EXTENDED SEARCH PLANNING

TRAINING COURSE

AIDE MEMOIRE

Table of Contents

Abbreviations

CIMS	Coordinated Incident Management System
CIS	Critical Incident Stress
CISD	Critical Incident Stress Debriefing
EAP	Employee Assistance Programme
ESP	Extended Search Planning
ETA	Estimated Time of Arrival
GOSA	Goal, Objectives, Strategies, Assignments
GPS	Global Positioning System
GSMEACS	Ground, Situation, Mission, Execution, Administration, Command, Control, Communications, Safety
IAP	Incident Action Plan
IC	Incident Controller
ICP	Incident Control Point
IMT	Incident Management Team
IPP	Initial Planning Point
ISRID	International Search & Rescue Incident Database
LAST	Locate, Access, Stabilise, Transport

LPB	Lost Person Behaviour
MBO	Management by Objectives
MMTIR	Marine: Manage the Initial Response
MP	Missing Person
NOK	Next of Kin
NSARC	National Search and Rescue Council
NZDF	New Zealand Defence Force
NZSAR	New Zealand Search and Rescue Council
PIM	Public Information Management
PLS	Position Last Seen
POA	Probability of Area
POD	Probability of Detection
POS	Probability of Success
RCCNZ	Rescue Coordination Centre of New Zealand
ROW	Rest of World
SAD	Search Area Determination

SAR	Search and Rescue
SAREX	Search and Rescue Exercise
SARNET	Search and Rescue Network
SAROP	Search and Rescue Operation
SEE	Search Effort Evaluation
SMART	Specific, Measurable, Achievable, Relevant, Timely
SME	Subject Matter Expert
SMS	Safety Management System
SOP	Standard Operating Procedure
SRU	Search and Rescue Unit
USAR	Urban Search and Rescue

Overview

The Managing the Initial Response course (MTIR) provided you with knowledge and a basic skill set, enabling you to participate meaningfully in an incident management team in the initial response phase of a search and rescue operation. Key topics covered for the initial response included:

- operational pre-planning
- search urgency assessment
- information gathering
- lost person behaviour theory
- initial actions
- establishment and confinement of the initial search area and decision points
- assigning search and rescue resources.

Search and rescue should be evidence based and intelligence led.

Search operations that progress beyond the initial response phase require a well-developed and structured approach to search planning and implementation. This period of formal search planning has a specific framework that has been developed around key principles of search management.

This training consists of five fundamental components: Operational Management, Search Area Determination, Search Implementation, Search Evaluation and Operational Review. This is presented as a cyclical process incorporating the NZSAR Response Guidelines (NZSAR, 2014).

Search Management involves a number of key principles that need to be recognised. Search and rescue is an emergency situation and therefore is time critical. If the ultimate goal of search and rescue is success in the shortest time possible, then attention should be paid to the two essential elements of a successful search:

1. Be looking in the right place.
2. Be able to detect what it is you are looking for.

To be successful in search and rescue it is important to recognise that both search and investigation are each vital components of the process. Search management should focus on manageable factors that are important and will influence search success:

- Good information gathering and management.
- Confinement of the search area.

- Searching for clues as well as the missing person.
- Deployment of appropriate trained resources in a defined order.

In the training, allocation of resources to the search areas are guided by intelligence-led, evidence-based assessments for specific scenarios. Following multiple operational periods the decision as to where to search in order to enhance the probability of success is now based on information provided by field teams, and informed assessment of the likelihood of detection and investigation.

Overview of search management phases

Search management is a process that is best considered in terms of a series of sequential phases.

Pre-planning phase

A response plan outlines an overall approach to search and rescue operations and provides a useful management tool where information, guidelines and technical data are collated. The response plan provides a foundation for further specific planning of individual operations, and is based on information that is researched and prepared in advance.

Initial response phase

Initial actions, which may be based on a response plan, often involve the rapid deployment of resources to likely spots and containment of the search area. These initial actions, based on the *Land Search and Rescue Response Guidelines* (NZSAR, 2014), will include:

- gathering information and start documenting search effort (includes subject description, search area, circumstances)
- conducting search urgency assessment
- investigation
- developing an initial action plan
- search planning for initial actions
- resource allocation
- risk management
- team tasking.

Extended search planning

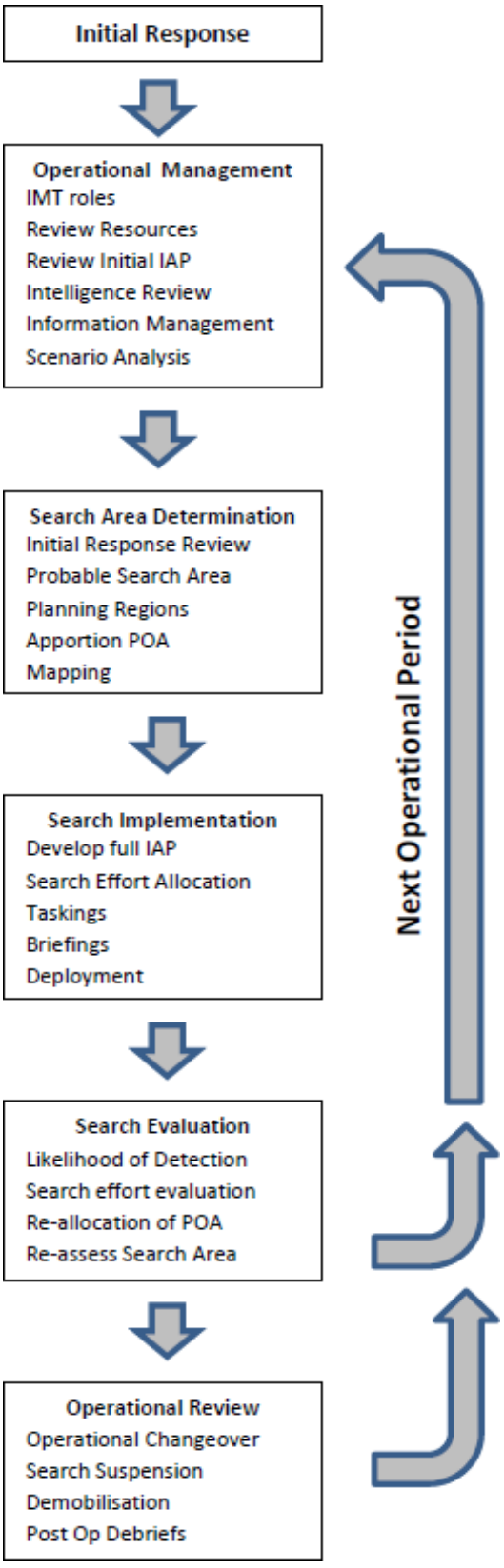
Following the initial response phase, if a search remains unresolved, then it will transition into a more deliberate search planning phase, the most detailed level of search planning.

This phase is described as extended search planning. It is based on analysis of initial actions, and effective use of search theory by a management team that uses investigation and intelligence together with consensus decision making.

The actions taken during extended searches are based on the Land Search and Rescue Response Guidelines (NZSAR, 2014) and include:

- scenario development and analysis
- expanding IMT
- establish probable search area
- create planning regions
- further investigation and information management
- incident action planning
- search effort evaluation
- revise planning region probability
- operational changeover/handover
- search suspension
- demobilisation
- debriefing.

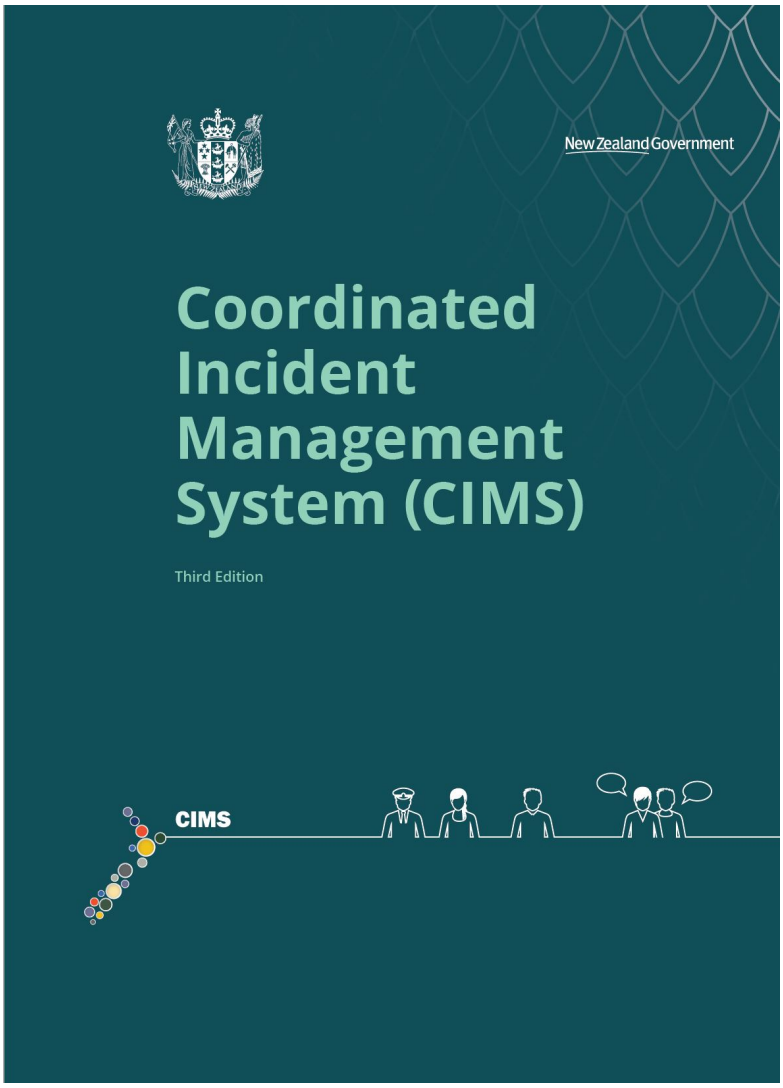
Operational Management



CIMS: A review

The New Zealand Coordinated Incident Management System (CIMS) provides a model for command, control and coordination of any emergency response. This is the agreed model for managing SAR incidents in New Zealand.

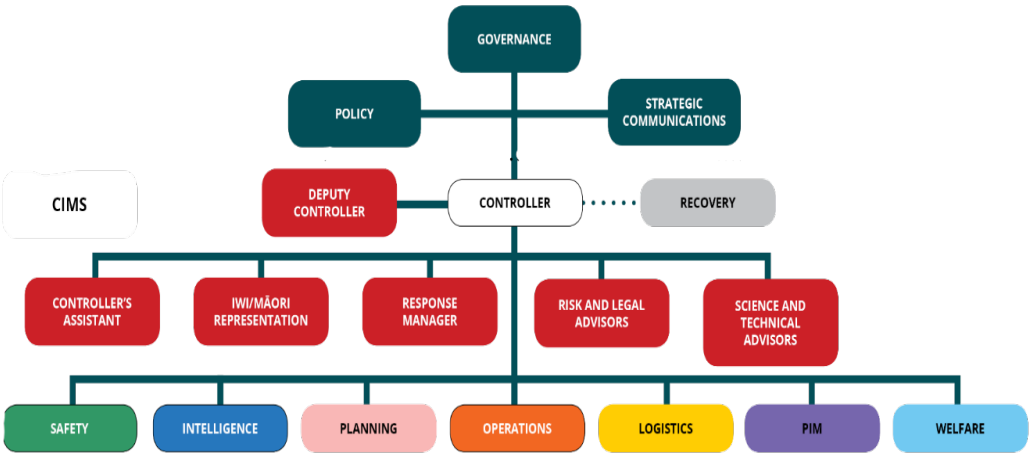
CIMS was updated in 2020 and all previous versions have been replaced by the CIMS 3rd edition. This has made several alternations to the principles and characteristics of CIMS as well as the functions. You need to be familiar with the contents of CIMS 3rd edition, which can be download from www.civildefence.govt.nz.



Incident management team structure

The members of the incident management team (IMT) in a single agency incident-level response are all from one agency, so command and control are relatively simple – there is one line of command.

However moving into an extended search planning phase requires a greater level of structure than the initial response.



The responsibilities for each of the functions are summarised in the table below.

Function	Responsibilities
Control	Coordinates and controls the response
Intelligence	Collects and analyses information and intelligence related to context, impact and consequences; also distributes intelligence outputs
Planning	Leads planning for response activities and resource needs
Operations	Provides detailed direction, coordination, and supervision of response elements on behalf of the Control function
Logistics	Provides personnel, equipment, supplies, facilities, and services to support response activities
Public Information Management	Develops and delivers messages to the public, directly and through the media, and liaises with the community if required
Welfare	Coordinates the delivery of emergency welfare services and resources to affected individuals, families/whānau, and communities

Risk management

This is the process of analysing exposure to risk and determining how best to manage that exposure. Risk management considerations may include:

- safety for response personnel and members of the public
- legal issues
- the reputations of the associated response and governance organisations.

Although the Incident Controller has overall responsibility for ensuring effective risk management practices, each team should have their own risk assessment and management plan.

The Land Search and Rescue Response Guidelines (NZSAR, 2014) suggest:

- a safety advisor should be appointed
- risks are identified, and risk management strategies developed
- emergency procedures considered in case of emergency
- all safety points, emergency procedures and rescue plans should be documented in the Safety Plan form of the Incident Action Plan (IAP) for each operational period.
- all agency safety management safety systems processes should be implemented, and appropriate documentation used.

The priority in risk management is ensuring responder safety.

> *A health and safety plan is a plan to keep all the people involved in search planning and implementation safe. The rescue plan is the plan that would be implemented should the rescuers need rescuing - it is a contingency plan in the event that the health and safety controls are insufficient to keep searchers safe in the field.*

The Incident Action Plan

An Incident Action Plan (IAP) is a document that describes how the response will be managed and how activities are integrated to achieve the response objectives for an operational period. It states the goal and objectives of the operation, where the goal is the desired outcome of the operation, and the objectives are specific, measurable, achievable, realistic and timely (SMART).

The main purpose of the IAP is to ensure that the objectives are aligned both in the IMT and in the field. It is the responsibility of the Incident Controller to ensure that there is an IAP – this is usually developed by the IMT team.

An IAP for an initial response includes the following key elements:

- situation summary
- command structure – individuals named using the CIMS structure
- goals, incident objectives, strategies and resource needs
- actions or operational taskings
- communication plan
- safety plan.

After the Initial Response, the IAP is developed for a multi-period and, in addition to the information contained in the initial response IAP, it also includes:

- detailed situation report
- missing person summary
- incident objectives for a specified operational period (these include strategies)
- more complex IMT structure, where required, including public information management - media liaison identified and a plan in place for interacting with media.
- sector assignments
- detailed safety plan that includes the management of safety and hazards during the operational period
- a rescue plan to ensure the safe rescue of all individuals in the field
- medical plan

- weather information – a continuously updated weather forecast for the search area.

Management by objectives

Management by objectives (MBO) is used to plan and track progress towards the identified Goal.

Management of the situation is driven by the Goal, which in all search and rescue operations is to locate the missing subject.

To achieve the goal:

1. Objectives are identified (what needs to be done)
2. Strategies decided (how will it be done), and
3. Assignments or taskings are assigned (who will do it).

The aim of the objectives is to achieve the goal. Each objective will require a number of different strategies to ensure that the objective is achieved. Each strategy will require one or more assignments – this is the operational detail.

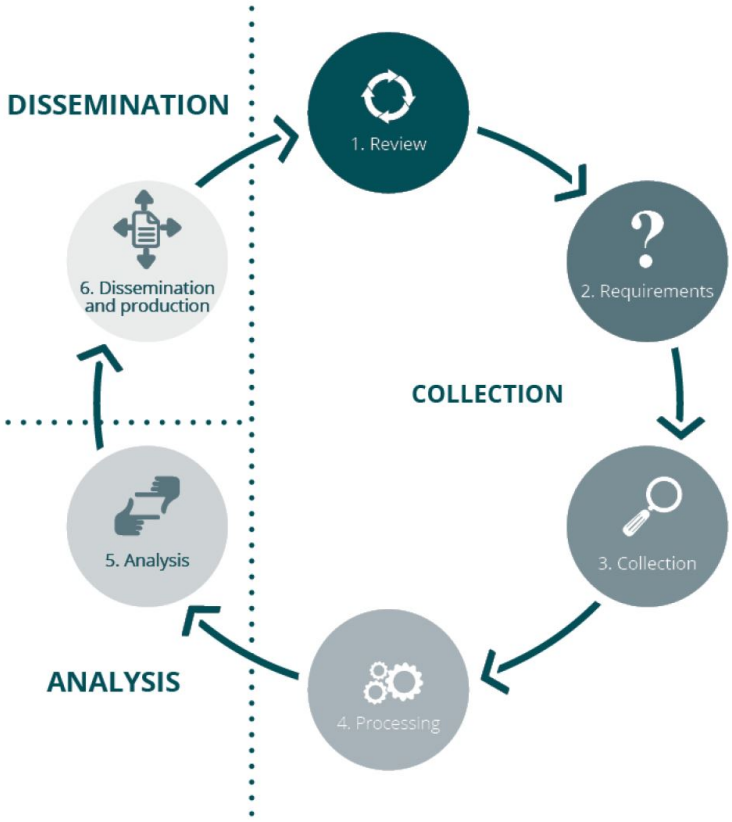
Intelligence review

A SAROP is an intelligence driven and evidenced based operation.

Intelligence provides the other CIMS functions with a detailed understanding of the incident and the ways the incident could potentially develop. It provides situational awareness and understanding for:

- immediate action
- forecasting, and
- emerging risks.

In the IMT the Intelligence role is responsible for collection and analysis of response information. The intelligence cycle (see diagram below from CIMS 3rd ed.) outlines the process used to answer the questions the IC has about the missing person and supports the effective operation of the Intelligence team member.



For multi-period search operations determine what information is needed.

In multi-period search operations it is important to identify what additional information can be found to help locate the missing person. This can be identified through gap analysis, which is a simple tool to help identify the gap between the current situation and the future situation that you want to reach.

A simple gap analysis may include:

- Identifying the future situation. In this case the operation goal might be the future situation.
- Analysing the current situation. What information do you have and where? Who has the knowledge you need? What is the best way to collect this information? Consideration can be given to interviews, review of current documentation, observations and field team debriefs.

- Identifying how to bridge the gap. Do you need more field teams, more interviewers, further internet searches?

Generating ideas by brain storming within the IMT is another technique that can be used to identify sources of further information.

Information analysis will feed into objectives and strategies. What information is required, where it can be sourced, and who is capable of sourcing it should be considered.

It is important to:

- consider tangential enquiries
- always seek corroboration from independent sources and avoid relying on a single source of information
- analyse all information received for reliability and accuracy.

Types of information or evidence may include:

Type	Examples	Positives	Comment
Testimonial	Obtained through interview. A variety of people may be asked (friends, relatives, peers, eye witnesses, experts).	Often the greatest source of information, most available form of information.	Can be contradictory, often unreliable, open to misinterpretation. May be incomplete.
Physical	In the field and may include vehicles, clothing, artefacts, hard evidence left by subject.	Often corroborates other types of evidence, least likely to be misinterpreted.	
Documentary	Logs, registrations, permits, hut books, bank records, video recordings.	Can help pinpoint a location, time and presence of subject. Used to corroborate other types of physical evidence.	

Statistical	International SAR statistics, e.g. Koester, Grampian Police Reports, local statistics.	Provides broad spectrum of information.	Needs to be supported by Missing Person Profile information.

Reliability of the Source	Credibility of the Information
A Completely reliable	1 Confirmed by other sources
B Usually reliable	2 Probably true
C Fairly reliable	3 Possibly true
D Not usually reliable	4 Doubtful
E Unreliable	5 Improbable
F Reliability cannot be judged	6 Truth cannot be judged

Information is evaluated to assess its reliability and credibility. How reliable the source is and how likely the information is true. Information cannot be taken at face value.

Information can be given a reliability score and a credibility score. This can be shown as a rating for an individual piece of information that indicates the degree of confidence placed in it.

Why does Intelligence fail?

A common theme is not the failure to collect intelligence but:

- failure to adequately resource the IMT (personnel),
- failure to share intelligence
- either unwillingness or inability of collectors or analysts to share intelligence
- failure to analyse collected material objectively
- conscious or unconscious bias

- failure to act on intelligence.

Bias

A cognitive bias is a strong, preconceived notion of someone or something, based on information we have, perceive to have, or lack. These preconceptions are mental shortcuts the human brain produces to expedite information processing—to quickly help it make sense of what it is seeing. Common biases are:

- Confirmation Bias – scenario lock
- The Dunning-Kruger Effect
- In-group bias
- Self-serving bias
- Availability bias
- Fundamental attribution bias Hindsight bias
- Anchoring bias
- Optimism bias
- Pessimism bias
- The halo effect
- Status quo bias

Information organisation

Information gathered during a SAROP can be overwhelming and therefore it must be organised and managed to ensure that the correct information reaches the right people in a timely fashion. Information management (flow) should be considered at the establishment of an IAP.

In order to ensure flow through the IMT, systems and processes must be established to allow:

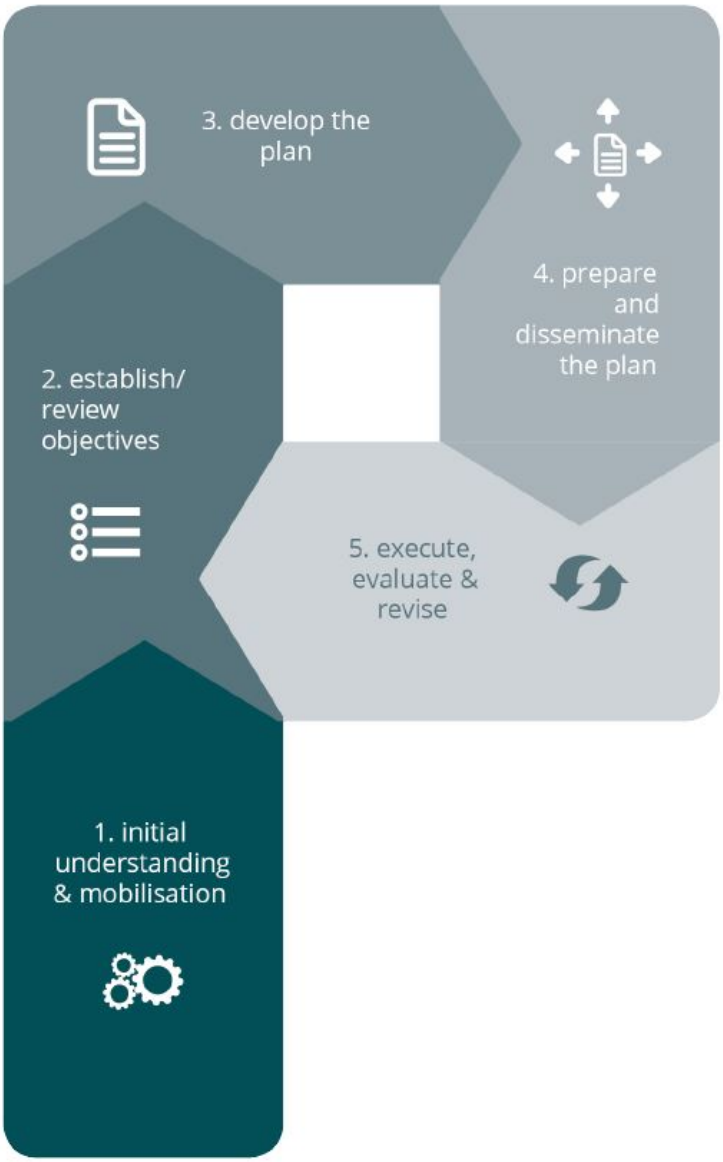
- all information to be documented, processed and analysed
- all relevant information to be disseminated e.g. briefings, wall charts, maps, displays
- all documents to be appropriately collated and stored.

The cyclical planning process

Search planning is a cyclical process - there is need to evaluate the response at the end of each operational period. The planning process model shown is from CIMS 3rd ed.

Planning is the role responsible for overseeing the development of response plans, e.g. Action, Long-term, Contingency and Transition Plans. The Controller has ultimate responsibility for these plans; planning is responsible for carrying out the planning process on the Controller's behalf.

The Planning Manager must utilise the "planning P" as illustrated on the following page to ensure that planning is effective. The planning process should be collaborative across all roles and key stakeholders.



Successful planning depends on the following inputs:

- The Controller's intent for the response.
- The Controller's response objectives, which are the outcomes that a response is aiming to achieve.
- Impact and context analysis from Intelligence outputs. These are used by Planning when developing and analysing options.
- Information and ongoing engagement in the planning process from Control, Operations, Logistics, Public Information Management (PIM), Welfare, Safety,

Recovery, support agencies and other Incident Management Team members, e.g. lifeline utilities and iwi/Māori representation; and

- Information on available response resources (immediately available and en-route) from Logistics, Operations and/or support agencies.

CIMS 3rd Edition notes - Without accurate information on the current state, predicted or forecast situation, and resource availability, planning cannot be effective.

Determining the search area

Review the Initial Response

Develop and rank scenarios

Construct the probable search area

Identify planning regions

Rank regions– high to low POA

Divide high POA regions into segments

Rank segments – high to low POA

The highest POA segments are searched.

Reviewing the Initial Response

The initial response will include the following.

Establishing the key planning points

These may include the initial planning point (IPP), last known position (LKP) and position last seen (PLS).

Identifying an initial search area

A close-in-search area around the IPP. This area around the IPP is considered clue-rich. The shape of the initial search area will be influenced by geographical terrain and linear features.

Analysing the terrain

In order to identify:

- likely travel routes or linear features
- hot spots and attractants
- any major decision points on map
- hazards for subject/s and searchers.

Calculating theoretical and statistical distances

Calculated the theoretical travel distance in the time elapsed. The search areas for 25%, 50%, 75% and 95% are recorded on a map.

Determining containment points

By determining appropriate containment points it prevented the probable search area from growing. Containment can also identify potential witnesses from which more information could be gathered.

Review those initial decisions – what it is and why each was chosen.

Developing scenarios

A scenario is a hypothesis – a description, in story form, of possible events to describe what might have happened to the missing person after they left the LKP/IPP. Scenarios are used to assist us to decide where to search, what to search and how to search. Scenarios should be evidence-based.

Each scenario should attempt to include these components:

- starting point
- direction of travel
- route
- destination
- an activity or purpose.

When developing scenarios, it is important that they:

- fit with the known facts (subject profile, technical advice)
- are realistic
- consistent with statistical LPB
- fit the terrain analysis.

Scenarios developed are recorded on a Scenario Recording form.

Scenario analysis

Scenarios are developed and then analysed using information from the missing person profile, incident history, map and local knowledge, likely behaviour (LPB information) and other sources and investigations.

After developing the scenarios, conduct analysis to determine the likelihood of the scenarios and then rank them. As more information becomes available, intelligence analysis will be used to continually assess the accuracy, and therefore the likelihood, of scenarios.

Different methods can be used to determine the likelihood or plausibility of the scenarios.

An evidenced-based approach analyses all of the evidence collected to date, and determine what evidence supports the scenario and what evidence refutes or is contrary to it. Based on this analysis of the evidence, the IMT team then make a judgement as to how likely the

scenario is. A similar approach can be taken to determine the priority order of the scenarios by comparing different scenarios.

When attempting to identify the cause of or predict the outcome of an event, most of us focus our analysis on a preconceived hypothesis. We then defend that hypothesis by trying to refute or simply ignore evidence to the contrary.

Analysis of Competing Hypotheses (ACH)

Developed in the 1970's by Richards J. Heuer, Jr., the former head of the analytic methods unit in the CIA, ACH is easy to do and can be applied to many problems. It is a technique used to combat the tendency to favour one explanation from the very beginning, and to focus on evidence that is inconsistent rather than consistent with various hypotheses.

The ACH process is designed to provide an unbiased methodology to evaluate competing hypotheses for observed data. The focus on "inconsistent" evidence is important because consistent evidence often applies to multiple hypotheses and therefore tends to reinforce biases of trying to prove a preconceived idea.

It is beyond most people's ability to retain five or seven scenarios in their working memory and note how each item of information fits into each hypothesis. ACH provides a process to understand this complexity.

ACH is appropriate for almost any analysis where there are alternative explanations. Use it to leave an audit trail of what relevant information was considered and how different analysts arrived at their judgments.

ACH has benefits as it can:

- leave a clear audit/decision trail
- reduce biases by focus on inconsistent evidence
- consider all evidence/does not ignore contrary evidence
- provide a process to analyse complex scenarios and note how each item of information fits into each hypothesis.

The process requires the assembling and organisation of the collected information in a useful way so that it can be readily retrieved for analysis. **This is done by creating a matrix with relevant information down the left side and hypotheses across the top**. Each item of information is then evaluated as to whether it is consistent or inconsistent with each hypothesis.

Evidence	Scenario A	Scenario B	Scenario C
Asked about walks to Red Tarns, Hooker and Kea Point	C	C	I
Empty camera case	C	C	C
Nike Cap	C	I	I
No banking activity	NA	NA	I
Not seen on carpark CCTV	I	C	C

C= Consistent, I= Inconsistent

Used to disprove Scenario - Scenario C least likely as it has most Inconsistent evidence at this time.

ACH can also be used to prioritise search areas.

Another means of scenario likelihood/plausibility evaluation is to use probability judgement to estimate the likelihood of the scenarios. In SAR this process is called **consensus management**. Consensus management utilises diversity in opinion and expertise in the analysis of usable data. It requires a group of people with a wide range and variety of experience to work collectively to develop possible scenarios and assign likelihoods to them based on the data.

Consensus management has benefits, as it can:

- reduce dominant personalities – this may be more pronounced in situations where power balance relationships may affect decisions
- reduce disagreements/arguments
- reduce bias in decision making by aggregating opinion – this allows for subjectivity but extreme opinions can be moderated through aggregation.

Use analysis to rank scenarios

After the initial response phase, the allocation of probability of area (POA) will be based on scenario plausibility. The process of analysing plausability is led by the Intelligence Manager or IC. When assembling a number of individuals that are to contribute to scenario analysis by consensus management, it is advisable to include a wide range of people from various agencies who do not necessarily need to be SAR experts. These individuals may have local area knowledge, understanding of the type of activity engaged by the subject (e.g. hunting, tramping), first aid knowledge, environmental knowledge (weather, terrain), experience of search and rescue and other experience.

The selection and set up of the group needs to take into account the following:

- **diversity of opinion** – who to use in the group.
- **access to intelligence** – all members of the group are required to have access to all of the information available.
- **independence** – ensure each member of the group has the opportunity to make decisions irrespective of others in the group.
- **uninterrupted time for discussion** – allows for sharing of ideas, discussion of opinions.

The NZSAR Scenario Weighting Worksheet (https://nzsar.govt.nz/sar-operational-support/forms/land/) is used to estimate the likelihood of scenarios after considering the available evidence.

During the initial response period a number of scenarios may have already been identified and used to give rise to taskings for the initial response. When developing further scenarios from available information it is important that those initial scenarios are revisited. Try to come up with at least three scenarios.

Applying weightings

Each member of the group independently selects the scenario they believe is the one that has most likely occurred. They assign it the reference value of 100.

Each member then independently ranks the other scenarios against their most likely scenario. This process of proportion-based analysis is designed to rank the likelihood of each scenario against the one scenario that you have identified as most likely to occur. The values allocated to the remaining scenarios are from 10 to 100.

Ranking the scenarios

Follow these steps:

1. Tabulate the values assigned to each scenario by each group member.
2. Calculate the total value for each scenario.
3. Calculate the total sum of all the scenarios.
4. To determine the ranking, divide the value for each scenario by the total sum for all scenarios and multiply by 100.

This will result in a weighted percentage ranking for each scenario – the larger the number the more plausible the scenario is felt to be by the group.

Therefore, if a scenario is given the value of 50 the group has identified that it is only half as likely to occur as the most likely scenario that was assigned a value of 100.

Scenarios should be reviewed following search effort evaluation and reallocation of POA.

Constructing the probable search area

The previous work done on scenario analysis feeds in this stage. Many of the features of the Bicycle Wheel Model (refer to the Appendix for a diagram of that) are still relevant in this phase.

The search area is most often determined using a combination of these four methods.

1. Theoretical area

This is the area identified by the distance the subject could theoretically have travelled from the IPP. The distance travelled is calculated as the time elapsed (h) since the subject was missing multiplied by the speed over ground the subject is capable of (kilometres per hour).

As the subject may travel in any direction from the IPP, the search area is identified as a circle whose area can be calculated as r2 (where = 3.14 and r is the distance travelled).

There are guidelines (such as the Mountain Safety Council's *Bushcraft Manual*) for determining the various average speeds over different types of terrain.

Naismith's Rule, devised to estimate time to cover distances in the mountains states 'allow 1 hour per 5km walked and 1 hour for every 600m ascended'. Refer to MSC *Bushcraft Manual* (2011).

There are a number of considerations that should be taken into account when calculating theoretical search area. These are:

- **Misjudging subject capabilities** – which include factors that can affect subject ability to travel (e.g. injury, health, mental state).
- **Time delay** – discrepancies between the assumed and the actual elapsed time may result in over or under-estimating the distance travelled by the subject.
- **Terrain** – which will influence speed over ground. There are guidelines that can be used to provide an indication of the effect of terrain type on subject speed.
- **Transport** – different or multiple modes of transport may have been used by the subject.
- **Lost person strategies** – subjects that become disorientated may employ one of a number of methods to try to find something familiar. Koester (2008) refers to this as different strategies for getting 'unlost' that are employed by subjects.

These may be the result of:

- **Random travelling** – theoretical calculation assumes a linear direction of travel, however lost persons may move more erratically.
- **Route travelling** – the lost person decides to follow a trail or route in the hope they come across familiar terrain.
- **Direction travelling** – moving in direction whilst ignoring trails or paths.
- **Route sampling** – travelling down a number of trails at an intersection point in search of something familiar before returning back to the intersection point.
- **Direction sampling** – where a landmark or feature is used as a base and travel is from that feature in various directions.
- **View enhancing** – the subject attempts to find familiar or noticeable landmarks through climbing a hill or tree.
- **Backtracking** – the subject attempts to reverse their route to follow the same track back out.
- **Staying put** – remaining in one place.

2. Statistical area

This is the area calculated from data derived from previous searches that identifies distances travelled from the IPP by subjects of similar categories.

The main data source used to determine statistical search area is *Lost Person Behaviour* (Koester, 2008). However there are other resources available such as the *Grampian Police Study* which contains statistics derived from a number of UK incidents involving missing children and persons with various mental disorders, plus some observations on their behaviour.

There are a number of considerations that should be allowed for when calculating statistical search area, including the following.

Lost person behaviour statistics

These provide generalities. As the search data provided is based on subject categories, it is important to develop a comprehensive subject profile which is unique to the subject of the search. There is a need to consider any local lost person behaviour data that might be available.

For each subject category, Koester (2008) provides a reference value for the distance travelled within which 25%, 50%, 75% and 95% of the cases were found.

The distance travelled is categorised into three distinct groups: temperate domain, dry domain and urban areas.

The distances are calculated for 25%, 50%, 75% and 95%. These are then drawn on the map as circles whose radius is the distance travelled.

Hiker

Distance (horizontal) from the IPP (miles)					
	Temperate		Dry		Urban
	Mtn	Flat	Mtn	Flat	
n	**568**	**274**	**221**	**58**	**8**
25%	0.7	0.4	1.0	0.8	
50%	1.9	1.1	2.0	1.3	1.6
75%	3.6	2.0	4.0	4.1	
95%	11.3	6.1	11.9	8.1	

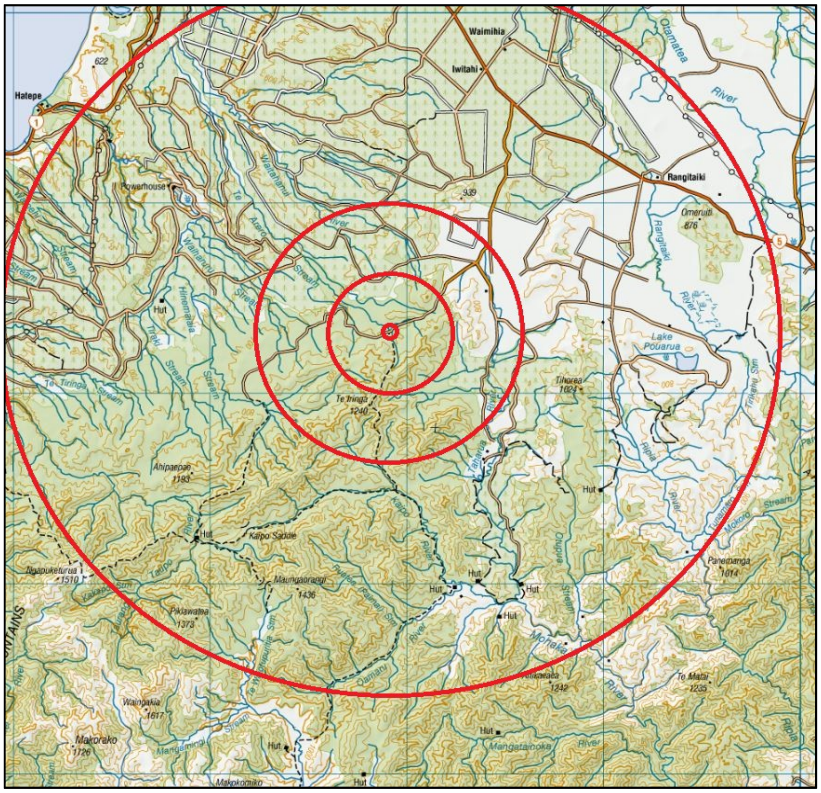
Distance (horizontal) from the IPP (kilometers)					
	Temperate		Dry		Urban
	Mtn	Flat	Mtn	Flat	
n	**568**	**274**	**221**	**58**	**8**
25%	1.1	0.6	1.6	1.3	
50%	3.1	1.8	3.2	2.1	2.6
75%	5.8	3.2	6.5	6.6	
95%	18.3	9.9	19.3	13.1	

Search data

It is important to note that the search data collected is very dependent on the context of the search and may not translate to the New Zealand context for the current search. Statistical data is predominantly derived from America using the International Search & Rescue Incident Database (ISRID), and less than 5% of the ISRID data is derived from New Zealand.

The size of the data set used to generate the statistical data for LPB varies both within categories and between databases, depending on the number of searches the data was taken from. This may influence the accuracy of the information.

The 95% distance is useful for establishing early containment. Beyond this distance are the statistical outliers (data that does not fit into normal understandings).



3. Using subjective analysis

An analysis of data can be used to determine a likely search area. This is the search area where SAR planners believe the subject they are searching for is most likely located given their assessment and evaluation of the available information.

The shape and size of this search area will be influenced by a range of factors. These may include:

- Careful consideration of subject intent, mobility (including physical and mental limitations of the subject) and possible behaviour.
- Most likely spots – these are locations that may offer some appeal to the missing subject in terms of shelter, food, water, ease of movement.
- Terrain analysis – which should be combined with the subject profile.
- Clues – those left by the subject. Sign cutting is used to search for clues, tracks and any other sign that the subject is or has been in the area. Binary strategy can then be considered as a process for reducing the size of the search area by

eliminating the area the subject has not passed through. It is based on 'yes' or 'no' decision-making using sign cutting.

- Intuition – experience may provide 'insight' into likely behaviour based on the planning team's experience.
- Case studies – historical data can be used to help identify behaviours. Lost person behaviour data (including local information) and the use of previous situations of a similar nature to the current search can also be used to predict possible scenarios.

Consider different perspectives when constructing the area to be searched using subjective analysis. The group's experience, or lack of it, may be a limiting factor to developing the search area. It is therefore important to utilise searchers, as well as those with local knowledge or people who share the interests or inclinations of the lost person. SMEs and experienced people that contribute to search planning will bring with them a wealth and variety of prior experience (note that they will also bring their personal feelings and search opinions).

25% of all subjects are found within 300m radius of the IPP.

4. Applying deductive reasoning

Deductive reasoning is the process of making inferences based on gathered facts and circumstantial evidence, in order to determine a probable conclusion about a search area.

Teams developing and analysing scenarios help to counter bias.

Through this process a hypothesis is developed. The hypothesis is then proved true or false through team taskings and intelligence gathering. The result of the search then validates, or does not validate, the hypothesis, and the process is then revised and repeated.

There are a number of considerations that should be taken into account when using deductive reasoning to determine the search area. These include:

- Using a team to carry out scenario analysis assists withs diversity of thought.
- Bias can limit or distort the plan. This is countered by developing scenarios in the team environment.

- Understand the role that subjectivity and search planners personalities have in influencing deductive reasoning and how these can be used to best effect.
- There may be a lack of resources to gather facts or evidence to prove or disprove a hypothesis.
- The possibility that individuals are too tied up with the details and management of the search to consider the bigger picture (situational awareness). This can result from people involved with an initial hasty search being drawn into the IMT for the extended search planning phase.
- Cognitive limitations and analytical complexity – searches can become very complex very quickly. The quantity of data generated, or required, needs careful analysis. The thorough understanding of search theory needed may also become intellectually challenging.
- Scenario plausibility – some scenarios may not be possible for the lost person given where they most likely are. It is therefore important to conduct a reality check for each scenario before progressing with search planning.

Planning Regions

Probable search area(s) → Region(s) with high POA → Segments → Segment POA → Search high POA

The probable search area has been constructed using a combination of methods – the final search area(s) then have to be decided on. To do that, regions are identified within the probable search area. Those regions are then evaluated to determine which ones have high POA (Probability of Area). The region that has the highest POA is in turn subdivided into smaller searchable segments (probably no more than 6-10 segments per region). Segments are created on the basis that they each have a size that can be searched within the allocated period by a single resource (for example, a search team or an air scenting dog). Segments with the highest POA are prioritised for searching.

In order to decide which region to focus the search effort on, the probability of locating the subject is now calculated for each region. This probability of area (POA) is the likelihood that the person(s) of interest is in the particular region, based on the scenarios, the geography and other information available.

High plausibility and single scenario

A single scenario may be either:

- directly related to a single region
- not related to any specific region.

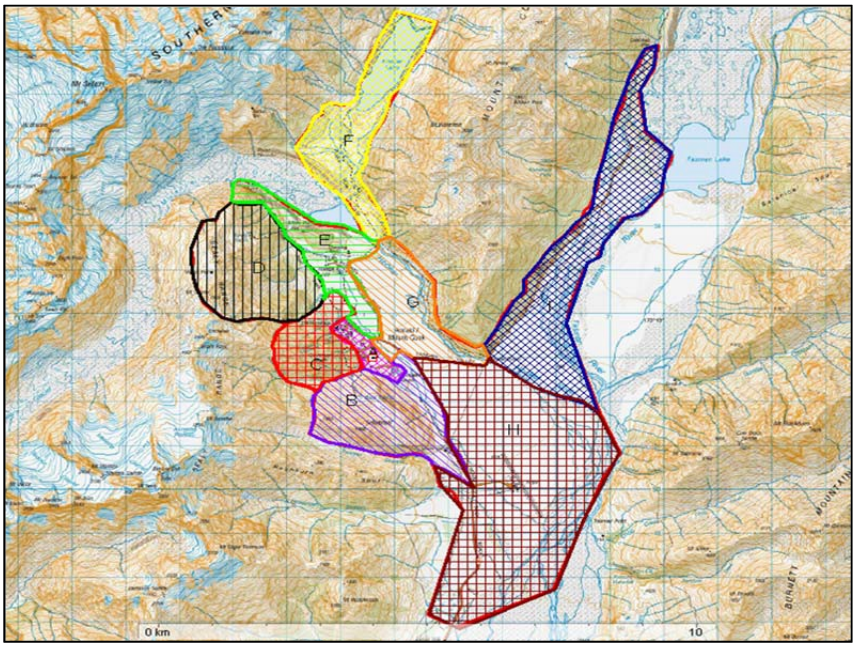
When a scenario is associated with a single region there is no need to apportion region POA. Instead the region is segmented in relation to that single scenario and segment POA determined.

If the single scenario is not to a specific region then region POA should be determined using the Region POA Consensus Worksheet tool. The most likely region(s) are then identified and segment POA can be apportioned.

Similar plausibility and multiple scenarios

When no particular scenario is identified as outstanding through the scenario weighting process then region POA is calculated for each scenario. The Combined Region POA Weighting Worksheet is used, which allows a POA allocation for each scenario.

The next stage in apportioning POA to regions using multiple scenario weightings is to develop an overall POA allocation for all regions that takes into account all scenarios, but has been weighted by the likelihood of each scenario occurring. The most likely region(s) are then identified and segment POA can be apportioned.



Segments

The region that has the highest POA is subdivided into smaller, searchable areas. This is the process of segmentation. If more than one region is identified that has very high yet similar POA, then all these may be included in the process of segmentation. However this may lead to greater complexity as the number of segments could increase quickly and may exceed the number of field teams available to search them. Further analysis is then required to prioritise search effort.

In order to ensure that field teams can properly identify and search allocated areas, segment boundaries should be chosen that are clearly defined by natural or man-made

features. Within a segment there should be no internal barriers to restrict searcher movements.

The search boundaries should be set on the basis of a realistic area to search in the allocated time in the prevailing conditions. This will be influenced by terrain, vegetation cover and weather. If segments are too large, or the area is perceived as being hard to search, searcher morale can be adversely affected.

Divide the segments so that the areas to be searched are roughly even in terms of the time required to search them (i.e. small areas for difficult terrain compared to larger areas for more open terrain). This will reduce the likelihood of waiting for an area to be completed before implementing the next phase of the search plan. It is difficult to manage leftover, unfinished areas within segments; dividing segments is therefore important to avoid this.

Segments identified on the map need to be easily located by searchers in the field. Careful selection of segment boundaries is important to avoid gaps in the area searched or duplication of resources in the field. The segments most likely to contain the missing person for each of the most likely scenarios are then identified.

> Because segments are two dimensional (2D), caves, mines, shafts and under snow etc are seen as separate segments. Until these are identified, they are essentially outside the search area. For example, if a body is covered under snow and you are only searching the surface of the snow, the body is essentially outside the search area.

Apportioning segment POA

The relative probabilities of locating the subject are calculated for each segment using the subjective consensus method.

Priorities can then be made as to which segments to search first. These are based on the POA consensus decisions and the resources available to search, and other factors such as weather. Search effort will be initially focused on high probability segments. Areas of low probability cannot be excluded from the search area, so these will be identified/mapped for later searching.

Search Implementation

Search operations that progress beyond the initial response phase require well developed and structured search planning and implementation. A SAR Readiness Plan can streamline and expedite the deployment of resources into the field in the initial response phase. It can also form a good basis of information to feed into an extended, multi-period Incident Action Plan.

SAR Incident Action Plan (Multi-Period)

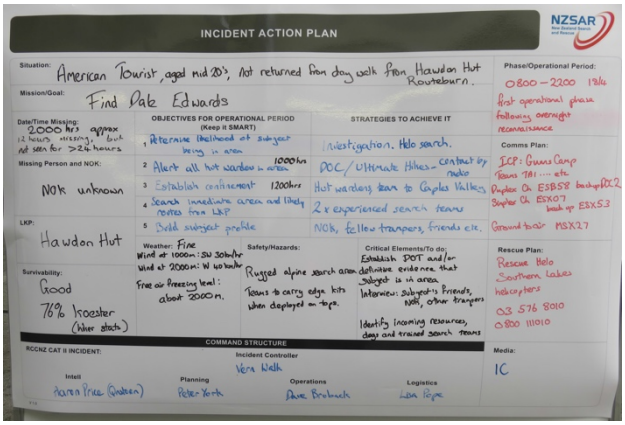
The Incident Action Plan is a document that describes how the response to a search will be managed and how response agencies will integrate their activities to achieve the response objectives.

In response to a call for a search, an initial action plan will focus on immediate lifesaving activities, mobilisation of response assets and information collection (New Zealand Government, 2014). Therefore, the planning document *NZSAR Incident Action Plan – Initial Response* is based on short timeframes. In the case of a land search, it may focus on responses such as hasty teams, containment and the completion of a comprehensive missing person summary.

In order to implement an extended search, a comprehensive NZSAR Incident Action Plan (multi-period) (https://nzsar.govt.nz/sar-operational-support/forms/land/) is required. This plan has the same format as the NZSAR Incident Action Plan (Initial Response), however it is more comprehensive in terms of timeframes and specified operational periods and detail. That said, many SAR operations and Groups have used the initial response IAP format for multi-day day searches by using a new IAP for each operational period.

The parts of the SAR Incident Action Plan (multi-period)

Situation report



Situation

This is a statement of what has happened. The situation report should draw together any facts or conditions that may be relevant to the missing person, their specific situation and the particular circumstances around their disappearance.

Action taken by responders

This section needs to consider two very basic questions:

1. What has happened?
2. What is happening?

The results of the initial search effort, or previous operational period, are the key considerations that inform the development of the IAP. This may include clues found, scenario(s) and probability of area (regions and segments), and team debrief information. These are the actions taken by the responders.

The actions are usually collated using the IAP (Initial Response) and log of actions. These actions can also be represented on a map with markers showing location of clues found, containment sites and areas (segments) searched by field teams. Each subsequent IAP (multi-period) will build on the previous one(s).

Factors impacting on planning

These may include aspects such as:

- mobility
- levels of response
- detectability
- survivability
- LPB
- weather
- terrain
- resources
- timeframes.

Contingencies and long term planning

This relates to how the incident may develop and is often referred to as 'predicted incident development'.

Missing person summary

This section collates information regarding the subject profile. This process is continuous and it is important to be continually gathering and investigating the subject - 'dig deep'.

A subject profile should be as comprehensive as possible. It will include basic information about the physical appearance of the missing person, their general state of health, disposition, and their normal patterns of behaviour. It will also include details of the subject's health status and state of mind in the immediate lead up to their disappearance.

Consider the following questions as the subject profile is developed:

- Is the person likely to be aware that they have been reported missing and that a search has been initiated?
- Do they wish to be found?
- How has this person responded in their previous experiences?"

Building a detailed picture of the likely thought process and behaviours of the missing person is critical to the process of developing appropriate scenarios. Scenarios are constructed around the question of '**What may have happened?' as well as 'If this did happen to this particular subject, what would they do?'**. The scenarios must be recorded in detail and filed for later reference. Make sure to record the evidence used to build the scenario and used to evaluate the likelihood of the scenario. Use the Scenario Recording sheet. The Missing Person Summary is continually added to as the search process is executed and further information and clues are sought, found and recorded.

Incident objectives

This section summarises those tactical decisions that have been made in order to meet the operational objectives. The objectives describe how the goal (or aim) of the IAP will be met.

Goal

States the desired outcome for the operation. It is a clear statement of intent, which in most cases for LandSAR is always 'to find the missing subject'.

Objectives for Operational Period

Incident objectives ask the question, 'What do we want to achieve in this operational period?' Incident objectives should be SMART:

- **S**pecific for the operational period,

- **M**easurable,
- **A**chievable and
- **R**elevant to the goal
- **T**ime bound.

An example of this might be to search all segments in planning region 'A' by 18:00 hours.

Strategies to achieve it

This is where the methods and options for achieving the outlined objectives are described and will help to determine, or prioritise, taskings (assignments). When planning strategies, there is a need to consider:

- determining the areas of highest probability within the search area (regions or segments) in order to deploy resources
- search effort allocated to maximise success.

The Incident Management Team (IMT)

The Incident Management Team assist the Controller by providing advice, specialist knowledge, and handling detailed work. In developing the IMT, careful consideration should be given to individuals' prior experiences and dispositions for Land SAR in order to develop an effective, well-rehearsed team.

Once an IMT is established a lot of activity ensues relatively quickly. The body of information increases constantly, as does the number of people and resources involved. The CIMS principle of a manageable span of control comes into play in this dynamic and expanding environment. Failure to regularly review the span of control of each of the leaders in the IMT can result in a lack of control, and ultimately reduce the effectiveness of the search planning effort.

Search success is influenced by how well the IC and the IMT leaders maintain a clear vision of the progress and developments within the various groups. Structured meetings and reporting are one means to achieve this, however these tools are best not used alone. Incident management effectiveness can be improved by deliberate, unstructured interaction.

Sector assignments

The NZSAR Multi-Period IAP may include sector assignments. When sectors are created the taskings for those sectors will develop from each sector assignment, with the taskings being managed by a sector supervisor.

Sectors can be determined in a number of different ways, including by:

- geography, particularly for a large search area
- terrain (e.g. bush or alpine)
- capability (e.g. field team v Alpine Cliff Rescue)
- agency (e.g. sea, land, air – Coastguard, LandSAR, USAR, Police, rescue helicopter)
- activity (e.g. following the Canterbury earthquake sector assignments were for specific activities such as cordons, checking buildings, searching, rescue)
- task (e.g. Police divers, cavers, dealing with concerned friends or family).

Safety Plan

All SAR missions involve some degree of risk. During an extended search the Incident Controller (IC) has responsibility for the overall safety of the incident. This will include maintaining a situational awareness of the whole incident and developing measures to ensure the safety of all personnel involved at all times. A Safety Manager should be appointed to maintain the priority of safety objectives as the operation develops.

LandSAR have a Safety Management System (SMS) that covers safety management for training, SAREX, operational and other activities of LandSAR volunteers and staff.

Operational risks are those risks that will cause harm to an individual during a SAR incident. Risk management is a systematic way of identifying, assessing, treating and monitoring these risks. Operational risks may include:

- meteorological hazards – weather phenomena (snow, heavy rain, high winds, heat)
- terrain hazards – landforms, powerlines, rivers
- physical hazards – machinery (helicopters, vehicles), search dogs, other people in area

- human hazards – training, experience, physical and mental state (e.g. hunger, thirst, fatigue, anxiety, confusion, cognitive tiredness).

Each search team has a responsibility to ensure any risk they are exposed to is managed. They should follow their established risk assessment procedures and manage risks according to their own agency-specific policies.

Health and safety in an IMT is overseen by the IC. The Safety Manager has a key role in identifying hazards and recommending appropriate mitigation steps.

Within the IMT one person will be tasked with the role of Safety Manager. This may be the IC themselves, or someone else tasked by the IC. The role of the Safety Manager is to:

- ensure risks to personnel (accidents, injuries or losses) are identified and reviewed
- review the causal or contributing factors to health and safety or hazards (people, equipment or environment)
- review risk management strategies (eliminate, isolate or minimise) by IMT and teams.

Rescue Plan

In developing a rescue plan, consideration should be given to the four phases (identified by the acronym LAST):

- **L**ocate – find the subject.
- **A**ccess – consider how to get to the subject's location. What are the issues? Are there safety risks?
- **S**tabilise – consider how to identify real injuries as well as potential (preventable) ones.
- **T**ransport – how to recover the subject? What are the potential hazards?
- Identify routes prior to transportation – plan ahead.

Consideration should be taken regarding the safety and welfare of the rescuers, and a plan put in place should the need arise to evacuate them. When planning a rescue, it is important that emergency procedures are reviewed in case things go wrong.

Medical Plan

The medical plan will consider the availability of services, the need for technical expertise or type of service required, and the transport of subject and medical personnel. It is also important to consider the needs of the searchers.

The communications plan will outline the means by which communications will be achieved throughout the search. This may include the net diagram and radio call signs for the IMT and field teams. It may also include phone numbers and email addresses to be used for search related communications. Code words, repeater locations and radio schedules may also be included.

Search Implementation

The IMT objective is to focus and suitably deploy resources on the segments of higher probability. Search effectiveness is used to inform search management decisions in order to increase POA. These may include decisions around where to search next, what resources to deploy, or when to suspend the search operation.

Effort allocation

Effort allocation is defined as the effort required to search a given area. This is determined by the number of resources used and how the resources search the area. This will be influenced by the complexity of the search area or the detectability of the subject.

Effort allocation has a number of variables that can be manipulated to accomplish the tasks in an efficient manner, and to bring about success in the shortest time. It is important to:

- Identify the availability of resources. Then consider what are the most appropriate, resources to conduct the search
- Define clear strategies that utilise the available resources most efficiently. In order to do this resources must be clearly prioritised.
- consider the length of time resources are available
- the length and complexity of the search
- consider the search health and safety plan as this may impact on resource use.

Taskings

Once the SAR IAP (Multi Period) has been completed the next step is the implementation of the taskings in order to achieve the goals of the operation.

Team tasks are developed and recorded using the NZSAR Combined Team Tasking and Field Safety Assessment form or a similar alternative. Key information recorded on a tasking form includes:

- details of the search area (or segment)
- tasking assignment (including the required search method)
- decision points
- hazards
- communications

- previous searches in the area.

A NZSAR Missing Person Summary Form, photo of the missing person, and a map of the area to be searched should be included with the NZSAR Combined Team Tasking and Field Safety Assessment form. The field safety assessment and safety briefing is identified on the form.

Field teams should be aware of the safety plan identified in the IAP. The LandSAR 'Take Five - safety briefing form for field teams' can be used by the team leader as a guide for structuring team safety assessments for taskings and safety briefings.

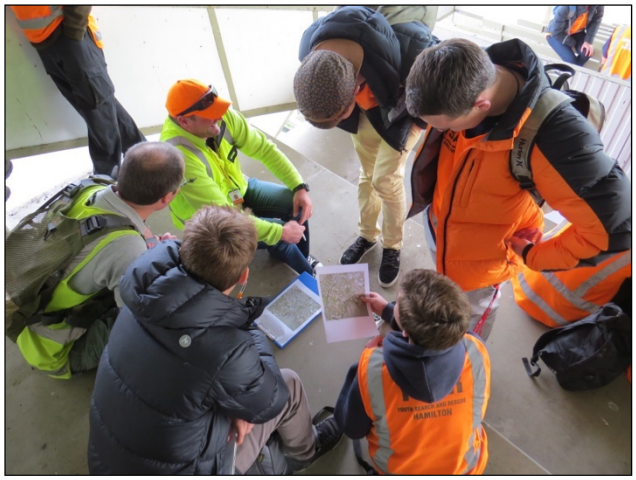
It is important to allow search teams discretion in the field as to how the taskings are conducted. Often decisions around implementation in the field will be made by the team leaders and will be dictated by the terrain, environment and conditions at that time. There will be opportunity for team leaders to update the IMT regarding evaluation of search effort over the radio and during debriefing.

Note that 'assignments' is interchangeable with the word 'taskings'.

Briefings

Briefings are conducted to present information to people in a clear and consistent manner. . The goal of a team briefing is to ensure the team understands the goal, situation, what task the team is to undertake (including safety and risk assessment), together with details around administration, command and communication.

Briefings will happen at different levels within the IMT - between function managers, team leaders, sector supervisors and other agencies. In most cases the Operations Manager or Staging Area Manager will brief the team leaders and then the team leaders will in turn brief their teams.



The GSMEACS briefing is a format that is widely used and ensures all essential details are covered in logical sequence during the briefing (CIMS 3rd Ed).

Ground

Orientates people to the search area, identifies maps required, location of important points such as staging areas, where the ICP is on the map etc.

Situation

Contains a summary of information about what has happened, what the situation is now and why the team is involved.

Mission

This is the objective of the team in order to achieve the goal.

Execution

Provides detailed information for the team about how the task is to be carried out, including boundaries, timings, search methods etc. This should also include information about other teams working nearby. This section will also cover any "actions on", such as action on injury to team member, action on finding the missing party, actions on deceased person found.

Administration

Information regarding logistics, e.g. equipment needed, transport, pick up point and drop off point, rations etc.

Command and communications

Who is in charge, their location, how to contact them, in addition to how everyone can communicate with each other

Safety

This briefing section includes safety information specific to the team and any risk assessment details.

Questions

At the end, ask for questions from the team.

A conclusion or summary at the end is useful to reinforce key points. You need to ensure that the briefing has been understood, so ask the group questions to check they have understood the briefing (these will be appropriate to the roles within the group).

Deployment

IMT deployment of teams in the field requires tracking and status monitoring. Tracking will:

- identify and determine the availability of resources, including those the resources that have been requested
- note their ETA
- note when they arrive
- note which section they have been assigned
- note when they have been stood down or left the operation.

Typically 'T' cards are used for resource tracking. Status monitoring will require applications such as SARTRACK, or whiteboards or paper that notes each teams assigned area, segment, task, time deployed, when 'on task', location at each sked and any other relevant information such as progress, condition of team and clues found.

Associated resource: *NZSAR Guidance Note Managing Fatigue , NZSAR Trauma Brochure.*

Search Evaluation and Debrief

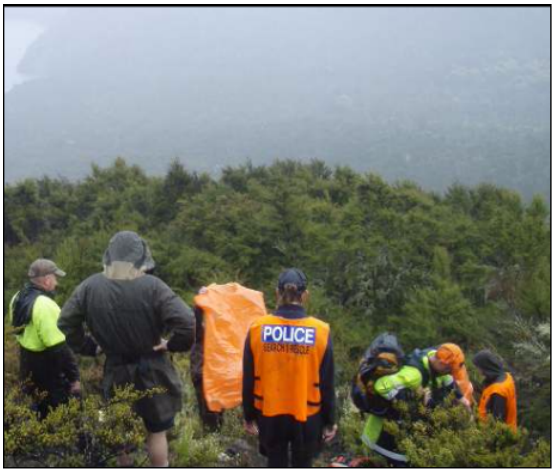
Likelihood of Detection

Search effort evaluation (SEE) is determined using a simplified scale of Likelihood of Detection ratings. The scale consists of four levels for each component part of the search area or segment: high, medium, low or 'not searched'.

Using likelihood of detection ratings provides greater opportunity to identify and evaluate sub areas within the total search area. The process of determining the likelihood of detection rating includes the opportunity to provide a rationale for assigning the various ratings.

Team debriefing

The form used during debriefing and allocation of SEE is called the NZSAR Team Debrief form (https://nzsar.govt.nz/sar-operational-support/forms/land/). The format of the document encourages the use of 'free recall' – an investigative interviewing technique that promotes more complete, accurate and reliable information to be obtained. During the debrief there is a stronger emphasis on those factors affecting detectability and coverage.



The form contains a number of key areas that should be used as prompts, or guidelines, for the debrief. These are:

- search effort
- techniques
- detectability
- clues
- personnel factors (team effectiveness)
- issues identified.

The role of debriefer is important as they are required to gather information in order to make comment or recommendations regarding the search effort. The debriefer could be the sector leader or the Operations Manager or a member of the Intelligence team, or someone

with investigative interviewing training. Evaluation of likelihood of detection will be determined by the field team.

Prior to the debrief it is important to collate all necessary information that could support the determination of detectability and coverage. This should include GPS tracks (the map can be printed for the debrief) to confirm that the team was searching in the right area. This will also help identify any gaps in coverage.

Photos taken on the ground during the search can be downloaded, shared or printed. They can help the IMT managers and other intelligence personnel understand or interpret the teams' likelihood of detection for the areas searched.

At the end of the debrief the debriefer comments on the effectiveness of the search effort, summarises the more pertinent information such as gaps in coverage and information gained, and makes recommendations for future search planning. This document is then checked by the Operations, Intelligence and Planning managers.

Analysis of Search Effort Evaluation (SEE)

Using the information gathered from the SAR Team Debrief, search planners can go through a process of reallocation of probability if required by analysing and evaluating the search effort. It is important that everyone involved in the POA allocation (proportional consensus) has access to all of the same information and data.

Vital in this process is a review of current information from previous search efforts, new information, clues found, investigation, scenario analysis and subject profiling.

Search Effort Evaluation (expressed as High, Medium, Low or Not Searched) will inform and influence opinions about the likelihood of the subject being in the area after it has been searched. A *high* search effort evaluation in an area without finding the subject should influence an individual's consideration when deciding which segment has the next highest likelihood.

Scenarios should be reviewed and a new scenario analysis conducted based on the latest evidence and search effort evaluation data. POA should be revised for regions or segments based on the revised scenarios. Re-analysis of all available data may also indicate a need to expand or make changes to the search area, including the segmentation of another unsegmented region.

Successful search planning depends on properly accounting for clues found during the search. Clues will provide evidence to prove or disprove scenarios and therefore ultimately

affect the search plan and POA values for the next operational period. The significance and relevance of clues will need to be determined firstly by the debriefer, and then by the search planning team. All clues found will need to be corroborated to avoid 'clue lock', where a major change in the search effort is based on uncorroborated evidence.

Operational changeover

Operational changeovers need to be structured, managed and phased to ensure continuity of the IMT team and the search operation. It is vital that the IMT maintains situational awareness throughout changeovers.

It is important to set times for operational periods early in the operation so that changeovers can be scheduled, resource needs can be reviewed, and resource availability can be checked.

An IAP must be created for the next operational period so that the incoming team has a plan to work to. Their role is to plan for the following operational period, not the period they are walking into. The information contained in the IAP must be detailed enough to be understood so that the intentions (objectives) of the outgoing IMT team can be followed.

Changeover should involve a briefing from the whole outgoing team on the situation, the plan they are working to and the plan that has been suggested for the next operational period, the search effort to date, as well as any other relevant factors.

Then one-to-one handovers should take place between the outgoing function managers and staff to the incoming function manager and staff. Outgoing personnel should not need leave until they have briefed their replacements.

The responsibilities for the incoming and outgoing personnel

Outgoing personnel	Incoming personnel
Set changeover time and locations, and inform incoming team	Receive briefing
Brief subordinate personnel	Manage changeover of subordinates
Brief replacement	Ensure Action Plan is understood
Leave	Plan the next changeover

Prior to a changeover all documentation needs to reviewed, completed and filed with Intelligence (or the Administration Unit under Logistics) by the current IMT.

Search Suspension

During extended search operations, if the subject has not been located, the IMT will be faced with the decision of either using a limited continuous search, scaling down the search or suspending the search.

Search suspension is one of the most difficult decisions to be made during a search operation. Consider these factors before starting that course of action.

Search effort evaluation

Segments or regions have been allocated high likelihood of detection and therefore the likelihood of the subject being in the search area is low. This also includes a thorough analysis of available evidence, clues and information.

Searcher safety

This is of paramount concern and if conditions in the field are deteriorating a decision to suspend the search may be needed.

Resource availability

Will determine the extent of searching or the scaling back of the search or a change in emphasis eg more investigation.

Consultation

Discussions with family, medical experts and coroner are an important aspect of the decision process.

Terminating or suspending a SAROP

When all avenues of SAR investigation and search have been exhausted and the missing person has not been found, the IC, having consulted with the IMT and specialist advisors, may recommend terminating or suspending a search.

All aspects of the SAR investigation and operation must be documented and collated by the IC. This must then be peer-reviewed by a Police SAR Coordinator not involved in the SAROP.

The final decision regarding search suspension rests with the Coordinating Authority.

The Police SAR Coordinator may establish an IMT to assist in this review and may include external expert advice, such as the RCCNZ.

The coroner must be consulted prior to the termination or suspension of a search where it is believed that a person is likely deceased.

Demobilisation

Planning

The purpose of demobilisation is to ensure that personnel and resources are safely returned to their point of origin. This will require management decision making and careful planning.

When developing a demobilisation plan the following need to be carefully considered:

- release priorities
- who or what goes first?
- consideration of searcher welfare is paramount - who are the most vulnerable?
- what are the logistics required?
- release procedures
- consider how to get resources out of the field safely (refer to the Combined Team Tasking field safety assessment)
- staff welfare issues including food, shower, dry clothes and sleep if necessary before driving off

- ensure communication is maintained until the demobilisation plan has been completed
- debrief
- ensure all documentation has been completed and submitted (i.e. hazard identification, incident/accident reports etc)
- information collation, including download of GPS tracks and photographs
- consider conducting a 'hot debrief' of actions taken and record lessons learnt
- return all equipment e.g. GPS, radios, spare batteries
- sign-out procedures
- ensure all personnel are accounted for.

Critical Incident Stress (CIS)

It is important to realise that every mission has elements of stress associated with it and that this general stress is normal and can be managed.

Critical incident stress is an individual's normal response to an abnormal situation. In order to manage searcher or personnel welfare, it is very important that leaders and managers are aware of and responsive to the signs and symptoms of critical incident stress.

These symptoms can manifest themselves within the physical, cognitive, emotional and behavioural dimensions. Although often considered normal responses, they can become dangerous if the symptoms persist for prolonged periods of time.

Some general guidance to being aware of for managing critical incident stress (CIS) include the following.

Signs and symptoms of CIS

Critical incident stress management is a specialised area. Team leaders, managers and searchers should be aware of tactics and strategies that can be employed to control or manage search stress. This can be achieved through specific training.

> "Symptoms associated with excessive acute or sustained stress may include cognitive impairments such as diminished memory, decision-making capacity, and attention span; emotional reactions such as anger, irritability, guilt, fear, paranoia, and depression; and physical problems ranging from fatigue, dizziness, migraine headaches, and high blood pressure to diabetes and cancer. Self-destructive and antisocial behavior may also be triggered. Symptoms can vary depending on social factors, such as trauma severity, amount of social support, and additional life stresses."
>
> *http://en.wikipedia.org/wiki/Incident_stress*

CIS support and resources

- NZSAR Trauma Brochure
- NZ Police CIS Brochure (*Trauma Policy*).
- NZ LandSAR Field Guide 2010.
- NZ Police EAP Services.

Operational documentation

All documentation must be organised coherently and correctly filed because a coronial inquiry or a Police investigation may follow the search operation and require that decision making information.

It is the responsibility and obligation of the Incident Controller to ensure detailed records are kept throughout the operation. The responsibility may be given to the Intelligence Manager to collate all documentation at a centrally accessible point using a standardised filing process (or during a large operation the Administration Unit would do this).

Post-operation debriefing

Quality debriefs are an important part of any SAR operation and are an established tool in the continual upgrading and improvement of the SAR response. The time and the place of the debrief should be selected to maximise the value of the exercise.

It is important to develop, discuss and disseminate an overall picture of the SAR operation. This includes any lessons learnt and actions to be taken identified and assigned to the relevant person. It may be prudent to appoint an independent chairperson with SAR knowledge to run the debrief, particularly if aspects of the search did not go well.

Operational debriefs may exclude the subject and/or the next of kin as the focus is around the search effort, not what the subject did or didn't do. The subject and next of kin should be debriefed separately, in particular to gather information around actions they took and why. This information is critical for building a comprehensive data set for lost person behaviour. Consideration should be given to selecting an appropriate person to conduct the interview.

All findings should be circulated to all the relevant personnel so that mistakes are not repeated in the future and the lessons learnt can be used in future training opportunities.

Operational debriefs should be conducted within 21 days to ensure that relevant information is recalled and recorded.

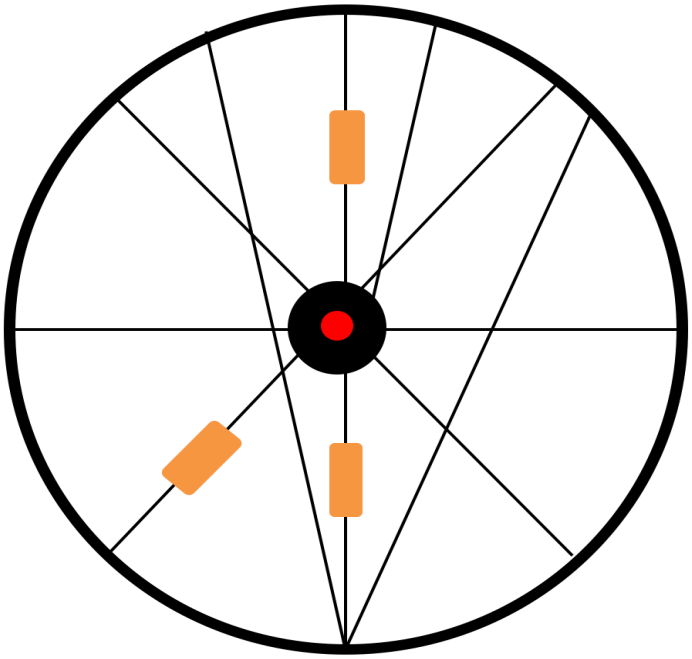
Further Reading

Copies of these will be available for reading during the training course.

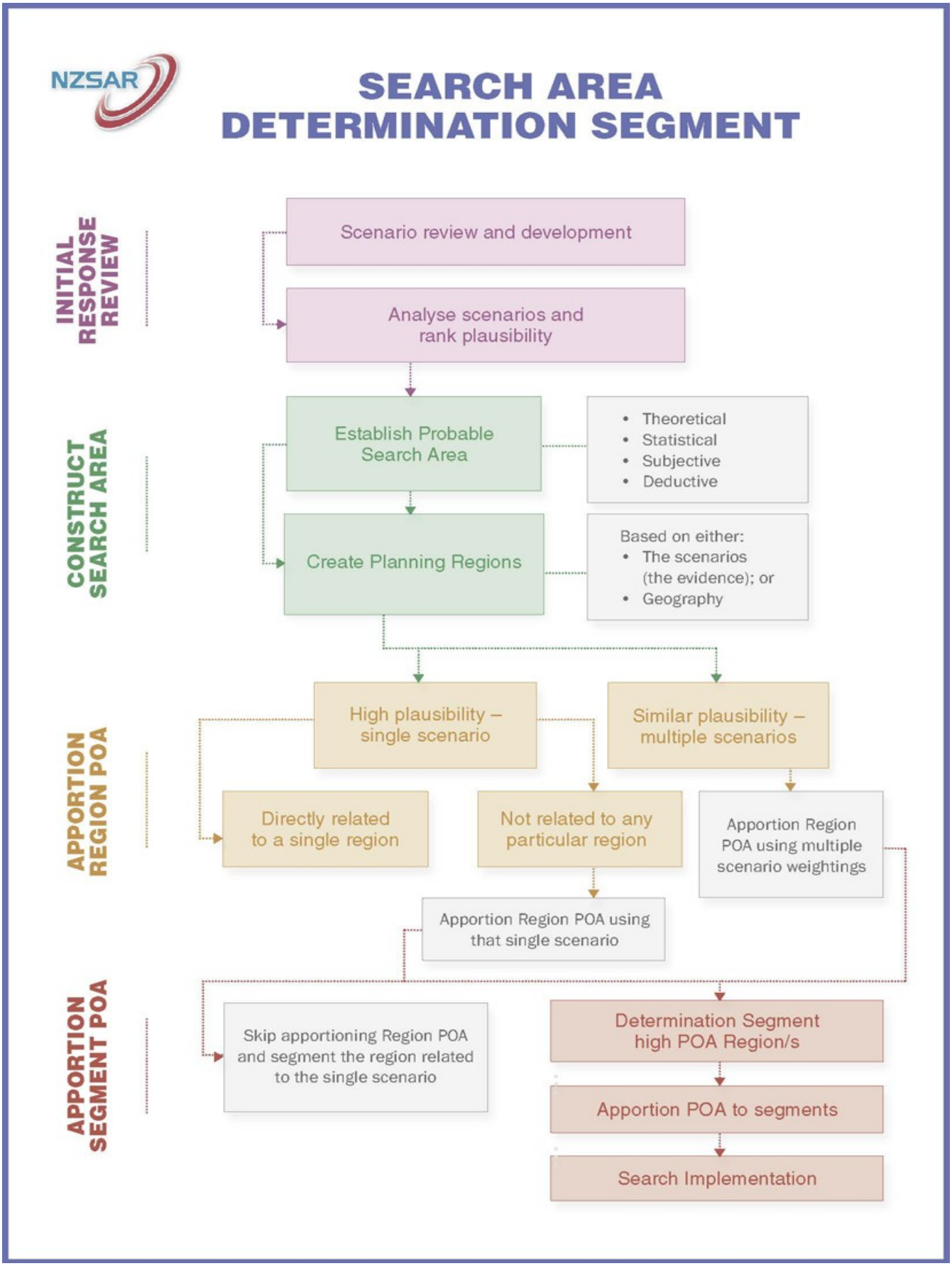
- Australian Government. (2004). *Urban Search and Rescue, Capability Guidelines for Structural Collapse Response*. Canberra, Australia: Emergency Management Australia. Available from https://www.em.gov.au/Documents/Manual16-USARCapabilityGuidelinesforStructuralCollapseResponse.pdf
- Gibb, G., & Woolnough, P. (2007). *Missing Persons. Understanding, Planning, Responding*. Aberdeen, Scotland: Grampian Police Force Headquarters. Available from http://www.searchresearch.org.uk/downloads/ukmpbs/GGIbb_missing_person_report.pdf
- Koester, R. (2008). *Lost Person Behaviour*. Charlottesville, VA: dbS Productions LLC Mountain Safety Council. (2011). BushCraft Manual - Outdoor Skills for the NZ Bush (5th edition). Wellington, New Zealand: Mountain Safety Council
- *The New Zealand Coordinated Incident Management System* (3nd edition). Wellington, New Zealand: New Zealand Government. From Ministry of Civil Defence website
- NZSAR. (2014). *Land Search and Rescue Response Guidelines*. Wellington, New Zealand: NZSAR

Appendix

Bike Wheel Model



- Axle – IPP
- Hub – close in phenomena / 300-metre/close-in search (was referred to as the 300m circle).
- Spokes are linear features and not all of these pass through IPP
- Rim – confinement, limit of search area.
- Reflectors – attractants, hot spots: huts, shelters etc.
- Cross spokes – decision points.


NZSAR
SEARCH AREA DETERMINATION SEGMENT
INITIAL RESPONSE REVIEW
Scenario review and development
Analyse scenarios and rank plausibility
CONSTRUCT SEARCH AREA
Establish Probable Search Area
Theoretical
Statistical
Subjective
Deductive
Create Planning Regions
Based on either:
The scenarios (the evidence); or
Geography
APPORTION REGION POA
High plausibility – single scenario
Similar plausibility – multiple scenarios
Directly related to a single region
Not related to any particular region
Apportion Region POA using multiple scenario weightings
Apportion Region POA using that single scenario
APPORTION SEGMENT POA
Skip apportioning Region POA and segment the region related to the single scenario
Determination Segment high POA Region/s
Apportion POA to segments
Search Implementation

Your Notes