

Lost Person Behavior



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Unit 3: Introduction to Lost Person Behavior

Date Last Updated February 20, 2020 [crosschecked]

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Lost? Missing?

- Hiker underestimates time on trail, doesn't get home for dinner as planned, spouse calls 911.
- 82 year old with dementia wanders away from home.
- Hiker follows a game trail off trail into the woods.
- 4 year old wanders out of their home range
- Despondent parks their car and walks to a rocky overlook.



(Reviewing from Unit 1)

For each person:

Are they lost?

Missing?

Is it an emergency?

Lost

- You feel like:
 - You don't know where you are
 - You don't know how to get to where you want to be



What is lost?

Your point of view.

Missing – someone else doesn't know where you are.



Who's been lost?

What does it feel like?

Discuss. (take up to about 10 minutes)

This was a picture taken while lost. Caption reads: "After walking a while we hit a dead end. We decided, instead of turning back along the path, to trudge through the undergrowth as we thought it was close to linking in to the path at the other side. It certainly wasn't close to the other path and we ended up having to trudge through masses of undergrowth and a very dense forest before eventually getting lost at the edge of the wood. "
-- Neil Willamson

Response to being Lost

- Error at a decision point
- Fuzzy feeling that something isn't quite right
 - Denial
 - Early recognition of problem, more likely to backtrack.
- Panic Reaction
 - High Stress level
 - Reduced Performance at complex tasks (navigation)
- Anger to Bargaining to Acceptance
- Survival Strategy or Self Rescue Strategy



You act like you are lost if you feel lost.

Behaviors (Ken Hill)

- random traveling
- direction traveling
- route sampling
- direction sampling
- view enhancement
- backtracking
- using folk wisdom
- staying put



Lost people try things to get unlost.

Ineffective Strategies

- Discard Gear (75% injured or dead [n=4])
- Do Nothing (44% injured or dead)
- View Enhancing (33% injured or dead)
- Travel Cross Country (33% injured or dead)
- Wander (33% injured or dead)

Data from New Zealand Study



Some things don't work well.

New Zealand data.

View (and cellphone signal) enhancing is a strategy some experienced hunters and hikers use. In New Zealand it isn't a good strategy.

Strategies

- Seek Shelter (8% injured or dead)
- Route or Direction Sampling (11% injured)
- Travel towards landmark (15% injured or dead)
- Backtracking (16% injured or dead)
- Staying Put (24% injured or dead)
- Following a travel aid (25% injured or dead)
- View or Cellphone signal enhancing

Data from New Zealand Study



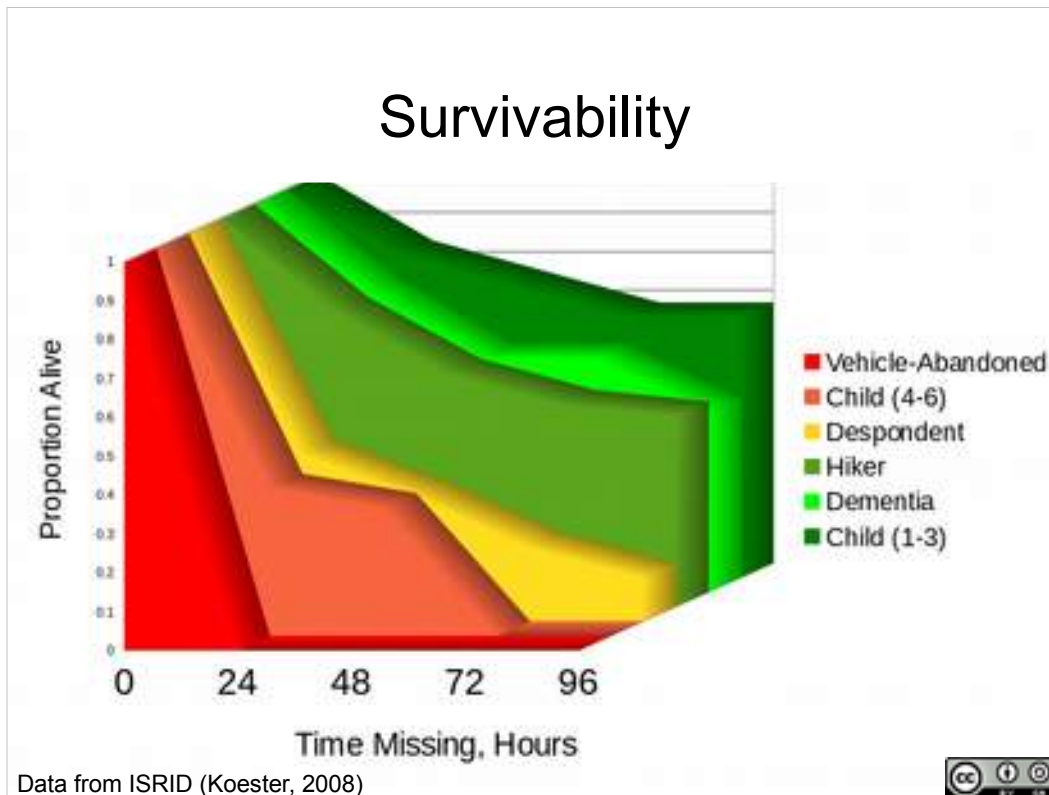
Some strategies are more effective – seeking shelter and direction sampling both seen as more effective.

Behaviors in Yosemite (74 cases)

- **Route Traveling** 41.9%
- Staying Put 25.7%
- Backtracking 16.2%
- Random Traveling 5.4%
- View Enhancing 4.1%
- Route Sampling 2.7%
- Direction Traveling 2.7%
- Doing Nothing 1.4%



Route traveling common amongst lost persons in Yosemite.



Survivability varies substantially with subject category.

Vehicle, abandoned very high risk.

Child 4-6 very high risk.

Child 1-3 much lower risk.

Factors Affecting Survivability

- Time
 - Most significant relationship
- Clothing, Equipment, Mental State, Fitness
 - Some relationship
- Experience, Survival Training
 - Minimal or no relationship



Time has greatest effect on survivability.

Experience and survival training have minimal to no relationship to survivability.

Lost Person Behavior Research

- 1973, Dennis Kelley: 308 cases, Colorado
- 1977, William Syrotuck: 229 cases, NY, WA
 - First subject categories
- 1985, Barry Mitchel: 3511 cases, CA, CO, East US
 - Regional differences
- 1986, Ken Hill – Behaviors when lost
- 1992, Robert Koester – Alzheimer's, VA
- 1997, Heth & Cornel – Dispersion
- 2011, Perkins, Roberts & Feeney: 1271 cases, UK
- 2012, Robert Koester: 16,863 cases ISRID



Long history of research on the behavior of lost persons.

ISRID: International Search & Rescue Incident Database



- Global Data Set
- Compiled by Robert Koester
- Initial 2002 funding from USDA
- 2008 (Lost Person Behavior book): 31,100 cases
- 42 Behavior Categories
- 2014 > 60,000 cases
- 2017 > 145,000 cases



Key tool in studying lost person behavior is ISRID.

Summarize some of Robert Koester's findings from there.

Statistically observed behaviors All differ among categories

- Distance from IPP to Find
- Travel Uphill or Downhill
- Time mobile (generally hours)
- Where found (structures, brush, woods, etc)
- Distance found from Roads/Tracks



Identifying a behavioral category for a lost person is important – people in different behavioral categories have statistically different behaviors.

Behaviors and Search Tactics

- Active or passive tactics?
- Call the Subject's Name?
- Where to search
 - Where to put field searchers?
 - Where do the field searchers look in their segment/route?
 - Investigative directions to elicit planning data.
- Decision points (map and field)



Subject behavioral category can suggest approaches to search – at both the larger planning scale and in the tactics to employ by searchers in the field.

Related idea is decision points – identifying places where the subject may have gone wrong and analyzing where they might have gone after an error at a decision point.

Some Categories

- Child 1-3
- Child 10-12
- Autism Spectrum Disorder
- Dementia/Alzheimer's
- Despondent
- Hiker
- Hunter
- Abduction



Categories have refined over time, here are some common ones distinguished in ISRID.

We'll walk through these categories.

Child (1-3)



- Tend to be very close to the IPP
- Tend to shelter/hide in structures, brush, inside logs – look anywhere they can fit.
- Check anywhere they may fit within abandoned vehicles.
- Often drawn to animals or water.
- Can sleep through loud noises.

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Very young children don't tend to travel far.

They tend to shelter/hide/curl up and sleep somewhere small.

Look anywhere they may fit.



Will shelter and hide anywhere they can fit. Will shelter in a hollow log in the back yard.

Can go to sleep and sleep through searchers walking right past them calling their name.



Check any place a missing child may fit.

Check Structures



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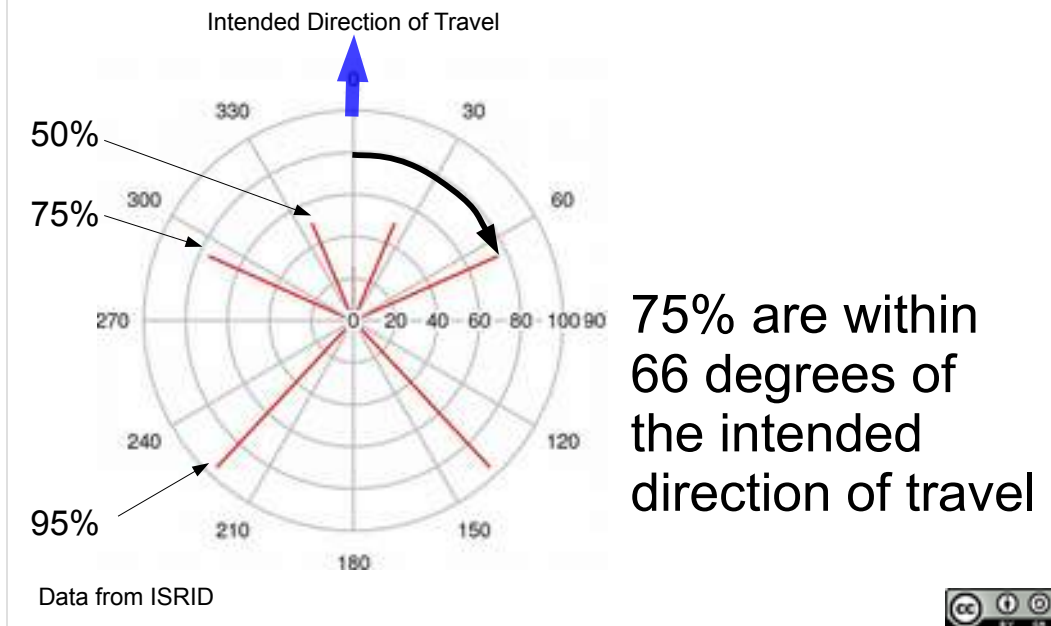


Abandoned vehicles, structures, old appliances, etc.

Anywhere they may fit.

Many categories of lost person are found in structures.

Dispersion Angle: Child (1-6)



Top of circle is intended/last known direction of travel from IPP. Red lines indicate proportion of subjects found within that angle from the direction of travel.

50% within about 30 degrees.

75% within 66 degrees

95% within about 140 degrees – a small portion found off in the opposite direction.

Check Structures (Temperate)

- Mental Retardation: 34%
- Child (1-3): 29%
- Child (4-6): 29%
- Child (7-9): 29%
- Child (10-12): 29%
- Abduction: 29%
- Despondent: 26%
- Child (13-15): 25%
- Worker: 25%



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Structures are a pattern for many subject categories, including all children.

Check Structures (Urban)

- Child (13-15): 80%
- Mental Retardation 57%
- Child (4-6): 56%
- Child (7-9): 56%
- Child (10-12): 56%
- Child (1-3): 50%
- Despondent: 47%
- Dementia: 35%
- Hiker: 24%



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Even more pronounced in urban/suburban areas.

Less often found in structures

- Dementia: 20%
- Mountain Biker: 14%
- Snowmobiler: 14%
- Hiker: 13%
- Hunter: 8%
- Runner: No cases (small sample size)
- Skier – Nordic: No cases (small sample size)



A few subject categories are less likely to be found in structures.



Let's look at children 10-12.

Child (10-12)

- Often adventuring, exploring, fantasy play,
- Often take shortcuts.
- Often make mistakes at decision points.
- May be well outside home range.
- Signcut and evaluate field decision points.
- Check anywhere they may fit within abandoned vehicles.



Very mobile and explore.

Can be well outside their usual home range. Home range as reported by the parents is usually an underestimate.

Look for decision points.

Check structures, check abandoned vehicles.



Substance Abuse

Substance Abuse

- Often investigative finds (29%)
- Very high mortality rate (42% Urban)
- Typically poorly dressed for the weather
- Point last seen often a bar or party, subject leaving on foot
- **Often drawn to water**



About a third not lost but found through investigation.
Tend to be poorly dressed. High mortality rate.
Typical pattern: seen at a bar or party, left on foot.

Often drawn to water.

Autism Spectrum Disorder

- **Attracted to lights, water, reflections**
- May be attracted to animals, transportation.
- May have catastrophic reaction if overstimulated.
- Often in structures.
- Very unlikely to respond to searchers.



Autism Spectrum Disorder.

General pattern of attraction to lights, water, reflections. Check nearby water.

May have specific attractor, often transportation related or animal related.

Unlikely to respond to searchers calling their name.

Upon a find, minimize noises (radio volume), number of people, and work to provide a calm, quiet environment.

Dementia

- Stop moving within hours
- Very unlikely to respond to searchers calling their name
- Tend to leave few clues other than sign
- Often in drainages, creeks, or brush
- May be stuck in dense brush.
 - **Keep going until they get stuck**
- Tend to leave or cross roads
- May have catastrophic reaction



Characteristic of critical elderly wanderers:

They keep going until they get stuck.

Like Autism Spectrum Disorder, upon a find, minimize noises (radio volume), number of people, and work to provide a calm, quiet environment.

Dementia

- IPP is residence or nursing home
- Oriented to the past
 - May attempt to travel to former place of work
 - May attempt to travel to former home
- May have wandered before
- May use public transportation
- **Look for decision points where the route turns but the subject could have kept going straight.**



Tend to be oriented to the past and may be thinking they are going to work or going home or going to church, or some activity that they used to do frequently.

They may use public transportation, even if they don't have money for a fare (some nice person may have paid the fare for the little old lady or gentleman...).

Tend to cross and leave roads – more generally, tend to travel straight unless they encounter a barrier.



Characteristic picture.

Unsteady on their feet, so they tend to look down.

Dementia tends to affect short term memory – thus affects the ability to use landmarks for navigation (look up, see the landmark, look back down and forget it).

Effects of Dementia on Navigation

- Short term memory problems Can't see or recall Landmarks
- Reduction in Peripheral Vision
- Difficulty judging passage of time Can't estimate Distances
- Reduced visual-spatial skills Poor sense of Direction



LOST



Dementia tends to affect sense of time – what's the main thing we use to estimate distance traveled?
Time traveled.

Dementia tends to degrade the ability to navigate – less able to use landmarks, less able to estimate distances traveled, reduced sense of direction.

All lead to more easily becoming lost.



Exercise to help understand navigation in critical elderly wanderers – look down (unsteady on feet), hold your hands on either side of your eyes (reduced peripheral vision), walk, keeping looking down (unable to remember landmarks).

Here are students in a lost person behavior class doing this exercise at a location that was the IPP for a missing couple with dementia. The gravel road turns right up ahead at a junction to a trail leading into the woods. Everyone in the class went straight onto the trail (as the lost couple did).

Look for, examine for sign, and report, field decision points where a subject with dementia could have gone straight and missed a turn in a travel route.

They go until they get stuck



Hallmark pattern. Travel in a straight line until they can't go any further.

How Far?

North East, less than 1000 feet relief:
Temperate Flat

175 cases (global – dementia, temperate flat)

25% within 0.2 miles

50% within 0.6 miles

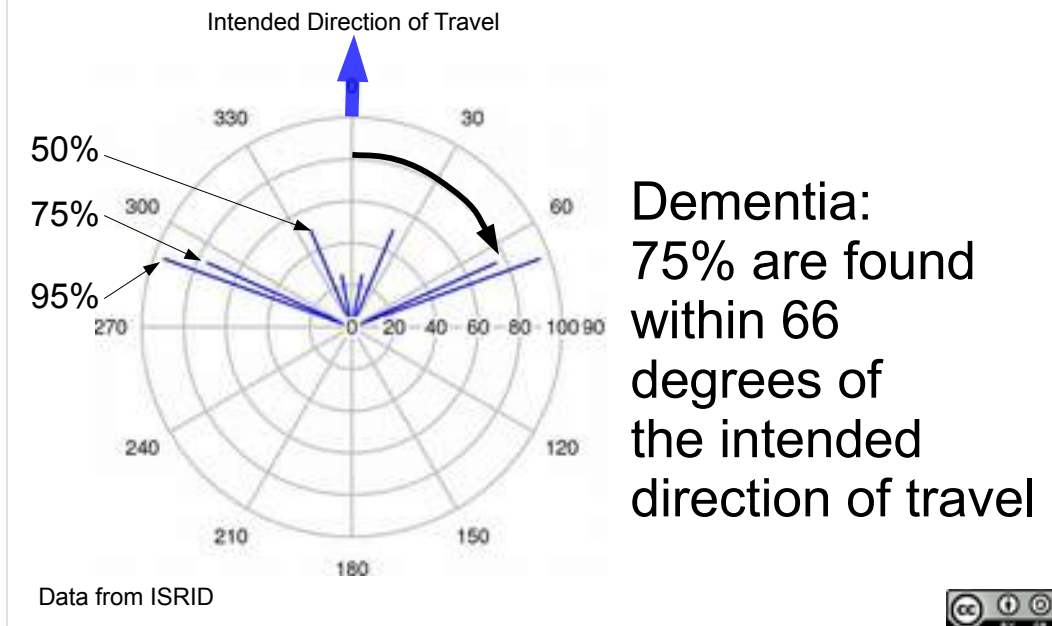
75% within 1.5 miles

95% within 7.9 miles



Critical elderly wanderers will travel much farther than caregivers think they can.

Direction of travel is strong predictor



75% within 66 degrees of intended direction of travel.

The door they exited from is a very strong predictor of where they will be found.

Despondent



Despondents

Find Location

- Temperate
 - Structure (26%)
 - Woods (25%)
 - Water (15%)
- Urban
 - Structure (47%)
 - Water (19%)

Most likely:

On a trail, path, or at their destination.

Survivors often in structures.

Often at interface between terrains.

Rarely in Brush

Seldom respond to searchers.



Often just out of sight at an interface between different sorts of land cover (just inside the tree line at the edge of an open area, on the shoreline of a lake).

Tend to be missing, not lost.

Check structures.

Two Patterns

- Get Just out of Sight
 - Urban 50% within 100 meters of IPP
 - Often at urban/rural interface or at treeline
- Travel to Scenic or Significant (to them) Location
 - Viewpoints
 - Just out of sight at that destination

Temperate less than 1000 feet relief: 50% within 0.7 miles of IPP
Temperate more than 1000 feet relief: 50% within 0.5 miles of IPP
Urban, 50% within 0.5 miles of IPP



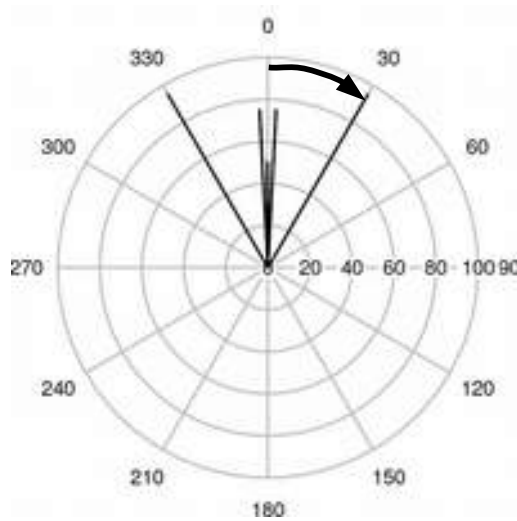
Two typical patterns:

Just out of sight at the IPP.

or

Traveled to a significant place and just out of sight there.

Dispersion Angle: Despondent



95% within
30 degrees
of intended
direction
of travel

Data from ISRID



Direction of travel is very strong predictor of find location, 95% within 30 degrees.



Hunters (rifle,shotgun,primitive,bow)

Hunting tactics (and resulting navigation behaviors) will vary.

Hunter

- Mostly (70%) Lost
 - May be focused on game, not navigation.
- Often travel at night (40 to 80%)
- Likely to follow a self rescue strategy
- May be comfortable sheltering overnight
 - Particularly older and more experienced hunters
- Follow both linear features and terrain.
- Type of hunter (Bow/Shotgun/Rifle) and game (Deer, Wildfowl, Bear, etc) very important.

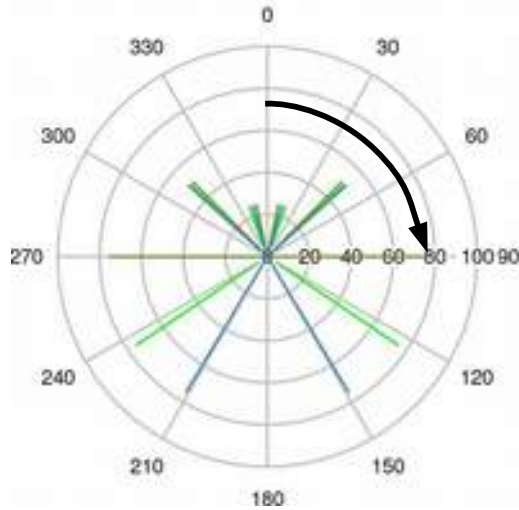


Pursuit of game and nightfall most common causes of becoming lost.

In following game, may get into very dense brush, boulder fields, dense forest, etc.

Go to great lengths to self rescue.

Dispersion Angle (Hunter, Nordic Skier, Snowmobile, Hiker-dry)



Hunter:
75% within
175 degrees
of intended
direction
of travel

Intended direction of travel is poor predictor of find location.

Data from ISRID



May be anywhere – intended direction of travel is poor predictor of find location.

Some other classes of lost person have similar lack of predictability of direction of travel (cross country skiers, snowmobilers, hikers)



Hikers

Follow trails.

As ground searchers, you are expected to have a higher level of skill and be able to navigate effectively off trail. Hikers may well not have off trail navigation skills.

Hiker

- Tend to be on or close to trails or linear features
 - Off trail, often follow terrain onto linear features
- Mostly (68%) Lost
 - Errors at decision points
 - Errors where trails are obscure (field decision points)
 - Leaving trail for game trail
 - Leaving trail for herd path
 - Leaving trail to cut switchbacks
 - Taking wrong direction on trail
- Some (16%) Overdue, errors in estimating time or physical fitness
- Often (30 to 40%) travel at night



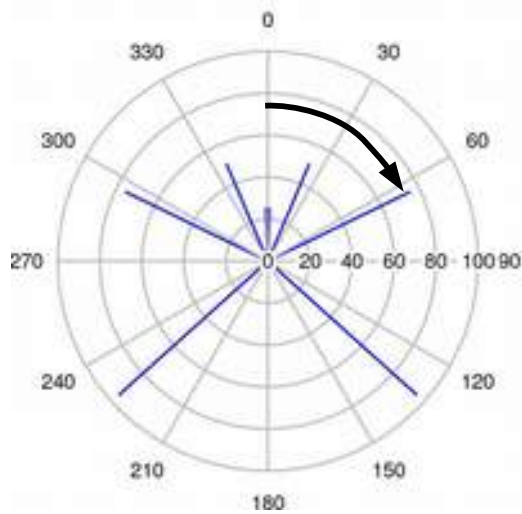
Get into trouble when they get off the trail.

Decision points are very important for missing hikers
– pay particular attention to field decision points
(check for sign, report).



Can be very easy to get off trail – above tree line, in places where trail system is poorly marked, etc.

Dispersion Angle: Hiker



Hiker:
75% within
64 degrees
of intended
direction
of travel
(Temperate)

Intended direction of travel is moderate predictor of find location.

Data from ISRID



Intended direction of travel is poor predictor of find location.

Abduction

- Red Flags
 - White Female, age 5-12
 - Missing from a familiar location
 - Hasn't done this before (no history of running away)
 - No explanation for disappearance
- Rapid Law Enforcement Response is Critical
- Only 16% are found alive



Abduction – stranger abductions.

Multiple Crime Scenes

- PLS
- Initial contact site
- Assault site
- Murder site
- Dump site
 - Body likely to be concealed
 - Likely to be in a different jurisdiction from the PLS.
50% are within 10 miles of PLS.



Abductions have four characteristic crime scenes – the location where the subject was initially contacted by the perpetrator, the site where the perpetrator committed the assault, the murder site, and the site where the perpetrator dumped the body. More than one event may have occurred at the same place.

Be alert for all of these and for clues at each in a known or potential abduction.



Potential Dump Site
Turnoff, near water, near main road,
downhill, out of sight.

Typical pattern for dump sites in abductions.

Dump Site

- Turnoff – within 1/2 mile of a junction
- Near a main road
- Vehicle Access – within 300 feet of vehicle
- Near water or in the water
- Downhill (if there is a slope)
- Remote location: Out of sight



Search carefully for clues and sign at locations with the characteristics of typical dump sites.

Some Other Categories

- Climbers (day climbers, mountaineers)
 - Weather, hazards often involved.
- Gatherers
 - Typically looking for a very specific habitat
- Mental Illness
 - Often Evade Searchers – May attack Searchers
- Camper (Car Camper)
 - Poorly marked trails near campground
 - Often overdue



Plenty more categories.

Distances of Find from Linear Features (50% distance)

- **Autistic :** **15 meters**
- **Dementia:** **15 meters**
- **Mental Retardation:** **15 meters**
- Despondent: 50 meters
- Hiker: 100 meters
- Hunter: 100 meters
- Worker: 2500 meters (small number of cases)



Track offset – some categories are often close to travel routes.

Some tend to be off trail.

Approaching the Subject

Particularly autistic and dementia:

- **May have catastrophic reaction**
- Simplify the environment
 - Reduce noise, turn down radios, etc.
- Approach from the front
- Make eye contact
- Ask simple direct questions.



When you make a find, be cautious approaching the subject.

Learning More:

- Robert Koester's Book: "Lost Person Behavior."
- Robert Koester's Lost Person Behavior course.

Robert Koester has good resources on lost person behavior – applicable to both search management and field tactics.

Practical Evolution 1. Walking like a person with dementia.

The material in this unit draws heavily from the writings of Robert Koester. His research and teaching in the field of Lost Person Behavior is very gratefully acknowledged.



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