SARINZ
SEARCH AND RESCUE INSTITUTE NEWZEALAND
Helping others save lives

SUMMARY REPORT:

FUTURE TRENDS INFLUENCING SEARCH & RESCUE – EXPERT OPINIONS

For: Search and Rescue Institute New Zealand Ltd (SARINZ)
By: Gordon Cessford and Bronek Kazmierow

20 August, 2010

Research Sponsored by New Zealand Oil and Gas

Key Point Summary

This report contains expert opinion from a small but highly experienced group of SAR specialists.

Of the six high level trends proposed as affecting the future of SAR, the group considered that the most likely and important of these trends are:

- *increasing technology*
- *increasing tourism*
- *aging population*

*Within these were listed several specific change scenarios related to each trend. The specific change scenarios considered **most likely** to occur include:*

- *Increased SAR callouts from people in easily accessible natural areas*
- *Increased recreation closer to home and in more accessible areas, with an increase in related SAR demand*
- *Increased proportions of non-recreation SAR incidents (e.g. Dementia, Despondent, Missing)*
- *Greater public expectations for immediate and successful SAR response*
- *Increased numbers of people visiting natural outdoor areas and parks*
- *Increased SAR callouts due to increased numbers of tourists*
- *Reduction in the 'search' component of many SAR call-outs due to better beacons, communications and location technology*

*The specific change scenarios considered **least likely** to occur include:*

- *SAR incidents will decrease overall as people engage in more urban-based recreation types*
- *Fewer recreation SAR incidents overall as people use the more accessible and less remote areas*
- *There will be decreased recreation in more remote areas, with decrease in related SAR demand*

SARINZ
SEARCH AND RESCUE INSTITUTE NEWZEALAND
Helping others save lives

SAR EXPERT OPINIONS ON KEY TRENDS

1. INTRODUCTION

A survey was circulated to a select expert group of SAR specialists to assess their informed professional perspectives on a number of issues potentially affecting SAR into the future. The survey was undertaken as part of a broader in-depth study of demographic changes and their implications for SAR in New Zealand[1].

2. METHODS

Based on insights developed during the progress of the project, six major social trends likely to have impact on SAR into the future were identified. Several simple change scenarios were developed under each of these six major trend areas, and these scenarios represented some of the more SAR-specific issues within.

These scenarios were designed to provide high-level coverage of the main issues without necessarily providing all the in-depth detail within each of them. In that respect, additional themes were expected to be identified from the survey itself. The main purpose was to provide a basis for assessing expert opinion about the relative importance of these coming trends and some of the main SAR changes that may occur with them. The scenarios were summarised into a series of proposed changes in a summary questionnaire, where the expert group was requested to view them online and give scores to indicate the likelihood of those changes occurring, and their possible importance.

An online questionnaire survey was developed and circulated by email to a list of SAR authorities (46 people) compiled by SARINZ which included a cross section of New Zealand and International SAR experts and practitioners. It was not designed to be a fully comprehensive quantitative measure, but to be an indicative qualitative guide on the major points of consensus or difference among leaders in the SAR sector. The issues presented for their judgment were those emerging themes derived for the project. The survey aimed to test the relative significance of those themes and to encourage contribution of any other key issues or interpretations not already raised.

---

[1] A description of methods and advice on use and interpretation of results are specified in the main study report. The two volume report was prepared for SARINZ by authors Gordon Cessford and Bronek Kazmierow (2010), entitled: *Predicting SAR response and operational requirements based on NZ population projections through to 2030* (unpublished report – B Kazmierow Recreation & Tourism Consulting, Porirua, New Zealand).

The six trends were:

Trend 1 - Travel cost (increased cost of travel/transport)

Trend 2 - Tourism growth (growth in tourism and recreation activities)

Trend 3 - Aging population (aging overall population structures)

Trend 4 - Increased technology (increased use of technology)

Trend 5 - Increased urban (increased population and urbanisation)

Trend 6 - Different funding (different funding/resourcing arrangements)

As mentioned earlier, each trend was accompanied by a number of simple change scenarios. Respondents rated the likelihood for each change scenario and trend overall. They were asked to also rate the importance of each trend in terms of its impact on the future of SAR.

Results (including a brief profile of respondents and the survey response rate) are presented below. These are presented firstly in summary form, followed by more in-depth analysis.

All results are presented as mean scores from the 1 - 5 point scale for each of the overall trends and the component change scenarios/issues. Mean scores, standard errors (SE) and 95% confidence intervals (CI) are used to aid interpretation.

The following points are provided here to guide interpretation of results:

- higher mean scores for scenarios (over 4) indicate that the expert group opinions favoured higher likelihood/importance, while lower mean scores (below 3) indicate opinions favouring lower likelihood/importance

- the level of agreement across the respondent group can be derived from the variability of responses (which is represented as the Standard Error of the Mean - SEM). Responses with high degree of consensus from respondents show SEM results in the low range, whereas those cases where there is divergence of opinion show up with SEM in the high range.

In addition, respondents from the expert group were able to make specific comment points throughout, and indicated a number of additional change scenarios that could also be considered in future. These added to those identified consequently by the research team in assessing these survey findings, and those drawn from the wider study.

A total of 24 responses were received, which represented 52% of the original list or 46 emailed by SARINZ. Brief profile information is summarised here to outline the scope of their experience:

- The respondents included 16 New Zealand SAR experts, 2 each from Australia and Canada, and 1 each from USA, UK, Iceland and Sweden.

- Most indicated that Land-based SAR was their main area of expertise (88%), with some (16%) indicating Marine SAR was their main area, and others (also 16%) indicating specialist SAR (e.g. alpine terrain, cliff, cave and urban etc). Some indicated multiple areas of main expertise (e.g. land and marine, land and specialist etc.).

- Combined they had over 650 years of SAR experience between them, representing approximately 28 years each.

- The predominant types of SAR roles they had were Operational SAR (33%), Management/Administration (33%), Training (17%) and Research (8%). Most did indicate they also had secondary roles across many of these types.

3. RESULTS

3.1. OVERALL IMPORTANCE OF TRENDS

Table 1 summarises the mean scores (and related statistics[2]) given for the overall importance of the 6 future trends addressed here. This is based on respondent scores from a 5-point importance scale (where 1 = Unimportant to 5 = Extremely Important).

TABLE 1. IMPORTANCE RATINGS FOR TRENDS OVERALL

TRENDS	Mean score	*SE*	*95% conf interval*
Increased use of technology	4.5	*0.10*	*(4.2 to 4.7)*
Increased tourism and recreation activities	4.3	*0.11*	*(4.0 to 4.5)*
Aging overall population	4.0	*0.15*	*(3.7 to 4.4)*
Increased population and urbanisation	4.0	*0.13*	*(3.7 to 4.2)*
Different funding/resourcing arrangements	3.9	*0.19*	*(3.5 to 4.3)*
Increased cost of travel/transport	3.0	*0.22*	*(2.5 to 3.4)*

[2] All results tables include standard errors for statistical means (SEM) which are used to estimate confidence intervals (95% level). In simple terms, lower standard errors represent higher degrees of consensus (or certainty) amongst respondents.

3.2. OVERALL LIKELIHOOD OF TRENDS

Table 2 summarises the scores given for the overall likelihood respondents considered that the specified Trend would affect SAR over the next 20 years. Likelihood was assessed using a 5-point response scale (from 1 = Extremely Unlikely to Occur to 5 = Extremely Likely to Occur).

TABLE 2. LIKELIHOOD RATINGS FOR TRENDS OVERALL

TRENDS	Mean score	*SE*	*95% conf interval*
Increased use of technology	4.1	*0.18*	*(3.7 to 4.5)*
Aging overall population	3.9	*0.17*	*(3.5 to 4.2)*
Increased tourism and recreation activities	3.8	*0.16*	*(3.5 to 4.1)*
Different funding/resourcing arrangements	3.4	*0.22*	*(3.0 to 3.9)*
Increased population and urbanisation	3.3	*0.18*	*(2.9 to 3.7)*
Increased cost of travel/transport	2.5	*0.22*	*(2.1 to 3.0)*

3.3. MOST PROMINENT TRENDS

Figure 1 summarises the combined likelihood and importance scores to illustrate which trends may be the most important for priority attention.

The overall Trends associated with Technology, Tourism and Aging were the most highly rated for importance and likelihood overall.

Details of the specific change scenarios/issues within each of these trends are summarised on following pages, and highlight some of the more specific issues that may require priority attention. While representing a summary of qualitative opinions, given the SAR sector expertise of the expert group involved, these findings do rate critical attention.

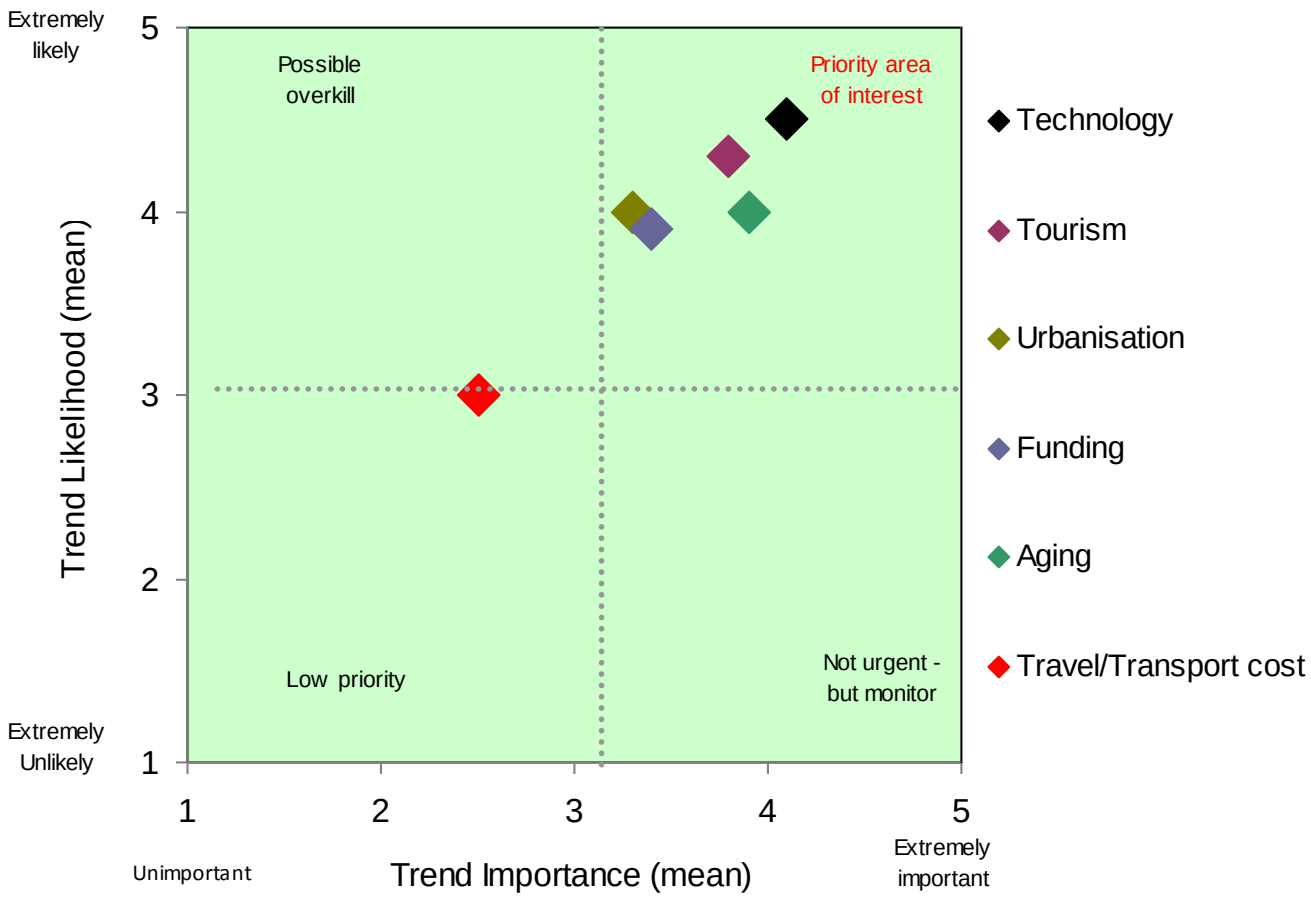

FIGURE 1. IMPORTANCE AND LIKELIHOOD OF TRENDS FOR SAR.

3.4. MOST PROMINENT CHANGE SCENARIOS

All of the individual change scenarios were individually scored using the same likelihood scales overall. Mean scores and summary statistics (e.g. standard errors and 95% confidence intervals) were then calculated from the combined responses.

These results were interpreted as indicators about what the expert group thought about each scenario, and these brief notes help with interpreting the results:

1. Scenarios with lower means = considered less likely by the group
2. Scenarios with higher means = considered more likely by the group
3. Scenarios with mid-range means = no clear distinction

The standard errors also indicated that the degree of opinion consensus within the expert group did differ between different scenarios. The low standard errors for some scenarios indicated that expert group opinion was relatively more consistent for those scenarios. Others with high standard errors suggested less consensus of opinion.

The results below are organised to highlight those scenarios that the expert group considered most un-likely (Section 3.5), those considered most likely (Section 3.6), and those where the expert group's likelihood consideration was unclear between either high or low likelihood (Section 3.6).

3.5. THE MOST UNLIKELY CHANGE SCENARIOS

Those change scenarios where the lower mean scores of around 1 and 2 *(taking standard errors and confidence intervals in to account)* were judged to be highly un-likely (Table 3).

TABLE 3. UNLIKELY CHANGE SCENARIOS

Change Scenarios - those considered less likely	**Mean score**	***SE***	***95% conf interval***
There will be decreased recreation in more remote areas, with decrease in related SAR demand	2.2	*0.190*	*(1.81 to 2.60)*
SAR incidents will decrease overall as people engage in more urban-based recreation types	2.3	*0.173*	*(1.89 to 2.61)*
Fewer recreation SAR incidents overall as people use the more accessible and less remote areas	2.4	*0.208*	*(1.99 to 2.85)*
Compulsory 'user-pays' types of insurance systems will be introduced as a requirement for anyone using more remote locations (i.e. backcountry or backwaters) in order to cover SAR costs	2.5	*0.217*	*(2.01 to 2.91)*

Among these scenarios considered less likely, the scenario with the highest consensus of expert opinion was:

- SAR incidents will decrease overall as people engage in more urban-based recreation types (SE = 0.173).

3.6. THE MOST LIKELY CHANGE SCENARIOS

Scenarios with high mean scores (i.e., 3.8-5.0) were judged to be highly likely (Table 4).

TABLE 4. LIKELY CHANGE SCENARIOS

Change Scenarios - those considered more likely	**Mean score**	***SE***	***95% conf interval***
There will be greater public expectations for immediate and successful SAR response	4.5	*0.120*	*(4.29 to 4.79)*
There will be increasing proportions of non-recreation SAR incidents (e.g. Dementia, Despondent, Missing)	4.4	*0.101*	*(4.17 to 4.58)*
Increased numbers of people visiting natural outdoor areas and parks	4.3	*0.115*	*(4.09 to 4.57)*
Increased SAR callouts due to increased numbers of tourists	4.2	*0.120*	*(3.96 to 4.46)*
People will live longer and remain more active, with sustained increase in SAR demands in some areas	4.1	*0.103*	*(3.87 to 4.30)*
Increased numbers of people engaged in marine recreation	4.1	*0.110*	*(3.90 to 4.35)*
Increased costs for SAR operations, training and support	4.1	*0.174*	*(3.77 to 4.48)*
There will be increasing reliance on professional SAR response agencies instead of volunteers	4.1	*0.174*	*(3.77 to 4.48)*
There will be reduction in the 'search' component of many SAR call-out due to better beacons, communications and location technology	4.1	*0.262*	*(3.81 to 4.36)*
Increased SAR callouts from people in easily accessible natural areas	4.0	*0.085*	*(3.82 to 4.18)*
There will be increased recreation closer to home and in more accessible areas, with an increase in related SAR demand	4.0	*0.095*	*(3.76 to 4.15)*
There will be increased diversity in SAR subjects/victims, from greater variety in ethnic and interest groups	4.0	*0.175*	*(3.60 to 4.32)*
Increased costs for volunteers involved in SAR	4.0	*0.195*	*(3.56 to4.36)*
There will be pressures in specific regions such as 'retirement belts' where volunteer SAR capacity declines while non-recreation SAR demands increase (e.g. dementia-related SAR demand)	3.9	*0.184*	*(3.50 to 4.25)*
Some people will put themselves at more risk because of over-dependence on technological devices - resulting in increased SAR callouts	3.8	*0.133*	*(3.68 to 4.23)*

Among these scenarios considered more likely, the highest expert consensus was demonstrated for the following scenarios:

- Increased SAR callouts from people in easily accessible natural areas (SE = 0.085)
- There will be increased recreation closer to home and in more accessible areas, with an increase in related SAR demand (SE = 0.95)
- There will be increasing proportions of non-recreation SAR incidents (e.g. Dementia, Despondent, Missing) (SE = 0.101)

3.7. UNCERTAIN SCENARIOS

Those change scenarios with middle-level mean scores (between 2.7 and 3.7) were judged to be neither highly likely nor highly unlikely (Table 5). The choice of 2.7-3.7 was arbitrary for indicative purposes, as it was felt that mean scores falling in to this range largely represented those scenarios around which the expert group was in relatively least consensus – with some clearly considering the scenario likely, some unlikely and some I the middle – with a result of a mean score very close to 3 (the mid-point). Note that in the table the scenarios are ranked according to how close their means scores are to 3, which is the most central score on the 1-5 response scale.

TABLE 5: CHANGE SCENARIOS ADJUDGED NEITHER HIGHLY LIKELY NOR UNLIKELY

Change Scenarios - not considered very likely or unlikely	**Mean score**	***SE***	***95% conf interval***
Increasing 'professionalisation' of SAR will require increased funding sources	3.0	*0.252*	*(2.44 to 3.48)*
As there will be relatively more aged people to be supported by relatively fewer in the 'working-age' sector, SAR will suffer because of increased competition for scarcer public funding	3.1	*0.225*	*(2.56 to 3.61)*
There will be reduced demand for SAR overall as people will have better technology for self-location and way-finding (e.g. GPS/phone/map interfaces)	2.9	*0.262*	*(2.38 to 3.46)*
There will be reduced need for active SAR volunteers because of fewer call outs.	2.8	*0.233*	*(2.31 to 3.27)*
People travel less often for recreation purposes	2.7	*0.213*	*(2.27 to 3.15)*
There will be decreased numbers of active volunteers available for SAR response and support	2.7	*0.221*	*(2.25 to 3.17)*
There will be greater reliance on publically funded agencies due to reduced availability of charitable and sponsorship funds	3.3	*0.215*	*(2.94 to 3.84)*
There will be little change in overall SAR incident numbers, but locations will shift closer to major population centres	3.3	*0.202*	*(2.83 to 3.67)*
There will be greater reliance on sponsorship funding due to reduced public funding options	3.4	*0.216*	*(2.97 to 3.86)*
People travel shorter distances for recreation - using areas closer to home and less remote	3.4	*0.158*	*(3.09 to 3.74)*
There will be increased numbers of active volunteers available for SAR response and support	3.4	*0.180*	*(3.04 to 3.79)*
Increased SAR callouts from people in remote natural areas	3.5	*0.170*	*(3.15 to 3.85)*
There will be increased numbers of people in remote areas with lower outdoor skills, resulting in more remote recreation SAR call-outs	3.5	*0.190*	*(3.11 to 3.89)*
It will be harder to maintain volunteer skills and motivations due to fewer call-outs	3.5	*0.233*	*(3.02 to3.98)*
An increased proportion of SAR incidents will occur in the more accessible and less remote areas	3.6	*0.158*	*(3.26 to 3.91)*
There will be greater reliance on volunteers and charitable funding due to reduced public funding options	3.6	*0.157*	*(3.30 to 3.93)*

3.8. DETAILED TABLES

TREND 1 - Increased cost of travel/transport

*Mean Scores from Likelihood scale – from: **(1** = Extremely Unlikely to occur TO **5** = Extremely Likely to occur)*

Change issues/scenarios	Mean scores
1. Increased costs for SAR operations, training and support	4.1
2. Increased costs for volunteers involved in SAR	4.0
3. People travel less often for recreation purposes	2.7
4. People travel shorter distances for recreation - using areas closer to home and less remote	3.4
5. An increased proportion of SAR incidents will occur in the more accessible and less remote areas	3.6
6. Fewer recreation SAR incidents overall as people use the more accessible and less remote areas	2.4

Likelihood of no change for SAR – 2.8

OVERALL

How likely is it that the TREND '*Increased cost for travel/transport*' will affect SAR over the next 20 years?	3.0

OTHER

Are there any other likely changes from the trend '*Increased cost for travel/transport*'?

Other suggested changes or general comments	Score
Because of increased transport cost people are likely to be more organized and trying to get more out of each trip - resulting in setting the bar to high without sufficient experience (pushing for the summit because the drive over was so expensive.	4
People will not be dissuaded from taking their recreational time despite the cost or expense. *However a following trend might be that outdoor users will become increasingly less and less prepared for outdoor activities as we move away from an existence that is close to the land.* *Less likely prepared means SAR will have to respond more quickly to insure survival in the harsher environments. Instant relief and rescue. It will be expected in this push button society.*	5

People still want a holiday so are turning back to outdoor activities they see as less costly - camping, hiking, fishing even snowmobiling - putting themselves in situations where SAR may be needed.	4
Cost of air travel will affect domestic use of helicopters/light aircraft for access to remote areas for hunting, fishing and climbing.	4
The relative costs of travel, particularly air travel will decrease over time but with inflation, the costs are bound to increase.	0
People will go less often - skills will drop (4). *People will go when they can - less regard for weather (4).* *Therefore a possible increase in SAR activity, but in a more front country setting*	4
With people likely to be travelling to "big country" for recreation less often, when they do go there, they are likely to be less experienced in those conditions than they are at present, so there is the potential for more serious SAR incidents.	4
It is most likely that the increased costs of providing SAR services will continue to be borne by SAR volunteers, as they are now.	0
Trend for recreation pursuits to be in less remote areas does not necessarily make them less hazardous therefore the influence on SAR operations is not necessarily a reduction in same. *Increased cost of travel can make operational options time critical and therefore a tendency for safety margins to be compromised (i.e., tendency to take greater risks due to cost of travel and time).* *Cost of travel also closely associated with cost of individuals "time pressure" in their recreation trips, wanting to do more in less time.*	0

TREND 2 - Increased tourism and recreation activities

*Mean Scores from Likelihood scale – from: **(1** = Extremely Unlikely to occur TO **5** = Extremely Likely to occur)*

Change issues/scenarios	Mean scores
1. Increased numbers of people visiting natural outdoor areas and parks	4.3
2. Increased numbers of people engaged in marine recreation	4.1
3. Increased SAR callouts due to increased numbers of tourists	4.2
4. Increased SAR callouts from people in easily accessible natural areas	4.0
5. Increased SAR callouts from people in remote natural areas	3.5

Likelihood of no change for SAR – 1.8

OVERALL

How likely is it that the TREND '*Increased tourism and recreation activities*' will affect SAR over the next 20 years?	4.3

OTHER

Are there any other likely changes from the TREND '*Increased tourism and recreation activities*'?

Other suggested changes or general comments	Score
Personal finance problems negating distant recreation locations	1
Mission numbers are going to increase in categories not even considered important now as new activities and ways to kill one's self in the outdoors increase.	5
Increased numbers on quick road end/tourist walks by tourists and older people *Increase in middle-older age people joining groups and or individually taking to walking/tramping"*	0
I would expect that with improvements in technology, less people will find themselves lost in remote areas and people will be able to "self-rescue" more without relying on SAR assistance.	0
Increased pressure to extract a levy from tourists for SAR, due to increased percentage of SAR costs being spent on incidents involving non-NZ tax-payers = 4	4
We note a change to more Helicopter "pick up "jobs which seen to come from the Ambo comms rather than the search & rescue jobs *Therefore this a 5 on scale*	5

TREND 3 – Aging overall population

*Mean Scores from Likelihood scale – from: **(1** = Extremely Unlikely to occur TO **5** = Extremely Likely to occur)*

Change issues/scenarios	Mean scores
1. People will live longer and remain more active, with sustained increase in SAR demands in some areas	4.1
2. There will be increased recreation closer to home and in more accessible areas, with an increase in related SAR demand	4.0
3. There will be decreased recreation in more remote areas, with decrease in related SAR demand	2.2
4. There will be decreased numbers of active volunteers available for SAR response and support	2.7
5. There will be increased numbers of active volunteers available for SAR response and support	3.4
6. As there will be relatively more aged people to be supported by relatively fewer in the 'working-age' sector, SAR will suffer because of increased competition for scarcer public funding	3.1
7. There will be pressures in specific regions such as 'retirement belts' where volunteer SAR capacity declines while non-recreation SAR demands increase (e.g. Dementia-related SAR demand)	3.9
8. There will be increasing reliance on professional SAR response agencies instead of volunteers	3.0

Likelihood of no change for SAR – 2.1

OVERALL

How likely is it that the TREND '*Aging overall population*' will affect SAR over the next 20 years?	4.2

OTHER

Are there any other likely changes from the TREND '*Aging overall population*'?

Other suggested changes or general comments	Score
The trend for conducting Search Operations in the Urban environment is going to increase substantially. The likelihood that this will affect training for urban search is extremely likely. That is going to mean some real research and development on searching effectively in urban areas. It is not the same as the rural environment.	5
SAR teams may need to develop new methods to look for Dementia patients especially in urban and urban interface environments.	5

Less remote areas, more old active SAR volunteers, to support SAR needs of elderly. Quite likely.	4
An aging volunteer base may not have the fitness and skills to complete demanding SAR activities. (4) *The increased need for specialisation in SAR may not occur in the volunteers due to shortage of time necessary for training.* (4) *The lack of outdoor skill level will affect the baseline entry level of SAR volunteers*. (5)	5
While there are likely to be more volunteers wanting to be involved in SAR, there will be fewer than at present who have solid backcountry skills. This may mean an increased need for bushcraft training, or more likely a heavier workload on the remaining few thoroughly capable people. (SAR skills can be taught, but backcountry skills and nous have to evolve through time.)"	4
Ageing population does not necessarily equate to a huge increase in Dementia related operations - in some areas such as vascular Dementia rates are actually declining due to better management of co morbidities such as high blood pressure and other cardio vascular risk factors. Research is currently very close to identifying a "marker" for Alzheimer's which could well further reduce operations for same	0

TREND 4 – Increased use of technology

*Mean Scores from Likelihood scale – from: **(1** = Extremely Unlikely to occur TO **5** = Extremely Likely to occur)*

Change issues/scenarios	Mean scores
1. There will be reduced demand for SAR overall as people will have better technology for self-location and way-finding (e.g. GPS/phone/map interfaces)	2.9
2. Some people will put themselves at more risk because of over-dependence on technological devices - resulting in increased SAR callouts	3.8
3. There will be reduction in the 'search' component of many SAR call-outs due to better beacons, communications and location technology	4.1
4. There will be reduced need for active SAR volunteers because of fewer call outs.	2.8
5. It will be harder to maintain volunteer skills and motivations due to fewer call-outs	3.5
6. There will be greater public expectations for immediate and successful SAR response	4.5

Likelihood of no change for SAR – 1.8

OVERALL

How likely is it that the TREND '*Increased use of technology*' will affect SAR over the next 20 years?	4.5

OTHER

Are there any other likely changes from the TREND '*Increased use of technology*'?

Other suggested changes or general comments	Score
Technology is going to increase in other areas than beacons and navigation. ATV's and snowmobiles are getting more powerful and reliable, all outdoor gear is getting lighter and better enabling people to go further, faster and steeper. So while one technology might make travelling safer another one will make it more dangerous.	4
Over dependence on technological devices has characteristically resulted in major cock-up's at every level. SAR responders are still going to have to do it the old fashioned way. I don't think we are ever are going to get away from "boots on the ground." The trend has still got to provide the basics necessary for the front line responder! That is very likely to occur	5

GPS based beacon systems for at risk groups from Alzheimer's, autistics, IHC will mean the intervention of self find, family find or agency find without alerting SAR authorities. *Electronic recording systems such as used on ski fields could apply to wider areas such as tracks or in at risk activities*.	0
Attempted Friend/family rescues of lost party due to ability to notify them as well. *People lost due to "flat Battery" situations*	0
SAR respondents will need to be more techno-savvy to use the new technologies that will become available for SAR.	4

TREND 5 – Increased population and urbanisation

*Mean Scores from Likelihood scale – from: **(1** = Extremely Unlikely to occur TO **5** = Extremely Likely to occur)*

Change issues/scenarios	Mean scores
1. SAR incidents will decrease overall as people engage in more urban-based recreation types	2.3
2. There will be little change in overall SAR incident numbers, but locations will shift closer to major population centres	3.3
3. There will be increasing proportions on non-recreation SAR incidents (e.g. Dementia, Despondent, Missing)	4.4
4. There will be increased diversity in SAR subjects/victims, from greater variety in ethnic and interest groups	4.0
5. There will be increased numbers of people in remote areas with lower outdoor skills, resulting in more remote recreation SAR call-outs	3.5

Likelihood of no change for SAR – 2.0

OVERALL

How likely is it that the TREND '*Increased population and urbanisation*' will affect SAR over the next 20 years?	4.0

OTHER

Are there any other likely changes from the TREND '*Increased population and urbanisation*'?

Other suggested changes or general comments	Score
More research and development on effective searching in the urban environment. *Experimentation and practical methodology will be developed for more efficient and consistently run operations that are reliable.* Extremely likely.	5
The increase in crime or even present level in such crimes as homicide will mean more prolonged and difficult searches which require large amounts of resources. *Searching for certain categories such as missing children, abduction, Alzheimer's will require specialised training.* *There will be a lower skill and equipment level when the urban people access remote areas resulting in more severe incidents.*	0

TREND 6 – Different funding/resourcing arrangements

*Mean Scores from Likelihood scale – from: **(1** = Extremely Unlikely to occur TO **5** = Extremely Likely to occur)*

Change issues/scenarios	Mean scores
1. Increasing 'professionalisation' of SAR will require increased funding sources	4.1
2. Compulsory 'user-pays' types of insurance systems will be introduced as a requirement for anyone using more remote locations (i.e., backcountry or backwaters) in order to cover SAR costs	2.5
3. There will be greater reliance on volunteers and charitable funding due to reduced public funding options	3.6
4. There will be greater reliance on sponsorship funding due to reduced public funding options	3.4
5. There will be greater reliance on publically funded agencies due to reduced availability of charitable and sponsorship funds	3.3

Likelihood of no change for SAR – 2.4

OVERALL

How likely is it that the TREND '*Different funding/resourcing arrangements*' will affect SAR over the next 20 years?	3.9

OTHER

Are there any other likely changes from the TREND '*Different funding/resourcing arrangements*'?

Other suggested changes or general comments	Score
I think the trend will be for some type of insurance or bonding arrangement ultimately having to be developed as a scheme to pay for the more expensive operations. We can't continue to offload the cost of SAR onto to the general public through tax dollars or just outdoor user fees. They won't stand for it. I think that this is extremely likely.	5
The Police and RCC are responsible for SAR and there is a high public expectation. This will mean more professional people involved to meet the desired standard. It is already happening in NZ with a 24 hour staffed RCC and appointment of more Police SAR Coordinators. *The public will contribute to specialist projects such as local radios or equipment.*	0

ACKNOWLEDGEMENTS

The authors wish to acknowledge the support provided to the search and rescue sector by New Zealand Oil and Gas, which made this study possible.

Also a big thanks to Dave Shearer, Ross Gordon and the rest of the team at SARINZ for initiating the research idea and enthusiastically backing us all the way with anything we needed.

We'd like to thank those respondents from the sample of SAR expert specialists and practitioners who were able to contribute through our scoping survey of potential future SAR issues. Thank you for allowing us to list your names and affiliations to demonstrate the experience and knowledge of this group (listed overleaf).

Expert Survey contributors

Name	SAR Role/affiliation
Clive G. Swombow	Director of Operations, U.K. Emergency Response International.
Robert C. "Skip" Stoffel	President, Emergency Response International Washington State, U.S.A.
Sigurður Ólafur Sigurðsson	Director of SAR School, ICESAR – Icelandic Association for Search and Rescue.
Martin Colwell	President, SAR Technology Inc
Pete Corbett	Programme Manager, SARINZ
Dave Shearer	Chief Executive, SARINZ
Ray Bellringer	Department of Conservation Aoraki/Mount Cook Team Medic/Ops Manager and Land SAR NZ (Director)
Monica Ahlstrom	SAR Alberta, Search and Rescue Volunteer Association of Canada
Paul Kelly	Senior Instructor, SARINZ.
Tom Clarkson	Wellington LandSAR NZ, also Director, SARINZ
Ross Gordon	SAR Development Manager SARINZ
Darren Hopkins	Inspector of Police, Tasmania Police
Colin Daniell	SAR Advisory Group, Christchurch ACR, Cave SAR
Laurie Gallagher	Adviser, LandSAR NZ Wellington
Hans Larsson	Superintendent, Search Manager/Coordinator, Stockholm County, Sweden
Kerryn Wratt	Team Member, Alpine Search and Rescue Victoria. Medic / Team Member, Rescue 24 International
Dave Robertson	Adviser, Dunedin LandSAR
Phil Pollero	Regional Manager, Coastguard Central Region Inc
Dave Comber	Director, LandSAR NZ
Tric Moller	LandSAR Group, Dunedin
Barry Were	Hamilton Group, LandSAR NZ
Ian Watts	Adviser, Search & Rescue Nelson Inc
Grant Prattley	Programme Manager Rescue, SARINZ
Plus 2 anonymous	*No name or affiliation given*

FURTHER INFORMATION

This summary report and other resources, including the full report from this study, will be available from SARINZ: www.sarinz.com.