



Searching Rivers and Floods

Learning outcomes and key teaching points



About Rescue 3 Europe

Rescue 3 Europe develops state of the art technical rescue courses, providing internationally recognised accreditation for organisations and individuals operating in high risk environments.

As an international accrediting body, Rescue 3 provide up to date best practice guidance that is constantly evolving in line with new research and testing. All changes and developments of Rescue 3 courses go through a process of peer review and oversight by a steering committee made up of industry experts from all over the world.

Rescue 3 training providers deliver courses worldwide, in multiple disciplines, including: rope, water, boat, ice and confined space rescue. Our large suite of courses have been adopted by mountain rescue teams, wind turbine operators, fire and rescue services, ambulance teams, utilities providers, and military personnel.

Within each discipline, Rescue 3 accredited courses cover every level of operations, whether this is at an awareness level, avoiding risks and applying simple safe systems of work; or at more advanced levels where practitioners must acquire high levels of personal skills and understanding to access and navigate difficult environments.

For over four decades Rescue 3 has provided the standard for technical rescue training, offering guidance and support for maintaining best practice.





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Searching Rivers and Floods (SEARCH)

Course overview and target audience

The Searching Rivers and Floods course is for existing Swiftwater and Flood First Responders or Swiftwater and Flood Rescue Technicians, who are tasked as search operatives in water-based searches.

Contact hours 12 hours (2 days)	Prerequisites Rescue 3 SFR or above
Qualification valid for 3 years	Accredited by Rescue 3 Europe

Taught by

- Searching Rivers and Floods Instructor (SEARCHI)

Assessment

The assessed elements of this course are:

- Foundation knowledge
- Navigation
- Search techniques



Searching Rivers and Floods (SEARCH) skill sheet contents

Theory	
1.	Prerequisite knowledge from SFR or SRT
2.	Search operative remit and role
3.	The command structure of search operations
4.	Search terminology
5.	Introduction to lost person behaviour
6.	Briefing and de-briefing
7.	Navigation
8.	Search equipment and techniques
9.	Suspending the search
Practical	
10.	Prerequisite skills from SFR or SRT
11.	Search scenarios in rivers and floods



Searching Rivers and Floods (SEARCH) learning outcomes and key teaching points

	Skill sheet element		Learning outcome	Key teaching points
1	Prerequisite knowledge from SFR or SRT	1.1	Recall water rescue knowledge, as covered on the Rescue 3 Swiftwater and Flood First Responder or Swiftwater and Flood Rescue Technician courses.	The Searching Rivers and Floods course is for existing SFR or SRTs who are tasked as search operatives in water-based searches. The core principles of working in and near water apply in SFR, SRT and SEARCH, including (but not limited to) PPE and team equipment, hazards, hydrology, rescues, self > team > victim.
2	Search operative remit and role	2.1	Recall the remit and role of a search operative	A search operative is performing searches of rivers and floods, rather than managing them. Awareness of reporting back to management team, and understanding of relevant information. Comparison of reflex tasking (eg SFR, SRT level) with formal search operations (eg SEARCH level). The reflex tasking using Koester's bike wheel (although an effective model) isn't successful all of the time. The SEARCH course picks up when the reflex tasking has been inconclusive. A search operative may be operating in the recovery phase rather than rescue phase. Consideration of search areas that are beyond the capability of the search operative, eg weir, deep water, heights, and other complex hazards.



	Skill sheet element		Learning outcome	Key teaching points
3	The command structure of search operations	3.1	State the agency responsible for the oversight of search operations within your area of operation	Within each operational area, there will be a designated body responsible for being the primary coordinating agency for search operations. (Search primacy). Eg in Ireland it's the local authority for flooding operations. In the UK, it's the police.
		3.2	Classify the strategic, tactical and operational levels of command and their role within a search operation	Describe the remit of each tier within an operational command structure.
		3.3	Describe the principles of joint interoperability	The use of a model to enhance interoperability when working with partner agencies (eg JESIP), to include a joint understanding of risk.



	Skill sheet element		Learning outcome	Key teaching points
4	Search terminology	4.1	Recall the definitions of probability of area, proportional consensus approach, probability of detection and probability of success	Probability of area (POA) – Likelihood that the Subject is in a given area, based upon a proportional consensus approach. Proportional consensus approach – methodology that enables all participants to have equal weighting within a decision-making process. Probability of detection (POD) – Calculation that a given search asset would have located the Subject, based upon coverage of a given area, track line length and search topography. Probability of success (POS) – $POA \times POD$. Enables managers to allocate resources with maximum effectiveness.
		4.2	Recall the definitions of the stages of a search, to include reflex tasking, primary phase and subsequent phases	Primary - Reconnaissance including identifying hazards, identifying locations for secondary search, shout and listen techniques, quick visual sweeps. Reporting. Secondary (river-based)- Searching identified hotspots from the bank. Secondary search (flood-based, low coverage) - searching hotspots highlighted in primary search. Secondary search (flood-based, high coverage) - full search of buildings, removal of debris from buildings, no further searching will take place after this. Potential for body recovery. Body recovery considerations



	Skill sheet element		Learning outcome	Key teaching points
5	Introduction to lost person behaviour	5.1	Identify sources of local, national and international lost person behaviour databases	Eg ICE-SAR lost person mapping, Dr Lorna Dennison-Wilkins' Body Recovery from Water Study, Lost Person Behavior by Robert Koester.
		5.2	Recall how search managers will apply the information within lost person behaviour datasets during a search operation.	Search operatives will be tasked by managers to search particular areas based on capability and risk, and likelihood of the locality of the Subject. Eg comparison of missing kayaker vs missing Subject in urban flooding setting.
6	Briefing and debriefing	6.1	Receive and record a briefing from an incident commander or relevant body	Accuracy of briefing, relevant information, location of deployment, relevant mapping, local knowledge
		6.2	Perform a pre-search briefing to a search team	What we face. What we are going to do. Why we are going to do that. Hazards. Now talk to me. Anyone can call stop if they have safety concerns. Consideration of locally-used briefing models including GSMEAC, IIMARCH etc.
		6.3	Debrief the incident	Team debriefing. Incident commander debrief. Where we've searched. Where we haven't searched. Search data, mapping, track line length from GPS.
7	Navigation	7.1	Recall appropriate navigational tools	Eg mapping apps, GPS, and map and compass.
		7.2	Demonstrate use of a map and compass to navigate to a feature/ marker	Orient the map using the compass. Pacing, timing and ground interpretation. Consideration of magnetic variation.
		7.3	Demonstrate use of electronic navigational aid (eg GPS) to navigate to a feature/marker	Phone navigation apps or specialised GPS. Waterproofing your phone. Limitations.



	Skill sheet element		Learning outcome	Key teaching points
8	Search equipment and techniques	8.1	Recall search-specific equipment	Bathyscope
		8.2	Describe the thriving rather than surviving approach to working in an environment	For a search operative to be able to effectively search, they must be very comfortable within the water environment. If they are merely surviving, they will not have the bandwidth to be able to search.
		8.3	Recall the technique of working in mutually-supportive teams, to effectively search opposite riverbanks concurrently	The teams communicate with each other and move at a similar speed, so that each bank is searched by the opposite team, looking into undercuts and eddies.
		8.4	Recall the search cube technique	Searchers gain a different perspective by looking forwards, backwards, to the left and to the right. Search operators are encouraged to 'purposefully wander' rather than adhere to a strict path. They should be inquisitive and empowered to investigate areas of suspicion and interest.
		8.5	Recognise hotspots that are beyond the capability of the search team, and report those to a search manager	Hotspot identification, awareness of risk (eg strainers, weirs etc), placement of marker of hotspot on map or app, reporting to search manager.
9	Suspending the search	9.1	Recall when search managers will suspend a search	Suspension of search operations when total POA reaches 85%, due to diminishing returns.
		9.2	Recall considerations within the recovery phase of a search operation	Mental health and well-being of search operators (eg in body recovery, or no person found), equipment care and maintenance, lessons learned.
		9.3	Collate evidence that would be provided to the agency with primacy at the suspension of a search	Mapping and data, search plans, bagged and tagged evidence if applicable, reports.



	Skill sheet element		Learning outcome	Key teaching points
10	Prerequisite skills from SFR or SRT	10.1	Demonstrate in-water skills, as covered on the Rescue 3 Swiftwater and Flood First Responder or Swiftwater and Flood Rescue Technician courses.	The Searching Rivers and Floods course is for existing SFR or SRTs who are tasked as search operatives in water-based searches The core principles of working in and near water apply in SFR, SRT and SEARCH, including (but not limited to) PPE and team equipment, hazards, hydrology, rescues, self > team > victim.
11	Search scenarios in rivers and floods	11.1	Perform multiple water search incident scenarios, taking the role of a search team leader or search operative	This can be split into small scenarios (such as perform a pre-search briefing) and full incident scenarios from pre-deployment to post-briefing. Scenarios should be tailored to the level of training of the rescue team. The focus of scenarios is on the search operative's role within any given incident. All students should have the opportunity to perform as team leader. Time should be given at the end of each scenario for the instructor to debrief the designated team leader and other students on their performance. Example scenarios to maximise the range of features including shallow water, fast water, strainers and recirculating features. The aim isn't to 'hide a dummy' and have the search team find it. The learning opportunities are in performing appropriate briefing and operating within a range of environments.



Managing Search Operations (MSO)

Course overview and target audience

The Managing Search Operations (MSO) course is for search managers, who will be tasking search operatives to perform water-based searches.

Contact hours 12 hours (2 days)	Prerequisites Rescue 3 SFR or above
Qualification valid for 3 years	Accredited by Rescue 3 Europe

Taught by

- Managing Search Operations Instructor (MSOI)

Assessment

The assessed elements of this course are:

- Foundation knowledge
- Tactical briefing and de-briefing
- Search management



Managing Search Operations (MSO) skill sheet contents

Theory	
1.	Prerequisite knowledge from SFR
2.	Search manager remit and role
3.	The command structure of search operations
4.	Search terminology
5.	Lost person behaviour
6.	Tactical briefing and debriefing
7.	Situational awareness with mapping and mapping aids
8.	Search equipment and techniques
9.	Suspending the search
Practical	
10.	Tabletop search management exercise



Management of Search Operations (MSO)

learning outcomes and key teaching points

	Skill sheet element		Learning outcome	Key teaching points
1	Prerequisite knowledge from SFR	1.1	Recall water rescue knowledge, as covered on the Rescue 3 Swiftwater and Flood First Responder course	The Managing Search Operations course has a prerequisite of Rescue 3 SFR or above (eg SRT, MWFI). This enables search managers to have a clear understanding of the environments that they will be tasking searching operatives to.
2	Search manager remit and role	2.1	Recall the remit and role of a search operative	Search manager is managing searches of rivers and floods, rather than operating in rivers and floods. Comparison of reflex tasking (eg SFR, SRT level) with formal search operations (eg SEARCH level). The search manager is responsible for the effective coordination of resources within a search operation. This includes the correct allocation of a team's capability to a given risk and terrain. The search manager should be able to apply principles derived from classical search theory, including POA, POD, and POS. A search manager may be operating in the recovery phase rather than rescue phase. Consideration of search areas that are beyond the capability of the search teams, eg weir, deep water, heights, and other complex hazards, and calling in of additional assets



	Skill sheet element		Learning outcome	Key teaching points
3	The command structure of search operations	3.1	State the agency responsible for the oversight of search operations within your area of operation	Within each operational area, there will be a designated body responsible for being the primary coordinating agency for search operations. (Search primacy). Eg in Ireland it's the local authority for flooding operations. In the UK, it's the police.
		3.2	Classify the strategic, tactical and operational levels of command and their role within a search operation	Describe the remit of each tier within an operational command structure.
		3.3	Describe the principles of joint interoperability	The use of a model to enhance interoperability when working with partner agencies (eg JESIP), to include a joint understanding of risk.



	Skill sheet element		Learning outcome	Key teaching points
4	Search terminology	4.1	Recall the definitions of probability of area, proportional consensus approach, probability of detection and probability of success	Probability of area (POA) – Likelihood that the Subject is in a given area, based upon a proportional consensus approach. Proportional consensus approach – methodology that enables all participants to have equal weighting within a decision-making process. Probability of detection (POD) – Calculation that a given search asset would have located the Subject, based upon coverage of a given area, track line length and search topography. Probability of success (POS) – $POA \times POD$. Enables managers to allocate resources with maximum effectiveness.
		4.2	Recall the definitions of the stages of a search, to include reflex tasking, primary phase and subsequent phases	Primary - Reconnaissance including identifying hazards, identifying locations for secondary search, shout and listen techniques, quick visual sweeps. Reporting. Secondary (river-based)- Searching identified hotspots from the bank. Secondary search (flood-based, low coverage) - searching hotspots highlighted in primary search. Secondary search (flood-based, high coverage) - full search of buildings, removal of debris from buildings, no further searching will take place after this. Potential for body recovery. Body recovery considerations



	Skill sheet element		Learning outcome	Key teaching points
5	Lost person behaviour	5.1	Identify sources of local, national and international lost person behaviour databases	Eg ICE-SAR lost person mapping, Dr Lorna Dennison-Wilkins' Body Recovery from Water Study, Lost Person Behavior by Robert Koester.
		5.2	Apply the information within lost person behaviour datasets to a search operation.	Search operatives will be tasked by managers to search particular areas based on capability and risk, and likelihood of the locality of the Subject. Use of lost person behaviour datasets (eg Lost Person Behavior by Robert Koester) to plan a search operation, based upon different subject profiles, eg comparison of missing kayaker vs missing Subject in urban flooding setting.
6	Tactical briefing and de-briefing	6.1	Deliver a tactical briefing to a search team	Accuracy of briefing, relevant information, location of deployment, relevant mapping, local knowledge Consideration of locally-used briefing models including GSMEAC, IIMARCH etc.
		6.2	Receive and capture a debrief from a search team at an incident	Team debriefing. Incident commander debrief. Where we've searched. Where we haven't searched. Search data, mapping, track line length from GPS.
		6.3	Relay a situational report to a strategic commander	Situational report template examples.
7	Situational awareness with mapping and mapping aids	7.1	Use appropriate mapping tools to plan a search area, apportion manageable sections, and allocate to search teams.	Mapping tools including mapping apps, GPS, and paper maps. Assessment of topography, search areas and search team capabilities.
		7.2	Appraise electronic navigational aids (eg GPS) and map and compass	Comparison of benefits and limitations of phone navigation apps or specialised GPS, and map and compass.



	Skill sheet element		Learning outcome	Key teaching points
8	Search equipment and techniques	8.1	Recall search-specific equipment	Bathyscope
		8.2	Describe the thriving rather than surviving approach to working in an environment	For a search operative to be able to effectively search, they must be very comfortable within the water environment. If they are merely surviving, they will not have the bandwidth to be able to search.
		8.3	Recall the technique of working in mutually-supportive teams, to effectively search opposite riverbanks concurrently	The teams communicate with each other and move at a similar speed, so that each bank is searched by the opposite team, looking into undercuts and eddies.
		8.4	Recall the search cube technique	Searchers gain a different perspective by looking forwards, backwards, to the left and to the right. Search operators are encouraged to 'purposefully wander' rather than adhere to a strict path. They should be inquisitive and empowered to investigate areas of suspicion and interest.
		8.5	Receive a hotspot marker from a search team that locates an area that is beyond the capability of the search team, log it, map it, and allocate additional assets	Hotspot identification, awareness of risk (eg strainers, weirs etc), placement of marker of hotspot on map or app, receiving hotspot marker, logging, mapping and allocating appropriate additional assets (eg discussing drones, powerboats, dive teams etc).



	Skill sheet element		Learning outcome	Key teaching points
9	Suspending the search	9.1	Defend the decision to suspend a search	Suspension of search operations when total POA reaches 85%, due to diminishing returns.
		9.2	Explain the management of media cells, family liaison, community volunteers and public perception	Considerations for the search manager's role of the management of media cells, family liaison, and community volunteers, and public perception.
		9.3	Recall the recovery phase of a search operation	Mental health and well-being of search operators (eg in body recovery, or no person found), equipment care and maintenance, lessons learned.
		9.4	Present evidence, received from a search team, that would be provided to the agency with primacy at the suspension of a search	Mapping and data, search plans, bagged and tagged evidence if applicable, reports.



	Skill sheet element		Learning outcome	Key teaching points
	Tabletop search management exercise	9.5	Apply lost person behaviour to the exercise-based Subject	Present initial (exercise) information pertaining to a lost person scenario
		9.6	Appraise the lost person scenario, and present a search scenario of what has happened	Set the objectives for the day, to include analysis of the missing Subject, the presentation of a scenario of what happened, the allocation of search areas, the reception of exercise-based data relating to teams in the field, and the subsequent application of that data.
		9.7	Use mapping tools to develop a search plan, based upon POA and manageable portions to search for the given search assets	Use of mapping tools, and tabletop exercise injects from the exercise director.
		9.8	Analyse the given search data from the exercise director, to determine POD.	Calculation of POD using tabletop exercise injects from the exercise director.
		9.9	Calculate POS based on POA and POD.	Calculation of POS using tabletop exercise injects from the exercise director.
		9.10	Determine subsequent search deployments based upon POS.	Search deployments based upon calculated POS.
		9.11	Close off a successful search incident	When closing an incident, search managers to demonstrate consideration of mental health and well-being of search operators (eg in body recovery, or no person found), equipment care and maintenance, lessons learned. Mapping and data, search plans, bagged and tagged evidence if applicable, reports.
		9.12	Defend the decision to suspend an unsuccessful search	Suspension of search operations when total POA reaches 85%, due to diminishing returns.





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