

Safety Management Plan for use of LBT sailing vessels

Version #	Implemented By	Revision Date	Considered or Approved by	Considered or Approval Date	Reason / Actions
1	Martin Riddle	14/08/21	Considered by LBT Committee	14/08/21	First draft version considered by Committee
2	Martin Riddle	08/12/21	Considered by LBT Committee	16/12/21	Added to v.1: pre-departure check-list and section on what to do after capsize. Action: circulate to LBT experienced sailors; add version control
3	Martin Riddle	10/02/22	Considered by LBT Committee	10/02/22	Added to v.2: version control information; changes suggested by LBT experienced sailors
3	Richard Forster	10/02/22	Approved by LBT Committee	10/2/22	

Sailing at the LBT

The Living Boat trust is a membership-based organisation that owns and maintains a mixed fleet of vessels available for use by members. Among other things the LBT constitution lists the following objects and purposes:

- To preserve Tasmania's maritime heritage through the documentation, interpretation and restoration of historic vessels, the building of replica and reproduction vessels and the functional use of historic craft, and,
- To encourage, develop and utilise traditional maritime skills in the local community

The Living Boat Trust is very different from most sailing organisations such as dinghy and yacht clubs. With the focus on historic and replica vessels and on traditional maritime skills, the LBT's sailing fleet consists mostly of traditionally constructed open boats with centre-boards ranging in size from 12-13ft sailing dinghies to 26-32ft whale-boats. Vessels of this type do not have the self-righting characteristics of keel boats or the designed-in capacity for easy righting and self-baling typical of modern racing dinghies. Vessels in the LBT fleet are prone to capsize and may not be easy to right after capsizing.

Safe use of the LBT sailing fleet depends on the risk of capsize being recognized and appropriate mitigation measures put in place to reduce the likelihood of capsize occurring and also to reduce the chance of a detrimental outcome when a capsize occurs.

Waters available to the LBT

Based in Franklin on the Huon River, the LBT has a range of very different sailing waters available to it. No single set of safety procedures would be appropriate for all waters easily accessible by boat under sail from Franklin.

The waters immediately adjacent to the LBT and upstream to Huonville and downstream as far as Heriots Point are narrowly constrained by Egg Island and the riverbanks and the area is moderately well populated. A vessel in trouble is highly likely to be seen from the shore and if drifting uncontrollably under most conditions of wind and tide is likely to run aground on one or other bank rather than be swept away.

Heading south past Heriots Point and the southern tip of Egg Island the estuary widens, and population density falls. Continuing further south the estuary widens again at Brabazon Point, and again when it joins the D'Entrecasteaux Channel south of Huon Island. The risk of a distressed vessel going unnoticed and/or being swept away therefore continues to increase with distance south from Franklin.

The increased risk with distance from Franklin should be considered and mitigated against in the planning for all LBT sailing activity in the area.

Sailing conditions in southeast Tasmania

Southeast Tasmania has a temperate climate with warm summers and cool winters. Average coastal seawater temperatures range from 10^o-13^o in winter to 16^o-18^o in late summer. As 'the hazardous responses to cold water appear to peak on immersion somewhere between 15 and 10°C' (Tipton et al, 2017) the risks from capsize in Tasmanian waters can include the detrimental effects of cold-water immersion throughout most of the year. Cold-water immersion can cause the following depending on the length of immersion:

- Initial immersion - 'Cold-shock' including the physiological responses of a gasp and uncontrollable hyperventilation which can lead to water inhalation and drowning.
- Short-term immersion (>3 min) - physical incapacitation and muscular weakness caused by neuromuscular cooling (Castellani & Tipton, 2015), leading to a reduced ability and strength to respond to the situation.
- Long-term immersion (>30 min) – deep tissue cooling (hypothermia) which progressively causes shivering (36°C), confusion, disorientation, introversion (35°C), amnesia (34°C), cardiac arrhythmias (33°C), clouding of consciousness (33–30°C), loss of consciousness (30°C), ventricular fibrillation (28°C) and death (25°C) (Bierens et al. 2016) (temperatures in parentheses are approximate deep body temperature). Even in ice-cold water hypothermia does not arise for at least 30 minutes in adults (Tipton et al, 2017).

The risks from cold-water immersion should be considered and mitigated against when planning any activity where capsizing, or immersion for other reasons, is possible.

Weather forecasting has improved considerably over the years, however, it will never be entirely accurate either in predicting wind strength or the timing of weather changes. Forecasts should be treated as a guide to likely conditions. If strong winds are forecast but have not eventuated at the time of departure, planning for the trip should include the possibility that winds at least as strong as those forecast will be encountered.

Wind in southeast Tasmania can change and increase beyond forecast predictions at short-notice and, because of the hilly topography of coastal land, wind direction and speed can vary considerably over relatively small distances, increasing the chance of capsizing.

Responsibilities of the person-in-charge

The person-in-charge of a vessel being used on the water is responsible for all decisions relating to safety on board, including but not limited to:

- Seaworthiness of the vessel in relation to the planned activity and prevailing conditions,
- Current, forecast and expected weather and sea conditions,
- Ability of crew,
- Operation of the vessel,
- Availability on board of all required safety equipment and additional safety equipment where conditions indicate,
- Whether additional on-water or shore-based safety back-up is needed

Nothing in this safety management plan in any way limits or reduces the complete and unlimited responsibility of the person-in-charge of a vessel.

Principles underlying this safety management plan

1. The person-in-charge of a vessel is responsible for all decisions relating to safety on board.
2. Consistent with Point 1 (above) this management plan is intended to be hortatory rather than prescriptive.
3. Notwithstanding Point 2 (above) all LBT vessels and on-water activities must comply with all relevant legal requirements applying to the safety of vessels on the water, including those established at state (such as MAST), national (such as AMSA) and international levels (such as IMO/COLREGS).

4. Members of the LBT are joint owners of all LBT's assets and are jointly responsible for asset maintenance, including LBT vessels.
5. The age demographic of the LBT is very different from that of a typical dinghy racing club – all safety decisions must take into consideration the physical capabilities of participants.
6. Sailing is a voluntary activity – each participant must make their own decision on whether to commence a trip.
7. LBT membership includes a very wide range of boating experience - people with limited boating experience may not be able to judge the potential risks of an activity and whether they are physically capable of dealing with a capsized vessel. Notwithstanding Point 1 above, all participants have a responsibility to share their experience and voice any concerns.
8. All the vessels in LBT's sailing fleet could capsize – the possibility of capsizing should be planned for.
9. Some vessels in LBT's sailing fleet are difficult to right after capsizing – self-rescue may not be possible in some conditions.
10. Some LBT vessels are difficult to bail – even if the vessel is righted after capsizing it may not be possible to bail and recommence sailing.
11. Wind direction and strength in LBT's area of operations can change quickly and unpredictably - this increases the likelihood of capsizing.
12. Water temperatures in LBT's area of operations are low enough to cause the harmful effects of cold-water immersion and to quickly reduce people's capacity to manage the vessel or themselves after capsizing.
13. Vessel preparation, crew selection and preparation (clothing, PFDs etc) and voyage planning should all be done with the understanding that capsizing is a real possibility.

LBT Safety Management Plan for sailing

Voyage planning

MAST Operational Areas

- MAST categorises Tasmanian marine waters according to the degree of exposure and risk
- Voyage planning and vessel preparation must, as a minimum, meet all MAST requirements (available on the MAST web-site) for the areas included in the voyage

LBT's sailing activities

- Sailing by LBT members using LBT-owned boats is generally either:
 - Day-sails starting in Franklin independently organised by members – these are the primary focus of this safety management plan
 - Day-sails or multi-day expeditions, possibly starting from locations other than Franklin, and independently organised by members – requests to the committee to use LBT vessels/assets for these should include a safety management plan which may be based on this document where appropriate.
 - As part of an LBT-organised small boat expedition, such as the Tawhunnugah Raids – expeditions of this type have operated under their own safety management plans for several years and will continue to do so. These safety management plans are revised regularly to ensure they include lessons learnt including from any safety incidents.

LBT day-sails from Franklin

Recognising that conditions and risk change quickly with distance south from Franklin, the level of planning and safety precautions should also increase for the more distant trips. The following

categories have been created by the LBT to manage safety on the waters easily accessible as a day-sail from Franklin

- Area 1 – Huonville to Heriots Point
- Area 2 – Heriots Point to Brabazon Point – all precautions required for Area 1 plus some additional precautions
- Area 3 – South of Brabazon Point – requires voyage-specific safety management plan and approval from LBT Sailing Subcommittee

The distinction between Areas 1 and 2 is to allow for continued, spur of the moment, independent sailing within the very sheltered waters between Huonville and Heriots Point (Area 1). The main difference between Area 1 and Area 2 is that beyond Heriots Point some shore-based or on-water back-up must be established in advance of the trip.

Weather and sea conditions

The person-in-charge of the vessel should use information from a variety of sources in making the decision on whether or not it is safe to proceed, including:

- Existing conditions
- Forecast conditions
- Local knowledge, including likely local deviations from forecast conditions (such as areas of shelter or areas prone to wind-channeling and strong gusts)
- Sailing characteristics of the vessel, including the ability to reduce sail quickly
- The number, sailing experience and physical capabilities of the crew

The risks from being caught out in bad weather increase with distance south from Franklin. The person-in-charge should therefore be more cautious if planning to sail south of Heriots Point in high winds than if limiting their sailing to waters closer to Franklin.

Consistent with the principle that the person-in-charge is responsible for all matters of safety this safety management plan does not specify wind strengths above which sailing should not happen. However, the person-in-charge should think very carefully before deciding to commence a voyage in an area for which a Strong Wind Warning (winds averaging from 26 to 33 knots) has been issued. Any decision to continue under such circumstances should include additional precautions to mitigate the increased risk of capsize. The forecast wind strength, the additional precautions and risk of capsize must be shared and discussed with all aboard so they can make an informed decision on whether or not to continue.

For any given set of wind and sea conditions, the factor most likely to reduce the likelihood of capsize is the experience of the crew, including their familiarity with the specific vessel and how much they have previously worked together as a team. The person-in-charge should be more cautious in their decision-making with a less experienced crew.

Record of voyage intentions

As a minimum, a written record of the voyage intentions should be left in the LBT shed in a place where it can easily be seen. This should include vessel name, crew list, departure time, indicative voyage plan and expected time of return. In addition, someone not on the trip should be aware that the trip is underway.

Vessel preparation

Vessel buoyancy

All vessels in LBT's sailing fleet are wooden and therefore have some intrinsic buoyancy. All have some added buoyancy, either in the form of airbags (Grebes), sealed compartments (Capricornia), foam-filled chambers (Monty) and/or blocks of closed cell foam affixed under thwarts (most vessels) and under floorboards (Capricornia).

Only Capricornia carries ballast and experience demonstrates the positive buoyancy of the hull, even when awash, is greater than the negative buoyancy of the ballast. Monty has a steel centreboard, the weight of which adds to the righting moment when under press of sail but also slightly reduces its overall buoyancy.

Investigation of the recent capsizing of Capricornia indicates that at least one of the fore/aft buoyancy chambers had leaked due to faulty alignment of the sealing hatch. This must be corrected.

Options for adding buoyancy or adjusting ballast are continually under review but will be done with caution to ensure it does not interfere with the operation of the vessel or contribute to instability under capsizing conditions, for example by increasing the risk of 180° inversion if buoyancy is placed too high under the gunwales.

Pre-departure checks

Applies to all LBT sailing activities in all areas. The person-in-charge is responsible for all aspects of pre-departure vessel preparation, including assessing the capabilities of the vessel and crew in relation to expected wind and sea conditions.

- A generic Pre-departure Check List to cover all LBT sailing activities is attached at the end of this document. Vessel specific check lists may be developed as required.
- The vessel should be inspected visually to ensure it has not been damaged by accident or neglect to a degree that could compromise safety
- Added buoyancy should be checked to ensure it is firmly attached and, in the case of air-filled compartments, that hatches seal correctly
- As a minimum, all vessels must carry the safety equipment required by MAST for the area in which the sailing is planned
- All the required safety equipment must be carried on the vessel, must be in serviceable condition and must be stowed in a manner that ensures it is accessible when needed, including after capsizing
 - All safety equipment is to be secured so that it cannot sink or drift away during capsizing
 - Safety equipment should not be stowed in waterproof lockers used for vessel buoyancy if accessing the equipment during capsizing would cause loss of buoyancy
 - Anchors and chain should be secured to ensure they do not 'deploy' accidentally during capsizing
- Irrespective of MAST requirements, at least one waterproof VHF radio will be carried on all LBT sailing vessels at all times
 - The LBT owns 10 waterproof hand-held VHF radios; they are stored in the office and each has a lanyard attached
 - The person-in-charge of the vessel is responsible for ensuring the VHF is charged and functional before departure

- o At all times on the water the VHF radio is to be worn by the person-in-charge using the lanyard or by a person delegated by the PIC to carry the radio
- Mobile phones are not a substitute for a VHF radio
 - o Phones are useful for seeking additional external help to deal with minor problems but should not be relied on as the only source of communication in an emergency
 - o People on LBT sailing vessels should plan for the event of a capsize and ensure their phone is either waterproof, in a waterproof cover with tether/lanyard or left ashore
 - o It is easy to drop an untethered phone if trying to make a call during a capsize or other distress situation
- All ancillary equipment required for the normal operation of the vessel must be secured in a manner that ensures it is not lost during capsize, including:
 - o Rudder and tiller
 - o Oars, paddles rowlocks
 - o Spare sails and spars

Crew preparation

Applies to all LBT sailing activities in all areas

Crew number, ability and experience

The person-in-charge of the vessel is responsible for ensuring the number of crew and their ability and experience are appropriate for expected weather/sea conditions and the area of operations.

The person-in-charge should confirm that the crew knows how to reduce sail area when needed, including (as appropriate to the vessel) dropping sail, changing head-sails and shortening sail by reefing, brailing (pull sail in towards mast), scandalizing (drop peak of sail) and/or tricing (raise tack of sail). If there is any doubt, such as with an unfamiliar/irregular crew, the person-in-charge should demonstrate and/or have the crew practice any procedures likely to be required at short notice.

Personal Flotation Devices (PFDs)

- Foam filled jacket-style PFDs of 100N or above are most suitable for activities which include a risk of capsize including sailing as they have the following safety advantages:
 - o The foam provides insulation to the wearer and will reduce heat loss,
 - o PFDs of 100N and above are designed to turn the wearer on their back and keep them in a safe floating position,
 - o Flotation is always present and does not rely on the wearer or an automatic system to inflate the PFD,
 - o The wearer will be supported in the water even if unconscious, for example if hit by the boom during an uncontrolled gybe leading to capsize,
- Foam filled jacket-style PFDs should:
 - o Be a good, snug fit
 - o Have a crotch strap
 - o Be correctly done up
 - o Be worn at all times on the vessel
- PFDs with inflatable bladders are not recommended when sailing on LBT's small-vessel fleet. If a person decides to use an inflatable PFD they must wear suitable clothing to ensure they have adequate thermal protection during normal operations and in the event of capsize.

Clothing

- All people on board should wear or have with them clothing appropriate for the worse possible conditions likely to be encountered, including:
 - Insulating layers to retain body heat
 - Windproof layers to reduce heat loss from wind-chill
 - Head covering to reduce heat loss
- People should choose clothing according to the characteristics of the fabric and weather conditions - factors to consider include:
 - Wool retains body heat even when wet but provides limited protection from wind and can be heavy when water-logged and during immersion
 - Cotton is comfortable in hot conditions because it does not retain heat but when wet it accelerates heat loss through evaporative cooling
 - Modern outdoor clothing made from artificial fibres offer various combinations of beneficial characteristics including lightweight, insulating, rapid draining/drying and windproof, they are relatively cheap and most of the benefits can be had without buying expensive specialist sailing brands
- People on board should monitor themselves and others for signs of getting cold or being under-dressed for conditions, the early signs include,
 - Shivering (first, most common symptom)
 - Fatigue
 - Loss of coordination
 - Confusion and disorientation (this can mask self-recognition of becoming cold)

Food and water

Strength, performance and thinking ability all decline when people are hungry and/or dehydrated. Everyone on board should bring enough food and water for the planned trip plus some extra to allow for unplanned delays.

Response to strong winds

Weather changes often happen very quickly in southeast Tasmania. Everyone on board should be alert for the signs of a weather change bringing strong winds, including:

- Ominous dark clouds, perhaps with rain beneath
- White caps or areas of dark water
- The behaviour of other vessels, including reefing, sudden direction change, heeling or broaching

Reducing sail is the most immediate way to reduce the risk of capsize:

- The traditional rigs on many of the LBT vessels are more complex than those of modern sloop-rigged yachts and require more crew skill and coordination to manage and reef
- Reefing when the wind has already strengthened is considerably more difficult than under mild to moderate wind conditions
- It is better to reef early and risk losing a little speed than to delay reefing and risk being over-powered
- The more experienced the crew, the more likely it is that reefing will happen smoothly, conversely an inexperienced crew may well have problems – the decision to reef should not be delayed particularly if the crew has limited experience of the vessel or working together

Shore-based and on-water back-up

Shore-based back-up are people on shore who are contactable from the sailing vessel and can provide assistance, including:

- Mobilise the LBT safety boat (currently Rowan) and either stand alongside or provide a tow
- Organise to meet the vessel if it has come ashore at a place other than the LBT pontoons in Franklin
- Provide or organise other assistance as needed

On-water back-up includes other vessels in radio contact and travelling in company with the sailing vessel(s). If strong winds are encountered and on-water back-up is called to assist, it is likely that all LBT's sailing vessels will be similarly incapacitated by the conditions and would be able to provide only limited assistance. For this reason, more capable vessels such as power boats or keel-boats are preferred as on-water back-up if there is any chance of unfavourable/strong winds.

Back-up, whether shore-based or on-water, will not reduce the likelihood of capsize but it could reduce the consequences of a capsize once it has occurred.

The level of back-up required will depend on weather conditions, the voyage plan (how far south of Franklin), the sailing vessel(s) involved (Grebes vs whaleboats) and the experience of crew.

Area	Back-up/support requirements
Area 1 – Huonville to Heriots Point	Written record of voyage plan, crew, departure time and expected return time left at LBT shed At least one person ashore knows the voyage intentions and is advised when the vessel(s) is/are back on the pontoons
Area 2 – Heriots Point to Brabazon Point	Written record as above. Contact person as above. Required - Shore-based support person capable of mobilizing an LBT safety boat is on stand-by with a VHF radio on and tuned to the agreed working channel To consider based on conditions and crew experience – on-water back-up
Area 3 – South of Brabazon Point	As specified in the Safety Management Plan for the voyage approved by the LBT Committee

In the event of a capsize

All crew should know that their safest option is to remain with the vessel as it provides additional buoyancy and is much easier for a rescuing boat to locate than isolated swimmers.

Different vessels will behave differently during and after capsize, and individual vessels will behave differently under different wind and sea conditions.

When capsize appears imminent

Sometimes capsize will be sudden and there will be little the crew can do before finding themselves in the water. On other occasions, after it is realized that capsize is unavoidable there will be a brief opportunity to prepare the vessel. If time allows, crew should do the following:

- loosen/let go all sheets
 - if the head sails are sheeted off the vessel may bear away after righting, which will increase the chance that the vessel is knocked down again
 - if the main sail is sheeted off it may carry too much weight of water to allow righting
- ensure the centre-board is down and locked in position

- position themselves ready to climb over the windward gunwhale

Immediately after capsize

The first priority is to check on the safety of all crew.

- Check that all crew are present and accounted for
- Check whether anyone was hurt during the capsize
- Remind everyone to stay with the vessel

Recovering from capsize

After the vessel has capsized and safety of crew has been confirmed, the overall situation should be assessed. Actions following capsize will depend on various factors including:

- characteristics of the capsized vessel
- experience and fitness of the crew
- weather and sea conditions
- location including proximity to a lee shore
- whether other vessels are near-by

Options to consider are:

- Stabilise the situation, including:
 - Make contact with back-up (handheld/waterproof VHF)
 - Consider deploying anchor if being blown towards dangerous lee shore or out to sea
 - Reduce sail (pull down, reef, bundle and secure)
- Self-recovery, including:
 - Righting the vessel
 - Bailing the vessel
 - Return to home port, continue to destination or divert to other safe place under own power
- Assisted recovery
 - By LBT rescue boat if nearby or other vessel
 - If possible, right and bail the vessel before taking under tow
 - If not possible to right and bail, secure the vessel to minimise damage during tow (such as dropping and bundling sails)
 - Consider whether some crew are needed to steer the towed vessel, and if so, choose those least effected by cold and with suitable experience

Calling assistance

Options for calling assistance include:

- VHF using agreed working channel to accompanying rescue boat, accompanying yacht or pre-arranged shore support
- VHF to other vessels known to be operating in the area, such as fish farms, yacht clubs etc. if their working channels are known
- Non-distress call to Tas Maritime Radio using VHF Ch 16
- Distress Call on Ch 16

The person responsible for the vessel should make the decision on whether a distress call on channel 16 is warranted and if, so it should be consistent with the International Regulations for Preventing Collisions at Sea (COLREGs). The decision should be based on whether there is an immediate threat

to life or to the vessel (Mayday) or whether the situation is urgent but not a "grave and imminent threat requiring immediate assistance" (Pan-pan).

The proximity of other vessels, including dedicated LBT support vessels, should be taken into account when considering a Ch 16 Distress Call.

LBT Sailing Activities - Pre-departure check-list		
Voyage plan	Destination	
	Route (if there are choices)	
	Expected time/date of arrival	
	Expected time/date of return	
	Record of voyage intentions lodged?	
Shore Contact	Name and phone number	
MAST Area	Smooth, Sheltered or Coastal Waters?	
LBT Area of Activity	Area 1 – Huonville to Heriots Point	
	Area 2 – Heriots Point to Brabazon Point	
	Area 3 – South of Brabazon Point Voyage Specific safety management plan? Sailing Subcommittee approval?	
Weather and sea conditions	Forecast - max. wind strength and direction	
	Warnings issued - yes/no & details	
	Tide - times of high/low and whether suitable for voyage	
Crew experience & preparation	Number and experience suitable for expected/possible conditions? Minimum of 5 including skipper recommended on whaleboats in windy conditions	
	Suitable clothing?	
	Food and drink?	
Vessel	Vessel suitable for expected/possible conditions?	
	Vessel seaworthy?	
Safety equipment	MAST required safety equipment present, accessible and serviceable?	
	Additional safety equipment present, accessible and serviceable?	
Person-in-charge of vessel	Name:	Signature/Date: