The primary aim of this Rescue Throwline Manual is to equip people with the skills and knowledge to manufacture the rescue throwline in-country.

The manual is designed for organisations based in low-resource areas with limited access to equipment.

This manual will be reviewed and, if necessary, updated every 3 years.

Please send any feedback or comments to international@rnli.org.uk.

This equipment should only be used when a community is not able to buy and use international standard lifesaving equipment.

Disclaimer
The content of this manual is for general guidance only. It represents best practice as at the date of publication and should not be considered as legal advice. Those using this manual should seek professional advice as and when necessary. The RNLI does not accept responsibility for any errors in this document.

The RNLI accepts no responsibility and makes no warranties of any kind regarding the use or manufacture of the rescue throwline. The use of the rescue throwline by the user is solely at the user’s risk.

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1.1 The international drowning problem

Drowning is one of the major causes of global mortality. It is responsible for the loss of an estimated 372,000 lives each year, but is relatively unrecognised and under-resourced relative to its impact. This figure is, unquestionably, an underestimation of the true drowning death toll.

Data collection, along with different areas using different categories, means that the majority of UN Member States fail to file accurate reports on drowning deaths, and lives lost in floods and water transport accidents are not included in official numbers. Even at the reported level, drowning ranks as the leading cause of child mortality in many Asian countries, including Bangladesh, where 48 children lose their lives to the water, needlessly, each and every day. The World Health Organization has created the following information on global drowning:

**KEY FACTS**

- **372,000** people die from drowning **EVERY YEAR**
- **OVER HALF** of all drowning deaths are among those aged **UNDER 25 YEARS**
- **MALES ARE TWICE AS LIKELY** to drown as females
- Drowning is one of the **10 LEADING CAUSES OF DEATH** for people aged 1-24 years

**PREVENTIVE ACTIONS**

- **Install BARRIERS** controlling access to water
- **Provide SAFE PLACES** (for example, a crèche) away from water for pre-school children, with capable child care
- **TEACH** school-age children basic **SWIMMING, WATER SAFETY AND SAFE RESCUE SKILLS**
- **TRAIN** bystanders in **SAFE RESCUE AND RESUSCITATION**
- **Set and enforce safe BOATING, SHIPPING AND FERRY REGULATIONS**
- **IMPROVE FLOOD RISK MANAGEMENT** locally and nationally

Despite the scale of the world’s drowning problem, it is barely recognised – a silent epidemic.

© World Health Organization 2014
1.2 The RNLI

The Royal National Lifeboat Institution (RNLI) is a UK-based charity with the aim of reducing loss of life due to drowning. It was founded in 1824, and now has a 24-hour on-call lifeboat service across more than 230 locations in the UK and Ireland, lifeguard services across 240 beaches, trained flood rescue teams and campaigns to educate the public about drowning prevention.

**Maritime search and rescue**

**Lifeguards**

**Flood rescue**

**Community safety**

**RNLI international work**

Building on over 190 years of lifesaving experience in the UK and Ireland, and in response to United Nations recommendations, the RNLI is now working in partnership with other organisations and governments around the world, to share its lifesaving experience and make drowning a global priority.

The RNLI is focused on empowering at-risk communities where drowning is a major risk, with the knowledge, equipment and skills they need to be more resilient, and reduce avoidable loss of life. This includes:

- Working with government and non-governmental organisations to develop coordinated national drowning prevention plans.
- Building the capacity and capability of life-saving institutions and search and rescue teams in low-income countries.
- Designing and applying low-cost life-saving and drowning prevention interventions (e.g. aquatic survival and safety programmes), undertaking ground-breaking research and data collection and international advocacy and awareness initiatives.

The *Rescue Throwline Manual* is part of a suite of low-cost equipment manuals, aimed to help international communities reduce deaths due to drowning.
2.1 The rescue throwline

A rescue throwline is a length of floating rope in a bag or container that can be quickly thrown to a casualty in the water. It is most suitable for swift-water and flood rescue where it can be used in a variety of ways. It is good practice for flood rescue operators to carry a rescue throwline at all times.

It can also be used as public rescue equipment (PRE) at locations such as river mouths, and areas around rocky coasts where strong currents are present.
2.2 Specification

**Line colour**
Brightly coloured (yellow, orange or red if possible. White would also be acceptable if it is the only colour available.)

**Line breaking strength**
Depending on the use, the line should have a minimum breaking strain of 0.3 tonnes = 3kN (kilonewtons).

For testing line that is used without a specification suitability for rescue purposes, this can be simulated by five people pulling on the line at the same time while its end is tied to a static object (for example a tree).

**The line must** be made from a material that floats on water. Polypropylene is often used to standard BS EN ISO 1346:2012.

**Line thickness 7–9.5 mm**
- 7 mm usually for rescue throwline only
- 9.5 mm usually for flood rescue operations.

**Bag colour**
Brightly coloured (yellow, orange or red if possible).

**Bag material**
Tough fabric (i.e. 500 denier – 500D) that is resistant to sunlight and water, e.g. nylon, ripstop or material similar to that used in making rucksacks.

**Line length**
For 7mm line – 20m
For 9.5mm line - 18m

18m or 20m (depending on line thickness)
Unit 2: Specification

Bag features

- Be rugged, lightweight and compact.
- The bag and line must float.
- One end of the line should securely attach to the inside of the bag – recommended double figure-of-eight knot. See unit 4.5.
- Be easy to repack the line into the bag quickly.
- Allow the secure loop part of the line to protrude from the base of the bag (the loop should be small so a hand cannot enter).
- Have holes that allow water to drain from the base of the bag.
- Be resistant to moisture, sunlight and dirt.
- The bag should have light reflective strips if possible so it can be seen at night and a small loop for attaching a chemical light (glow stick).
- If the bag is used as public rescue equipment (PRE), simple instructions can be printed on the side of the bag. This could be a simple list as shown right, or if the capability exists, the graphic at the bottom of the page can be printed on the bag.

Bag marking

The bag should be clearly marked with the length of the line contained inside.

Example instructions

1. Pick up the bag.
2. Hold on to the end of the line with one hand.
3. Throw the bag to the casualty with the other hand.
4. DO NOT tie the line to yourself.
5. Pull the casualty to safety.
6. Repack the line in bag (feed line into bag, do not coil the line).

Example instruction graphic

[Diagram showing steps: Pick up the throwline, Keep hold of the end of the line, Throw the bag to the casualty]
3.1 Storage
The rescue throwline should be stored in a clean and dry location away from direct sunlight. During use the rescue throwline should be ready for deployment at all times.

3.2 Rescue use
Please refer to relevant training materials from professional organisations.

The RNLI has produced international Flood Safety and Flood Rescue Manuals, which are available from RNLI.org.
3.3 Use as public rescue equipment (PRE)

The rescue throwline can be positioned near to areas of water for members of the community to use for rescue. The community must be trained in its purpose and use before it is put in place. It should be inspected and tested regularly.

Placement

The rescue throwline should be placed where it is visible and accessible. It should be positioned away from direct sunlight if possible.

Signage

A sign should be placed near the rescue throwline to show how to use it. A suitable sign is shown below. A full-size version of this sign can be found at the back of this manual to photocopy, laminate and place near your rescue throwline.

The law

You must make sure that you obey any law in your country or community that may affect the use or construction of the rescue throwline.

3.4 Safety

Lines can be very dangerous in static and moving water. They should never be tied to a rescuer or casualty. When in use they should be able to be released in an emergency. It is good practice for flood rescuers to carry a knife to cut a line in case of becoming tangled. Lines should never be wrapped around peoples hands.

3.5 After-use care

After use, the line and bag should be inspected for damage, cleaned in freshwater if possible and dried in a warm place (away from direct sunlight).

3.6 Test schedule

The line and bag should be inspected after every use and at a minimum of once a month to ensure that they are not damaged. Ensure that the Velcro strap still secures the bag. Check that the line is tied to the bag with the correct knot (see Unit 4). Check the entire length of the line for any damage. If damage is found, replace the full length of the line.

Ownership

A member of the community should be given ownership of the rescue throwline. This person should be responsible for making sure that it is ready for use at all times by making a regular check each day.

Community awareness

The whole community should be made aware of the throwline and where it is placed. They should be given a demonstration of how to use the throwline to rescue a casualty. Children should be made aware that the throwline should not be used as a toy, it should only be used for rescue purposes only. A suitable member of the community should given the responsibility to make sure the throwline is present, in the right location and tested regularly.

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4.1 Community production

For communities that need a basic rescue throwline in low volumes, this section will provide you with all the information you need to source tools, resources and materials to make your own rescue throwline. It will also outline safety precautions prior to and during production, along with a step-by-step guide on each stage of the manufacturing process.

The following instructions and template can be used by a community tailor or craft person with a sewing machine to make a simple rescue throwline for emergency use.

4.2 Production safety

Sewing machines can cause serious injury if not handled correctly. Make sure you keep your hands clear of the needle when moving the fabric through the machine. Keep your fingers pointed outwards and use your thumbs to guide the fabric, making sure not to get too close to the sewing machine foot or needle. Remove pins before they get near the foot, sewing over a pin could cause breakage and a potential injury. Use the hammer and fabric shears with care to avoid any hand injuries.

4.3 Tools, resources and materials

**Tools**

- **Pattern** (at the back of this manual)

**Pattern**

- **Tools**
  - Sewing machine
  - Denim needles
  - Pegs/spring clips
  - Pencil/pen
  - Hammer
  - Pins
  - Fabric shears/scissors

**Diagram**

*Top View*

*Bottom View*

*Side View*

*Hem line*

*Loop positioning*

*Velcro positioning*

*Extra material*

Fabric grain
Unit 4: Community production (low volume)

Materials required

- **Polypropylene multifilament rope (floating strong rope)**
  
  - 7mm diameter x 20m, 3–10kN static breaking strength or
  
  - 9.5mm diameter x 18m, 3–10kN static breaking strength

- **Lightweight, tough nylon bright fabric**
  
  - 500 denier or ripstop nylon
  
  - 600m x 450mm

- **Webbing**
  
  - 30 x 280mm

- **Polyester thread**

- **Eyelets**
  
  - 22mm stainless steel

- **Velcro (double-sided)**
  
  - 20 x 160mm
  
  If double-sided is not available, stitch together two lengths of opposing Velcro together

Tips and notes

- Cut out your pattern slowly and carefully.
- Make sure you snip all notches (►) for guidance.
- Only pin fabric in the seam allowance.
- Use a heavy-duty sewing machine if possible.
- Use a medium-size stitch (2–2.5mm) max.
- Reverse stitch at the start and end of each seam.
- Always sew 10mm in from the edge unless instructed to do otherwise.
- Sew two or three times in areas where specified in the instructions where more strength is needed.

The line **must** be made from a material that floats on water. Polypropylene is often used to standard BS EN ISO 1346:2012.
4.4 Templates/pattern

Unit 8 has loose, full size, A4 master templates/pattern to help production of and signage for the rescue throwline. You will find seven pages that make up the pattern, four rulers and an instructional sign. Photocopy the master templates at 100% scale, then cut them out before using for production/signage. See the following page for information for creating the full size pattern.

REFERENCE ONLY
SEE THE FULL SIZE TEMPLATES/PATTERN IN UNIT 8 FOR PRODUCTION AND SIGNAGE

Pick up the throwline
Keep hold of the end of the line
Throw the bag to the casualty
Rescue throwline full-size pattern

Seven A4 pages in Unit 8 make up the master pattern for the rescue throwline bag. PAGE 1–6 make up the bag tube (as shown below) and PAGE 7 is the bag base.

Where possible, keep the seven loose A4 pages in this manual as your master copies.

Photocopy them at 100% (DO NOT SCALE THEM UP OR DOWN). Arrange the pattern pages as shown below, then follow the arrows on each page to overlap the pages as shown at the bottom right of this page. Stick/attach the pages as you go. Page 7 can be used in isolation.
4.5 Manufacturing instructions
Rescue throwline bag manufacture

1. Lay and pin the pattern for the bag on the material, pinning close to the edge. Cut away any excess material.

2. Do the same with the pattern for the base of the bag. Snip all notches where shown on the pattern.

3. Fold the top of the bag twice using your snipped markers for guidance. Sew along the hem line.

4. Take the two 160mm lengths of Velcro, arrange back-to-back and stitch together as above.

5. Pin the Velcro in place using the snipped markers to guide you. Sew to the bag as shown on the pattern.

6. Cut 120mm of the webbing. Fold in half to create a loop. Burn the ends to stop any fraying.

7. Pin, then sew the loop in place on the bag as shown on the pattern.

8. Stitch the sides of the bag together, creating a fabric tube.

9. Cut 150mm of webbing, burn the ends, pin in place across the base of the bag in the centre.
10. Sew to the base as shown on the pattern; sew at both ends and along the length of the webbing at each side.

11. Using the pattern, mark and cut the fabric using the inner part of the eyelet.

12. Carefully place the two halves of the eyelets together, join using the hammer.

13. If an eyelet kit is not available, pierce the fabric with a very hot metal rod, working until you have two 10mm holes.


15. If using 8mm rope, cut a 20m length, if using 10mm rope, cut an 18m length.

16. Create a figure of eight in your rope approx 560mm from the end of the rope (see steps 16–20).

17. Creating a figure-of-eight knot.

18. Creating a figure-of-eight knot.
19. Your knot should look like this.

20. With the bag inside out, pass the rope through one eyelet into the bag and back out through the other eyelet.

21. Create a double figure-of-eight. Take the end of the rope and follow through the shape of the existing figure-of-eight knot.

22. Creating a double figure-of-eight knot.

23. Creating a double figure-of-eight knot.

24. You should leave 150mm of rope coming out of the knot (about a hand’s width).

25. You must have a small loop between the rope and bag so your hand cannot pass through it (see red section above).

26. Turn the bag out the right way. Hold the bag as above, feed the rope into the bag hand over hand (do not coil).

27. Clearly label the bag to indicate the length of line inside the bag.
Rescue throwline bag manufacture (continued)

28. Leave 200mm of rope coming out of the bag.
   Wrap the Velcro strap around the top of the bag.
   Your rescue throwline is ready to use!

4.6 Testing

Once the rescue throwline has been completed, it should be tested by holding on to the end of the line and throwing it into some water. Test that the bag and line float and that the line is tied securely to the bag.

- Ensure the line and bag are not damaged.
- Ensure the velcro fastening is working correctly.
- Test that the line is strong enough for its use (refer to Unit 2.2).
5.1 High volume production for professional rescue use

For a high volume production rescue throwline for professional use, please see the resource below.

Equipment Resource
Rescue Throwline Manual
High Volume Production

AUGUST 2018
DEVELOPED FOR LOW-RESOURCE AREAS
6.1 Disposal/recycling

The line and bag can be used for other purposes in the community. It is possible to recycle polypropylene and nylon and local recycling specialists should be consulted for advice.

6.2 Environmental impact assessment

Producing equipment in low volumes locally with recycled materials will have minimum effect on the environment. When undertaking high volume production the following guidance will ensure that the environment is considered.

**Materials**

Ensure recycled or re-purposed materials are used whenever possible. Always use the minimum amount of materials needed. It is good practice to investigate where the materials that are used in production have come from. Try to ensure that they are from a sustainable and ethical source.

**Production**

Ensure that the minimum amount of energy is used in the production process and waste materials are minimised.
7.1 Feedback
The RNLI welcomes feedback on this manual and the rescue throwline design. Please email international@rnli.org.uk with comments and suggestions.

7.2 Lifesaving equipment needs
If you have a need for an item of lifesaving equipment please email international@rnli.org.uk with the following:
• name
• organisation
• country
• region
• area of lifesaving
• type of equipment needed
• why it is needed
• why existing equipment is not suitable?

7.3 Stories
If you have a story involving this item of equipment or if you have used it to help or save someone please email details and any photographs to international@rnli.org.uk.
8.1 Master templates/pattern

The loose A4 pages inserted on the inside of the back cover are your full size master templates to help with production of and signage for the rescue throwline.

There are seven pages that make up the pattern, a template with four rulers and an instructional sign template. Photocopy the master templates/pattern at **100% scale** to use for production/signage. Cut out the rulers and sign where necessary.

For the rescue throwline pattern, arrange the pages as shown below, then follow the arrows on each page to overlap the pages. Stick/attach the pages as you go along. Page 7 can be used in isolation.

If available, you will find thinner paper easier to work with when you pin your pattern to the fabric.
Throwline pattern (PAGE 1 - PAGE 7)
master template

Hem line

Extra material

TOP

Hem line

410mm (16½"

Extra material

PHOTOCOPY AT 100% FOR USE AS PRODUCTION PATTERN

TO SCALE
Eyelet Ø 10mm

Ø 130.5mm
(Gives a circumference of 410mm)

PAGE 7
Rulers
master template

TO SCALE
PHOTOCOPY AT 100% FOR USE AS PRODUCTION TEMPLATES
Pick up the throwline

Keep hold of the end of the line

Throw the bag to the casualty