distances on the water are deceiving. The shoreline is further away than you think.

- Swimming in rough water takes more energy than swimming in calm water and progress is slower. A swimmer will cover a much shorter distance before becoming exhausted.
- Indian Arm tides cause water to flow north or south at a half knot. If you try to swim against the tide towards shore, you effectively have further to go and you won't end up where you are aiming.
- Swimming increases heat loss by 35% to 50%. A rower can survive longer in the water if they stay with the rowing shell in a heat-conserving position.
- A swimmer is much harder to find when they are separated from the rowing shell. When only the head is visible, a swimmer is almost impossible to see at a distance more than two hundred feet in rough water. If the coach or emergency responders are looking for rowers, they will be much easier to find if they remain with the rowing shell.

Given these considerations, **rowers are strongly encouraged to stay with the rowing shell.**

A rower should only attempt to swim to shore if **all** of the following conditions exist:

- All rowers and/or coxes in a buddy pair or threesome decide to swim without coercion. If a single rower of the buddy pair or threesome declines to swim, all rowers in the pair or threesome shall stay with the rowing shell.
- The rowers and/or coxes in the buddy pair or threesome are all strong swimmers.
- The nearest shore is close (< 50 metres in winter, < 100 metres in summer).
- Rescue by the coach or emergency responders is not possible in the next 15 minutes in winter or 30 minutes in summer.
- The condition of the nearest shoreline allows the rowers to get out of the water. There is no point swimming towards a shoreline that is a vertical wall of rock.

Rowers of singles, and possibly doubles, should consider using their rowing shell as flotation while trying to swim to shore. The shell will move through the water even if it is full of water. It will take more energy to swim, but the consequences are not as severe if the rower becomes exhausted.

If rowers successfully swim to shore, they shall preferably stay on the shoreline until retrieved by the coach. If it is necessary to seek shelter or assistance (e.g. due to weather, hypothermia), the rowers shall contact the coach as soon as possible. The coach probably has no idea where the rowers are, so a water search for the missing rowers will be initiated.

#### **Actions by Rowing Shells Not Affected by Emergency**

All rowing shells not affected by an emergency shall gather near the emergency scene. The rowing shells shall remain out of the way of the coach and emergency responders unless directed otherwise by the coach.



If it is necessary for the coach to transport victims to shore, unaffected rowing shells shall accompany the coach to shore unless directed otherwise by the coach. One reason for such direction might be that victims in the water are holding on to the unaffected rowing shell or its rowers.

If an unaffected rowing shell accompanies the coach to shore, rowers shall exit from the shell upon reaching shore. The rowers shall not re-enter the shell unless the coach is present. Rowers shall not leave the shoreline location unless directed otherwise by the coach. If weather or other conditions are unfavourable, the coach may direct the rowers to seek shelter. Before doing so, the coach and rowers shall agree on a location to meet later. The default location shall be the boathouse.

### **On Site Authority**

The senior coach present will assume command in the event of an emergency. Rowers are required to follow the directions of the senior coach.

If a rowing shell gets into trouble, the coxswain or bow person shall assume control until such time as the senior coach arrives. The coxswain or bow person shall:

- try to keep everybody calm
- keep track of all crew members and their condition
- assign responsibilities
- consider all ideas and input offered by crew members

Crew members shall work as a group to resolve the emergency (e.g. offering ideas and suggestions). Crew members shall defer to the decisions of the coxswain or bow person in charge.

### **Emergency Calls**

If an emergency arises and it is not obvious that it can be resolved without help, call for help. If there is the slightest uncertainty, call for help. The emergency services would far rather have you waste their time than have somebody be injured or killed because they were called in too late.

For an emergency on land:

1. Call 911.
2. You will be asked for the municipality. If you are in Deep Cove, on the west side of Indian Arm or near Cates Park, respond with North Vancouver District. If you are on the east side of Indian Arm between Camp Howdy and Bedwell Bay or in Belcarra Bay east of Hamber and Boulder islands, respond with Anmore/Belcarra. If you are on the southern shore of Burrard Inlet near the refineries or Barnet Marine Park, respond with Burnaby. If you are east of the second set of overhead transmission lines in Port Moody inlet, respond with Port Moody.
3. You will be asked for the type of emergency service needed. Respond with fire, ambulance and/or police.

4. You will be asked for a location. If assistance is required at the boathouse, the address is:

2156 Banbury Road, at the boathouse in Deep Cove Park

If you have pulled off the water at one of the public access points, refer to the map on the emergency action plan sheet for an address. As a last resort, send somebody to find a street intersection or address.

5. Provide a concise description of the current situation and the nature of the assistance required. Imagine that you are the emergency responders responding and try to anticipate what they need to know to help you.

For an emergency on water requiring a water rescue:

1. Call the Coast Guard directly at \*16 on a mobile phone or on VHF channel 16.
2. If the Coast Guard cannot be reached, call 911 and ask for the Coast Guard. E-Comm will transfer the call to the Coast Guard (but not before they ask questions in case the connection is lost).
3. The Coast Guard will ask you for a location. Respond first with Indian Arm and then identify a nearby landmark (e.g. Jug Island). Give the distance and direction from the landmark (e.g. 1 km SW of Jug Island). Please note that the Coast Guard will not be aware of "Pretty House Island" or "Camp Howdy". On their charts, these locations are known as Lone Rock Pt and Farrer Cove respectively. All other landmarks use the same names that you are already familiar with. If your cell phone has GPS capability, give the Coast Guard a GPS location.
4. Provide a concise description of the current situation and the nature of the assistance required. Mention that rowing shells are involved and that they are very low on the water and consequently hard to see. Imagine that you are the Coast Guard responding and try to anticipate what they need to know to help you.

## Emergency Procedures – Specific Situations

### Rapidly Degrading Water Conditions

Despite checking the weather forecast, rowers will occasionally be surprised by winds that rapidly intensify. The surprise can be minimized if both coaches and rowers keep an eye out for the first signs of increasing wind. These include water that appears to be dull (non-reflective) and rough in the distance. If the winds build quickly enough, white caps might be seen in the distance getting closer.

Rowers who are some distance ahead of the group and the coach must be especially vigilant. By the time the coach recognizes the situation and gets everybody turned around, it may take several minutes to retrieve the separated rowers. This may be several minutes that you do not have.

In a worst case scenario (probably a Squamish wind), the wind may build so quickly that you are surrounded by white caps before you can reach shelter. To reduce the probability of swamping, use the following strategies:

- Rowing at 90 degrees to the wind and waves is the most dangerous. The waves will be getting larger. Eventually they will start coming in over the side causing the rowing shell to swamp or capsize.
- Row downwind in preference to upwind. This will reduce the relative speed of wind and waves. In Indian Arm, a shoreline is always present downwind even if it is further away. Your primary goal is to get off the water. Getting back to Deep Cove is a discardable secondary goal.
- If the rowing shell moves faster than the waves, you will have a smoother, more stable ride at a slight angle away from directly downwind. The most stable ride is achieved when the rowing shell speed matches the speed of the waves.
- Consider seeking shelter behind a nearby island. Even a small island will break the wind. Consider landing on the leeward (downwind) shore of the island.
- Angle away from shoreline that is high bank, rocky or has cliffs dropping directly into the water. Head toward low bank waterfront. Be extremely careful if the low bank waterfront is rocky and waves are crashing on to the shore.
- Despite previous guidelines to the contrary, heading for a dock is not a good idea. Most of the docks in Indian Arm are a foot or two high, so the riggers will not pass over the top of the dock. With oars in place and riggers in the way, it won't be possible to get the rowing shell close enough to the dock to get out. If an attempt is made to remove the oars in rough water, the rowing shell will probably capsize. Instead of heading for the dock, head for the shoreline behind the dock.
- If a dock is the only option, approach it from downwind or crosswind. Do not approach the dock from upwind, as wind and waves will push the rowing shell on to the dock and cause it to capsize. Since it probably will not be possible to land on the dock itself, consider getting within 5 to 10 feet of the dock and then bail out of the

rowing shell and swim to the dock. Make sure everybody has removed their feet from their shoes before anybody leaves the shell. Make sure everybody gets to the dock. This option should only be considered if everybody in the rowing shell is a strong swimmer.

In rapidly degrading water conditions, it is imperative that all rowing shells stay together in a group. Strangely enough, this policy is directed at the stronger, experienced rowers rather than the weaker, inexperienced rowers. It will be the stronger rowers that think they can make it to shore on their own, not the weaker rowers.

The problem with separating is that the coach cannot be in two places at once. The coach will have to choose and will probably opt to be with the weaker, inexperienced rowers. If the experienced rowers get swamped despite their confidence, they may find themselves alone. Due to the separation, the coach may not notice they are in difficulty or their location. In rough water, a swamped shell is very hard to see beyond a couple of hundred metres because riggers, oars and heads visually blend into the waves and spray. Even if the swamped rowing shell is noticed, the coach is now faced with a dilemma: how to shepherd the inexperienced rowers while at the same time trying to rescue the experienced rowers. The distance between the two groups may be practically insurmountable.

There is a benefit in having the experienced rowers stay nearby the inexperienced rowers. The experienced rowers can offer moral support by their presence. If a rowing shell capsizes, the experienced rowers may be able to help effect a rescue even if it is only to offer a rowing shell to cling to.

### Swamping

Once a rowing shell has been completely swamped, it is unlikely that its crew can empty the water out by themselves or move the rowing shell any significant distance before they become exhausted. Crew members can attempt to bail out the rowing shell, but if this effort fails, the remainder of this procedure must be followed.

First and foremost, the crew is strongly encouraged to stay in the rowing shell. By keeping at least some of the body out of the water, heat will be retained longer. The crew must get themselves into the most comfortable, survivable situation until help arrives.

If possible the rowing shell should be oriented bow to wind. This will minimize further water ingress and maximize stability. The bow person will partially shelter the other occupants of the rowing shell from the wind. Oars can be used to keep the rowing shell upright.

Crew members shall remove their feet from the rowing shell shoes or at least loosen the rowing shell shoes. This prevents feet from being trapped if the rowing shell turns over before the coach arrives. Upon arrival the coach will evacuate the shell, so the crew might as well get ready. The only reason for keeping feet in loosened shoes is if they provide some warmth.

Crew members shall put on all available clothing to minimize heat loss. If the rowing shell has been positioned bow to wind, the bow person will be experiencing the most heat loss, so make sure she or he has at least the same protection as everybody else.

Crew members shall hunch over to minimize exposed surface area while holding the oar handles to their chest to maintain stability.

If the air cavities at either end of the rowing shell have a leak, the rowing shell may start settling lower in the water. If so, the crew shall exit from the rowing shell and flip the rowing shell over to trap any remaining air inside the overturned hull. At this point, the emergency has now transformed into a capsized and should be handled as such.

The cox or bow person shall assign responsibility to one crew member to wave their arms to draw the attention of the coach. The accepted signal for distress is raising and lowering outstretched arms. At night, the assigned person should set their flashing light to a steady light if possible and wave their arms up and down. Waving a flashing light is less effective, because the waving motion is harder to see.

Upon arrival, the coach will approach the swamped shell from the downwind direction. The coach will determine whether the shell can be bailed out or the crew will be evacuated to the coach boat. If evacuation is necessary, crew members are evacuated into the coach boat one at a time.

### Capsizing

When a rowing shell capsizes, the first action of crew members must be to get their feet out of the rowing shoes. Most of the time this will occur automatically. If it does not, the crew member must not panic. When the rowing shell started to turn over, your automatic reaction will have been to draw in air, so you have enough time to get free. Bend at the waist so you can reach your shoes. Pull the Velcro strap or the lace joining the two Velcro straps to loosen the straps. Wiggle your feet to loosen the shoe and pull out.

If you have successfully extracted yourself from the rowing shell and are floating alongside, do a head count. Make sure that the other rowers have gotten free. If not, identify who is missing. Firmly hold on to a rigger and check the missing rower's seat. If they are stuck in their shoes, help free them from their shoes. Be careful that the trapped rower does not drag you under in a panic.

As a last resort, if somebody cannot be freed from their shoes, try flipping the rowing shell upright. Put your feet on the near side rigger and reach across to the far side rigger. Partially stand up and use your weight to flip the shell. If you can even get the rowing shell on its side, this may be enough to get air to the trapped rower.

There are three options for recovering from a capsized:

- Perform a self-rescue without the coach's presence or assistance
- Perform a self-rescue with the coach's presence or assistance

- Evacuate to the coach boat

The self-rescue options are only viable if there is a reasonable likelihood that water conditions (waves, wind) will allow the shell to be righted and any water bailed out. If the rowing shell can not be bailed out, rowers shall evacuate to the coach boat.

If a self-rescue without the coach's presence is not possible, the rowing shell shall be turned upside down to trap as much air as possible inside the hull. Once the coach arrives, either a self-rescue with the coach's assistance or an evacuation to the coach boat can be performed.

If the water is cold, it is imperative that rowers and coaches perform whichever recovery method will get them out of the water the quickest. Cold water will incapacitate a rower quickly. Once they are incapacitated, they will not be able to get themselves out of the water and they will not be able to put on a PFD or lifejacket.

#### **Self-Rescue Without Coach's Assistance**

The self-rescue option with no assistance will be most feasible for doubles and quads in calm water.

Oars are left in the oarlocks. The shell is righted. If the wind is strong, roll the shell over in the downwind direction.

Crew members shall split up evenly on both side of the shell. Crew members shall grab the riggers and use their weight to stabilize the rowing shell.

One at a time, crew members shall pull themselves back into the rowing shell using the following procedure:

1. Place one hand on the middle of the rigger and one hand on the seat platform and pull yourself up so you are lying on your stomach on the seat platform. The pelvic area must be at least part way on to the rowing shell. Make sure that your ribs do not land on the edge of the boat as they are easily fractured.
2. Rotate on your stomach so the body is lying on the seat platform with head closest to the stern of the boat and one leg hanging over each side of the shell.
3. Lever upright in the rowing shell while swinging the legs downward into the water.
4. Bring the legs into the shell.
5. Grab the oar handles and position the oars outwards with blades flat on the water to maximize rowing shell stability.

If the rowing shell is full of water, it may be necessary for the remaining crew members to wait until the first crew member back in the rowing shell has bailed out most of the water. Otherwise, bailing can wait until all the crew members are back in the rowing shell.

Do not wait too long to get the crew back into the shell. If crew members get cold, they will start to lose the ability to get in to the shell unaided.

A single rower can also perform a self-rescue, but it is only likely to be successful in calm water. The following variant of the above procedure can be used:

1. The oars in the oarlocks are oriented at 90 degrees to the shell with the blades flat on the water just as if the rower was in the shell trying to provide stability.
2. The hand closest to the oars is used to grab both oar handles and push them down on to the middle of the rigger or the foot stretcher. The oars blades will be up in the air and the oars will no longer be at 90 degrees to the shell.
3. The other hand is placed on the seat platform.
4. By pushing downward on the oar handles and on the seat platform, lift yourself on to the shell, so your stomach and pelvic area are centred over the seat platform. Again, make sure that the ribs do not land on the edge to avoid a fractured rib. Because the oar handles have been pressed downwards onto the rigger or foot stretcher, the shell will lean until the blades contact the water. The oar blades will still prevent the shell from flipping.
5. While continuing to hold the oar handles, pull the leg that is furthest from the stern over the shell, so one leg is hanging over each side of the shell. You want to end up lying on the shell facing the stern.
6. Continuing to hold both oar handles together, rotate upright with legs hanging over the sides.
7. Continuing to hold both oar handles together, bring the legs into the shell.

#### **Self-Rescue With Coach's Assistance**

Self-rescue with assistance is probably the most effective self-rescue option for singles and makes self-rescue easier for doubles.

If the coach will take a while to reach the rowing shell, the crew members shall roll the shell over so it is hull up. This ensures that the maximum amount of air is trapped in the hull despite any open vent plugs or caps. Only once the coach has arrived will the shell be turned upright again to attempt the self-rescue. If the wind is strong, it will be easier to roll the shell over in the downwind direction.

Crew members shall form pairs and threesomes distributed on either side of the shell and shall hold on to each other.

The coach shall approach the rowing shell from the downwind direction to prevent the coach boat from being blown or pushed on to the capsized shell and rowers.

The assisted self-rescue proceeds the same as the unassisted self-rescue except that the coach grabs a rigger to help stabilize the rowing shell until all crew members are back in the shell.

#### **Coach Boat Evacuation**

Coach boat evacuation will be required if:

- water conditions are too rough

- the rowers are not agile or athletic enough to perform a self-rescue
- sufficient water cannot be bailed from the rowing shell to return it to a rowable condition

As with the assisted self-rescue, the rowing shell shall be turned hull upwards until the coach boat arrives. Crew members shall form pairs and threesomes distributed on either side of the shell and shall hold on to each other.

The coach will approach the capsized shell from the downwind direction. All of the crew members are evacuated into the coach boat one at a time.

## Collision

### Avoiding Collisions with Human Propelled Watercraft and Swimmers

Rowers must maintain a close watch for other rowing shells, kayaks, canoes, paddleboards and even the occasional swimmer. Whenever a rowing shell is in the vicinity of other shells, smaller boats and swimmers, it will slow down so that a collision will not cause any serious damage. Speed shall remain reduced until the risk of collision has passed.

The bow of a rowing shell is like a spear. It can impale another rowing shell, a small boat or swimmer causing death or serious injury. The Canadian Olympic rower Silken Laumann had her lower leg ripped apart when a German coxless pair struck her during training. Silken was lucky and recovered. The person you hit may not be so lucky.

### Avoiding Collisions with Recreational and Commercial Watercraft

Larger power boats, yachts and commercial craft may have a difficult time seeing a rowing shell. The human eye is much more sensitive to moving objects than still objects. Still objects blend into the background. The rowing shell will be more visible if it is moving.

A boat approaching a moving rowing shell from the side will see the shell moving against the background. The dangerous approaches are power boats approaching head on or from the stern. The rowing shell has a small visual cross section and appears to be stationary because it is moving directly towards or away from the power boat. The most visible part of the rowing shell is the blades. The blades will flash as they alternate between squaring up and feathering. Despite their smaller surface area, the blades will be noticed at greater distances than the rest of the rowing shell.

If a power boat is closing and you don't think they have seen you, start waving your arms. Hopefully the motion will catch the power boat operator's attention. It is probably a waste of time yelling as the power boat operator is unlikely to hear voices over the noise of their motor.

A group of rowing shells will be more visible if they stay together in a group. The visual cross-section is larger. Observed motion within the group will draw the attention of the power boat to the group. Conversely, a rowing shell that is separated from the group will be



harder to see. The group will attract the power boat operator's attention which may result in the separate rowing shell not being seen.

You are on a collision course with another boat if it's bearing (direction relative to the rowing shell) does not change. You can affect the outcome by speeding up, slowing down, stopping or changing direction and watch how this affects the bearing. If the bearing starts to change, the risk of collision is decreasing. Continue the action until the risk is eliminated.

If a collision is unavoidable, try speeding up or stopping to avoid a direct hit. A glancing collision is preferable to a direct collision.

### **Reacting to a Power Boat Collision**

If your shell is hit by a power boat, you are likely to end up in the water. Get yourself free from the shell if your feet did not come out of the shoes. Find everybody else who was in the shell and make sure they got free from the shell.

If a rower is injured by the collision, or even if they are not directly injured, they may go into shock. They may lose consciousness and drown. It is imperative that all rowers form buddy pairs and look out for each other.

Use any available flotation. Hold on to the rowing shell if it is still floating. If at all possible, swim to a nearby rowing shell that was not hit and hold on to the shell.

Rowers in the uninvolved shells shall hold on to the rowers in the water if possible. The rowers in the water may have injuries that they are not aware of or their injuries may be more serious than they realize. Holding on to the rower will prevent them from drowning if they were to become unconscious.

### **Reacting to a Collision with a Kayak, Canoe, Paddleboard or Swimmer**

If your shell hits a human propelled watercraft or swimmer, the third party may be severely injured. Attract the attention of the coach as quickly as possible. If the coach is not immediately available, try to determine if the third party has been injured.

If you suspect that the third party is injured and they are in the water or may go into the water shortly, try to manoeuvre your shell over to the third party. Needless to say, avoid hitting them again with the shell or oars. Take your time and manoeuvre slowly to avoid further injury.

Once you have reached the third party, stabilize their watercraft if they are not in the water or hold on to them if they are in the water. Keep their head above water to prevent drowning.

### **Cold Water Shock and Hypothermia**

For half of the year, Indian Arm water temperatures are between 5 and 10 °C. These temperatures are cold enough to induce cold water shock (< 15 °C) and hypothermia (< 25 °C).

Cold water shock occurs immediately after entering cold water. The first phase is an involuntary gasp for air. This is followed by approximately one minute of hyperventilation. Breathing difficulties can cause panic. Heart rate increases and some people can experience heart fibrillation for a minute or two.

Cold water shock is dangerous. The involuntary gasp and hyperventilation can result in ingestion of significant water into the lungs if the face is immersed at the time. Heart fibrillation can cause a heart attack. Panic is always dangerous. According to one writer on marine safety<sup>9</sup>, 20% of the people who die in cold water die in the first two minutes after entry into the water, well before the onset of hypothermia.

The first stage of hypothermia is incapacitation. Incapacitation occurs when the body reacts to cold water by shutting off the flow of blood to arms and legs in order to retain heat in the torso. With no blood, swimming becomes impossible. Without some form of flotation, death by drowning quickly follows.

The second stage of hypothermia is reduction in core body temperature. This leads eventually to unconsciousness. It is the least dangerous effect, because it takes quite a while to occur.

Rowers are at risk of cold water shock between October and May. Rowers are at risk of hypothermia any time of the year.

If a rowing shell is swamped or capsizes, the most important thing for rowers to do is keep their head above water and stay calm. The effects of cold water shock are temporary and will disappear within a minute or two. During this time, it may be difficult to do anything else.

After the cold water shock has passed, it is important to get out of the water or get into a PFD or lifejacket before being incapacitated by the cold water. Depending on the design of the PFD or lifejacket, self-rescue may not be possible while wearing the PFD or lifejacket and extraction into the coach boat may become more difficult.

If multiple rowing shells are involved, the coach will be trying to extract rowers from the water before they are incapacitated. If there are too many rowers to fit in the coach boat, they will be ferried as quickly as possible to the nearest shoreline. Because core body temperature reduction occurs quite a while after incapacitation, the priority will be to get rowers out of the water before worrying about getting them warm.

If not all rowers can be quickly extracted from the water, it is imperative for the rowers in the water to reduce heat loss to a minimum. The rowing shell should be turned over to ensure that it remains afloat with air trapped inside. Rowers should pull themselves as far out of the water as possible by draping themselves over the hull to minimize heat loss. If

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<sup>9</sup> [http://gcaptain.com/cold\\_water/](http://gcaptain.com/cold_water/)

practical, arms should be held at the side of the body and legs should be kept together to minimize heat loss from the torso and groin areas respectively (HELP: Heat Escape Lessening Posture).

### **Hyperthermia**

Hyperthermia (heat stroke) occurs when the body cannot dispose of excess heat fast enough and body temperature rises.

Rowers generate a lot of heat, especially during a race. If the day is hot and/or humid, hyperthermia can result.

Symptoms of mild hyperthermia include red skin, hot skin, dry skin, swollen lips, nausea, vomiting, headaches and low blood pressure (fainting, dizziness). Symptoms of severe hyperthermia include confusion, hostility, apparent intoxication, high heart rate, high respiration rate, pale skin, bluish skin, seizures and unconsciousness.

Avoid hyperthermia by not rowing during the heat of the day. Wear looser clothing and a hat. Clothing should provide protection from the sun yet be porous enough to allow sweat to evaporate. Avoid salt tablets and sports beverages with high levels of sodium as they can cause dehydration. Dilute with water any drink containing more than 2.5% sugar to aid in absorption.

Rowers and coaches must watch for signs of hyperthermia on hot and/or humid days. If hyperthermia is detected, take immediate measures to resolve the problem before it becomes serious.

Mild hyperthermia can be corrected by drinking water, resting in a cool location, removing excess clothing, using a wet cloth or sponge to apply water to the body and immersion in cool water.

Severe hyperthermia is a medical emergency. Call for an ambulance immediately.

### **Thunderstorm**

The first indication of a thunderstorm is usually the rumbling of thunder in the distance. If thunder is heard or lightning is seen, do not go out on the water. If already out on the water, the rowing session must be immediately terminated and rowers must proceed to shore.

If the thunder appears to be far away, it is acceptable to head back to the boathouse. If not, rowers will proceed to the nearest shore. Even if the thunder appears to be far away, a course that follows the shoreline back to the boathouse shall be chosen in case the storm moves in quicker than anticipated.

If it is necessary to head for the nearest shore, rowers will disembark and seek shelter in a building or vehicle if possible. Get rid of and stay away from metal objects. This includes oars and rowing shells as the carbon fiber is conductive. Do not stand under a tree since lightning prefers hitting tall objects (and anything near them). As a last resort, find a low

spot and crouch down on the balls of your feet with your heels together<sup>10</sup>. Do not lie on the ground, because current flowing through the ground from a nearby strike can electrocute you.

### Third Party Emergencies

When rowers are out on the water they may witness emergencies in which they themselves are not involved. Examples include accidents involving kayakers or recreational boats.

The question that will arise is whether the coach and/or rowers should get involved. There is no easy answer. Factors to consider are:

- In most cases, a rowing shell is not an effective platform to aid in a rescue. One exception might be a situation where rowers can keep someone in the water alive by holding on to them until emergency responders arrive.
- A person in the water, grabbing at a rigger in panic, can easily upset a single and possibly a double.
- A rowing shell has poor maneuverability and stability, so it is likely to get in the way and may capsize when other boats or emergency responders arrive.
- A rowing shell is hard to see. This combined with other boaters racing to the scene is a recipe for disaster.
- If the coach responds to the emergency, she or he will not be paying attention to the rowers. This increases their risk.

Given these factors, the following guidelines should be followed:

- Novice and beginning rowers must not get involved. Experienced rowers in singles must not get involved. If they get into trouble, they will compromise the ability of responders to assist third party victims.
- Experienced rowers should only get involved if nobody else is available who can assist, it is clear what their role should be, and it is clear they can effectively perform that role without getting into trouble.
- If rowers decide to get involved, they should withdraw as soon as they can relinquish their role to another responder.
- Coaches with novice or beginning rowers should preferably not respond unless there is a risk of serious injury or death and there are no other responders available.
- Coaches with experienced rowers can choose to respond as long as it is obvious that their assistance will materially affect the outcome.
- If the emergency is likely to attract a number of responders or the coach will be occupied for a significant time, the coach shall designate a nearby shoreline location where the rowers will head to and wait for the coach to arrive.

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<sup>10</sup> [http://www.edu4hazards.org/lightning\\_crouch.html](http://www.edu4hazards.org/lightning_crouch.html)  
[http://www.lightningsafety.com/nlsi\\_pls/hazardwarning.html](http://www.lightningsafety.com/nlsi_pls/hazardwarning.html)

- If the emergency is not likely to attract a number of responders and can be dealt with reasonably quickly (e.g. kayak capsize), rowers shall wait in a group out of the way nearby.

## Safety Improvement Process

The safety program will be continually improved by incorporating feedback and incident reports.

### Suggestions & Feedback

A feedback box is attached to the wall in the boathouse. If you have a safety-related concern (or any other concern), please feel free to drop a note in the box explaining your concern. It is not required that you identify yourself although it may be helpful if we have questions. All submissions will be reviewed and changes made where appropriate.

Alternatively, feedback can be emailed to [safety@deepcoverowingclub.com](mailto:safety@deepcoverowingclub.com).

### Incident Reporting & Documentation

All incidents that involve any of the following factors shall be reported and documented:

- Termination of rowing session due to rapidly degrading water conditions where rowers are on the water, white caps are present and the risk of swamping is high
- Swamping or capsize in water conditions where white caps are present
- Multiple rowing shells are swamped
- Multiple rowing shells capsize
- Collision or near collision
- Medical problem requiring termination of rowing session
- Hypothermia
- Hyperthermia
- Any incident where someone was injured
- Any incident requiring intervention by emergency responders
- Any incident requiring intervention by other boaters

All incidents shall preferably be reported using the Deep Cove Rowing Club Incident Reporting Form. To foster timely reporting:

- Any other format (e.g. email message) will be accepted that provides the same information.
- Incomplete reports will be accepted as long as contact information for the reporting party and some description of the incident is provided. The safety committee will follow up with the reporting party to get the remaining information.

If an incident results in personal injury and/or damage to third party property, it must be reported immediately in writing to RCA (Rowing Canada) per the requirements of our insurance policy. The incident shall be reported using the RCA Incident Report Form.

Please keep in mind that the intent of reporting incidents is not to censure the coach or rowers. The intent is to improve safety procedures.

### **Incident Review & Analysis**

The safety committee shall review and evaluate all received feedback and incident reports. The safety committee may ask for additional information from submitters to aid in the review and evaluation. The safety committee shall write a summary of its review and evaluation. The summary shall contain one or more recommendations for further action. A single recommendation that no further action is required at this time may be appropriate in some situations. The summary shall be submitted to the board of directors for review and action on recommendations.

The safety committee shall respond to all questions from the board of directors, coaches and rowers about incidents that are under review. The safety committee and board of directors shall take appropriate measures to protect privacy where appropriate.

## Appendix A – Water Temperatures

The following table shows the average monthly sea water surface temperature at the Department of Fisheries and Oceans research establishment in West Vancouver<sup>11</sup>. Because of tidal action, average water temperatures in Indian Arm will be very similar.

Month	Temperature (°C)	Temperature (°F)
January	6.0 – 7.8	43.5 – 45.3
February	5.9 – 7.7	43.3 – 45.1
March	6.0 – 8.2	43.7 – 45.9
April	6.2 – 8.0	43.9 – 45.7
May	6.4 – 9.2	44.6 – 47.4
June	6.7 – 10.0	45.3 – 48.6
July	8.7 – 11.2	48.6 – 51.1
August	10.0 – 12.4	51.0 – 53.4
September	10.4 – 12.1	51.4 – 53.1
October	8.8 – 11.4	48.9 – 51.5
November	7.7 – 9.8	46.7 – 48.8
December	6.8 – 8.4	44.9 – 46.5

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<sup>11</sup> Adapted from <https://www.seatemperature.org/north-america/canada/vancouver.htm>



## Appendix B – Daylight Hours

The following table<sup>12</sup> shows the approximate local time (i.e. PST and PDT) of the start of morning civil twilight, sunrise, sunset and end of civil twilight in Vancouver for different dates during the year.

Civil twilight occurs before sunrise and after sunset. It is defined to be that period of time when there is enough light in clear sky conditions for outdoor activities to take place without additional lighting.

Date	Civil Twilight Starts	Sunrise	Sunset	Civil Twilight Ends
January 1	7:30 AM	8:08 AM	4:25 PM	5:02 PM
9	7:29 AM	8:06 AM	4:34 PM	5:11 PM
17	7:24 AM	8:00 AM	4:46 PM	5:22 PM
25	7:17 AM	7:52 AM	4:58 PM	5:33 PM
February 1	7:09 AM	7:43 AM	5:10 PM	5:44 PM
8	6:59 AM	7:33 AM	5:21 PM	5:55 PM
15	6:48 AM	7:21 AM	5:33 PM	6:06 PM
22	6:36 AM	7:08 AM	5:45 PM	6:17 PM
March 1	6:22 AM	6:54 AM	5:56 PM	6:28 PM
9	6:06 AM	6:38 AM	6:09 PM	6:41 PM
17	6:49 AM	7:21 AM	7:21 PM	7:53 PM
25	6:32 AM	7:04 AM	7:34 PM	8:06 PM
April 1	6:17 AM	6:49 AM	7:44 PM	8:17 PM
9	5:59 AM	6:32 AM	7:57 PM	8:30 PM
17	5:42 AM	6:16 AM	8:09 PM	8:43 PM
24	5:28 AM	6:03 AM	8:19 PM	8:54 PM
May 1	5:14 AM	5:50 AM	8:30 PM	9:06 PM
9	5:00 AM	5:37 AM	8:41 PM	9:19 PM
17	4:47 AM	5:26 AM	8:52 PM	9:32 PM
25	4:37 AM	5:17 AM	9:02 PM	9:43 PM
June 1	4:30 AM	5:11 AM	9:10 PM	9:52 PM
9	4:25 AM	5:07 AM	9:17 PM	9:59 PM
17	4:23 AM	5:06 AM	9:21 PM	10:04 PM
24	4:24 AM	5:08 AM	9:22 PM	10:05 PM
July 1	4:28 AM	5:11 AM	9:21 PM	10:04 PM
9	4:36 AM	5:18 AM	9:17 PM	9:59 PM
17	4:45 AM	5:26 AM	9:11 PM	9:51 PM
25	4:56 AM	5:36 AM	9:02 PM	9:41 PM
August 1	5:07 AM	5:45 AM	8:52 PM	9:29 PM
9	5:20 AM	5:56 AM	8:39 PM	9:15 PM
17	5:32 AM	6:07 AM	8:24 PM	8:59 PM

<sup>12</sup> <https://www.timeanddate.com/sun/canada/vancouver>

Date	Civil Twilight Starts	Sunrise	Sunset	Civil Twilight Ends
25	5:45 AM	6:19 AM	8:09 PM	8:43 PM
September 1	5:56 AM	6:29 AM	7:54 PM	8:27 PM
9	6:08 AM	6:41 AM	7:38 PM	8:10 PM
17	6:20 AM	6:52 AM	7:20 PM	7:52 PM
24	6:31 AM	7:02 AM	7:05 PM	7:37 PM
October 1	6:41 AM	7:13 AM	6:50 PM	7:22 PM
9	6:53 AM	7:25 AM	6:34 PM	7:05 PM
17	7:05 AM	7:37 AM	6:18 PM	6:50 PM
25	7:17 AM	7:50 AM	6:02 PM	6:35 PM
November 1	7:28 AM	8:01 AM	5:50 PM	6:24 PM
9	6:40 AM	7:14 AM	4:38 PM	5:12 PM
17	6:51 AM	7:27 AM	4:28 PM	5:03 PM
24	7:01 AM	7:37 AM	4:21 PM	4:57 PM
December 1	7:10 AM	7:47 AM	4:16 PM	4:53 PM
9	7:19 AM	7:56 AM	4:14 PM	4:51 PM
17	7:25 AM	8:03 AM	4:15 PM	4:52 PM
25	7:29 AM	8:07 AM	4:19 PM	4:56 PM