

A Review of Advances in Search Techniques over the last five years



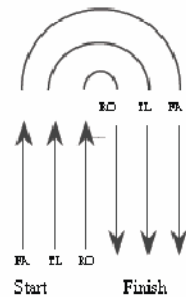
Circa 2004

Creeping Line / Base Line

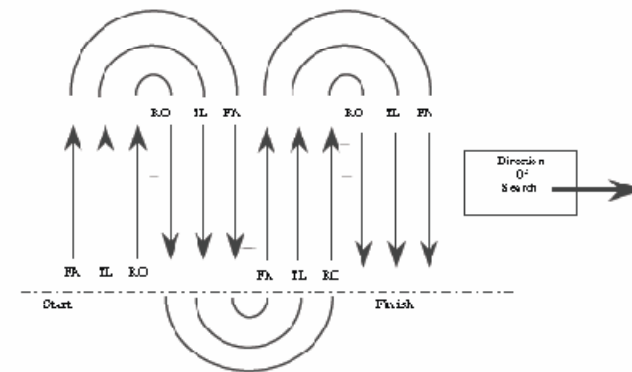
Creeping Line / Base Line

Creeping Line search

This can feel that you are not making any progress as you start and finish on the same base line.



Base Line Search



Taken from a Unit's 2009 training manual -
online

Critical Separation

ALSAR Conference Presentation
© Robert Bradley 2009

Some Terminology

Sweep Width

A measure of the effectiveness with which a particular sensor can detect a particular object under specific environmental conditions [IMO/ICAO, 1999b]. A measure of “detectability.” *Effective sweep width* depends on the search object, the sensor and the environmental conditions prevailing at the time and place of the search. There is no truly simple or intuitive definition.

Selected Inland Search Definitions
by Donald C. Cooper and John R. Frost

Some Terminology cont.

Sweep Width...

The *effective sweep width* may be thought of as the width of a swath centered on the sensor's track such that the probability of failing to detect an object within that width equals the probability of detecting the same object if it lies outside that width, assuming the object is equally likely to be anywhere.

Selected Inland Search Definitions
by Donald C. Cooper and John R. Frost

In the past



In the past



Now we understand better



What this means

Critical Separation?



What this means

Straight Lines?

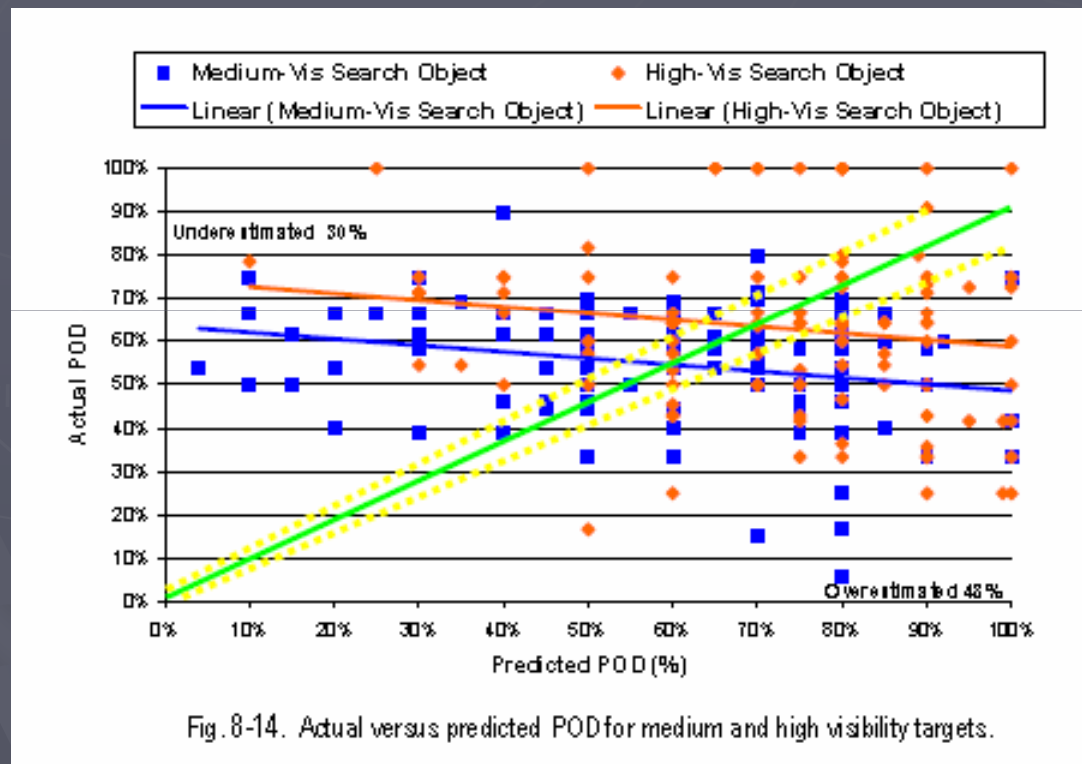


December 2004

Sweep Width Estimation

Koester, Cooper, Frost, Robe

Predicting POD



...estimated POD
maybe no better than
random chance, such
as picking POD values
out of a hat.

Search Fatigue

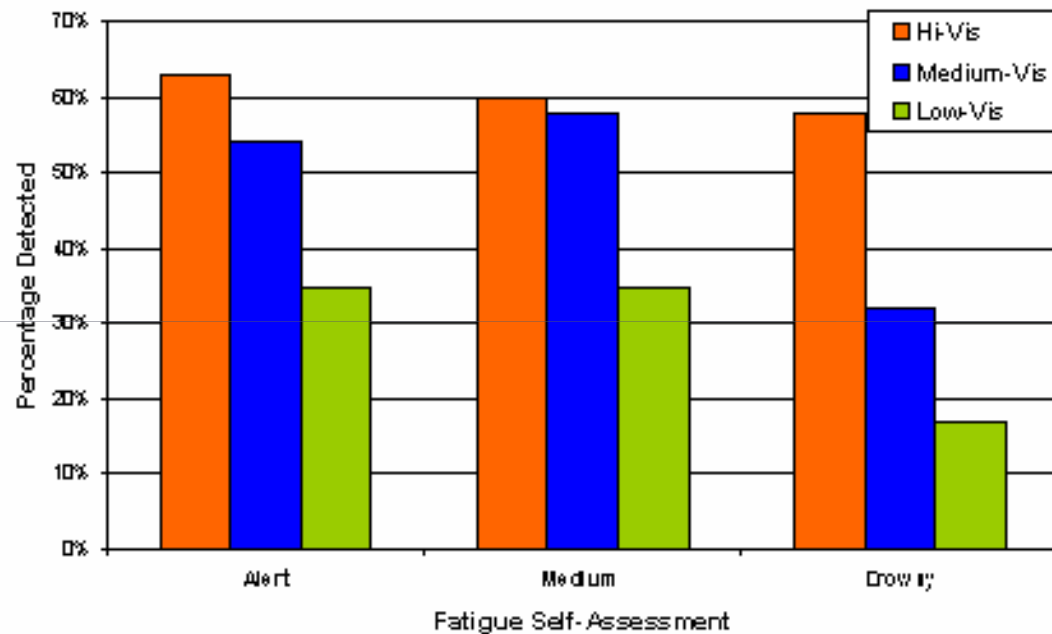


Figure 8-9. The relationship between searcher fatigue and actual POD.

When significantly fatigued they are that much more easy to miss.

Search Techniques

Failure to look behind
Failure to stop and scan
Looking beyond ESW
Scan beyond first foliage
Scan after a distraction
Get low, if applicable
Use corrected vision
Talking whilst searching



2008

Searcher Spacing

“There are two outcomes: either the missing person is found and evacuation is initiated, or the area is cleared ...”

“day ended successfully with all missing persons and items found ...”

Unit websites - 2009

A Search Scenario

A POA 25%	B POA 25%
C POA 25%	D POA 25%

Three possible tactics

Only 4 searchers for 4 hours!

1. Search one area at 10m spacing
2. Search two areas at 20m spacing
3. Search three areas at 40m spacing

What is the best course of action?

The Maths

Searcher track length = 8000m

4 searchers track length = 32,000m

Sweep width = 36m *

Area effectively swept = 1,152,000m²

Coverage = 3.6

More maths

POD for one area = 97%

Therefore;

POS = 24.3%

Spreading out a bit

Coverage in each area = 1.8

POD in each area = 83%

Therefore

POS = 41.5%

Spreading out a bit more

Coverage in each area = 0.8

POD in each area = 59%

Therefore

POS = 59%

Summary

A	B
C	D

Tactic One

POS 24%

A	B
C	D

Tactic Two

POS 42%

A	B
C	D

Tactic Three

POS 59%

Taken from Success Fast,
Steve Upton

For all sweep widths

Sweep Width Figure	Scenario One	Scenario Two	Scenario Three
16m (Lowest !)	Cov. 1.6, POD 80%, POS 20%	Cov. 0.8, POD 55%, POS 27.5%	Cov. 0.4, POD 33%, POS 33%
61m (Median)	Cov. 6.1, POD 99%, POS 24.9%	Cov. 3.1, POD 95%, POS 47.5%	Cov. 1.5, POD 78%, POS 79%

What this means

- ▶ Smaller Teams
- ▶ Better Raindances
- ▶ Less control for and by TLs
- ▶ Greater autonomy for TMs
- ▶ A BIG culture shock!



Route & Path

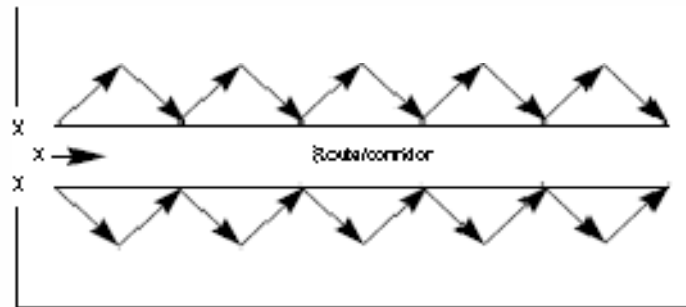


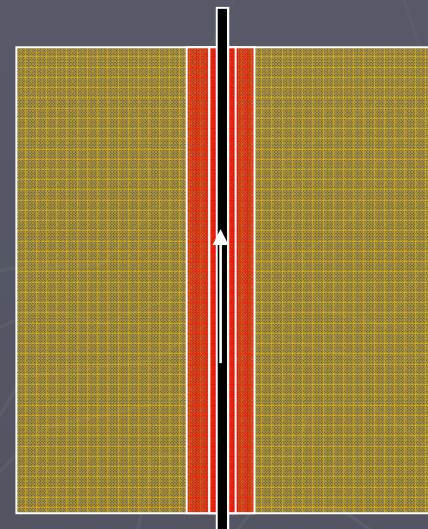
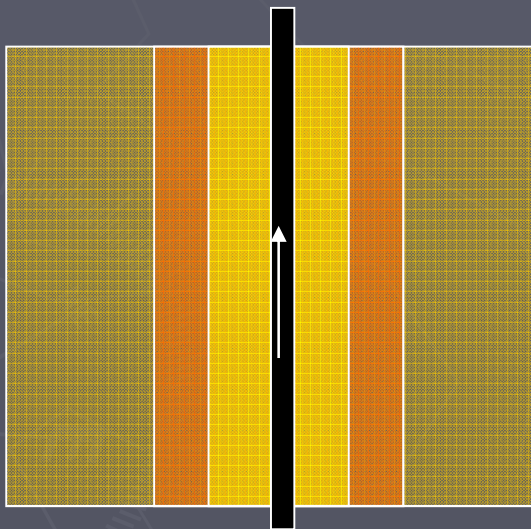
Figure 1. A Traditional Route and Path²

A route and path and up to 5 metres either side...

Why 5 metres?

Track Offset Data

Taken from Lost Person Behaviour,
Robert Koester



New Route & Path

The search of a route, path or track. Typically done as part of a hasty search (although can be done by TL s at the start of an *Efficient* search of a sector.) Searchers will quickly move along the R&P searching either side of the track. Whilst traditionally defined as “up to 5 metres either side” modern thinking allows TL s greater flexibility to search potential areas whilst maintaining the pace of the search.

Taken from UKLSI Basic Search
Techniques Course Notes –
Johnnie Walker

Questions?

