

A precis of...

Investigation into the Effectiveness and Efficiency of  
Various Man Overboard Recovery (MOB) Methods and  
Equipment

By

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## 1. Abstract

The following report of this dissertation is an investigation into the effectiveness and efficiency of different Man Overboard (MOB) recovery methods. The tests I have conducted are to discover and compare the differences between the methods. From this I can decide on the most favourable retrieval system, which yachtsmen might carry onboard in case of emergency in the future.

By using various methods of recovery and recovery equipment, I was able to carry out an in-depth study that highlighted the safest, easiest and quickest recovery method. The aim of this study was to prove which modern MOB recovery systems are efficient and safe and the advantages and disadvantages of different systems.

Each time we lifted a 40Kg Ruth Lee Man OverBoard mannequin from the water to the deck of a yacht and timed how long it took.

The results were interesting (Figure 1) and it was found that in most cases the hypothesis was proven. However, when looking further into it, the results could be questionable, because there are a number of variables that one needs to take into account;

- is the MOB conscious
- can the MOB assist in their recovery
- the experience of the crew
- sea state
- light conditions
- is it possible to lower someone in to the water to aid the MOB

An MOB Likert scale questionnaire was filled out by a volunteer to see how they felt about each recovery (figure 2) which ranged from excellent to poor, and to see how they felt about each system tested in terms of safety and usability. The volunteer has sailed for many years and has had much practice at MOB Drills and so was able to advise and compare the safety aspect of each system by comparison with the time taken.

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Level 1 Maritime skills

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## 4.Introduction

We carried out research on a number of MOB recovery systems;

A 40kg Ruth Lee, which the BRNC use to simulate an unconscious body was lifted out using

- Jason's Cradle
- Various lifting strops
- Storm sail
- Lifting strop on a lifejacket
- MOB Lifesaver

The MOB Lifesaver is a product that has recently been developed by Duncan Wells to be attached to a lifejacket strop to help aid lift and recovery of a man overboard if they are wearing a lifejacket, which is simple yet very effective in comparison to other techniques. There are also other add-ons to bring the casualty out horizontally with this MOB Lifesaver which we did not use during this experiment, but they are highly recommended.

We conducted side by side tests to compare the retrieval systems against each other and from this we produced a set of results that showed the most efficient and effective recovery. The idea being to show cruising sailors, which system might provide the with the quickest, safest and speediest form of MOB recovery.

Practical RYA courses which range from Competent Crew to Yachtmaster are very focused on the procedures for what to do when an MOB has occurred, how to get back to the MOB using either the sails or motor but they do not deal with getting the MOB out. In training they use a bucket tied to a fender, which is collected with a boat hook. It is relatively easy to get a fender and a bucket out of the water. It is much harder to get a real person - you cannot get them out with just a boathook. This is what influenced my chosen topic. Also I taught myself how to use all the equipment and procedures involved in this experiment. There was no expert help to call upon.



The first to be tested was the traditional lift using the lifejacket's stitched in lifting strop. The design of the lifejacket is simple the purpose being to keep the casualty afloat facing upwards. During testing in the River Dart which has a lot of tidal flow, attaching the halyard was quite difficult, this was because the person(s) onboard had to reach down to water level to attach the casualty to the halyard (first image above), and in conditions that are less favourable than the river there could be the risk of another overboard casualty.

## MOB lifesaver



The MOB lifesaver was found to be a very useful aid to recovery. The MOB Lifesaver is 3 metres bright yellow coated HMPE (dyneema) which is spliced into a loop with a triangle at the end. An advantage of this colour and length it became very eye catching in the murky water as seen in the image below. One end of this is fitted to the lifejacket's lifting strop and packed in and released when the lifejacket has been set off and floats out onto the surface of the water, which makes it a lot easier to gain contact with the MOB by using a boat hook therefore a lot quicker attaching the halyard without leaning over the guard rails like the previous method. You just simply put the Lifesaver around the cleat to keep them attached to the vessel whilst the crew sort out the retrieval rig. The HMPE material will lift 1.5 tons so can be recommended to use for a faster recovery which reduces the time the casualty is in the cold water.

In terms of time the MOB lifesaver preformed the best in the results, with a simple lift and recovery taking less than 50 seconds on the 3<sup>rd</sup> attempt once we had mastered

how to manage the recovery. This is great to see this improvement straight away as it is so simple yet effective and with practice it may have become a lot quicker.

MOB Lifesaver have told us that they recommend using their heavy duty strop to go under the knees of the casualty so that he can be brought out horizontally. That way warm blood that will have been kept around his organs by the pressure of the water on his body - hydrostatic squeeze - will remain in place. If a man is brought out vertically, when the pressure of the water is removed, this warm blood can rush to his toes and he can suffer a heart attack.



The storm sail in theory was a good idea, using the same principle as a Jason's cradle, by scooping the person from the water into a 'bag' of sail to lie horizontally and to be rolled up on deck ( first image below). The foot of the sail was shackled to the gunwhale and the head of the sail was attached to a halyard which was used to raise the sail to get the casualty out of the water and tucked alongside the vessel. When we did this it proved difficult to scoop the person into the sail, the sail became too saggy and would not sink below the dummy . The sail sat on the surface and the only means of getting the dummy into the sail was to be quite forceful and using a boathook pull on the life jacket to haul him into the sail. It quickly became apparent that this method of recovery was not ideal, even in the mild conditions on the day it was a struggle, so would be nearly impossible to collect a real man over board in more extreme conditions. The testing for the storm sail recorded over 360 seconds (5 mins) which was too long compared to the other tests, so this was a method that was not recommended for a speedy and secure recovery. The set-up of the sail was quite difficult and required a number of shackles to attach the foot of the sail to the stanchions, which might not necessarily be available on a vessel, so we would tend to avoid this method.

Thinking about the care and wellbeing of the casualty, this method would not be suited due to the forcefulness of getting the MOB into the sail then from the sail manually to be lifted up on deck and to be rolled against the hull of the boat as he came up. This could lead to damage to the MOB. It would certainly be uncomfortable. Also while we were trying to get the MOB into the sail we found that with immersion in water the sail became increasingly slippery resulting in the dummy sliding out of the sail and back into the water, unless we held him there with the boathook.

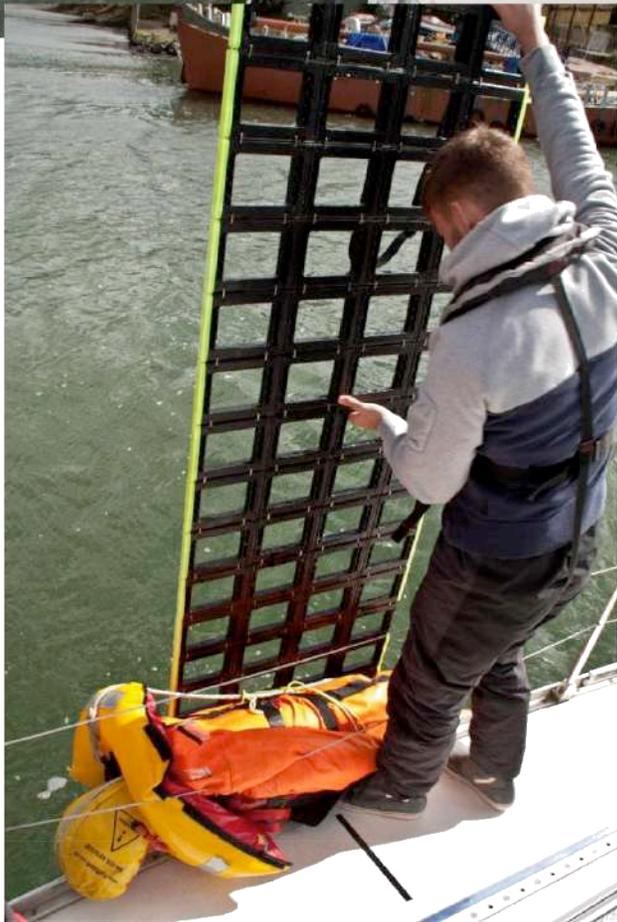




The standard Jason's cradle as previously mentioned is lowered into the water underneath the MOB. It has one side which is made from heavy plastic pieces which link together known as 'gates' and which allow one side to roll and the other to stay straight, the holes allowing water to pass through. It comes rolled up, so stows easily. One clips the base to the deck with shackles. the top is attached to a halyard. The cradle is SOLAS approved and guaranteed for 3 years. With the casualty lying horizontally in the cradle they are then raised up and rolled onto the deck.

This piece of equipment requires the rescuer to understand how to set it up in advance. It is not something that would be easy to do fir the first time, especially under pressure. It is easy to rig the cradle the wrong way round. There are arrows to show you but these may not be visible at night. Being heavy to allow the cradle to sink under the MOB, it does mean that it is heavy to move about the deck. This could be a problem in heavy weather on a heaving deck.





The under arm lifting strop is a one way to support the MOB reasonably comfortably. It is made from rope and cushioned with sponge and attaches easily to the halyard via two rings and a shackle. It is used by lowering the strop already attached to the rope it is an easy and quick set up. However, the difficulty of this system became apparent when trying to fasten and secure the strop around someone in the water, with a life jacket and a dummy which effectively represents and unconscious MOB. It became very dangerous to get this onto the dummy as to get the strop over it needed to be at same water level and it took a lot of moving his arms and shunting his body to eventually get it on, and with the rescuer leaning down there is a high risk of a second man overboard. The image below shows the rescuer hanging right over the side of the boat in their attempt to get the under arm strop attached. Time taken to get the man out this way was reasonable on the first attempt at 90 seconds but oddly the third attempt was 35 seconds slower than this.







The last method of recovery to be tested was the under arm and under knee lifting strop. Made from the same materials as the single strop, the second strop allows you to lift the MOB horizontally instead of vertically (as shown in the image below) – this prevents the possibility of the blood rushing from the core of the body to the feet when the pressure of the water - hydrostatic squeeze - in hypothermic casualties. SAR bodies have long moved away from the vertical lift because of this and always bring casualties out horizontally. Of course getting two strops under the MOB was twice as difficult as getting one strop under them and so was the slowest method of retrieval.



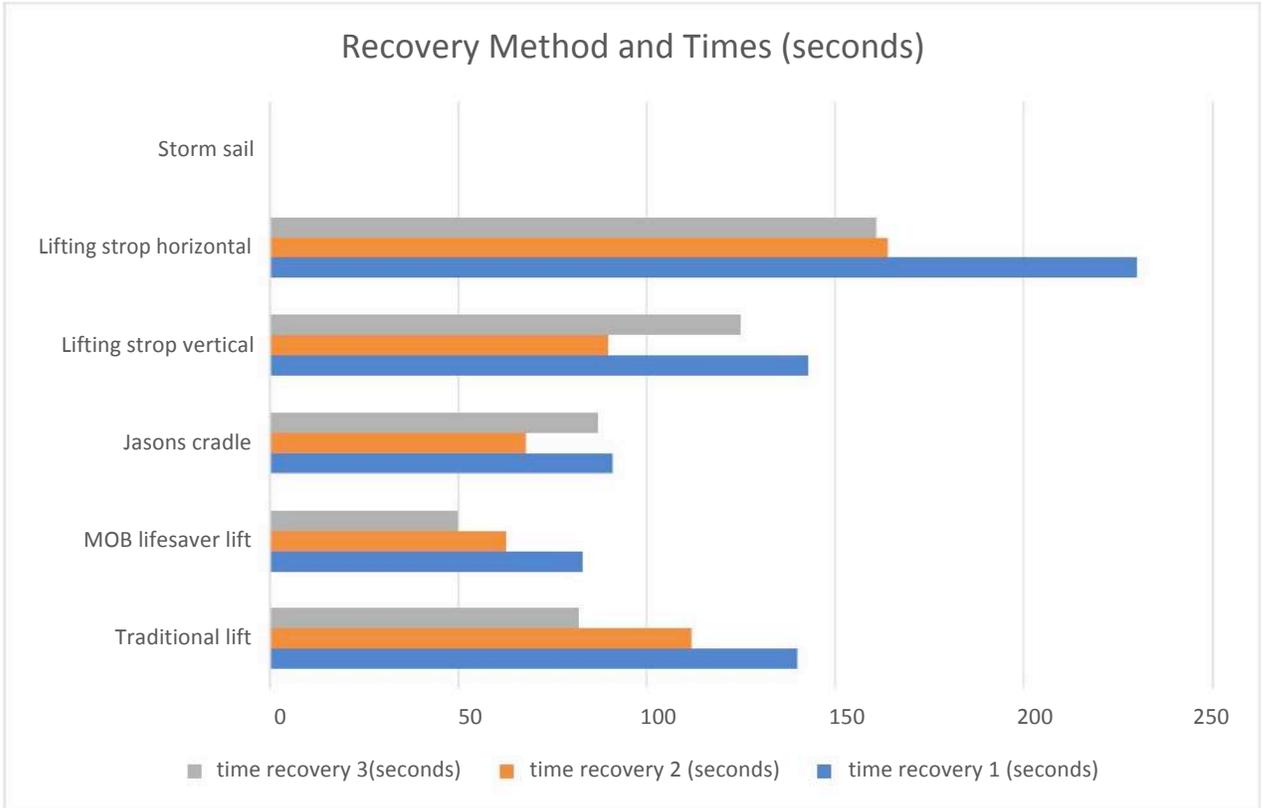
## 7. Conclusion

The cradle method worked well, and is a tough contender with the MOB lifesaver due to their durability and being able to be used in most conditions which seem apparent, the speed to be rolled or lifted seemed very alike, in terms of storage, the MOB lifeline is simply tucked in the life jacket whereas the cradle needs to be stowed away in a big amount of space, which may lead it being covered or things being put onto it to prevent a quicker access. Bringing the cradle on deck or transporting and setting up the cradle maybe difficult during bad weather or night time whereas the lifesaver can simply be attached to the boat via boathook to cleat or boathook to halyard and then lifted straight away with no extra equipment. They both have the bright yellow to make them visible during the day but with the use of a headtorch or hand torch being spotted in the dark should not be a problem if you have spotted the Man overboard and next to them ready for recovery. They are both safe for the crew to use as no one will need to hang off the sides or reach down to the water level or be in the water to assist like the lifting strops vertical and horizontal, unless as previously mentioned the casualty is able to assist. The lifesaver comes at a far lower cost of £19.95 which is simple yet effective and all the crew can have one or two attached for less price of the cradle. The cradle is also great if the vessel has a high free board but the MOB lifesaver has a length of 3 meters which should be plenty to be hooked with and either attached to a cleat or straight to the halyard.

## 8. Recommendations

The research that carried out gave a better understanding of the MOB industry and the subjects within. With all research questions the testing process will always find new questions and new research to investigate further into. If this research project had been able to go on a lot longer, It would have been great to be able to use a lot more methods of recovery by companies in the industry donating or temporally loaning some of their equipment or potentially created a way of recovery using the data and making a hybrid between the better pieces of equipment that could be used for small to large vessels that was quick, safe and secure and been able to come up with a training scheme, to then make a lot more people aware of MOB and enforce it more to become more important and not overseen, training would go far and it would be beneficial to companies and anyone in the marine industry to carry out training, to prevent less lives lost at sea, therefore less call outs for help and in many circumstances instead of waiting for help being able to safely carry out the MOB. Prevention and safety is the main goal but being able to attack the situation is just a matter of life and death in the water.

# 10. Appendices



(Figure 1)

MOB Questionnaire Likert Scale (figure 2)

Q1	Q2	Q3	Q4	Method		
How easy did you find it to capture the MOB?	Excellent	Good	Average	Fair	Poor	Traditional Lift
How eady did you find it to lift the MOB?	Excellent	Good	Average	Fair	Poor	
How comfortable did the recovery appear for the MOB?	Excellent	Good	Average	Fair	Poor	
How would you rate your safty recovering the MOB?	Very safe	Safe	Not Safe	Dangerous		
How easy did you find it to capture the MOB?	Excellent	Good	Average	Fair	Poor	MOB UfeSaver
How eady did you find it to lift the MOB?	Excellent	Good	Average	Fair	Poor	
How comfortable did the recovery appear for the MOB?	Excellent	Good	Average	Fair	Poor	
How would you rate your safty recovering the MOB?	Very Safe	Safe	Not Safe	Dangerous		
How easy did you find it to capture the MOB?	Excellent	Good	Average	Fair	Poor	Jasons Cradle
How eady did you find it to lift the MOB?	Excellent	Good	Average	Fair	Poor	
How comfortable did the recovery appear for the MOB?	Excellent	Good	Average	Fair	Poor	
How would you rate your safty recovering the MOB?	Very Safe	Safe	Not Safe	Dangerous		
How easy did you find it to capture the MOB?	Excellent	Good	Average	Fair	Poor	Lifting Strop - Vertical
How eady did you find it to lift the MOB?	Excellent	Good	Average	Fair	Poor	
How comfortable did the recovery appear for the MOB?	Excellent	Good	Average	Fair	Poor	
How would you rate your safty recovering the MOB?	Very Safe	Safe	Not Safe	Dangerous		
How easy did you find it to capture the MOB?	Excellent	Good	Average	Fair	Poor	Lifting Strop - Horizontal
How eady did you find it to lift the MOB?	Excellent	Good	Average	Fair	Poor	
How comfortable did the recovery appear for the MOB?	Excellent	Good	Average	Fair	Poor	
How would you rate your safty recovering the MOB?	Very Safe	Safe	Not Safe	Dangerous		