

## **Observations from UK Dog Training Data**

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This set of papers looks at the training and assessment of air scenting search dogs in the UK. The work has been done with the co-operation of SARDA (South Scotland), without whose involvement it would not have been possible.

Part 1 provides the background; it outlines the function of the organisation SARDA (Search and Rescue Dog Association), focussing in particular on its role in the assessment of dogs and handlers. In Part 2 we show how information collected in the past as part of the assessment process has proved to be a useful source of data for analysis. In Part 3 we show a technique that SARDA (South Scotland) has started to teach handlers how to ensure that their area has been properly searched.

## **PART 1**

### **Organisation**

In the UK, the overwhelming majority of non-Police dogs used for SAR are air scenting. The usual mode of operation is one handler to one dog, although it is not unknown for a handler to work two dogs at the same time. When working, the dog is not on a leash and may travel out to distances of up to two or three hundred yards away from the handler. In an ideal situation, the mode of operation is as follows: the handler and dog start at the downwind end their allotted search area and head into the wind as they move through it to the other end. The handler will tend to keep to the centre-line whereas the dog will move out to some distance from the handler, first on one side and then on the other, in its attempt to pick up an airborne scent. If that should happen, the dog will try to find the source of the scent by continuing to work first in one direction and then in the other - but now their movements will be confined within the path of the scent, carried by the wind and emanating from the person they are looking for. The dog will work its way into the wind and eventually arrive at the lost person.

In reality, the relative movements of the handler and dog will be constrained by the direction of the wind through their search segment - they may have to work at an angle to it - or features of the terrain and vegetation such as trees or broken ground which will affect the behaviour of the wind or the route that can be followed through the segment. The net effect, though, will be exactly as described.

The dog's training is designed to teach or enhance its natural skills in ranging (working at a distance from the handler), quartering (working first in one direction

and then in the other), striking (responding to a scent) and indicating (telling the handler when it has located the lost person).

A handler must be a fully trained member of a SAR team. This ensures that they are sufficiently hill-competent and hill-fit to be able to operate in any area into which they are assigned. As well as being members of a SAR team, every handler must be a member of the branch of SARDA that covers the part of the UK in which they will operate. SARDA has its own callout system, and a trained dog can be called upon to work with any SAR team within a wide area around its home base. It is not restricted to working solely with the team of which the handler is a member. The decision to involve SARDA is taken by the SAR team within whose area the incident has occurred. A handler who is a member of an English SAR team and who will operate in conjunction with English teams has to be a member of SARDA (England); similarly, there are regional branches of SARDA (Scotland) and SARDA (Wales).

### **An outline of the assessment process**

One of the main functions of SARDA is the assessment of handlers and their dogs. All assessment is done at national level. An Assessment Meeting typically lasts for three or four days, and takes place in a mountainous area in wintertime. The assessment is done by experienced handlers from across the country in order to provide consistent standards.

All dogs start by taking an Acceptance Test, involving basic obedience tests and a stock test. This latter is essential since they are likely to have to operate in rural areas containing farm livestock; the dog must show no interest in them. If they pass the Acceptance Test, the handler will begin training the dog and recording progress in a logbook. The following year, provided that sufficient progress has been made, they will be invited to take part in an Assessment Meeting. If they are successful they will be classed as a Novice Grade search dog and will be eligible for callout duty.

A year later they will be assessed again. This assessment is at a more demanding level, and if they pass then they become a Full Grade search dog. They will be reassessed at intervals of up to a maximum of three years after that.

## **How assessment is carried out**

Over the duration of the Assessment Meeting, each handler and dog will be given up to five areas to search, each of which can contain up to three volunteer "bodies". The areas vary in size, but each of them should take between 45 and 90 minutes to search. In each area they are watched by two or three Assessors, who agree between themselves on the mark to award for each aspect of the search process. These marks are recorded on an Assessment Record Card. Each dog will have one of these for the Assessment Meeting, so that all their marks are recorded on one document.

Side 1 of the card is the part used by the Assessors for recording marks and comments. The marks awarded are between 1 and 10, and correspond to the descriptors printed on the card. Side 2 gives guidelines on which the Assessors will base the marks they award, together with codes to use in the event of the dog not finding a body. The use of guidelines, descriptors and codes helps to create consistency of standards. Readers are encouraged to examine these; they will provide an insight into not only what the Assessors are assessing but will also give an idea of the way in which the dog and handler operate.

For each search area, the Assessors award marks between 1 and 10 for all aspects of the search process. A mark of 4 or below for any of these is regarded as a failure. A dog that has been awarded marks of 5 or above throughout the entire Assessment Meeting is considered to have passed.

During an Assessment Meeting around ten dogs will be assessed. About two-thirds of the search areas will contain one body, and the rest will contain more than one. The information recorded over the duration of the Assessment Meeting therefore gives data on the way in which the dogs have performed in about fifty individual searches for a missing person. When we consider that Assessment Meetings occur at frequent intervals around the country then we can see that over the years a large volume of valuable data will be built up.

## PART 2

In Part 1 we discussed the assessment process used by SARDA (Search and Rescue Dog Association) in the UK, and explained how the Assessment Record Card contains a wealth of information on how dogs and their handlers performed during assessment. In part 2 we will discuss what we found when we analysed that information.

### The Analysis

Two hundred Assessment Record Cards were made available for us to analyse, relating to around 20 different handlers and their dogs, and covering the period 1988 to 1994. These cards contained information on a variety of factors for a total of 476 potential body finds that had occurred during assessment in that period.

The purpose of the analysis was:

- a. to arrive at a working estimate of the Probability of Detection (PoD) for an air scenting search dog
- b. to see if any of the factors recorded by the Assessors had any bearing on how successful the handler and dog were.

### Probability of Detection

It is essential for the Search Manager to understand the capability of each of the search resources which are available on an incident; this includes not only the kind of terrain and conditions for which the resource is best suited, but also some measure of how successful the resource is likely to be. This figure - the Predictive PoD - is at worst based on some kind of informed guess, and at best is based on the analysis of data from field trials.

Overall, the data that we examined provided 476 opportunities for a dog to find a body, and a find had been made on 430 occasions. **This gave an overall value for PoD of 90%.**

The data on which this figure is based is for dogs and handlers with a wide range of experience - in other words the kind of typical cross section of SARDA members who one might encounter on a callout. It has been carefully collected in a reasonably

large volume over a period of time from something that is fairly close to real operational conditions rather than from field trials set up specifically to determine PoD. We therefore feel that this is an acceptable value for the PoD of an air scenting search dog.

### **Why dogs were not finding bodies - the "missed body" codes**

When a dog failed to make a find, the reason for failure was recorded on the Assessment Record Card as a letter code. These are referred to as "missed body" codes and are pre-printed on the card for ease of reference. They are not exclusive, for example codes D and F ("due to poor coverage of area" and "failure to read the dog's interest") were seen recorded together, but more often than not (on 43 out of the 46 occasions when a body was not found) only one code was recorded. On one occasion the Assessors had written "handler error" instead of a code, and on five occasions they had noted that they were unable to give a reason for the failure. The Assessors had recorded a total of 51 codes or comments on the 46 occasions when a find had not been made. These are shown in Table 1.

Some of the "missed body" codes represent errors on the part of the handler; codes C, D, E, F, G and the comment "handler error" fall into this category. Together these accounted for 38 of the 51 recorded reasons, telling us that, **in the opinion of the Assessors, the handler was at fault on at least 75% of the occasions when no find was made.** Furthermore, errors relating to coverage (codes C, D and E) were recorded on 24 occasions, telling us that, **in the opinion of the assessors, half of the failures to find the body occurred because the area was not searched completely.**

### **Why dogs were not finding bodies - what affects their success rate?**

The "missed body" code is used only when the dog fails to make a find, and since this happened on only 46 occasions it provided us with a relatively small amount of data. There is, however, a lot more information available on the Assessment Record Card - the Assessors are expected to record ten items of general information plus an additional four items of information for each body for every search area in which the dog and handler are assessed. Two of the items of information relate to wind conditions, some relate solely to the dog but the majority (seven of them) relates to the handler; we were interested in these seven factors.

We have divided the seven factors into two groups for convenience of analysis: the first group contains factors relating to how successfully the handler organises and manages their search, while the second group contains factors relating to how successfully they control and read their dog. The first group of factors consisted of Initial Search Strategy (the way in which the handler approaches the problem of searching the area, Coverage (their method of ensuring that the whole of the search area has been covered) and Handler's Response to Change (how they react to changes in terrain and wind). The second group of factors consisted of Directional Control (the handler's ability to send the dog in a particular direction, Reading the Strike (the handler's ability to recognise that the dog had picked up a scent, and how they react to it, Reading the Find (the handler's ability to recognise that the dog has made a find) and Reading the Dog's Actions (knowing where the dog has searched and understanding what it is doing at all times). The factor Reading of Strike had not been recorded on all of the cards that we analysed because during the period covered by the study the cards had been redesigned and that item of information had been removed.

We wanted to investigate the bearing that each of these factors had on how successful the handler and dog were at finding a body; the way the data was analysed was to take the factors one at a time, and group the Record Cards according to the mark awarded by the Assessors for the factor under consideration. It was then a case of working out the total number of bodies that could have been found and the number of bodies actually found and expressing one as a percentage of the other. This is referred to as the success rate. Table 2 illustrates how this was done for the factor General Reading of Dog's Actions.

Table 2 shows that there were 448 occasions on which the Assessors were able to give a grade for the factor General Reading of Dog's Actions, and on 405 of those occasions the dog made a find. Around 80% of the grades awarded were in the two ranges acceptable / moderately good and good / very good. The success rate was highest on those occasions on which the handler was given a high grade for reading the dog's actions, and reduces as the grade awarded becomes less good. The success rate appears to reflect the handler's ability to read the dog. This does not seem too surprising, and as we will see, this kind of relationship occurs for several other factors.

The result of the analysis of all seven factors is shown in Figs. 1 and 2. In each case the graph shows the success rate plotted against the grade awarded by the Assessors. The downward slope of the graphs is generally evident, telling us that a handler who was awarded a high mark for any of these factors was more likely to make a find than a handler who was awarded a low mark. The exceptions to this are Reading the Strike and Reading the Find - the body is found more or less regardless of how well these were done, which seems reasonable - the fact that they did it was sufficient.

**Fig. 1 suggests that if we can improve the way in which the handler organises and manages the search of their area then we should see an improvement in success rate. An improvement in any one of the factors involved should have some effect, but if we can find a way of improving all three then a better success rate should follow automatically.**

**Fig. 2 suggests that the same will happen if we can improve the handler's directional control of their dog and their ability to read the dog's actions.**

### **The effect of the wind**

Wind Strength and Wind Direction are recorded on the Assessment Record Cards. Wind Strength was a subjective assessment (calm, light, moderate or strong), while Wind Direction meant consistency of direction (steady, turbulent or variable). The cards were analysed to see how these affected the success rate; the findings are shown in Tables 3 and 4.

Table 3 shows that when there is no wind then this has an adverse effect on the success rate - this is reasonable, in that any scent will have little horizontal movement and will rise straight up from the source. For any amount of wind from light through to strong the success rate is roughly the same. The consistency of wind direction (Table 4) appears to have little effect on success rate; the handler can allow for this as the search progresses.

### **Summary of the main findings**

The analysis of the 200 Assessment Record Cards gave the following results:

1. The overall value for PoD was 90%.



2. The handler was considered to be at fault on at least 75% of the occasions when no find was made.
3. On 50% of the occasions when no find was made the coverage had been incomplete - the area had not been searched in its entirety.
4. The handlers who were best at organising and managing their search (i.e. were good at devising a strategy, ensuring proper coverage of the area and reacting to changes of terrain and wind) were more likely to find the bodies than handlers who were not so good at those things.
5. Similarly, the handlers with the best directional control of their dog and who could best read their dog's actions were more likely to find the bodies than the handlers who were not so good at those things.
6. When the wind was assessed as "calm", the PoD was 75%; otherwise, it remained close to 90% whatever the wind conditions.

## **Conclusions**

The Probability of Detection of a search resource is a simple enough concept but it is far from simple in terms of the variables involved and their relative influence. This is true for all manner of search resources. We feel that one approach to understanding the problem is to think of the PoD for some resource as having some basic value, together with a number of contributory factors or parameters. This basic value is enhanced (improved) when the parameters take values in one direction, or detracted from (made worse) when they take values in the opposite direction. Based on the analysis we have done here, we would suggest the following:

Basic value of the Predictive PoD for an air scenting search dog: 90%

PoD enhancers:

- a handler who is good at developing a search strategy
- a handler who can ensure properly coverage of the search area
- a handler who reacts well to changes of terrain and wind
- a handler who has good directional control of their dog
- a handler who is good at reading their dog's actions

PoD detractors:

- a handler who is not good at developing a search strategy
- a handler who cannot ensure proper coverage of the search area
- a handler who does not react well to changes of terrain and wind
- a handler who does not have good directional control of their dog
- a handler who is not good at reading their dog's actions

calm wind

While we would hesitate to put numbers to these, it is worth pointing out that our analysis gave success rates - in effect PoD's - of between 95% and 100% for handlers who were rated as excellent or perfect. However, for handlers at the other end of the scale they were seen to be as low as 44%.

**It would seem that much can be done to improve the overall level of success by teaching handlers how to ensure that their area is properly searched - by devising good strategies, assessing coverage and responding to changes in the terrain - as well as by encouraging them to improve their skills with the dog.**

**Table 1: Reasons given for failing to find a body - the "missed body" codes**

Code	meaning	number of occurrences
A	not assessable by assessors or body	2
B	bad luck in very bad conditions	6
C	bad luck, but dubious coverage of area	9
D	due to poor coverage of area	13
E	due to bad coverage of area	2
F	failure to read dog's interest	5
G	failure to recognise that dog has found	8
H	dog has no interest in an obvious body	0
None	"handler error"	1
None	no reason given	5
Total		51

**Table 2: Analysis of data for General Reading of Dog's Actions**

Grade Descriptor	potential number of finds	actual number of finds	percentage success rate
perfect or excellent	49	47	96
very good or good	235	222	95
moderate or acceptable	118	103	87
doubtful or weak	37	29	78
poor or bad	9	4	44
totals	448	405	

**Table 3: Wind Strength and Success Rate**

wind strength	success rate %
calm	75
light	88
moderate	92
strong	89

**Table 4: Consistency of Wind Direction and Success Rate**

wind direction	success rate %
steady	90
turbulent	89
variable	91

Fig.1 Factors relating to managing the search

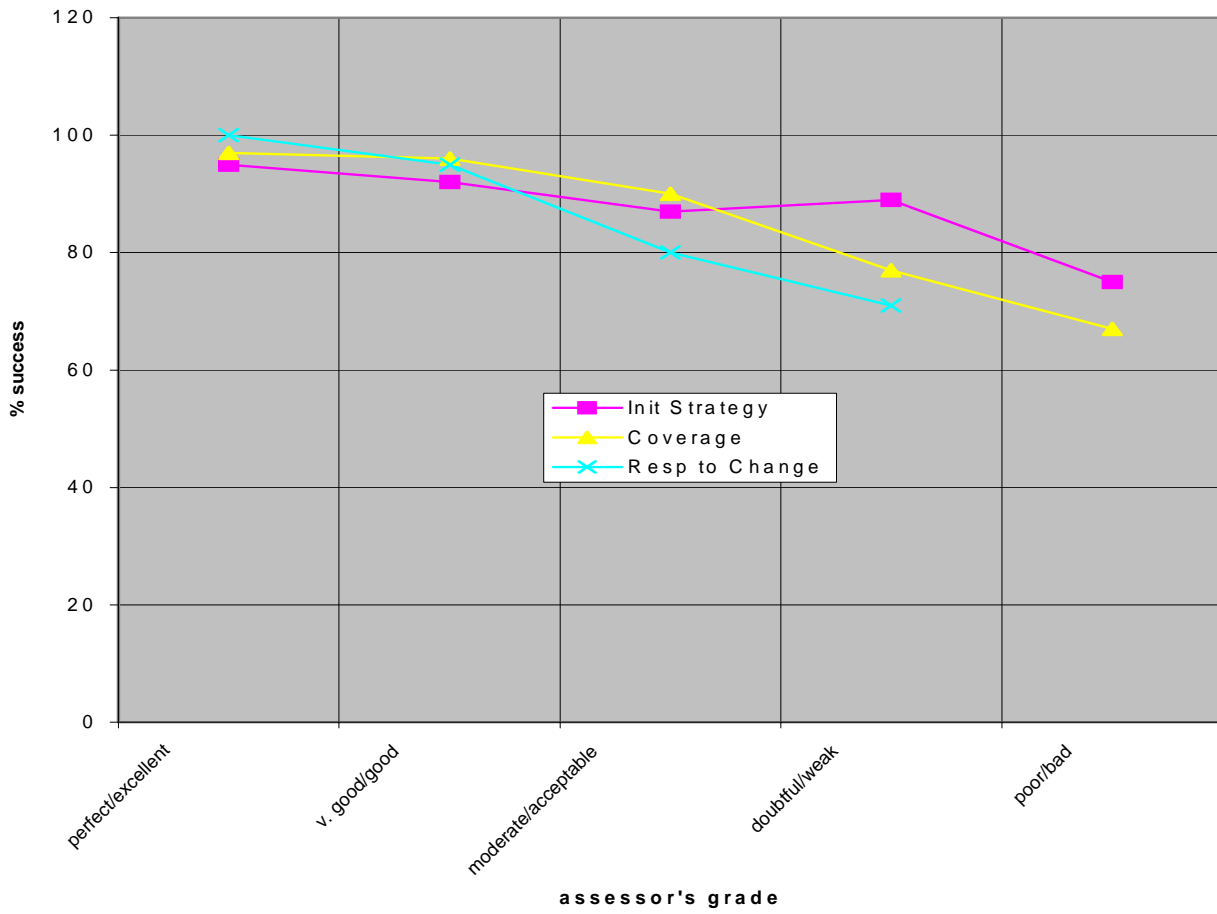
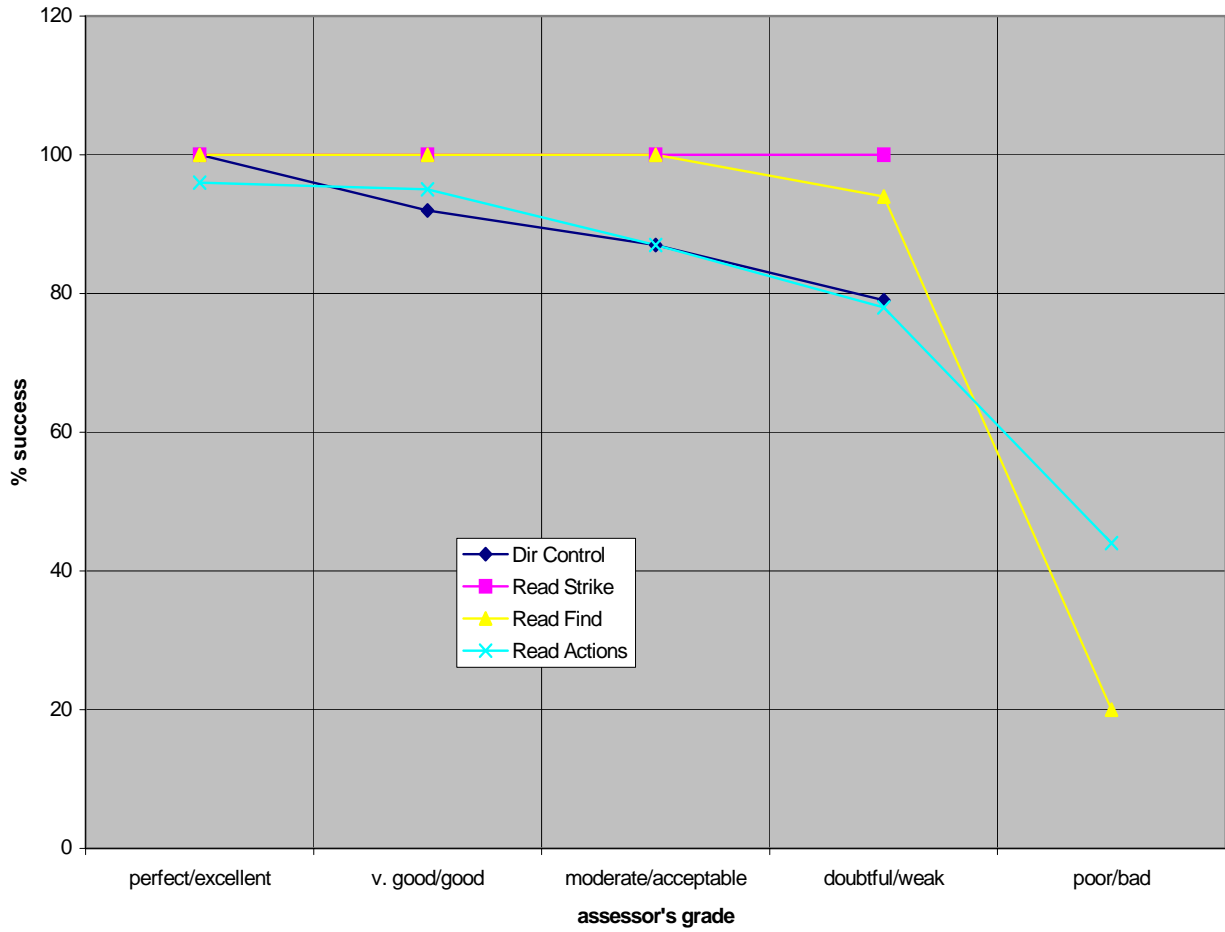


Fig. 2 Factors relating to controlling and reading the dog



## **PART 3**

### **THE SIX STEP PROCESS FOR DOG HANDLERS**

#### **Step 1 - Size up the situation - what are the facts?**

You must identify and collect all the relevant facts that are currently available.

##### **Actions:**

- find out who you are looking for
- find out how you fit into the overall plan
- find out what your segment looks like - what are its boundaries, what are its main features
- determine the wind direction and strength
- determine how consistent the wind strength and direction are likely to be
- decide if the segment contains or lies near to any features which will have an effect on airborne scent

#### **Step 2 - Identify contingencies - what are the 'maybes'?**

You now have to consider the "maybes" - where the person might have gone, what they might have done and what might have happened to them. You will need to find out what scenarios the Search Management Team are considering. You should understand the principles behind Lost Person Behaviour Statistics and know how they relate to the person you are looking for. This Step is likely to be done in conjunction with a member of the Search Management Team.

##### **Actions:**

- find out what scenarios are being considered
- find out what Lost Person Behaviour Statistics tell you about this category of missing person

- find out if there are any features in your segment that might have attracted them
- identify any tracks or paths that they might have used

### **Step 3 - Determine Goal and Objectives - what do you want to achieve?**

Your *Goal* is to search the segment that you have been given in order to find the missing person and ensure their safety. You will work towards achieving that *Goal* by means of a number of steps called *Objectives*. These will relate to specific areas, features or locations that you will need to search. Some *Objectives* may have a higher priority than others. Each of your *Objectives* is likely to consist of a number of *Tasks*.

#### **Actions:**

- identify your *Goal*
- identify your *Objectives*
- break each *Objective* down into a series of *Tasks*

### **Step 4 - Identify resources - how do the resources you have match up to what you want to do?**

You are going to have to meet each of the *Objectives* you have identified with the resources that you have available to you. Typically, these will be you and your dog, but there may be two of you, or you may have a support person or group with you.

#### **Actions:**

- establish what search resources you have

### **Step 5 - Build a plan and a structure - how will you achieve your Objectives?**



You need to plan how you are going to search the segment - how and in what order are you going to attempt the Tasks? What will *you* do? What will you expect the dog to do? If anyone else is involved, what will they do?

**Actions:**

- decide how you will accomplish each of your Tasks
- decide how you will move through the segment
- decide how you are going to deploy the dog
- decide how any other resource at your disposal will be deployed

**Step 6 - Take Action - do it!**

In this Step you will put your plan into action and afterwards assess how successful you have been at meeting each of your Objectives. You will need to brief any other resources involved before they start and debrief them when they finish.

**Actions:**

- make sure you have been briefed and brief any else involved
- carry out the plan you devised in Step 5
- assess how successful you have been at meeting each of your Objectives
- debrief anyone else involved at the end
- get debriefed